KENTUCKY-AMERICAN WATER COMPANY, INC.

CASE NO. 2018-00358

DIRECT TESTIMONY

OF

PATRICK L. BARYENBRUCH

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BACKGROUND

Q. Please state your name and business address.

A. Patrick L. Baryenbruch, 2832 Claremont Road, Raleigh, North Carolina 27608.

Q. Please describe your educational and professional background.

A. I received a Bachelors degree in Accounting from the University of Wisconsin-Oshkosh and a Masters in Business Administration degree from the University of Michigan.

I am a Certified Public Accountant (CPA) with active licenses from the state of Wisconsin (license number 5343-1) and North Carolina (reciprocal license number 41832). I am a Certified Information Technology Professional (CITP), an accreditation awarded by the American Institute of Certified Public Accountants to CPA professionals who demonstrate expertise in Information Technology management. I also hold a Global Information Assurance Certification (GIAC) in cybersecurity from the SANS Institute. I am a member of the American Institute of Certified Public Accountants and the North Carolina Association of Certified Public Accountants.

I began my career with Arthur Andersen & Company where I performed financial audits of utilities, banks and finance companies. After three years I left to pursue an M.B.A. degree. Upon graduation from business school, I worked

with the consulting firms of Theodore Barry & Associates and Scott Consulting Group (predecessor firm to Scott, Madden & Associates).

During my consulting career, I have performed consulting assignments for approximately 50 utilities and 10 public service commissions. I have participated as project manager, lead or staff consultant for 24 commission-ordered management and prudence audits of public utilities. Of these, I have been responsible for evaluating the area of affiliate charges and allocation of corporate expenses in the Commission-ordered audits of Connecticut Light and Power, Connecticut Natural Gas, General Water Corporation (Pennsylvania Operations), Philadelphia Suburban Water Company (now Aqua America) and Pacific Gas & Electric Company.

My firm has performed the commission-ordered audit of Southern California Edison's 2002, 2003, 2004 and 2005 transactions with its non-regulated affiliate companies.

Q. What are your duties and responsibilities in your current position?

A. I am the President of my own consulting practice, Baryenbruch & Company, LLC, which was established in 1985. In that capacity, I provide consulting services to utilities and their regulators.

Q. Please describe the reason for your testimony in this case.

A. I am presenting the results of my study, which evaluated the services provided by American Water Works Service Company, Inc. (Service Company) during the 12 months ended August 31, 2018 (review period) to Kentucky American Water

Company (KAWC). This study was undertaken in conjunction with KAWC's rate case and is accurate to the best of my knowledge and belief. The study is attached as Exhibit PLB-1.

Q. What were the objectives of your study?

A. This study was undertaken to answer four questions concerning the services provided by the Service Company to KAWC, each of which bears on the reasonableness of those charges as incurred during the review period. First, were the Service Company's charges to KAWC during the review period reasonable? Second, was KAWC charged the lower of cost or market value for managerial and professional services provided by the Service Company during the review period? Third, were review period costs of the Service Company's customer accounts services, including those of the National Call Centers, comparable to those of other utilities? Fourth, are the services KAWC receives from the Service Company necessary?

Q. What conclusions were you able to draw concerning question number 1, whether the Service Company charges to KAWC were reasonable?

A. The Service Company's review period cost per KAWC customer is reasonable compared to cost per customer for electric and combination electric/gas service companies. During the review period, KAWC was charged $67 per customer for administrative and general (A&G)-related services provided by the Service Company. This compares to a 2017 average of $107 per customer for service companies reporting to the Federal Energy Regulatory Commission (FERC).

Seventeen of the 24 utility service companies that filed a FERC Form 60 for 2017 had a higher per-customer A&G cost than KAWC's charges from the Service Company.

Q. What conclusions were you able to draw concerning question number 2, whether KAWC was charged the lower of cost or market services provided by the Service Company?

A. I was able to draw the following conclusions:

(1) KAWC was charged the lower of cost or market for managerial and professional services during the review period.

(2) On average, the hourly rates for outside service providers are 44% higher than the Service Company's hourly rates.

(3) The managerial and professional services provided by the Service Company are vital and could not be procured externally by KAWC without careful supervision on the part of KAWC. If these services were contracted entirely to outside providers, KAWC would have to add at least 1 position to manage activities of outside firms. This position would be necessary to ensure the quality and timeliness of services provided.

(4) If all the managerial and professional services now provided by the Service Company had been outsourced during the 12 months ended August 31, 2018, KAWC and its customers would have incurred almost $3 million in additional expenses. This amount includes the higher cost of outside providers and the cost of 1 KAWC position needed to direct the outsourced work.

(5) This study's hourly rate comparison actually understates the cost advantages that accrue to KAWC from its use of the Service Company. Outside service providers generally bill for every hour worked. Service Company exempt personnel, on the other hand, charge a maximum of 8 hours per day even when they work more hours. If all overtime hours of Service Company personnel were factored into the hourly rate calculation, the Service Company would have had an even greater annual dollar advantage than the $3 million cited above.

(6) It would be difficult for KAWC to find local service providers with the same specialized water and wastewater industry expertise as that possessed by the Service Company staff. Service Company personnel spend substantially all their time serving operating water and wastewater companies. This specialization brings with it a unique knowledge of water and wastewater utility operations and regulation that is most likely unavailable from local service providers.

(7) Service Company fees do not include any profit markup. It assigns only its actual expenses to the American Water subsidiaries it services, including KAWC.

Q. What conclusions were you able to draw concerning question number 3, whether the review period costs of the Service Company's customer account services, including those of the National Call Centers, were reasonable?

A. The cost of the Service Company's customer accounts services, including those provided by the National Call Centers, is below the weighted average of the neighboring electric utility comparison group. As will be explained further herein, this group of companies provides a reasonable proxy group for comparison to a regulated utility of the size and scope of the Service Company and KAWC. During the 12 months ended August 31, 2018, the cost of customer accounts services for KAWC customers was $27.26 compared to the 2017 average of $28.37 for neighboring electric utilities. The highest comparison group per-customer cost was $46.73 and the lowest $12.15.

Q. What conclusions were you able to draw concerning question number 4, whether the services KAWC receives from the Service Company are necessary?

A. I was able to draw the following conclusions:

(1) The services that the Service Company provides are necessary and would be required even if KAWC were a stand-alone water utility.

(2) There is no redundancy or overlap in the services provided by the Service Company to KAWC.

Q. Does this complete your testimony?

A. Yes.

VERIFICATION

STATE OF NORTH CAROLINA)
) **SS:**
COUNTY OF WAKE)

The undersigned, **Patrick L. Baryenbruch**, being duly sworn, deposes and says he is the President of Baryenbruch & Company, LLC, that he has personal knowledge of the matters set forth in the foregoing testimony, and the answers contained therein are true and correct to the best of his information, knowledge, and belief.

Patrick L. Baryenbruch
PATRICK L. BARYENBRUCH

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 15 day of November, 2018.

Shanda Overbay (SEAL)
Notary Public

My Commission Expires:
5-10-21

SHANDA OVERBAY
Notary Public
Wake Co., North Carolina
My Commission Expires May 10, 2021

Market to Cost Comparison of Service Company Charges to Kentucky American Water Company

12 Months Ended August 31, 2018

November 2018

Kentucky American Water Company
Market to Cost Comparison of Service Company Charges
12 Months Ended August 31, 2018

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Purpose of This Study

This study was undertaken to answer four questions concerning the services provided by American Water Works Service Company, Inc., (Service Company) to Kentucky-American Water Company (KAWC):

1. Were the Service Company's charges to KAWC during the 12 months ended August 31, 2018, reasonable?

2. Was KAWC charged the lower of cost or market for managerial and professional services provided by the Service Company during the 12 months ended August 31, 2018?

3. Were the 12 months ended August 31, 2018 costs of Service Company's customer accounts services, including those of the National Call Centers, comparable to those of other utilities?

4. Are the services KAWC receives from the Service Company necessary?

Study Results

Concerning question 1, the following conclusion was reached:

- The Service Company's 12 months ended August 31, 2018 cost per KAWC customer is reasonable compared to costs per customer for electric and combination electric/gas service companies. During the 12 months ended August 31, 2018, KAWC was charged $67 per customer for administrative and general (A&G)-related services provided by the Service Company. This compares to a 2017 average of $107 per customer for service companies reporting to the Federal Energy Regulatory Commission (FERC). Seventeen of the 24 utility service companies that filed a FERC Form 60 for 2017 had higher per customer A&G costs than KAWC's charges from the Service Company.

Concerning question 2, the following conclusions were drawn from this study:

- KAWC was charged the lower of cost or market for managerial and professional services during the 12 months ended August 31, 2018.

- On average, the hourly rates for outside service providers are 44% higher than the Service Company's hourly rates.

- The managerial and professional services provided by the Service Company are vital and could not be procured externally by KAWC without careful supervision on the part of KAWC. If these services were contracted entirely to outside providers, KAWC would have to add at least 1 position to manage activities of outside firms. This position would be necessary to ensure the quality and timeliness of services provided.

- If all the managerial and professional services now provided by the Service Company had been outsourced during the 12 months ended August 31, 2018, KAWC and its customers would have incurred almost $3 million in additional expenses. This amount includes the higher cost of outside providers and the cost of 1 KAWC position needed to direct the outsourced work.

- This study's hourly rate comparison actually understates the cost advantages that accrue to KAWC from its use of the Service Company. Outside service providers generally bill

for every hour worked. Service Company exempt personnel, on the other hand, charge a maximum of 8 hours per day even when they work more hours. If all overtime hours of Service Company personnel were factored into the hourly rate calculation, the Service Company would have had an even greater annual dollar advantage than the $3 million cited above.

- It would be difficult for KAWC to find local service providers with the same specialized water and wastewater industry expertise as that possessed by the Service Company staff. Service Company personnel spend substantially all their time serving operating water and wastewater companies. This specialization brings with it a unique knowledge of water and wastewater utility operations and regulation that is most likely unavailable from local service providers.

- Service Company fees do not include any profit markup. It assigns only its actual expenses to the American Water subsidiaries it services, including KAWC.

Concerning question 3, the following conclusion was reached:

- The cost of the Service Company's customer accounts services, including those provided by the National Call Centers, is below the weighted average of the neighboring electric utility comparison group. As will be explained further herein, this group of companies provides a reasonable proxy group for comparison to a regulated utility of the size and scope of the Service Company and KAWC. During the 12 months ended August 31, 2018, the cost of customer accounts services for KAWC customers was $27.26 compared to the 2017 average of $28.37 for neighboring electric utilities. The highest comparison group per-customer cost was $46.73 and the lowest $12.15.

Concerning question 4, the following conclusions were drawn:

- The services that the Service Company provides are necessary and would be required even if KAWC were a stand-alone water utility.

- There is no redundancy or overlap in the services provided by the Service Company to KAWC.

Overview of American Water Works Service Company

American Water's Service Company exists to provide certain shared services to American Water subsidiaries. It follows a service company model used by many utility holding companies that own multiple regulated utilities. By consolidating executive and professional services into a single service company, utility holding companies are able to realize the following benefits for customers:

- Purchasing Economies – Common expenses (e.g., insurance, chemicals, piping) can be procured on a much larger scale, thereby providing greater bargaining power for the combined entity compared to individual utility operating companies. A service company facilitates enterprise-wide purchasing programs through its procurement and contract administration functions.

- Operating Economies of Scale – A service company is able to deliver services more efficiently because workloads can be balanced across more persons and facilities. For instance, American Water's Service Company is able to maintain one principal data center for the entire organization. This is much more cost-efficient than each operating utility funding its own data center with large fixed hardware, software and staffing costs.

- Continuity of Service – Centralizing service company personnel who perform similar services facilitates job cross-training and sharing of knowledge and expertise. This makes it easier to deal with staff turnover and absences and to sustain high levels of service to operating utilities. An individual operating utility might experience considerable disruption if a key professional left and it were necessary to hire outside to fill the vacancy.

- Maintenance of Enterprise-Wide Guidance – Personnel in American Water's Service Company establish guidance for many functions (e.g., engineering designs, operating procedures and maintenance practices). It is easier to align operating utility operations because their implementation is supported by the Service Company.

- Improved Support and Guidance – American Water's Service Company provides another dimension of management and financial support and guidance that supplements local operating utility management. The Service Company facilitates standard planning and reporting, which helps ensure that operating utilities meet the requirements of their customers in a cost-effective manner.

- Retention of Personnel – A service company organization provides operating utility personnel with another career path beyond what may be available on a local level. These opportunities tend to improve employee retention.

American Water follows the model for other utility service companies in another important regard: Its services are provided to affiliate operating utilities, like KAWC, at cost. American Water's Service Company is not a profit-making entity. It assigns only its actual expenses to the American Water subsidiaries it services.

The Service Company provides services to American Water operating companies from the following locations:

- Corporate Headquarters – Provides corporate governance and service functions, including executive management, finance, external affairs, human resources and benefits. The corporate headquarters was located in Voorhees, New Jersey during the review period and has relocated to Camden, New Jersey. Service Company employees and functions that were located in the Mount Laurel and Woodcrest offices during the review period (see below) are now located at the corporate headquarters.

- Central Lab – The national trace substance laboratory is located in Belleville, Illinois, and performs testing for all American Water operating companies.

- Customer Service Centers – Provides customer call center and billing services from two locations: Alton, Illinois, and Pensacola, Florida.

- Customer Relations Centers – Provides customer relations and field resource coordination services from two locations: Belleville, Illinois, and Wilkes Barre, Pennsylvania.

- Hershey Technology & Innovation (T&I) Services Center –The T&I Center in Hershey, Pennsylvania supports the technology infrastructure required to run corporate and operating company business applications and communications systems for American Water's operating companies. American Water's primary data center used to be located in Hershey but has been transitioned to an IBM facility in Sterling Forrest, New York.

- Haddon Heights Technology & Innovation Services Center – American Water's data center, located in Haddon Heights, New Jersey, maintains data servers for back-up and disaster recovery.

- Mount Laurel Office – Provides corporate service functions, including engineering and supply chain services. The office is located in Mount Laurel, New Jersey but the staff will move into the new corporate headquarters in Camden, New Jersey by the end of 2018,

- Woodcrest Office – The Woodcrest Office, located in Cherry Hill, New Jersey, provides individual operating companies with accounting, audit, tax, regulatory and security services. The Woodcrest office, American Water's main Technology & Innovation Services (T&I) center for employees, provides software delivery and enhancements for SAP and non-SAP (legacy) systems, provides local on-site support as well as the T&I Service Desk for remote assistance for all employees using personal computers in the performance of their day-to-day activities, supports mission-critical systems such as SCADA as well as emerging technologies such as geographic information systems and mobility and provides technical expertise in project governance and release management while ensuring compliance with all governmental regulations. Staff in the Woodcrest Office will relocate to the new corporate headquarters in Camden, New Jersey by the end of 2018.

- Divisional Support Services – Operating companies are provided with certain support services that are delivered more effectively on a regional basis because individual operating company workloads are not sufficient to warrant maintaining their own full-time staff for these activities. These services require closer proximity to operating

companies and therefore are located closer to the operating companies the employees provide service to instead of one of the corporate locations.

Service Company Accounting

Service Company maintains an accounting ledger for recording transactions (e.g., labor, expenses, overhead, capital and other assets, liabilities and equity) in a Service Company ledger separate from Affiliates' ledgers. Monthly financial statements are prepared that summarize month-to-date and year-to-date costs, budgets and prior year comparison, with variances and explanations, by category and function. Accounting categories by transaction type are described below:

- Service Company Labor: The Service Company utilizes a system that tracks time and attendance. Employees electronically enter hours worked (including vacation, sick, family leave, etc.) and accounting information (e.g., business unit; formula; pay type) and electronically submit the timesheet for approval. Submitted timesheets are electronically routed to authorized approvers. Time sheets require approval (of hours and accounting information such as formulas, etc.) by an authorized timesheet approver in the employee's home business unit.

- Service Company Expenses: Expenditures (i.e., standard invoices, purchase orders, electronic disbursements, miscellaneous invoices, recurring invoices, recurring vouchers, and procurement cards) and journal entries require a preparer to enter accounting coding details (e.g., cost center, cost element and Work Breakdown Structure (WBS)) and a reviewer to approve the information in accordance with the corporate Delegation of Authority Policy. Expenditures are processed electronically and are automatically routed to the employee's supervisor for approval. Costs are posted many times daily, in detail, in the business unit selected. Journal entries are submitted as prepared to the appropriate reviewer and posted as approved.

- Service Company Assets: Service Company assets are procured directly by Service Company or through a capital leasing arrangement with Laurel Oak Properties (LOP). Service Company capitalizes these LOP leases as Non-Utility Plant assets in accordance with generally accepted accounting principles. Generally speaking, Service Company assets (including hardware, servers, laptops, desktops, storage racks, furniture, laboratory and test equipment, security cameras, monitors and leasehold improvements) are acquired through LOP via a capital lease. LOP, on behalf of the Service Company, will acquire the necessary materials and services to build the assets that are needed for the Company to meet its business needs. In the future, a new affiliate, One Water Street (OWS), which owns the Camden headquarters will provide furniture, fixtures and office-related equipment for the first 7 years of the lease with the Service Company.

- Service Company Overhead: Costs for support personnel (e.g., administrative assistants, mailroom clerks), rents, facility expenses, pension, medical insurance, taxes, general office supplies and other similar expenses are recorded in the ledger of the cost center responsible for incurring the charge. Overhead expenditures are posted using the labor and expense processes noted above, and are recorded, in detail, in the ledger of the cost center responsible for the charge using an overhead WBS element.

Service Company Billing and Clearing

Service Company has developed a billing system which charges directly or allocates costs for services provided to Affiliates. Service Company billing is processed monthly and includes all Service Company costs charged to Affiliates using the WBS element selected for each transaction.

- WBS element: Every Service Company transaction (vouchers, journal entries, payroll batch, etc.) requires a WBS element within the account coding string. Each WBS element is configured in the SAP system with the following: Affiliate(s) to be charged, percent of charge to be billed to each Affiliate (total must equal 100%), receiving object (e.g., Affiliate's cost center) for O&M expenses or an Affiliate's WBS element for capital costs. WBS elements are configured in SAP with an end date (month/year) to prevent transactions from using an expired WBS during data input.

- Affiliate Billing Process: Service Company billing is a two-step process that first calculates allocations of transactions for all non-overhead WBS elements. The second step calculates overhead transaction allocations using the ratio of direct labor (Cost Element 5012000) allocations to Affiliates from the first step above multiplied by the pool of overhead expenses by physical location.

- Bill Clearing Process: Service Company billings are cleared through American Water Capital Corporation, Inc. (an affiliate), monthly via an intercompany journal entry to GL Account 23120000 (Notes Payable – Associated Companies) posted on the last day of the month. Payments are estimated for each Affiliate using the prior month actual billing (current month estimate) with adjustment for prior month actual to estimate (previous month funding) true-up.

Service Company Review Period Charges

During the 12 months ended August 31, 2018 (review period"), the Service Company billed KAWC a total of approximately $12.5 million, as shown in the table below. These charges were subjected to a market-to-cost comparison.

	12 Months Ended August 31, 2018
Management Fees - O&M	$ 9,364,402
Management Fees - Capital	$ 3,130,243
Total Service Company Charges	$ 12,494,645

For purposes of comparing these charges to certain outside benchmarks, Service Company services were placed into two categories:

- Managerial and Professional Services – Includes such services as management, accounting, legal, human resources, technology and innovation and engineering.

- Customer Accounts Services – Includes customer-related services, such as call center, credit, billing, collection and payment processing.

Total 12 months ended August 31, 2018 Service Company dollar and hour charges break down between management and professional services and customer account services as follows:

	12 Months Ended August 31, 2018	
	Amount	Hours
Management and Professional Services	$ 10,441,355	45,347
Customer Account Services	$ 2,053,290	41,524
Total Service Company Charges	$ 12,494,645	86,870

Service Company Cost Comparison Approach

This study's first question—whether Service Company 2017 charges were reasonable—was determined by comparing KAWC's A&G-related Service Company charges per regulated retail customer to the same charges for utility companies that must file the Federal Energy Regulatory Commission (FERC) Form 60 – Annual Report of Service Companies.

The second question—whether the Service Company charges during the 12 months ended August 31, 2018 were at the lower of cost or market—was evaluated by comparing the cost per hour for managerial and professional services provided by Service Company personnel to hourly billing rates that would be charged by outside providers of equivalent services. Service Company costs per hour were based on actual charges to KAWC during 2017. Outside providers' billing rates came from surveys or other information from professionals who could perform the services now provided by the Service Company.

The third question—whether Service Company's 12 months ended August 31, 2018 customer account services charges, including National Call Center costs, were comparable to other utilities—was addressed by comparing KAWC's customer accounts services expenses to those of neighboring investor-owned electric utilities. This utility comparison group was selected because the cost of outside providers of customer accounts services is proprietary and not publicly available. Comparison to electric utilities is appropriate because all utilities, regardless of service type, must perform customer account services activities, including updating customer records for meter reads, printing and mailing bills, and collecting and processing customer payments. Electric utility costs are available from the FERC Form 1; thus, there is appropriate data

transparency. The selection of electric utilities from Kentucky and neighboring states provides a comparison group of sufficient size.

The fourth question—the necessity of Service Company services—was investigated by defining the services provided to KAWC and determining if these services would be required if KAWC were a stand-alone utility.

Methodology

Utility service companies deliver a variety of services. Some may support their regulated utility affiliate's operations-related functions (e.g., transmission, distribution). All utility service companies, however, provide A&G services to their affiliates. This is the case because considerable economies of scale derive from centralizing the management of corporate A&G services such as technology and innovation, finance and human resources. Because A&G-related services are consistently delivered by utility service companies, this study uses A&G charges per customer as the metric by which to test the reasonableness of affiliate charges.

KAWC's Service Company A&G Cost per Customer

During the 12 months ended August 31, 2018, KAWC was charged $67 per customer by the Service Company for A&G-related services. The calculation of this amount, shown in the table below, starts with total Service Company charges and adjusts for capital and non-A&G function (e.g., engineering, operations and water quality) charges. These adjustments are necessary to develop a per-customer cost that can be compared to the cost of the utility service company comparison group.

	12 Months Ended August 31, 2018
Total Service Company charges	$ 12,494,645
Less: Capital charges	$ (3,130,243)
Less: Non-A&G charges	
Engineering	$ (104,276)
Operations	$ (286,128)
Water Quality	$ (99,607)
Net A&G Service Company Charges	$ 8,874,391
KAWC Customer Count	133,054
KAWC A&G SC Charges per Customer	$ 67

Comparison Group Cost Per Customer

Every centralized service company in a holding company system subject to regulation by the FERC must file a Form 60 in accordance with the Public Utility Holding Company Act of 2005, Section 1270, Section 390 of the Federal Power Act, and 18 Code of Federal Regulations paragraph 366.23. This report is designed to collect financial information from service companies that are subject to regulation by the FERC.

Charges to utility affiliates for the comparison group service companies were obtained from Schedule XVI – Analysis of Charges for Service Associate and Non-Associate Companies (p. 303 to 306) of each entity's FERC Form 60. Information from Form 60 schedule Account 457 – Analysis of Billing – Associate Companies was also used to isolate and eliminate charges to non-regulated affiliates from the cost pool used to calculate A&G expenses per regulated service customer.

For 2017, a Form 60 was filed by service companies associated with 24 utility holding companies. These service companies support utilities that provide regulated electric and, in some cases, gas service to retail customers.

FERC Form 60 shows service company charges to affiliates by FERC account. The table below shows a list of FERC A&G accounts and designates which correspond to services the Service Company provides to KAWC. Amounts in the designated FERC accounts are included in the calculation of service company A&G expenses per regulated customer.

FERC Account	Included In Cost Calculation
901 - Supervision	X
902 - Meter reading expenses	
903 - Customer records and collection expenses	X
904 - Uncollectible accounts	
905 - Miscellaneous customer accounts expenses	X
907 - Supervision	
908 - Customer assistance expenses	
909 - Informational And Instructional Advertising Expenses	
910 - Miscellaneous Customer Service And Informational Exp	X
911 - Supervision	
912 - Demonstrating and Selling Expenses	
913 - Advertising Expenses	
916 - Miscellaneous Sales Expenses	
920 - Administrative and General Salaries	X
921 - Office Supplies and Expenses	X
923 - Outside Services Employed	X
924 - Property Insurance	X
925 - Injuries and Damages	
926 - Employee Pensions and Benefits	X
928 - Regulatory Commission Expenses	
930.1 - General Advertising Expenses	
930.2 - Miscellaneous General Expenses	X
931 - Rents	X
935 - Maintenance of Structures and Equipment	X

The A&G expenses per regulated utility customer for the 24 utility companies whose service companies filed a Form 60 for 2017 are calculated in Exhibit 1 (page 11).

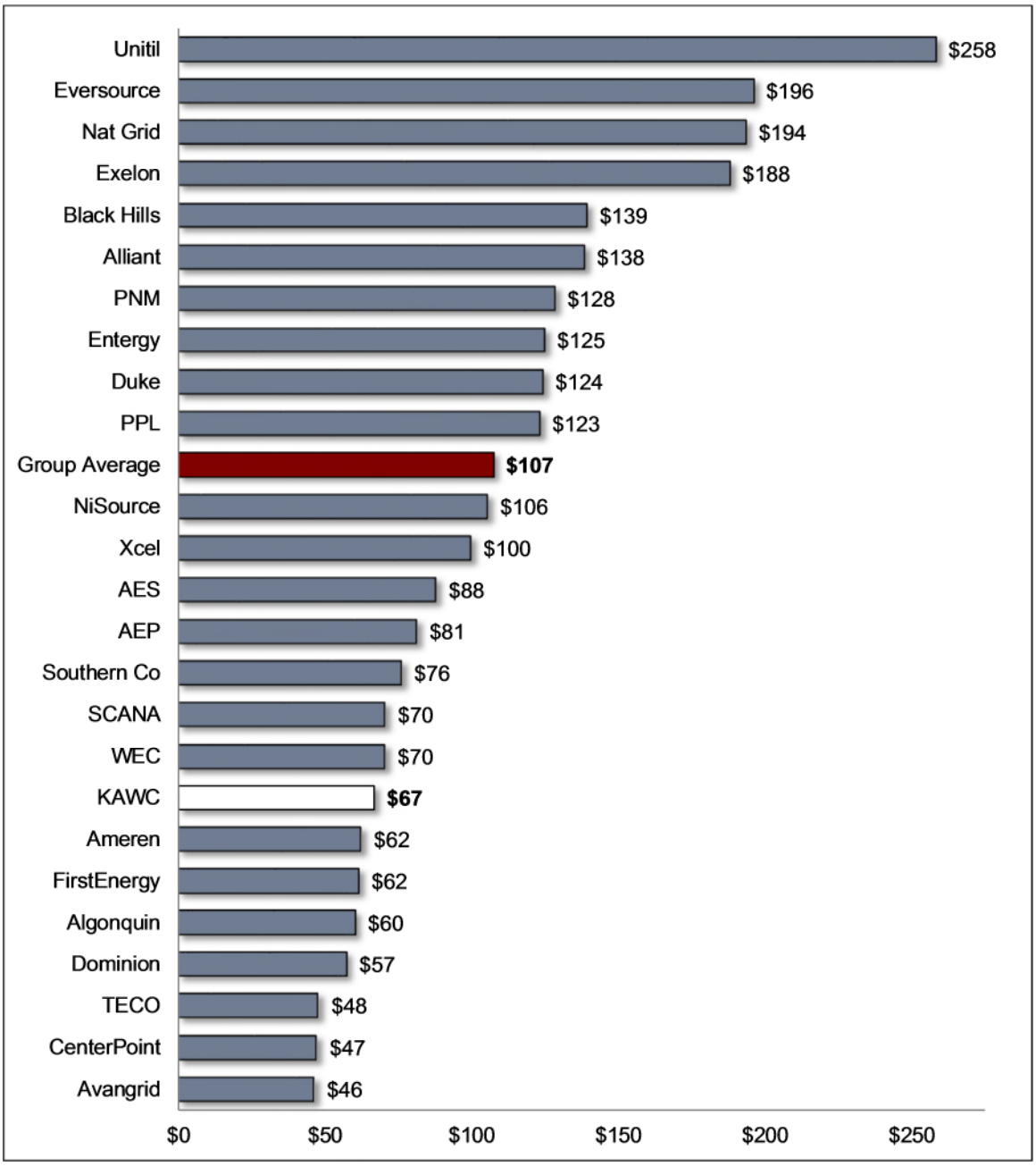
Exhibit 2 (page 12) shows KAWC's 12 months ended August 31, 2018 Service Company cost per customer of $67 to be lower than the average of $107 per customer for the comparison group service companies. Seventeen of the 24 comparison group service companies had higher per customer A&G costs than KAWC's charges from the Service Company. Based on this result, it is possible to conclude that the Service Company's charges to KAWC were reasonable.

Kentucky American Water Company
Calculation of 2017 Service Company A&G Expenses Per Customer

Utility Company	2017 Regulated Retail Service Company A&G Expenses	Regulated Retail Customers	Cost per Customer
AEP	$438,890,527	5,400,000	$ 81
AES	$65,918,860	750,622	$ 88
Algonquin	$45,681,680	758,000	$ 60
Alliant	$190,442,009	1,375,175	$ 138
Ameren	$205,647,993	3,300,000	$ 62
Avangrid	$148,532,619	3,209,450	$ 46
Black Hills	$174,635,129	1,252,523	$ 139
CenterPoint	$267,594,992	5,659,220	$ 47
Dominion	$281,060,124	4,900,000	$ 57
Duke	$1,131,814,714	9,100,000	$ 124
Entergy	$387,315,119	3,099,000	$ 125
Eversource	$712,905,964	3,634,000	$ 196
Exelon	$1,841,470,017	9,790,000	$ 188
FirstEnergy	$369,031,399	6,000,000	$ 62
Nat Grid	$1,336,022,949	6,900,000	$ 194
NiSource	$411,798,390	3,900,000	$ 106
PNM	$99,261,645	773,000	$ 128
PPL	$332,841,876	2,700,000	$ 123
SCANA	$158,719,721	2,252,373	$ 70
Southern Co	$704,734,402	9,263,000	$ 76
TECO	$76,809,801	1,605,000	$ 48
Unitil	$47,585,313	184,200	$ 258
WEC	$312,453,243	4,438,093	$ 70
Xcel	$558,930,060	5,600,000	$ 100
Total	**$10,300,098,546**	**95,843,656**	**$ 107**

Exhibit 2

Kentucky American Water Company
Comparison of Service Company A&G Expenses Per Customer



Methodology

The lower-of-cost-or-market comparison is accomplished by comparing the cost per hour for Service Company managerial and professional services to those of outside service providers to whom these duties could be assigned. Based on the nature of the Service Company services, it was determined that the following outside providers could perform the categories of services indicated below:

- Management Consultants – executive and administrative management, risk management, human resources and communications services
- Attorneys – legal services
- Certified Public Accountants – accounting, financial and rates and revenues services
- T&I Professionals – information technology services
- Professional Engineers – engineering, operations and water quality services.

The services provided by the Belleville lab are assumed to be transferable to professional engineers for purposes of this cost comparison. This was done for two reasons. First, there is no readily available survey of hourly billing rates for testing services such as those performed by Belleville. Second, Belleville personnel have similar scientific educational backgrounds as Service Company engineering personnel. Thus, it is appropriate to compare the hourly rates of Belleville services to those of outside engineering firms.

Service Company's hourly rates were calculated for each of the five outside service provider categories, based on the dollars and hours charged to KAWC during the 12 months ended August 31, 2018. Hourly billing rates for outside service providers were developed using third party surveys or directly from information furnished by outside providers themselves.

It should be noted that by using the Service Company's hours charged KAWC during the 12 months ended August 31, 2018, its hourly rates are actually overstated because some Service Company personnel charge a maximum of 8 hours per day even when they work more. Outside service providers generally bill for every hour worked. If all overtime hours of Service Company personnel had been factored into the hourly rate calculation, Service Company hourly rates would have been lower.

The last step in the lower-of-cost-or-market comparison was to compare the Service Company's average cost per hour to the average cost per hour for outside providers.

Service Company Hourly Rates

Exhibit 3 (page 15) details the assignment of 2017 management and professional Service Company charges by outsider provider category. Exhibit 4 (page 16) shows the same assignment for Service Company management and professional hours charged to KAWC during the 12 months ended August 31, 2018.

Certain adjustments to these dollar amounts were necessary to calculate Service Company hourly rates that are directly comparable to those of outside providers. Adjustments were made to the following 2017 non-labor Service Company charges:

- Contract Services – Twelve months ended August 31, 2018, Service Company charges to KAWC include expenses associated with the use of outside professional firms to perform certain corporate-wide services (e.g., legal, financial audit, actuarial services).

These professional fees are excluded from the Service Company hourly rate calculation because the related services have effectively been out-sourced already.

- Travel Expenses – In general, client-related travel expenses incurred by outside service providers are not recovered through their hourly billing rates. Rather, actual out-of-pocket travel expenses are billed to clients in addition to fees for professional services. Thus, it is appropriate to remove these Service Company charges from the hourly rate calculation.
- Information Technology Infrastructure Expenses – Included in the 12 months ended August 31, 2018 Service Company charges to KAWC are leases, maintenance fees and depreciation related to American Water's enterprise computing and network infrastructure and corporate business applications. An outside provider that would take over operation of this infrastructure would recover these expenses over and above the cost of personnel necessary to operate the data center.
- Non-Service Related Expenses – These are corporate expenses such as current and deferred income tax expense, line of credit fees and board expenses. These are not related to the provision of services by Service Company personnel and have been excluded.

Exhibit 5 (page 17) shows how contract services, travel expenses, information technology infrastructure and non-service-related Service Company charges are assigned to the four outside provider categories.

Based on the assignment of expenses and hours shown in Exhibits 2 and 3 and the excludable items shown in Exhibit 4, the Service Company's equivalent costs per hour for the 12 months ended August 31, 2018 are calculated below.

	Attorney	Management Consultant	Certified Public Accountant	T&I Professional	Professional Engineer	Total
Total management, professional & technical services charges	$ 528,674	$ 3,464,584	$ 1,622,517	$ 4,386,821	$ 438,758	$ 10,441,355
Less: Exclusions						
Contract services	$ 67,789	$ 191,064	$ 157,991	$ 1,824,316	$ (13,604)	$ 2,227,557
Travel expenses	$ 11,324	$ 77,761	$ 29,260	$ 46,114	$ 8,937	$ 173,396
IT infrastructure expenses	$ 1,456	$ 658,645	$ 7,602	$ 698,176	$ 3,328	$ 1,369,208
Non-service related expenses	$ 46,928	$ 76,104	$ (58,510)	$ 80,293	$ 35,635	$ 180,450
Total Exclusions	$ 127,497	$ 1,003,574	$ 136,343	$ 2,648,900	$ 34,297	$ 3,950,610
Net Service-Related Charges (A)	$ 401,177	$ 2,461,010	$ 1,486,175	$ 1,737,921	$ 404,462	$ 6,490,745
Total Hours (B)	1,994	10,926	15,009	14,017	3,400	45,347
Average Hourly Rate (A / B)	**$ 201**	**$ 225**	**$ 99**	**$ 124**	**$ 119**	

Exhibit 3

Kentucky American Water Company
12 Months Ended August 31, 2018 Service Company Charges by Location and Function

Location	Function	2017 Service Company Charges					
		Attorney	Management Consultant	Certified Public Accountant	T&I Professional	Professional Engineer	Total
Belleville Lab	Water Quality					$ 101,346	$ 101,346
Call Center	Human Resources		$ 20,835				$ 20,835
Corporate	Accounting			$ 661,414			$ 661,414
	Administration		$ 1,101,473				$ 1,101,473
	Audit			$ 86,132			$ 86,132
	Business Development		$ 87,797				$ 87,797
	Communications		$ 170,864				$ 170,864
	Engineering					$ 263,883	$ 263,883
	External Affairs		$ 48,536				$ 48,536
	Finance			$ 459,572			$ 459,572
	Human Resources		$ 590,799				$ 590,799
	Information Technology				$ 224,702		$ 224,702
	Legal	$ 348,203					$ 348,203
	Operations		$ 298,231				$ 298,231
	Procurement			$ 193,516			$ 193,516
	Rates & Regulatory		$ 17,791				$ 17,791
	Risk Management		$ 51,616				$ 51,616
Regional Offices	Administration		$ 922,719				$ 922,719
	Business Development		$ 786				$ 786
	Engineering					$ 73,529	$ 73,529
	External Affairs		$ 83,345				$ 83,345
	Finance			$ 212,537			$ 212,537
	Human Resources		$ 69,273				$ 69,273
	Legal	$ 180,471					$ 180,471
	Operations		$ 517				$ 517
	Rates & Revenue			$ 9,347			$ 9,347
Technology & Innovation	Information Technology				$ 4,162,119		$ 4,162,119
Total Dollars Charged		**$ 528,674**	**$ 3,464,584**	**$ 1,622,517**	**$ 4,386,821**	**$ 438,758**	**$ 10,441,355**

Exhibit 4

Kentucky American Water Company
12 Months Ended August 31, 2018 Service Company Hours by Location and Function

		2017 Service Company Hours					
Location	Function	Attorney	Management Consultant	Certified Public Accountant	T&I Professional	Professional Engineer	Total
Belleville Lab	Water Quality					906	906
Call Center	Human Resources		248				248
Corporate	Accounting			6,859			6,859
	Administration		1,009				1,009
	Audit			521			521
	Business Development		334				334
	Communications		949				949
	Engineering					1,878	1,878
	External Affairs		73				73
	Finance			4,079			4,079
	Human Resources		4,222				4,222
	Information Technology				2,033		2,033
	Legal	845					845
	Operations		579				579
	Procurement			1,991			1,991
	Rates & Regulatory		47				47
	Risk Management		343				343
Regional Offices	Administration		2,540				2,540
	Business Development		-				-
	Engineering					616	616
	External Affairs		487				487
	Finance			1,558			1,558
	Human Resources		96				96
	Legal	1,149					1,149
	Operations		-				-
	Rates & Revenue			1			1
Technology & Innovation	Information Technology				11,984		11,984
Total Hours Charged		**1,994**	**10,926**	**15,009**	**14,017**	**3,400**	**45,347**

Exhibit 5

Kentucky American Water Company

12 Months Ended August 31, 2018 Service Company Charges Excludable from the Hourly Rate Calculation

Charges By Function	Exclusions From Hourly Rate Calculation: Contract Services	Travel Expenses	T&I Infrastructure	Non-Services-Related Items	Total	Outside Service Provider Category
Accounting	$ 111,717	$ 6,529	$ 1,682	$ (53,618)	$ 66,310	Certified Public Accountant
Administration	$ 28,344	$ 31,818	$ 656,854	$ 31,422	$ 748,438	Management Consultant
Audit	$ 30,341	$ 1,401	$ 619	$ 2	$ 32,363	Certified Public Accountant
Business Development	$ 1,560	$ 3,609		$ 1,148	$ 6,317	Management Consultant
Communications	$ 34,831	$ 2,258	$ 747	$ 13,073	$ 50,909	Management Consultant
Engineering	$ 2,299	$ 8,279	$ 3,328	$ 1,106	$ 15,012	Professional Engineer
External Affairs	$ 6,532	$ 4,274	$ 239	$ 697	$ 11,742	Management Consultant
Finance	$ 9,392	$ 12,764	$ 376	$ 2,295	$ 24,827	Certified Public Accountant
Human Resources	$ 116,110	$ 22,841	$ 667	$ 4,149	$ 143,766	Management Consultant
Information Technology	$ 1,824,316	$ 46,114	$ 698,176	$ 80,293	$ 2,648,900	IT Professional
Legal	$ 67,789	$ 11,324	$ 1,456	$ 46,928	$ 127,497	Attorney
Operations	$ 2,427	$ 9,359	$ 119	$ 18,326	$ 30,231	Management Consultant
Procurement	$ 7,411	$ 7,518	$ 4,912	$ (7,265)	$ 12,576	Certified Public Accountant
Rates & Regulatory	$ (870)	$ 1,048	$ 13	$ 76	$ 267	Certified Public Accountant
	$ (105)	$ 2,592		$ 10	$ 2,497	Management Consultant
Risk Management	$ 1,365	$ 1,010	$ 19	$ 7,280	$ 9,674	Management Consultant
Water Quality	$ (15,904)	$ 659		$ 34,529	$ 19,284	Professional Engineer
Total	**$ 2,227,557**	**$ 173,396**	**$ 1,369,208**	**$ 180,450**	**$ 3,950,610**	

Recap By Outside Provider	Exclusions From Hourly Rate Calculation: Contract Services	Travel Expenses	T&I Infrastructure	Non-Services-Related Items	Total
Attorney	$ 67,789	$ 11,324	$ 1,456	$ 46,928	$ 127,497
Management Consultant	$ 191,064	$ 77,761	$ 658,645	$ 76,104	$ 1,003,574
Certified Public Accountant	$ 157,991	$ 29,260	$ 7,602	$ (58,510)	$ 136,343
IT Professional	$ 1,824,316	$ 46,114	$ 698,176	$ 80,293	$ 2,648,900
Professional Engineer	$ (13,604)	$ 8,937	$ 3,328	$ 35,635	$ 34,297
Total	**$ 2,227,557**	**$ 173,396**	**$ 1,369,208**	**$ 180,450**	**$ 3,950,610**

Outside Service Provider Hourly Rates

The next step in the lower-of-cost-or-market comparison was to obtain the average billing rates for outside service providers. The source of this information and the determination of the average rates are described in the paragraphs that follow.

It should be noted that professionals working for three of the five outside provider categories may be licensed to practice by state regulatory bodies. However, not every professional working for these firms is licensed. For instance, among US certified public accounting firms, only more experienced staff are predominantly CPAs (see table below). Some Service Company employees also have professional licenses. Thus, it is valid to compare the Service Company's hourly rates to those of the outside professional service providers included in this study.

Position	US Average
Partners/Owners	98%
Directors (11+ years experience)	87%
Managers (6-10 years experience)	79%
Sr Associates (4-5 years experience)	50%
Associates (1-3 years experience)	22%
New Professionals	10%

Source: AICPA's National PCPS/TSCPA Management of an Accounting Practice Survey (2010)

Attorneys

The Kentucky State Bar does not survey its members as to their hourly billing rates. In addition, publicly available billing rate information could not be found for Kentucky attorneys. Therefore, an estimate of Kentucky attorney rates was developed from a 2017 billing rate survey from National Law Journal. As shown in Exhibit 6 (pages 20-22), data from this survey has been adjusted for cost-of-living differences between each law firm's location and Lexington, Kentucky. The National Law Review billing survey hourly rates data is for 2017.

Management Consultants

The cost per hour for management consultants was developed from the 2016 annual survey information from ALM Intelligence, a research firm that follows the management consulting industry. The survey includes rates that were in effect during 2016 for firms throughout the United States. Consultants typically do not limit their practice to any one region and must travel to a client's location. Thus, in this case the U.S. national average is appropriate for comparison.

The first step in the calculation, presented in Exhibit 7 (page 23), was to determine an average rate by consultant position level. From these rates, a single weighted average hourly rate was calculated based upon the percent of time that is typically applied to a consulting assignment by each consultant position level. The calculated average rate was escalated to February 28, 2018—the midpoint of the 12 months ended August 31, 2018.

Certified Public Accountants

The average hourly rate for Kentucky CPAs was developed from a 2016 survey performed by the American Institute of Certified Public Accountants (AICPA). The Kentucky version of this survey was used to develop hourly rates for member firms in Kentucky.

As shown in Exhibit 8 (page 24), a weighted average hourly rate was developed based on a set of accountant positions and a percent of time that is typically applied to an accounting assignment. This survey includes rate information in effect during 2015. The calculated average rate was escalated to February 28, 2018—the midpoint of the 12 months ended August 31, 2018.

Technology and Innovation Professionals

The average hourly rate for technology and innovation consultants and contractors was developed from two sources: the Service Company for IT contractor rates and ALM Intelligence for information technology consultants. As shown in Exhibit 9 (page 25), that data was compiled and a weighted average was calculated based on a percent of time that is typically applied to a T&I consulting assignment based on Baryenbruch & Company's experience.

Professional Engineers

The Company provided hourly rate information for outside engineering firms that provided KAWC with their rate schedules. As presented in Exhibit 10 (page 26), an average rate was developed for each engineering position level. Then, using a typical percentage mix of project time by engineering position, a weighted average cost per hour was calculated.

Kentucky American Water Company
Estimated Billing Rates for Kentucky Attorneys

City	2017 Billing Rates (Note A) Average Billing Rate Partner	Associate	Weighted Average Rate Calculation 0.25 Partner	0.75 Associate	(A) Weighted Average	Cost of Living (COL) Adjustment (Note B) COL Indices Law Firm Location	Lexington, KY	(B) COL Adjustment	(A x B) Adjusted Rate
Albany, NY	$ 350	$ 180	$ 88	$ 135	$ 223	110.9	88.4	80%	$ 178
Albuquerque, NM	$ 475	$ 238	$ 119	$ 179	$ 298	94.3	88.4	94%	$ 279
Alhambra, CA	$ 475	$ 425	$ 119	$ 319	$ 438	131.0	88.4	67%	$ 296
Amenia, NY	$ 300	$ 250	$ 75	$ 188	$ 263	110.9	88.4	80%	$ 210
Arlington, TX	$ 385	$ 195	$ 96	$ 146	$ 242	95.7	88.4	92%	$ 223
Astoria, NY	$ 425	$ 325	$ 106	$ 244	$ 350	151.4	88.4	58%	$ 204
Atlanta, GA	$ 521	$ 371	$ 130	$ 278	$ 408	93.5	88.4	95%	$ 386
Atlantic Beach, FL	$ 295	$ 248	$ 74	$ 186	$ 260	95.5	88.4	93%	$ 241
Austin, TX	$ 445	$ 400	$ 111	$ 300	$ 411	92.5	88.4	96%	$ 393
Baltimore, MD	$ 432	$ 295	$ 108	$ 221	$ 329	111.3	88.4	79%	$ 261
Baton Rouge, LA	$ 388	$ 350	$ 97	$ 263	$ 360	91.7	88.4	96%	$ 347
Beverly Hills, CA	$ 510	$ 373	$ 128	$ 280	$ 408	131.0	88.4	67%	$ 275
Bloomfield Hills, MI	$ 373	$ 275	$ 93	$ 206	$ 299	96.1	88.4	92%	$ 275
Boca Raton, FL	$ 438	$ 325	$ 110	$ 244	$ 354	109.5	88.4	81%	$ 286
Boston, MA	$ 1,075	$ 515	$ 269	$ 386	$ 655	140.1	88.4	63%	$ 413
Brooklyn, NY	$ 625	$ 575	$ 156	$ 431	$ 587	175.6	88.4	50%	$ 295
Buffalo, NY	$ 288	$ 175	$ 72	$ 131	$ 203	96.2	88.4	92%	$ 187
Calabasas, CA	$ 450	$ 250	$ 113	$ 188	$ 301	131.0	88.4	67%	$ 203
Camp Hill, PA	$ 250	$ 150	$ 63	$ 113	$ 176	98.9	88.4	89%	$ 157
Carrollton, GA	$ 325	$ 270	$ 81	$ 203	$ 284	94.7	88.4	93%	$ 265
Cary, NC	$ 300	$ 290	$ 75	$ 218	$ 293	94.6	88.4	93%	$ 274
Cerritos, CA	$ 400	$ 188	$ 100	$ 141	$ 241	131.0	88.4	67%	$ 163
Chapel Hill, NC	$ 325	$ 200	$ 81	$ 150	$ 231	110.9	88.4	80%	$ 184
Charlotte, NC	$ 435	$ 303	$ 109	$ 227	$ 336	96.1	88.4	92%	$ 309
Cherry Hill, NJ	$ 350	$ 275	$ 88	$ 206	$ 294	121.2	88.4	73%	$ 214
Cherry Hill, PA	$ 425	$ 350	$ 106	$ 263	$ 369	92.2	88.4	96%	$ 354
Chicago, IL	$ 578	$ 407	$ 145	$ 305	$ 450	117.4	88.4	75%	$ 339
Claremont, CA	$ 270	$ 250	$ 68	$ 188	$ 256	112.0	88.4	79%	$ 202
Columbia, MO	$ 250	$ 250	$ 63	$ 188	$ 251	96.9	88.4	91%	$ 229
Corpus Christi, TX	$ 250	$ 150	$ 63	$ 113	$ 176	91.9	88.4	96%	$ 169
Dallas, TX	$ 536	$ 312	$ 134	$ 234	$ 368	95.7	88.4	92%	$ 340
Decatur, GA	$ 350	$ 350	$ 88	$ 263	$ 351	93.5	88.4	95%	$ 332
Denver, CO	$ 449	$ 308	$ 112	$ 231	$ 343	104.0	88.4	85%	$ 292
East Meadow, NY	$ 425	$ 413	$ 106	$ 310	$ 416	129.2	88.4	68%	$ 285
East Orange, NJ	$ 400	$ 375	$ 100	$ 281	$ 381	128.4	88.4	69%	$ 262
El Paso, TX	$ 350	$ 300	$ 88	$ 225	$ 313	90.8	88.4	97%	$ 305
Encino, CA	$ 450	$ 400	$ 113	$ 300	$ 413	131.0	88.4	67%	$ 279
Englewood, NJ	$ 463	$ 325	$ 116	$ 244	$ 360	133.0	88.4	66%	$ 239
Escondido, CA	$ 400	$ 300	$ 100	$ 225	$ 325	129.2	88.4	68%	$ 222
Fair Oaks, CA	$ 350	$ 325	$ 88	$ 244	$ 332	109.8	88.4	81%	$ 267
Fort Lauderdale, FL	$ 400	$ 343	$ 100	$ 257	$ 357	109.5	88.4	81%	$ 288
Fort Worth, TX	$ 492	$ 355	$ 123	$ 266	$ 389	100.1	88.4	88%	$ 344
Fountain Valley, CA	$ 350	$ 200	$ 88	$ 150	$ 238	140.7	88.4	63%	$ 149
Franklin, TN	$ 395	$ 310	$ 99	$ 233	$ 332	86.3	88.4	102%	$ 340
Frederick, MD	$ 300	$ 300	$ 75	$ 225	$ 300	127.4	88.4	69%	$ 208
Freehold, NJ	$ 500	$ 500	$ 125	$ 375	$ 500	122.2	88.4	72%	$ 362
Frisco, TX	$ 400	$ 300	$ 100	$ 225	$ 325	90.2	88.4	98%	$ 319
Glendale, CA	$ 600	$ 450	$ 150	$ 338	$ 488	131.0	88.4	67%	$ 329
Granada Hills, CA	$ 200	$ 200	$ 50	$ 150	$ 200	131.0	88.4	67%	$ 135

Kentucky American Water Company
Estimated Billing Rates for Kentucky Attorneys

2017 Billing Rates (Note A)

City	Average Billing Rate		Weighted Average Rate Calculation			Cost of Living (COL) Adjustment (Note B)			
			0.25	0.75	(A)	COL Indices		(B)	(A x B)
	Partner	Associate	Partner	Associate	Weighted Average	Law Firm Location	Lexington, KY	COL Adjustment	Adjusted Rate
Grand Rapids, MI	$ 406	$ 295	$ 102	$ 221	$ 323	92.5	88.4	96%	$ 309
Greenbelt, MD	$ 467	$ 347	$ 117	$ 260	$ 377	127.4	88.4	69%	$ 262
Greensburg, PA	$ 400	$ 195	$ 100	$ 146	$ 246	92.2	88.4	96%	$ 236
Grosse Pointe Woods, MI	$ 375	$ 250	$ 94	$ 188	$ 282	96.1	88.4	92%	$ 259
Hackensack, NJ	$ 658	$ 305	$ 165	$ 229	$ 394	133.0	88.4	66%	$ 262
Harrisburg, PA	$ 292	$ 225	$ 73	$ 169	$ 242	98.9	88.4	89%	$ 216
Harrisonburg, VA	$ 300	$ 250	$ 75	$ 188	$ 263	97.7	88.4	90%	$ 238
Hawthorne, NJ	$ 425	$ 400	$ 106	$ 300	$ 406	133.0	88.4	66%	$ 270
Houston, TX	$ 522	$ 345	$ 131	$ 259	$ 390	99.0	88.4	89%	$ 348
Huntingdon Valley, PA	$ 220	$ 125	$ 55	$ 94	$ 149	121.2	88.4	73%	$ 109
Indianapolis, IN	$ 452	$ 337	$ 113	$ 253	$ 366	91.1	88.4	97%	$ 355
Irvine, CA	$ 402	$ 325	$ 101	$ 244	$ 345	140.7	88.4	63%	$ 217
Jacksonville, FL	$ 350	$ 250	$ 88	$ 188	$ 276	95.5	88.4	93%	$ 255
Johnstown, PA	$ 250	$ 250	$ 63	$ 188	$ 251	92.2	88.4	96%	$ 241
Kansas City, MO	$ 407	$ 305	$ 102	$ 229	$ 331	98.0	88.4	90%	$ 299
Knoxville, TN	$ 269	$ 225	$ 67	$ 169	$ 236	88.5	88.4	100%	$ 236
LaGrange, IL	$ 400	$ 400	$ 100	$ 300	$ 400	97.4	88.4	91%	$ 363
Las Vegas, NV	$ 383	$ 338	$ 96	$ 253	$ 349	102.7	88.4	86%	$ 301
Long Beach, CA	$ 400	$ 400	$ 100	$ 300	$ 400	131.0	88.4	67%	$ 270
Los Angeles, CA	$ 515	$ 404	$ 129	$ 303	$ 432	131.0	88.4	67%	$ 291
Mamaroneck, NY	$ 495	$ 375	$ 124	$ 281	$ 405	151.4	88.4	58%	$ 237
Manasquan, NJ	$ 400	$ 250	$ 100	$ 188	$ 288	122.2	88.4	72%	$ 208
Maple Shade, NJ	$ 400	$ 275	$ 100	$ 206	$ 306	121.2	88.4	73%	$ 223
McAllen, TX	$ 250	$ 213	$ 63	$ 159	$ 222	86.3	88.4	102%	$ 228
Metairie, LA	$ 350	$ 180	$ 88	$ 135	$ 223	98.2	88.4	90%	$ 201
Miami, FL	$ 338	$ 300	$ 84	$ 225	$ 309	107.2	88.4	82%	$ 255
Middletown, NY	$ 400	$ 400	$ 100	$ 300	$ 400	110.9	88.4	80%	$ 319
Minden, NV	$ 363	$ 200	$ 91	$ 150	$ 241	90.1	88.4	98%	$ 236
Minneapolis, MN	$ 680	$ 463	$ 170	$ 347	$ 517	110.3	88.4	80%	$ 414
Murrieta, CA	$ 250	$ 175	$ 63	$ 131	$ 194	112.0	88.4	79%	$ 153
Nashville, TN	$ 413	$ 338	$ 103	$ 253	$ 356	86.3	88.4	102%	$ 365
New City, NY	$ 400	$ 400	$ 100	$ 300	$ 400	151.4	88.4	58%	$ 234
New Orleans, LA	$ 388	$ 235	$ 97	$ 176	$ 273	98.2	88.4	90%	$ 246
New York, NY	$ 748	$ 501	$ 187	$ 376	$ 563	221.3	88.4	40%	$ 225
Newark, NJ	$ 735	$ 495	$ 184	$ 371	$ 555	128.4	88.4	69%	$ 382
Newport Beach, CA	$ 595	$ 425	$ 149	$ 319	$ 468	131.0	88.4	67%	$ 316
Newton, MA	$ 350	$ 300	$ 88	$ 225	$ 313	140.1	88.4	63%	$ 198
North Andover, MA	$ 400	$ 275	$ 100	$ 206	$ 306	140.1	88.4	63%	$ 193
North Bergen, NJ	$ 400	$ 300	$ 100	$ 225	$ 325	133.0	88.4	66%	$ 216
Northbrook, IL	$ 425	$ 363	$ 106	$ 272	$ 378	117.4	88.4	75%	$ 285
Oakland, CA	$ 575	$ 575	$ 144	$ 431	$ 575	134.9	88.4	66%	$ 377
Okemos, MI	$ 300	$ 205	$ 75	$ 154	$ 229	87.9	88.4	101%	$ 230
Ontario, CA	$ 350	$ 350	$ 88	$ 263	$ 351	112.0	88.4	79%	$ 277
Orlando, FL	$ 400	$ 400	$ 100	$ 300	$ 400	95.9	88.4	92%	$ 369
Palo Alto, CA	$ 1,100	$ 735	$ 275	$ 551	$ 826	148.8	88.4	59%	$ 491
Philadelphia, PA	$ 653	$ 406	$ 163	$ 305	$ 468	121.2	88.4	73%	$ 341
Phoenix, AZ	$ 462	$ 276	$ 115	$ 207	$ 322	97.3	88.4	91%	$ 293
Pittsburgh, PA	$ 375	$ 226	$ 94	$ 170	$ 264	92.2	88.4	96%	$ 253
Plano, TX	$ 400	$ 163	$ 100	$ 122	$ 222	96.6	88.4	92%	$ 203

Kentucky American Water Company
Estimated Billing Rates for Kentucky Attorneys

2017 Billing Rates (Note A)

City	Average Billing Rate Partner	Average Billing Rate Associate	Weighted Average Rate Calculation 0.25 Partner	Weighted Average Rate Calculation 0.75 Associate	(A) Weighted Average	Cost of Living (COL) Adjustment (Note B) COL Indices Law Firm Location	COL Indices Lexington, KY	(B) COL Adjustment	(A x B) Adjusted Rate
Portland, OR	$ 375	$ 345	$ 94	$ 259	$ 353	119.1	88.4	74%	$ 262
Red Bank, NJ	$ 425	$ 250	$ 106	$ 188	$ 294	122.2	88.4	72%	$ 213
Richmond, VA	$ 522	$ 333	$ 130	$ 250	$ 380	99.7	88.4	89%	$ 337
Ridgeland, MS	$ 375	$ 225	$ 94	$ 169	$ 263	89.0	88.4	99%	$ 261
Roanoke, VA	$ 365	$ 216	$ 91	$ 162	$ 253	92.0	88.4	96%	$ 243
Royal Oak, MI	$ 350	$ 300	$ 88	$ 225	$ 313	96.1	88.4	92%	$ 288
Sacramento, CA	$ 400	$ 250	$ 100	$ 188	$ 288	109.8	88.4	81%	$ 232
San Antonio, TX	$ 315	$ 271	$ 79	$ 203	$ 282	87.6	88.4	101%	$ 285
San Diego, CA	$ 475	$ 362	$ 119	$ 271	$ 390	129.2	88.4	68%	$ 267
San Francisco, CA	$ 443	$ 377	$ 111	$ 282	$ 393	159.9	88.4	55%	$ 217
San Jose, CA	$ 438	$ 350	$ 109	$ 263	$ 372	148.8	88.4	59%	$ 221
San Mateo, CA	$ 495	$ 395	$ 124	$ 296	$ 420	159.9	88.4	55%	$ 232
Santa Ana, CA	$ 350	$ 350	$ 88	$ 263	$ 351	140.7	88.4	63%	$ 220
Santa Barbara, CA	$ 438	$ 300	$ 110	$ 225	$ 335	131.0	88.4	67%	$ 226
Santa Clara, CA	$ 475	$ 400	$ 119	$ 300	$ 419	148.8	88.4	59%	$ 249
Santa Clarita, CA	$ 438	$ 300	$ 110	$ 225	$ 335	112.0	88.4	79%	$ 264
Santa Monica, CA	$ 575	$ 350	$ 144	$ 263	$ 407	131.0	88.4	67%	$ 275
Santa Rosa Beach, FL	$ 300	$ 300	$ 75	$ 225	$ 300	97.6	88.4	91%	$ 272
Scottsdale, AZ	$ 300	$ 213	$ 75	$ 160	$ 235	113.9	88.4	78%	$ 182
Seattle, WA	$ 425	$ 310	$ 106	$ 233	$ 339	117.5	88.4	75%	$ 255
Sherman Oaks, CA	$ 405	$ 350	$ 101	$ 263	$ 364	131.0	88.4	67%	$ 246
Southfield, MI	$ 330	$ 245	$ 83	$ 184	$ 267	96.1	88.4	92%	$ 246
Spring Lake, NJ	$ 400	$ 275	$ 100	$ 206	$ 306	122.2	88.4	72%	$ 221
Springfield, NJ	$ 375	$ 300	$ 94	$ 225	$ 319	128.4	88.4	69%	$ 220
St. Louis, MO	$ 556	$ 351	$ 139	$ 263	$ 402	94.4	88.4	94%	$ 376
Staten Island, NY	$ 450	$ 425	$ 113	$ 319	$ 432	151.4	88.4	58%	$ 252
Sugar Land, TX	$ 450	$ 400	$ 113	$ 300	$ 413	99.0	88.4	89%	$ 369
Tampa, FL	$ 385	$ 290	$ 96	$ 218	$ 314	92.9	88.4	95%	$ 299
Tempe, AZ	$ 380	$ 240	$ 95	$ 180	$ 275	97.3	88.4	91%	$ 250
The Woodlands, TX	$ 600	$ 600	$ 150	$ 450	$ 600	95.0	88.4	93%	$ 558
Tucker, GA	$ 350	$ 300	$ 88	$ 225	$ 313	93.5	88.4	95%	$ 296
Tucson, AZ	$ 400	$ 343	$ 100	$ 257	$ 357	96.4	88.4	92%	$ 328
Upper Marlboro, MD	$ 425	$ 380	$ 106	$ 285	$ 391	111.3	88.4	79%	$ 311
Ventura, CA	$ 350	$ 235	$ 88	$ 176	$ 264	131.0	88.4	67%	$ 178
Wantagh, NY	$ 595	$ 415	$ 149	$ 311	$ 460	129.2	88.4	68%	$ 315
Washington, DC	$ 781	$ 510	$ 195	$ 382	$ 577	141.6	88.4	62%	$ 360
Wayne, NJ	$ 425	$ 375	$ 106	$ 281	$ 387	128.4	88.4	69%	$ 266
West Orange, NJ	$ 563	$ 275	$ 141	$ 206	$ 347	128.4	88.4	69%	$ 239
West Palm Beach, TX	$ 425	$ 425	$ 106	$ 319	$ 425	90.1	88.4	98%	$ 417
Wheaton, IL	$ 405	$ 350	$ 101	$ 263	$ 364	117.4	88.4	75%	$ 274
White Plains, NY	$ 463	$ 354	$ 116	$ 266	$ 382	151.4	88.4	58%	$ 223
Wilmette, IL	$ 450	$ 395	$ 113	$ 296	$ 409	117.4	88.4	75%	$ 308
Wilmington, DE	$ 703	$ 359	$ 176	$ 269	$ 445	108.4	88.4	82%	$ 363
Winston-Salem, NC	$ 525	$ 375	$ 131	$ 281	$ 412	87.9	88.4	101%	$ 414
Woodland Hills, CA	$ 625	$ 485	$ 156	$ 364	$ 520	131.0	88.4	67%	$ 351
York, PA	$ 345	$ 235	$ 86	$ 176	$ 262	98.9	88.4	89%	$ 234
							2017 Overall Average Billing Rate		**$ 273**

Note A: National Law Journal 2017 Billing Survey
Note B: Cost of Living Index, Source Council for Community and Economic Research
Note C: U.S. Bureau of Labor Statistics (https://data.bls.gov/cgi-bin/surveymost)

Kentucky American Water Company
Billing Rates of U.S. Management Consultants

Survey billing rates in effect in 2016 (Note A)

A. Calculation of Average Hourly Billing Rate by Consultant Position

	Average Hourly Rates (Note A)				
	Analyst Consultant	Associate	Sr. Assoc/ Manager	Principal	Partner
Average	$ 206	$ 234	$ 288	$ 438	$ 523

B. Calculation of Overall Average Hourly Billing Rate Based on a Typical Distribution of Time on an Engagement

	Entry-Level Consultant	Associate Consultant	Senior Consultant	Junior Partner	Senior Partner	
Average Hourly Billing Rate (from above)	$ 206	$ 234	$ 288	$ 438	$ 523	
Percent of Consulting Assignment	30%	30%	25%	10%	5%	Weighted Average
	$ 62	$ 70	$ 72	$ 44	$ 26	$ 274

Average Hourly Billing Rate For Management Consultants During 2016	**$ 274**
Escalation to Review Period Midpoint (February 28, 2018)	
CPI at December 31, 2016	241.4
CPI at February 28, 2018	249.0
Inflation/Escalation (Note B)	3.1%
Average Hourly Billing Rate For Management Consultants at February 28, 2018	**$ 283**

Note A: Source is ALM Intelligence
Note B: Source is U.S. Bureau of Labor Statistics (https://data.bls.gov/cgi-bin/surveymost)

Kentucky American Water Company
Billing Rates of Kentucky Certified Public Accountants

A. Calculation of Average Hourly Billing Rate by Public Accounting Position
Survey billing rates were those in effect in 2015 (Note A)

	Average Hourly Billing Rate (Note A)				
	Staff Accountant	Senior Accountant	Manager	Partner	
Average Hourly Billing Rate by CPA Firm Position	$ 96	$ 125	$ 182	$ 259	
Percent of Accounting Assignment	30%	30%	20%	20%	Weighted Average
	$ 29	$ 37	$ 36	$ 52	**$ 154**

Escalation to Review Period Midpoint (February 28, 2018)	
CPI at December 31, 2015	236.5
CPI at February 28, 2018	249.0
Inflation/Escalation (Note B)	5.3%
Average Hourly Billing Rate for Indiana CPAs at February 28, 2018	**$ 162**

Note A: Source is AICPA's 2016 National PCPS Management of an Accounting Practice Survey (Indiana edition)
Note B: Source is U.S. Bureau of Labor Statistics (http://data.bls.gov/cgi-bin/surveymost)

Exhibit 9

Kentucky American Water Company
Billing Rates of Technology and Innovation Professionals

A. Calculation of Average Hourly Billing Rate by Information Technology Position
Survey billing rates were those in effect in 2016/2017 (Note A)

	Average Hourly Billing Rate (Note A)					
	Contractor Positions		Consultant Positions			
	Developer, Analyst	Proj Mgr, Architect	Associate	Manager	Partner	
Average Hourly Billing Rate by IT Position Category	$ 85	$ 115	$ 218	$ 323	$ 406	
Percent of IT Assignment	25%	25%	25%	15%	10%	Weighted Average
	$ 21	$ 29	$ 55	$ 48	$ 41	**$ 194**

Note A: Source is ALM Intelligence and American Water Service Company information

Kentucky American Water Company
Billing Rates of Kentucky Engineers

A. Calculation of Average 2017 Hourly Rate by Engineer Position (Note A)

	Average Hourly Billing Rates			
Name of Firm	Technician Senior Technician	Engineer Design Engineer Project Engineer	Project Manager Sr. Mgr. Engineer	Officer Principal Engineer
Firm #1	$100	$113	$150	NA
Firm #2	$105	$125	$162	NA
Firm #3	$107	$140	NA	$205
Firm #4	$113	$145	$165	$250
Firm #5	$128	$129	$191	$244

B. Calculation of Overall Average Engineering Hourly Billing Rate

	Technician Senior Technician	Engineer Design Engineer Project Engineer	Project Manager Sr. Mgr. Engineer	Officer Principal Engineer	
Average Hourly Billing Rate (From Above)	$110	$130	$167	$233	
American Water Svc Co. Engineering Complement	13%	31%	46%	10%	Weighted Average
	$15	$40	$76	$24	**$155**

Note A: Source is American Water Service Company Information

Service Company versus Outside Provider Cost Comparison

As shown in the table below, Service Company costs per hour are considerably lower than those of outside providers.

	12 Months Ending August 31, 2018		
Service Provider	Service Company	Outside Provider	Difference--Service Co. Greater(Less) Than Outside
Attorney	$ 201	$ 273	$ (72)
Management Consultant	$ 225	$ 283	$ (58)
Certified Public Accountant	$ 99	$ 162	$ (63)
T&I Professional	$ 124	$ 194	$ (70)
Professional Engineer	$ 119	$ 155	$ (36)

Based on these cost-per-hour differentials and the number of managerial and professional services hours billed to KAWC during the 12 months ended August 31, 2018, outside service providers would have cost $2,826,467 more than the Service Company (see table below). Thus, on average, outside providers' hourly rates are 44% higher than those of the Service Company ($2,826,467 / $6,490,745).

	12 Months Ending August 31, 2018		
Service Provider	Hourly Rate Difference--Service Co. Greater(Less) Than Outside	Service Company Hours Charged	Dollar Difference
Attorney	$ (72)	1,994	$ (143,560)
Management Consultant	$ (58)	10,926	$ (633,719)
Certified Public Accountant	$ (63)	15,009	$ (945,563)
T&I Professional	$ (70)	14,017	$ (981,216)
Professional Engineer	$ (36)	3,400	$ (122,409)
Service Company Less Than Outside Providers			$ (2,826,467)

It should be noted that the cost differential associated with using outside providers is even greater because exempt Service Company personnel do not charge more than 8 hours per day even when they work more. Outside providers generally charge clients for all hours worked. Thus, KAWC would have been charged by outside providers for overtime worked by Service Company personnel who are not paid for that time.

If KAWC were to use outside service providers rather than the Service Company for managerial and professional services, it would incur other additional expenses besides those associated with higher hourly rates. Managing outside firms who would perform almost 45,300 hours of work (around 30 full-time equivalents at 1,500 "billable" hours per FTE per year) would add a significant workload to the existing KAWC management team. Thus, it would be necessary for KAWC to add at least 1 position to supervise the outside firms and ensure they deliver quality and timely services. The individual who would fill this position would need a good understanding of each profession being managed. The person must also have management experience and the authority necessary to provide credibility with the outside firms. As calculated in the table below, the position would add around $175,000 per year to KAWC's personnel expenses

Cost of Adding 1 Professional Position To
Kentucky American Water Company's Staff

	Total
Senior Manager Position Salary	$ 120,000
Benefits (at 31%)	$ 37,200
Office Expenses (15%)	$ 18,000
Total Cost of Position	$ 175,200

Thus, the total effect on the customers of KAWC of contracting all services now provided by Service Company would be an increase in their costs of $3,001,667 ($2,826,467 + $175,200). Based on the results of this comparison, it is possible to conclude that the Service Company charged KAWC at the lower of cost or market for services provided during the 12 months ended August 31, 2018.

Background

Customer Accounts Services involve the processes that occur from the time meter-read data is recorded in the customer information system through the printing and mailing of bills, concluding with the collection and processing of customer payments. Customer Accounts Services are accomplished by the following utility functions:

- Customer Call Center Operations – customer calls/contact, credit, order taking/disposition, bill collection efforts and outage calls
- Customer Call Center Maintenance – support of phone banks, voice recognition units, call center software applications and telecommunications
- Customer billing – bill printing, stuffing and mailing
- Remittance processing – processing customer payments received in the mail
- Bill payment centers – processing customer payments at locations where customers can pay their bills in person

Neighboring electric utility cost information comes from the FERC Form 1 that each utility subject to FERC regulation must file. FERC's chart of accounts is defined in Chapter 18, Part 101 of the Code of Federal Regulations. FERC accounts that contain expenses related to customer accounts services are Account 903 Customer Accounts Expense – Records and Collection Expense and Account 905 Customer Accounts Expense – Miscellaneous Customer Accounts Expense. Exhibit 11 provides FERC's definition of the type of expenses that should be recorded in these accounts.

In addition to the charges in these FERC accounts, labor-related overhead charged to the following FERC accounts must be added to the labor components of Accounts 903 and 905:

- Account 926 Employee Pension and Benefits
- Account 408 Taxes Other Than Income (employer's portion of FICA)

Comparison Group

Electric utilities included in the comparison group are shown in the table below. These are companies whose FERC Form 1 reports show amounts for accounts 903 and 905.

Kentucky	• Duke Energy Kentucky • Kentucky Power	• Kentucky Utilities • Louisville Gas & Electric
Virginia	• Appalachian Power	• Virginia Electric Power
Ohio	• Cleveland Elect Illuminating • Dayton Power & Light • Duke Energy Ohio	• Ohio Edison • Ohio Power • Toledo Edison
Indiana	• Duke Energy Indiana • Indiana Michigan Power • Indianapolis Power & Light	• No. Indiana Public Service • Vectren
Tennessee	• Kingsport Power	
Illinois	• Ameren Illinois • Commonwealth Edison	• MidAmerica Energy
Missouri	• Ameren Missouri • Empire District Electric	• Kansas City Power & Light
West Virginia	• Appalachian Power • Monongahela Power	• Potomac Edison • Wheeling Power

Kentucky American Water Company
FERC Account Descriptions

903 – Customer Records and Collection Expenses
This account shall include the cost of labor, materials used and expenses incurred in work on customer applications, contracts, orders, credit investigations, billing and accounting, collections and complaints.

Labor
1. Receiving, preparing, recording and handling routine orders for service, disconnections, transfers or meter tests initiated by the customer, excluding the cost of carrying out such orders, which is chargeable to the account appropriate for the work called for by such orders.
2. Investigations of customers' credit and keeping of records pertaining thereto, including records of uncollectible accounts written off.
3. Receiving, refunding or applying customer deposits and maintaining customer deposit, line extension, and other miscellaneous records.
4. Checking consumption shown by meter readers' reports where incidental to preparation of billing data.
5. Preparing address plates and addressing bills and delinquent notices.
6. Preparing billing data.
7. Operating billing and bookkeeping machines.
8. Verifying billing records with contracts or rate schedules.
9. Preparing bills for delivery, and mailing or delivering bills.
10. Collecting revenues, including collection from prepayment meters unless incidental to meter reading operations.
11. Balancing collections, preparing collections for deposit, and preparing cash reports.
12. Posting collections and other credits or charges to customer accounts and extending unpaid balances.
13. Balancing customer accounts and controls.
14. Preparing, mailing, or delivering delinquent notices and preparing reports of delinquent accounts.
15. Final meter reading of delinquent accounts when done by collectors incidental to regular activities.
16. Disconnecting and reconnecting services because of nonpayment of bills.
17. Receiving, recording, and handling of inquiries, complaints, and requests for investigations from customers, including preparation of necessary orders, but excluding the cost of carrying out such orders, which is chargeable to the account appropriate for the work called for by such orders.
18. Statistical and tabulating work on customer accounts and revenues, but not including special analyses for sales department, rate department, or other general purposes, unless incidental to regular customer accounting routines.
19. Preparing and periodically rewriting meter reading sheets.
20. Determining consumption and computing estimated or average consumption when performed by employees other than those engaged in reading meters.

Materials and expenses
21. Address plates and supplies.
22. Cash overages and shortages.
23. Commissions or fees to others for collecting.
24. Payments to credit organizations for investigations and reports.
25. Postage.
26. Transportation expenses, including transportation of customer bills and meter books under centralized billing procedure.
27. Transportation, meals, and incidental expenses.
28. Bank charges, exchange, and other fees for cashing and depositing customers' checks.
29. Forms for recording orders for services, removals, etc.
30. Rent of mechanical equipment.

905 – Miscellaneous Customer Accounts Expenses
This account shall include the cost of labor, materials used and expenses incurred not provided for in other accounts.

Labor
1. General clerical and stenographic work.
2. Miscellaneous labor.

Materials and expenses
3. Communication service.
4. Miscellaneous office supplies and expenses and stationery and printing other than those specifically provided for in accounts 902 and 903.

KAWC's Cost per Customer

As calculated below, KAWC's customer accounts services expense per customer was $27.26 for the 12 months ended August 31, 2018. The cost pool used to calculate this average includes charges for Service Company services (e.g., call center, billing, payment processing) and postage and forms expenses, which are incurred directly by KAWC. It is necessary to adjust the Service Company's charges because electric utilities experience an average of 2.50 calls per customer compared to American Water's 1.06 calls per customer during the 12 months ended August 31, 2018. Thus, the Service Company's expenses had to be increased, for comparison purposes, to reflect its costs if it had had 2.50 calls per customer.

Kentucky American Water Company			Adjustment Fewer Calls For		
	Cost Component	Service Co Charges	Water Cos. (A)	Adjusted	
Service Company					
Call Centers	Call processing, order processing, credit, bill collection	$2,053,290	$ 784,123	$ 2,837,413	
Service Company	Customer payment processing			$ 106,496	Note B
Operating Company	Postage & forms			$ 683,687	
			Cost Pool Total	$ 3,627,596	
			Total Customers	133,054	
Mo. Ending August, 31 2018 Customer Account Services Cost per Kentucky American Customer				$ 27.26	

Note A: Adjustment for the Service Company's fewer calls per customer
This adjustment is necessary because water utilities experience fewer calls per customer than do electric utilities

Review Period Call Handling charges		$ 577,589
Electric utility industry's avg calls/customer	2.50	
American Water's avg calls/customer	1.06	
Percent different	136%	136%
Total Adjustment B		$ 784,123

Note B: Estimated customer payment processing expenses

Number of customers	133,054
Number of payments/customer/year	12.0
Total payments processed/year	1,596,648
Bank charge per item	$ 0.0667
Total estimated annual expense	$ 106,496

Electric Utility Group Cost per Customer

Exhibit 12 (pages 32-35) shows the calculation of customer accounts expense per customer for 2017 for the electric utility comparison group. All of the underlying data was taken from the utilities' FERC Form 1.

Kentucky American Water Company
Comparison Group 2017 Customer Accounts Expense Per Customer

	Kentucky				Virginia	
	Duke Energy Kentucky	Kentucky Power	Kentucky Utilities	Louisville Gas & Electric	Appalachian Power	Virginia Elect Power
Customer Account Services Cost Pool						
FERC Account Balances:						
Account 903 - Customer Records & Collection (page 322, line 161)	$ 4,302,161	$ 5,319,350	$ 19,507,799	$ 7,045,154	$ 25,973,036	$ 48,436,050
Account 905 - Misc Customer Accounts (page 322, line 163)	$ 451	$ 20,074	$ 2,764	$ 3,309	$ 97,593	$ -
Subtotal	$ 4,302,612	$ 5,339,424	$ 19,510,563	$ 7,048,463	$ 26,070,629	$ 48,436,050
Add: Employee Benefits & Employer FICA (not included in above amounts)						
Account 926 - Employee Pension & Benefits (Note A)	$ 378,166	$ 179,014	$ 3,237,040	$ 810,962	$ 1,133,226	$ 7,105,756
Account 408 - Taxes Other Than Income (Employer's Portion of FICA) (Note I	$ 175,227	$ 93,811	$ 746,470	$ 249,547	$ 541,416	$ 2,523,413
Total Cost Pool	**$ 4,856,006**	**$ 5,612,249**	**$ 23,494,073**	**$ 8,108,971**	**$ 27,745,271**	**$ 58,065,219**
Total Customers (page 304, line 43)	141,274	167,599	550,636	408,738	955,861	2,574,679
Customer Account Services Expense per Customer	**$ 34.37**	**$ 33.49**	**$ 42.67**	**$ 19.84**	**$ 29.03**	**$ 22.55**
Note A: Pension & Benefits Pertaining to Customer Acct Services						
Account 926 - Employee Pension & Benefits (page 323, line 187)	$ 6,033,202	$ 3,796,598	$ 35,113,462	$ 23,052,071	$ 17,225,440	$ 134,474,869
Total O&M Payroll (page 355, line 65)	$ 36,543,135	$ 26,007,537	$ 105,846,521	$ 92,725,636	$ 107,578,015	$ 624,248,740
Benefits as Percent of Payroll	16.5%	14.6%	33.2%	24.9%	16.0%	21.5%
Payroll Applicable to Customer Account Services						
Total Payroll Charged to Customer Accounts Function						
Electric (page 354, line 7)	$ 2,771,485	$ 1,315,805	$ 12,318,503	$ 4,377,588	$ 8,277,360	$ 39,361,177
Percent Applicable to Customer Accounts Services (903 and 905):						
Account 903 - Customer Records & Collection (page 322, line 161)	$ 4,302,161	$ 5,319,350	$ 19,507,799	$ 7,045,154	$ 25,973,036	$ 48,436,050
Account 905 - Misc Customer Accounts (page 322, line 163)	$ 451	$ 20,074	$ 2,764	$ 3,309	$ 97,593	$ -
Subtotal - Total Charges Applicable to Customer Accounts Services	$ 4,302,612	$ 5,339,424	$ 19,510,563	$ 7,048,463	$ 26,070,629	$ 48,436,050
Account 902 - Meter Reading Expenses (page 322, line 160)	$ 903,386	$ 389,782	$ 5,120,136	$ 2,410,404	$ 4,420,505	$ 9,361,569
Total Charges Applicable to Customer Acccounts Svcs & Meter Reading	$ 5,205,998	$ 5,729,206	$ 24,630,699	$ 9,458,867	$ 30,491,134	$ 57,797,619
Percent Applicable to Customer Accounts Services (903 and 905)	82.6%	93.2%	79.2%	74.5%	85.5%	83.8%
Customer Account Services Portion of Total Payroll	$ 2,290,555	$ 1,226,285	$ 9,757,779	$ 3,262,047	$ 7,077,335	$ 32,985,787
Pension & Benefits Pertaining to Customer Accounts Services	$ 378,166	$ 179,014	$ 3,237,040	$ 810,962	$ 1,133,226	$ 7,105,756
Note B: Calculation of Employer's FICA Pertaining to Customer Accounts Svcs						
Customer Account Services Portion of Total Payroll	$ 2,290,555	$ 1,226,285	$ 9,757,779	$ 3,262,047	$ 7,077,335	$ 32,985,787
Employer's Portion of FICA (6.20%) and Medicare (1.45%)	7.65%	7.65%	7.65%	7.65%	7.65%	7.65%
Estimated Employer's Portion of FICA	$ 175,227	$ 93,811	$ 746,470	$ 249,547	$ 541,416	$ 2,523,413

Kentucky American Water Company
Comparison Group 2017 Customer Accounts Expense Per Customer

	Ohio					
	Cleveland Electric Illumin.	Dayton Power & Light	Duke Energy Ohio	Ohio Edison	Ohio Power	Toledo Edison
Customer Account Services Cost Pool						
FERC Account Balances:						
Account 903 - Customer Records & Collection (page 322, line 161)	$ 7,691,842	$ 6,935,866	$ 18,633,366	$ 11,788,080	$ 38,632,003	$ 4,533,970
Account 905 - Misc Customer Accounts (page 322, line 163)	$ 781,889	$ -	$ 2,280	$ 1,203,640	$ 206,025	$ 352,255
Subtotal	$ 8,473,731	$ 6,935,866	$ 18,635,646	$ 12,991,720	$ 38,838,028	$ 4,886,225
Add: Employee Benefits & Employer FICA (not included in above amounts)						
Account 926 - Employee Pension & Benefits (Note A)	$ 1,835,869	$ 1,547,700	$ 1,343,370	$ 1,537,608	$ 1,680,144	$ 557,473
Account 408 - Taxes Other Than Income (Employer's Portion of FICA) (Note I	$ 243,011	$ 356,437	$ 758,714	$ 400,697	$ 764,564	$ 158,782
Total Cost Pool	**$ 10,552,611**	**$ 8,840,003**	**$ 20,737,730**	**$ 14,930,024**	**$ 41,282,736**	**$ 5,602,480**
Total Customers (page 304, line 43)	750,660	261,210	712,328	1,046,760	1,472,768	310,305
Customer Account Services Expense per Customer	**$ 14.06**	**$ 33.84**	**$ 29.11**	**$ 14.26**	**$ 28.03**	**$ 18.05**
Note A: Pension & Benefits Pertaining to Customer Acct Services						
Account 926 - Employee Pension & Benefits (page 323, line 187)	$ 18,058,539	$ 24,324,441	$ 13,131,784	$ 11,127,451	$ 11,965,703	$ 3,371,421
Total O&M Payroll (page 355, line 65)	$ 31,246,775	$ 73,228,130	$ 96,949,247	$ 37,905,688	$ 71,177,757	$ 12,552,437
Benefits as Percent of Payroll	57.8%	33.2%	13.5%	29.4%	16.8%	26.9%
Payroll Applicable to Customer Account Services						
Total Payroll Charged to Customer Accounts Function						
Electric (page 354, line 7)	$ 5,348,713	$ 6,990,311	$ 10,313,745	$ 8,933,702	$ 11,719,416	$ 3,171,163
Percent Applicable to Customer Accounts Services (903 and 905):						
Account 903 - Customer Records & Collection (page 322, line 161)	$ 7,691,842	$ 6,935,866	$ 18,633,366	$ 11,788,080	$ 38,632,003	$ 4,533,970
Account 905 - Misc Customer Accounts (page 322, line 163)	$ 781,889	$ -	$ 2,280	$ 1,203,640	$ 206,025	$ 352,255
Subtotal - Total Charges Applicable to Customer Accounts Services	$ 8,473,731	$ 6,935,866	$ 18,635,646	$ 12,991,720	$ 38,838,028	$ 4,886,225
Account 902 - Meter Reading Expenses (page 322, line 160)	$ 5,794,155	$ 3,469,931	$ 743,936	$ 9,166,961	$ 6,703,812	$ 2,579,173
Total Charges Applicable to Customer Acccounts Svcs & Meter Reading	$ 14,267,886	$ 10,405,797	$ 19,379,582	$ 22,158,681	$ 45,541,840	$ 7,465,398
Percent Applicable to Customer Accounts Services (903 and 905)	59.4%	66.7%	96.2%	58.6%	85.3%	65.5%
Customer Account Services Portion of Total Payroll	$ 3,176,613	$ 4,659,313	$ 9,917,825	$ 5,237,864	$ 9,994,304	$ 2,075,578
Pension & Benefits Pertaining to Customer Accounts Services	$ 1,835,869	$ 1,547,700	$ 1,343,370	$ 1,537,608	$ 1,680,144	$ 557,473
Note B: Calculation of Employer's FICA Pertaining to Customer Accounts Svcs						
Customer Account Services Portion of Total Payroll	$ 3,176,613	$ 4,659,313	$ 9,917,825	$ 5,237,864	$ 9,994,304	$ 2,075,578
Employer's Portion of FICA (6.20%) and Medicare (1.45%)	7.65%	7.65%	7.65%	7.65%	7.65%	7.65%
Estimated Employer's Portion of FICA	$ 243,011	$ 356,437	$ 758,714	$ 400,697	$ 764,564	$ 158,782

Kentucky American Water Company
Comparison Group 2017 Customer Accounts Expense Per Customer

	Indiana					Tennessee
	Duke Energy Indiana	Indiana Michigan Pwr	Indianapolis Pwr & Light	No. Indiana Public Service	Vectren	Kingsport Power
Customer Account Services Cost Pool						
FERC Account Balances:						
Account 903 - Customer Records & Collection (page 322, line 161)	$ 20,898,514	$ 12,792,694	$ 10,007,128	$ 11,680,019	$ 2,490,864	$ 1,196,809
Account 905 - Misc Customer Accounts (page 322, line 163)	$ 2,626	$ 65,601	$ 65,537	$ -	$ 275,436	$ 8,167
Subtotal	$ 20,901,140	$ 12,858,295	$ 10,072,665	$ 11,680,019	$ 2,766,300	$ 1,204,976
Add: Employee Benefits & Employer FICA (not included in above amounts)						
Account 926 - Employee Pension & Benefits (Note A)	$ 1,222,035	$ 488,267	$ 1,548,756	$ 1,399,590	$ 769	$ 46,390
Account 408 - Taxes Other Than Income (Employer's Portion of FICA) (Note I	$ 569,472	$ 237,982	$ 396,287	$ 547,085	$ 91,481	$ 25,163
Total Cost Pool	**$ 22,692,646**	**$ 13,584,544**	**$ 12,017,708**	**$ 13,626,694**	**$ 2,858,550**	**$ 1,276,529**
Total Customers (page 304, line 43)	819,569	591,984	489,601	467,780	149,213	47,840
Customer Account Services Expense per Customer	**$ 27.69**	**$ 22.95**	**$ 24.55**	**$ 29.13**	**$ 19.16**	**$ 26.68**
Note A: Pension & Benefits Pertaining to Customer Acct Services						
Account 926 - Employee Pension & Benefits (page 323, line 187)	$ 32,170,369	$ 26,450,155	$ 33,440,233	$ 33,135,893	$ 24,191	$ 266,020
Total O&M Payroll (page 355, line 65)	$ 195,967,095	$ 168,521,167	$ 111,849,669	$ 169,313,472	$ 37,622,927	$ 1,886,219
Benefits as Percent of Payroll	16.4%	15.7%	29.9%	19.6%	0.1%	14.1%
Payroll Applicable to Customer Account Services						
Total Payroll Charged to Customer Accounts Function						
Electric (page 354, line 7)	$ 10,350,655	$ 3,320,710	$ 7,689,795	$ 7,969,150	$ 1,767,037	$ 362,008
Percent Applicable to Customer Accounts Services (903 and 905):						
Account 903 - Customer Records & Collection (page 322, line 161)	$ 20,898,514	$ 12,792,694	$ 10,007,128	$ 11,680,019	$ 2,490,864	$ 1,196,809
Account 905 - Misc Customer Accounts (page 322, line 163)	$ 2,626	$ 65,601	$ 65,537	$ -	$ 275,436	$ 8,167
Subtotal - Total Charges Applicable to Customer Accounts Services	$ 20,901,140	$ 12,858,295	$ 10,072,665	$ 11,680,019	$ 2,766,300	$ 1,204,976
Account 902 - Meter Reading Expenses (page 322, line 160)	$ 8,160,971	$ 867,290	$ 4,879,727	$ 1,335,513	$ 1,321,348	$ 121,188
Total Charges Applicable to Customer Acccounts Svcs & Meter Reading	$ 29,062,111	$ 13,725,585	$ 14,952,392	$ 13,015,532	$ 4,087,648	$ 1,326,164
Percent Applicable to Customer Accounts Services (903 and 905)	71.9%	93.7%	67.4%	89.7%	67.7%	90.9%
Customer Account Services Portion of Total Payroll	$ 7,444,073	$ 3,110,882	$ 5,180,223	$ 7,151,442	$ 1,195,835	$ 328,927
Pension & Benefits Pertaining to Customer Accounts Services	$ 1,222,035	$ 488,267	$ 1,548,756	$ 1,399,590	$ 769	$ 46,390
Note B: Calculation of Employer's FICA Pertaining to Customer Accounts Svcs						
Customer Account Services Portion of Total Payroll	$ 7,444,073	$ 3,110,882	$ 5,180,223	$ 7,151,442	$ 1,195,835	$ 328,927
Employer's Portion of FICA (6.20%) and Medicare (1.45%)	7.65%	7.65%	7.65%	7.65%	7.65%	7.65%
Estimated Employer's Portion of FICA	$ 569,472	$ 237,982	$ 396,287	$ 547,085	$ 91,481	$ 25,163

Kentucky American Water Company
Comparison Group 2017 Customer Accounts Expense Per Customer

	Illinois			Missouri		
	Ameren Illinois	Com Edison	MidAmerica Energy	Ameren Missouri	Empire District Electric	Kansas City Power & Light
Customer Account Services Cost Pool						
FERC Account Balances:						
Account 903 - Customer Records & Collection (page 322, line 161)	$ 28,010,663	$ 150,278,223	$ 15,583,671	$ 14,065,290	$ 3,761,593	$ 14,436,740
Account 905 - Misc Customer Accounts (page 322, line 163)	$ 188,492	$ -	$ 291,125	$ 88,245	$ 131,180	$ 1,031,796
Subtotal	$ 28,199,155	$ 150,278,223	$ 15,874,796	$ 14,153,535	$ 3,892,773	$ 15,468,536
Add: Employee Benefits & Employer FICA (not included in above amounts)						
Account 926 - Employee Pension & Benefits (Note A)	$ 1,324,971	$ 30,919,546	$ 1,189,268	$ 403,517	$ 1,487,354	$ 3,435,449
Account 408 - Taxes Other Than Income (Employer's Portion of FICA) (Note I	$ 830,085	$ 6,016,477	$ 945,362	$ 210,479	$ 242,413	$ 563,574
Total Cost Pool	**$ 30,354,211**	**$ 187,214,245**	**$ 18,009,426**	**$ 14,767,531**	**$ 5,622,540**	**$ 19,467,559**
Total Customers (page 304, line 43)	1,221,130	4,006,465	770,330	1,215,789	171,841	539,408
Customer Account Services Expense per Customer	**$ 24.86**	**$ 46.73**	**$ 23.38**	**$ 12.15**	**$ 32.72**	**$ 36.09**
Note A: Pension & Benefits Pertaining to Customer Acct Services						
Account 926 - Employee Pension & Benefits (page 323, line 187)	$ 32,625,050	$ 136,896,648	$ 20,343,997	$ 51,518,524	$ 23,913,454	$ 81,463,294
Total O&M Payroll (page 355, line 65)	$ 267,181,072	$ 348,209,409	$ 211,394,236	$ 351,276,668	$ 50,947,418	$ 174,689,955
Benefits as Percent of Payroll	12.2%	39.3%	9.6%	14.7%	46.9%	46.6%
Payroll Applicable to Customer Account Services						
Total Payroll Charged to Customer Accounts Function						
Electric (page 354, line 7)	$ 15,406,460	$ 99,050,496	$ 16,060,516	$ 7,143,734	$ 4,832,722	$ 9,642,526
Percent Applicable to Customer Accounts Services (903 and 905):						
Account 903 - Customer Records & Collection (page 322, line 161)	$ 28,010,663	$ 150,278,223	$ 15,583,671	$ 14,065,290	$ 3,761,593	$ 14,436,740
Account 905 - Misc Customer Accounts (page 322, line 163)	$ 188,492	$ -	$ 291,125	$ 88,245	$ 131,180	$ 1,031,796
Subtotal - Total Charges Applicable to Customer Accounts Services	$ 28,199,155	$ 150,278,223	$ 15,874,796	$ 14,153,535	$ 3,892,773	$ 15,468,536
Account 902 - Meter Reading Expenses (page 322, line 160)	$ 11,839,366	$ 38,987,477	$ 4,756,711	$ 22,595,228	$ 2,044,086	$ 4,777,993
Total Charges Applicable to Customer Acccounts Svcs & Meter Reading	$ 40,038,521	$ 189,265,700	$ 20,631,507	$ 36,748,763	$ 5,936,859	$ 20,246,529
Percent Applicable to Customer Accounts Services (903 and 905)	70.4%	79.4%	76.9%	38.5%	65.6%	76.4%
Customer Account Services Portion of Total Payroll	$ 10,850,779	$ 78,646,752	$ 12,357,673	$ 2,751,360	$ 3,168,795	$ 7,366,979
Pension & Benefits Pertaining to Customer Accounts Services	$ 1,324,971	$ 30,919,546	$ 1,189,268	$ 403,517	$ 1,487,354	$ 3,435,449
Note B: Calculation of Employer's FICA Pertaining to Customer Accounts Svcs						
Customer Account Services Portion of Total Payroll	$ 10,850,779	$ 78,646,752	$ 12,357,673	$ 2,751,360	$ 3,168,795	$ 7,366,979
Employer's Portion of FICA (6.20%) and Medicare (1.45%)	7.65%	7.65%	7.65%	7.65%	7.65%	7.65%
Estimated Employer's Portion of FICA	$ 830,085	$ 6,016,477	$ 945,362	$ 210,479	$ 242,413	$ 563,574

Kentucky American Water Company
Comparison Group 2017 Customer Accounts Expense Per Customer

	West Virginia				
	Appalachian Power	Monongahela Power	Potomac Edison	Wheeling Power	
Customer Account Services Cost Pool					
FERC Account Balances:					
Account 903 - Customer Records & Collection (page 322, line 161)		$ 5,315,199	$ 4,796,552	$ 1,016,748	
Account 905 - Misc Customer Accounts (page 322, line 163)		$ 356,548	$ 388,126	$ 5,503	
Subtotal		$ 5,671,747	$ 5,184,678	$ 1,022,251	
Add: Employee Benefits & Employer FICA (not included in above amounts)					
Account 926 - Employee Pension & Benefits (Note A)		$ 2,394,831	$ 670,625	$ 54,000	
Account 408 - Taxes Other Than Income (Employer's Portion of FICA) (Note B)		$ 235,169	$ 180,424	$ 24,523	
Total Cost Pool		**$ 8,301,747**	**$ 6,035,727**	**$ 1,100,774**	**$ 586,757,805**
Total Customers (page 304, line 43)		390,806	407,172	41,427	20,683,173
Customer Account Services Expense per Customer	**see VA**	**$ 21.24**	**$ 14.82**	**$ 26.57**	**$ 28.37**
					Group Average
Note A: Pension & Benefits Pertaining to Customer Acct Services					
Account 926 - Employee Pension & Benefits (page 323, line 187)		$ 44,895,540	$ 4,462,155	$ 2,224,367	
Total O&M Payroll (page 355, line 65)		$ 57,629,745	$ 15,692,706	$ 13,204,738	
Benefits as Percent of Payroll		77.9%	28.4%	16.8%	
Payroll Applicable to Customer Account Services					
Total Payroll Charged to Customer Accounts Function					
Electric (page 354, line 7)		$ 7,280,184	$ 4,285,821	$ 383,768	
Percent Applicable to Customer Accounts Services (903 and 905):					
Account 903 - Customer Records & Collection (page 322, line 161)		$ 5,315,199	$ 4,796,552	$ 1,016,748	
Account 905 - Misc Customer Accounts (page 322, line 163)		$ 356,548	$ 388,126	$ 5,503	
Subtotal - Total Charges Applicable to Customer Accounts Services		$ 5,671,747	$ 5,184,678	$ 1,022,251	
Account 902 - Meter Reading Expenses (page 322, line 160)		$ 7,760,256	$ 4,236,885	$ 201,555	
Total Charges Applicable to Customer Acccounts Svcs & Meter Reading		$ 13,432,003	$ 9,421,563	$ 1,223,806	
Percent Applicable to Customer Accounts Services (903 and 905)		42.2%	55.0%	83.5%	
Customer Account Services Portion of Total Payroll		$ 3,074,103	$ 2,358,484	$ 320,563	
Pension & Benefits Pertaining to Customer Accounts Services		$ 2,394,831	$ 670,625	$ 54,000	
Note B: Calculation of Employer's FICA Pertaining to Customer Accounts Svcs					
Customer Account Services Portion of Total Payroll		$ 3,074,103	$ 2,358,484	$ 320,563	
Employer's Portion of FICA (6.20%) and Medicare (1.45%)		7.65%	7.65%	7.65%	
Estimated Employer's Portion of FICA		$ 235,169	$ 180,424	$ 24,523	

Summary of Results

As shown in the table below, KAWC's cost per customer is below than the 2017 average cost of the neighboring electric utility comparison group. It can be concluded that KAWC's 12 months ended August 31, 2018 customer accounts expenses, including those of the Alton and Pensacola Call Centers, assigned by the Service Company to KAWC are comparable to those of other utilities.

Customer Account Services Expenses Per Customer		
Com Edison	$	46.73
Kentucky Utilities	$	42.67
Kansas City Pwr & Light	$	36.09
Duke Energy Kentucky	$	34.37
Dayton Power & Light	$	33.84
Kentucky Power	$	33.49
Empire District Electric	$	32.72
No. Indiana Public Svc	$	29.13
Duke Energy Ohio	$	29.11
Appalachian Power	$	29.03
Comparison Group Average	**$**	**28.37**
Ohio Power	$	28.03
Duke Energy Indiana	$	27.69
Kentucky American Water	**$**	**27.26**
Kingsport Power	$	26.68
Wheeling Power	$	26.57
Ameren Illinois	$	24.86
Indianapolis Power & Light	$	24.55
MidAmerica Energy	$	23.38
Indiana Michigan Power	$	22.95
Virginia Elect Power	$	22.55
Monongahela Power	$	21.24
Louisville Gas & Electric	$	19.84
Vectren	$	19.16
Toledo Edison	$	18.05
Potomac Edison	$	14.82
Ohio Edison	$	14.26
Cleveland Electric Illumin.	$	14.06
Ameren Missouri	$	12.15

Analysis of Services

The final aspect of this study is whether the services provided to KAWC by the Service Company would be necessary if KAWC were a stand-alone water utility. The first step in this evaluation was to determine specifically what the Service Company does for KAWC. Based on discussions with Service Company personnel, the matrix in Exhibit 13 (pages 39-41) was created showing which entity— KAWC or a Service Company location—is responsible for each of the functions KAWC requires to ultimately provide service to its customers. This matrix was reviewed to determine: (1) if there was redundancy or overlap in the services being provided by the Service Company and (2) if Service Company services are typical of those needed by a stand-alone water utility.

Upon review of Exhibit 13, the following conclusions can be drawn:

- The services that the Service Company provides are necessary and would be required even if KAWC were a stand-alone water utility.

- There is no redundancy or overlap in the services provided by the Service Company to KAWC. For all of the services listed in Exhibit 13, there was only one entity that was primarily responsible for the service.

Kentucky American Water Company
Designation of Responsibility for Water Utility Functions

P - Primarily Responsible S - Provides Support	Performed By:					
		American Water Service Company				
Water Company Function	KAWC	Customer Call Center	Southeast Division	Central Services	T&I Service Centers	Central Lab
Engineering and Construction Management						
CPS Preparation	S			P		
Five-Year System Planning	P			S		
Engineering Standards & Policies Development				P		
Project Design						
Major Projects (e.g., new treatment plant)	P			S		
Special Projects	P			S		
Minor Projects (e.g., pipelines)	P					
Construction Project Management						
Major Projects	P			S		
Special Projects	P					
Minor Projects	P					
Hydraulics Review	P					
Developers Extensions	P					
Tank Painting	P					
Water Quality and Purification						
Water Quality Standards Development	P (1)			P (1)		S
Research Studies	S			P		S
Water Quality Program Implementation	P			S		S
Water Treatment Operations & Maintenance	P			S		
Compliance Sampling	P					S
Testing/Other Sampling	P					S
Transmission and Distribution						
Preventive Maintenance Program Development	P			S		
System Maintenance	P					
Leak Detection	P					
Customer Service						
Community Relations	P			S		
Customer Contact	P (2)	P (2)				
Call Processing		P				
Service Order Processing	P	S				
Customer Credit		P				
Meter Reading	P				S	
Customer Bill Preparation	S	S			P	
Bill Collection		P			S	
Customer Payment Processing	S			P	S	
Meter Standards Development	S			P		
Meter Testing, Maintenance & Replacement	P					

Note 1: KAWC responsible for State regulations, Central Services responsible for Federal regulations
Note 2: KAWC provide in-person customer contact while Service Company call centers provide customer phone contact

Kentucky American Water Company
Designation of Responsibility for Water Utility Functions

P - Primarily Responsible S - Provides Support	Performed By:					
		American Water Service Company				
Water Company Function	KAWC	Customer Call Center	Southeast Division	Central Services	T&I Service Centers	Central Lab
Financial Management						
Financial Planning			P	S		
Financings--Equity			S	P		
Financings--Long Term Debt & Preferred			S (3)	P (3)		
Short Term Lines of Credit Arrangements			S (3)	P (3)		
Investor Relations			S	P		
Insurance Program Administration	S			P		
Loss Control/Safety Program Administration	P			S		
Pension Fund Asset Management				P		
Cash Management/Disbursements				P		
Internal Auditing				P		
Budgeting and Variance Reporting						
Corporate Guidelines & Instructions			S	P		
Budget Preparation						
Revenue and O&M			P	S		
Depreciation and Interest Expense			S	P		
Budget Preparation--Service Company Charges		S	S	P	S	S
Capital Budget Preparation—Projects	S		P	S		
Capital Budget Preparation—Non-Project Work	P		S	S		
Prepare Monthly Budget Variance Report			P	S		
("Budget/Plan Analysis")						
Prepare Capital Project Budget Status Report	P		S			
Year-End Projections	P		S			
Accounting and Taxes						
Accounts Payable Accounting	S			P		
Payroll Accounting	S			P		
Work Order Accounting	S		S	P		
Fixed Asset Accounting	S		S	P		
Journal Entry Preparations--Billing Corrections	S		S	P		
Journal Entry Preparation--All Others	S		S	P		
Financial Statement Preparation	S		S	P		
State Commission Reporting	S		S	P		
Income Taxes--State				P		
Income Taxes--Federal				P		
Property Taxes	S		S	P		
Gross Receipts (Town) Taxes	S		S	P		

Note 3: Lines of credit are the responsibility of American Water Capital Corporation ("AWCC"). AWCC is also responsible for Corporate financings which may be distributed to the regulated subsidiaries. KAWC has the abilility to issue LTD.

Kentucky American Water Company
Designation of Responsibility for Water Utility Functions

P - Primarily Responsible S - Provides Support	Performed By:					
		American Water Service Company				
Water Company Function	KAWC	Customer Call Center	Southeast Division	Central Services	T&I Service Centers	Central Lab
Rates						
Rate Studies & Tariff Change Administration			P	P		
Rate Case Planning and Preparation			P	S		
Rate Case Administration			P	S		
Commission Inquiry Response			P	S		
Legal			P	S		
Purchasing and Materials Management – National (pipe, chemicals, meters, etc.)						
Specification Development	S			P		
Bid Solicitation	S			P		
Contract Administration	S			P		
Purchasing and Materials Management – State (state supplier service agreements)						
Specification Development	P			S		
Bid Solicitation	P					
Contract Administration	P					
Ordering	P					
Inventory Management	P					
Human Resources Management						
Benefit Program Development				P		
Benefits Program Administration			S	P		
Management Compensation Administration			S	P		
Wage & Salary Program Design			S	P		
Wage & Salary Administration			P	S		
Labor Negotiations--Wages	S		P			
Labor Negotiations--Benefits	S		P	S		
Labor Negotiations-- Work Rules	S		P			
Training Program Development			S	P		
Training--Course Delivery	S		P			
Affirmative Action/EEO--Plan Development			S	P		
Affirmative Action/EEO--Implementation			P			
Information Technology Services						
Service Company Data Centers						
System Operations & Maintenance					P	
Software Maintenance					P	
Network Administration			S		P	
Workstation Acquisition & Support			P		S	
Help Desk			S		P	

Practices Associated with Service Company Charges

There are several ways by which KAWC exercises control over Service Company services and charges. The most important of these are described below.

1. **KAWC Company Board Oversight** – The KAWC board of directors includes the KAWC's President, Vice President of Operations, Divisional CFO and external business and community leaders. This diverse board ensures that the needs of KAWC and its customers are a consideration when overseeing the delivery of Service Company services. The KAWC Board meets at a minimum of four times each year and at every meeting, financial and operational reports and issues are discussed at length. Besides the quarterly meetings, the Board is a resource KAWC's Leadership Team can call upon throughout the year.
2. **Divisional CFO (CFO)** – The CFO and supporting staff are responsible for monitoring the overall financial performance of KAWC. This includes overseeing KAWC's financial reporting process, performing revenue and expense analysis, coordinating the annual budgeting process, and monitoring internal control performance. Every month, the Finance team performs a detailed expense analysis that includes Service Company charges. Actual and year-to-date actual performance is compared against budget and prior period actuals. The Finance team also reviews and investigates monthly Service Company charges based on the results of the team's analytical procedures in order to determine the appropriateness of the charges.
3. **Service Company Board Oversight** – The Service Company Board of Directors is comprised of 16 members who meet four times a year to oversee activities and bylaws of Service Company. The Board's primary responsibilities include:
    a. Approve the Business Plan and Operating Budget
    b. Review Financial Performance
    c. Review performance metrics for certain functional groups
    d. Approve American Water policies, procedures and practices as they relate to Service Company.
4. **Service Company Budget Review/Approval** – Several state-regulated water utility presidents serve on the Service Company board of directors. The board reviews and approves the Service Company's budget charges for the next year. The Service Company's overall budget is assigned to each operating company, which consolidates these charges with its own direct spending to arrive at a total operating company budget. This is presented to the operating company's board of directors (e.g., KAWC) for their approval.
5. **Major Project Review and** Approval – Before major Service Company non-capital projects are undertaken, they must be reviewed and approved by American Water's Executive Management Team, which includes the Chief Operating Officer. The Chief Operating Officer, with significant input from his direct reports, has the ability to affect all new initiatives and projects before they are authorized. Major non-capital projects and initiatives for the Service Company are approved through the Business Planning process. A 3-year technology roadmap of initiatives is developed from American Water's vision, strategy, operational objectives and key business programs. The alignment of these initiatives with enterprise goals is approved by the Executive Leadership Team and key business leaders from various operational and functional areas of American Water. The roadmap is updated annually to produce a rolling 3-year roadmap and investment plan.
6. **Capital Investment Management (CIM**) – CIM covers capital and asset planning and is employed throughout American Water, including the Service Company. CIM provides a

full range of governance practices, including a formal protocol for assessing system needs, prioritizing capital expenditures, managing the capital program, approving project spending, delivering projects and measuring outputs. CIM ensures that:

a. Capital expenditure plans are aligned with the strategic intent of the business
b. The impact of capital expenditure and income plans are fully reflected in operating expense plans
c. The impacts of these plans on state operating company budgets and operating results are understood
d. Effective controls are in place over budgets (through business plans) and individual capital projects (through appropriate authorization thresholds, management and reporting processes).

The CIM process was designed to optimize the effectiveness of asset investment.

7. **Accounting and Financial Reporting** – The Service Company follows the same accounting and financial reporting processes as American Water's regulated utilities. At month-end, the Service Company's Finance team performs detailed expense analysis and variance analysis for monthly actual results (compared to budget and prior year actual results) and year-to-date actual results (compared to budget). Once this is complete, the Service Company bill is run and the actuals allocated and assigned to the state operating companies based on predetermined formulas. A review document is then created to explain expense variances that meet or exceed certain thresholds. KAWC's Finance personnel review the document on a monthly basis for accuracy and reasonableness and have the opportunity to inquire about expenses and spending levels to gain a better understanding of results. Any errors or overcharges are corrected on a subsequent billing.

8. **KAWC Company Budget Variance Analysis** – Each month a Service Company Affiliate Billing Analysis Report is prepared and provided to operating companies. This report allows each operating company to monitor its Service Company budget-versus-actual charges for the month and year-to-date.

KENTUCKY AMERICAN WATER COMPANY, INC.

DOCKET NO. 2018-00358

DIRECT TESTIMONY

OF

ANN E. BULKLEY

ON

(Authorized Return on Equity and Capital Structure)

SPONSORING ATTACHMENTS AEB-1 THROUGH AEB-13

DIRECT TESTIMONY
OF
ANN E. BULKLEY

DOCKET NO. 2018-00358

I. BACKGROUND

Q. Please state your name, affiliation, and business address.

A. My name is Ann E. Bulkley. I am employed by Concentric Energy Advisors, Inc. ("Concentric") as a Senior Vice President. My business address is 293 Boston Post Road West, Suite 500, Marlborough, Massachusetts 01752.

Q. On whose behalf are you submitting this testimony?

A. I am submitting this testimony on behalf of Kentucky American Water Company ("KAWC" or the "Company"), a wholly-owned subsidiary of American Water Works Company Inc. ("AWK").

Q. Please describe your background and professional experience in the energy and utility industries.

A. I hold a Bachelor's degree in Economics and Finance from Simmons College and a Master's degree in Economics from Boston University, with more than 20 years of experience consulting to the energy industry. I have advised numerous energy and utility clients on a wide range of financial and economic issues with primary concentrations in valuation and utility rate matters. Many of these assignments have included the

determination of the cost of capital for valuation and ratemaking purposes. My qualifications and testimony listing are presented in more detail in Appendix A.

Q. Please describe Concentric's activities in energy and utility engagements.

A. Concentric provides financial and economic advisory services to many and various energy and utility clients across North America. Our regulatory, economic, and market analysis services include utility ratemaking and regulatory advisory services; energy market assessments; market entry and exit analysis; corporate and business unit strategy development; demand forecasting; resource planning; and energy contract negotiations. Our financial advisory activities include buy- and sell-side merger, acquisition, and divestiture assignments; due diligence and valuation assignments; project and corporate finance services; and transaction support services. In addition, we provide litigation support services on a wide range of financial and economic issues on behalf of clients throughout North America.

II. PURPOSE AND OVERVIEW OF TESTIMONY

Q. What is the purpose of your Direct Testimony?

A. The purpose of my Direct Testimony is to present evidence and provide a recommendation regarding KAWC's authorized return on equity ("ROE" or "cost of equity") and to assess the reasonableness of its proposed capital structure for ratemaking purposes.

Q. Are you sponsoring any Attachments in support of your Direct Testimony?

A. Yes. I am sponsoring Attachments AEB-1 through AEB-13. These exhibits were prepared by me or under my direction and supervision.

Q. Please provide a brief overview of the analyses that led to your ROE recommendation.

A. As discussed in more detail in the remainder of my Direct Testimony, it is important to consider the results of several analytical approaches in determining a reasonable recommendation for the Company's ROE. To develop my ROE recommendation, I developed two proxy groups – the Water Proxy Group ("WPG") and the Combined Utility Proxy Group ("CUPG") – that consist of companies that face risks generally comparable to that faced by KAWC. The Water Proxy Group includes only water utilities; however, this resulted in a proxy group of only five companies. Recognizing that the Water Proxy Group is small, I also developed the Combined Utility Proxy Group which consists of both water utilities and natural gas distribution companies. I applied the Constant Growth Discounted Cash Flow ("DCF") model and the Capital Asset Pricing Model ("CAPM"). In addition to these analyses, I also considered the Value Line projected ROEs for the companies in the WPG, and a Constant Growth DCF analysis based on projected dividend yields and share prices. My recommendation also takes into consideration the following business risk factors as compared with the Combined Utility Proxy Group: (1) the Company's capital expenditure requirements; and (2) the

Company's adjustment mechanisms. Although I did not make any specific adjustments to my ROE estimates for the foregoing factors, I considered each of them when determining where the Company's ROE should fall within the range of analytical results. Finally, I compared KAWC's proposed capital structure to the actual capital structures of the proxy group companies.

Q. Please summarize your analytical results.

A. My analytical results are summarized in Figure .

Figure 1: **Summary of Cost of Equity Results**

Forward-Looking CAPM Results- Water Proxy Group (WPG)[1]				
	Current Risk-Free Rate (3.09%)	**2018-2020 Projected Risk-Free Rate (3.52%)**	**2020-2024 Projected Risk-Free Rate (4.20%)**	**Mean Result**
Including AWK				
Bloomberg Beta	12.66%	12.75%	12.89%	12.76%
Value Line Beta	12.41%	12.50%	12.66%	12.52%
Excluding AWK				
Bloomberg Beta	13.09%	13.16%	13.28%	13.18%
Value Line Beta	12.77%	12.85%	12.99%	12.87%
Forward-Looking CAPM Results- Combined Utility Proxy Group (CUPG)[2]				
	Current Risk-Free Rate (3.09%)	**2018-2020 Projected Risk-Free Rate (3.52%)**	**2020-2024 Projected Risk-Free Rate (4.20%)**	**Mean Result**
Including AWK				
Bloomberg Beta	11.31%	11.45%	11.67%	11.47%
Value Line Beta	11.76%	11.88%	12.08%	11.91%
Excluding AWK				
Bloomberg Beta	11.35%	11.48%	11.70%	11.51%
Value Line Beta	11.84%	11.95%	12.14%	11.98%

[1] *See* Attachment AEB-9.

[2] *See* Attachment AEB-10.

Figure 1: Summary of Cost of Equity Results (cont'd)

	Median Low	Median	Median High
Water Proxy Group			
Constant Growth DCF – 180 Day Average[3]			
Including AWK	8.95%	9.16%	11.23%
Excluding AWK	8.02%	8.36%	10.74%
Constant Growth DCF – Projected DCF Model 2021-2023[4]			
Including AWK	9.48%	9.71%	11.79%
Excluding AWK	8.56%	8.94%	11.25%
Value Line Projected Equity Returns 2021-2023[5]			
Including AWK	10.50%	12.50%	14.00%
Excluding AWK	11.50%	13.00%	14.00%
	Median Low	**Median**	**Median High**
Combined Utility Proxy Group			
Constant Growth DCF – 180 Day Average[6]			
Including AWK	8.87%	9.58%	11.85%
Excluding AWK	8.80%	9.29%	11.77%
Constant Growth DCF – Projected DCF Model 2021-2023[7]			
Including AWK	8.85%	9.68%	12.10%
Excluding AWK	8.45%	9.64%	12.10%

As shown in Attachments AEB-1 and AEB-2, the DCF model is producing individual company results as low as 4.64 percent, or 126 basis points lower than KAWC's embedded cost of long-term debt of 5.90 percent for the test year ending June 30, 2020.[8] This result is inconsistent with the relative risk of owning common equity or debt

[3] *See* Attachment AEB-1.
[4] *See* Attachment AEB-3.
[5] *See* Attachment AEB-5.
[6] *See* Attachment AEB-2.
[7] *See* Attachment AEB-4.
[8] Source: Company provided data.

instruments. Because shareholders are the residual claimants on the firm's earnings and assets, the return to equity holders necessarily must be higher than the return to bond holders. As discussed in more detail in Section VI of my Direct Testimony, I applied a minimum threshold of 7.00 percent to the DCF results.[9] The results summarized in Figure 1 reflect this lower bound.

As also discussed in more detail in Section IV of my Direct Testimony, there are concerns among investors and regulators that the DCF model is not producing reasonable results at this time due to anomalous conditions in capital markets. My ROE recommendation also considers the results of a forward-looking CAPM analysis and the projected ROEs for the companies in my Water Proxy Group, as published by Value Line. In addition, I consider company-specific risk factors and current and prospective capital market conditions.

Q. What is your conclusion regarding the appropriate authorized ROE for KAWC in this proceeding?

A. A reasonable range of ROE estimates for KAWC is from 10.00 percent to 10.80 percent. Considering the business and financial risk factors facing KAWC, I believe that an ROE of 10.80 percent is reasonable and appropriate. The required ROE should be a forward-looking estimate; therefore, the analyses supporting my recommendation rely on forward-

[9] The lower bound is based on a recent position established by the Minnesota Department of Commerce in Docket No. E017/GR-15-1033, In the Matter of the Application of Otter Tail Power Company for Authority to Increase Rates for Electric Service in the State of Minnesota (August 16, 2016), at 11.

looking inputs and assumptions (e.g., projected analyst growth rates in the DCF model, forecasted risk-free rate and Market Risk Premium in the CAPM analysis, etc.). I also take into consideration capital market conditions, including the effect of the current low interest rate environment on utility stock valuations and dividend yields, and the market's expectation for higher interest rates.

Q. How is the remainder of your Direct Testimony organized?

A. The remainder of my Direct Testimony is organized in seven sections. Section III reviews the regulatory guidelines pertinent to the development of the cost of capital. Section IV discusses the current and prospective capital market conditions and the effect of those conditions on KAWC's cost of equity. Section V explains my selection of the proxy group of water utilities and the proxy group of water utilities and natural gas companies. Section VI describes my analyses and the analytical basis for the recommendation of the appropriate ROE for KAWC. Section VII provides a discussion of specific business risks that have a direct bearing on the Company's authorized ROE in this case. Section VIII provides an assessment of the reasonableness of KAWC's proposed capital structure relative to the proxy group. Section IX presents my conclusions and recommendations on the cost of equity and capital structure.

III. REGULATORY GUIDELINES

Q. Please describe the principles that guide the establishment of the cost of capital for a regulated utility.

A. The United States Supreme Court's *Hope* and *Bluefield* decisions established the standards for determining the fairness or reasonableness of a utility's authorized ROE. Among the standards established by the Court in those cases are: (1) consistency with other businesses having similar or comparable risks; (2) adequacy of the return to support credit quality and access to capital; and (3) the principle that the specific means of arriving at a fair return are not important, only that the end result leads to just and reasonable rates.[10]

Q. Has the Kentucky Public Service Commission ("Commission") provided similar guidance in establishing the appropriate return on common equity?

A. Yes. Part 1 of Kentucky Revised Statute ("KRS") 278.030 states that "every utility may demand, collect and receive fair, just and reasonable rates for the services rendered or to be rendered by it to any person".[11] Therefore, the Commission which regulates utilities based on the provisions outlined in KRS 278 must ultimately ensure that the calculated rates allow the utility the opportunity to earn a reasonable return for its shareholders. This position was supported by Commission in a 2014 news article:

[10] Bluefield Water Works v. Public Service Comm'n, 262 U.S. 679, 692-93 (1923); Federal Power Comm'n v. Hope Natural Gas, 320 U.S. 591, 603 (1944).

[11] Kentucky Revised Statute ("KRS") 278.030 part (1).

> Like every other investor owned utility in the state, Kentucky Power is entitled – by both Kentucky and federal law - to the opportunity to earn a reasonable but not excessive rate of return on equity for its shareholders.[12]

Q. Why is it important for a utility to be allowed the opportunity to earn a return that is adequate to attract capital at reasonable terms?

A. A return that is adequate to attract capital at reasonable terms enables KAWC to continue providing safe, reliable water distribution service while maintaining its financial integrity. That return should be commensurate with returns expected elsewhere in the market for investments of equivalent risk. If it is not, debt and equity investors will seek alternative investment opportunities for which the expected return reflects the perceived risks, thereby inhibiting KAWC's ability to attract capital at reasonable cost.

Q. What are your conclusions regarding regulatory guidelines?

A. The ratemaking process is premised on the principle that, in order for investors and companies to commit the capital needed to provide safe and reliable utility services, a utility must have the opportunity to recover the return of, and the market-required return on, its invested capital. Because utility operations are capital-intensive, regulatory decisions should enable the utility to attract capital at reasonable terms; doing so balances the long-term interests of the utility and its customers.

[12] Public Service Commission. "PSC Responds to Criticism of Ky. Power." The Mountain Eagle, 2014, www.themountaineagle.com/articles/psc-responds-to-criticism-of-ky-power/.

The financial community carefully monitors the current and expected financial condition of utility companies and the regulatory framework within which they operate. In that respect, the regulatory framework is one of the most important factors in both debt and equity investors' assessments of risk. The Commission's order in this case, therefore, should establish rates that provide KAWC with the opportunity to earn a ROE that is: (1) adequate to attract capital at reasonable terms; (2) sufficient to ensure its financial integrity; and (3) commensurate with returns on investments in enterprises with similar risk. To the extent the Company is authorized the opportunity to earn its market-based cost of capital, the proper balance is achieved between customers' and shareholders' interests.

IV. CAPITAL MARKET CONDITIONS

Q. Why is it important to analyze capital market conditions?

A. The ROE estimation models rely on market data that are either specific to the proxy group, in the case of the DCF model, or the expectations of market risk, in the case of the CAPM. The results of the ROE estimation models can be affected by prevailing market conditions at the time the analysis is performed. Because the ROE that is established in a rate proceeding is intended to be forward-looking, an ROE analysis should use current and projected market data, specifically stock prices, dividends, growth rates and interest rates in the ROE estimation models to estimate the required return for the subject company. As discussed in the remainder of this section, analysts and regulatory

commissions have concluded that current market conditions are "anomalous". These conditions have affected the results of the ROE estimation models. As a result, it is important to consider the effect of these conditions on the ROE estimation models when determining the appropriate range and recommended ROE for a future period. If investors do not expect current market conditions to be sustained in the future, it is possible that the ROE estimation models will not provide an accurate estimate of investors' required return during that rate period. Therefore, it is very important to consider projected market data to estimate the return for that forward-looking period.

Q. What factors are affecting the cost of equity for regulated utilities in the current and prospective capital markets?

A. The cost of equity for regulated utility companies is being affected by several factors in the current and prospective capital markets, including: (1) the current low interest rate environment and the corresponding effect on valuations and dividend yields of utility stocks relative to historical levels; (2) the market's expectation for higher interest rates; and (3) recent Federal income tax reform. In this section, I discuss each of these factors and how it affects the models used to estimate the cost of equity for regulated utilities.

A. The Effect of Market Conditions on Valuations

Q. How has the Federal Reserve's monetary policy affected capital markets in recent years?

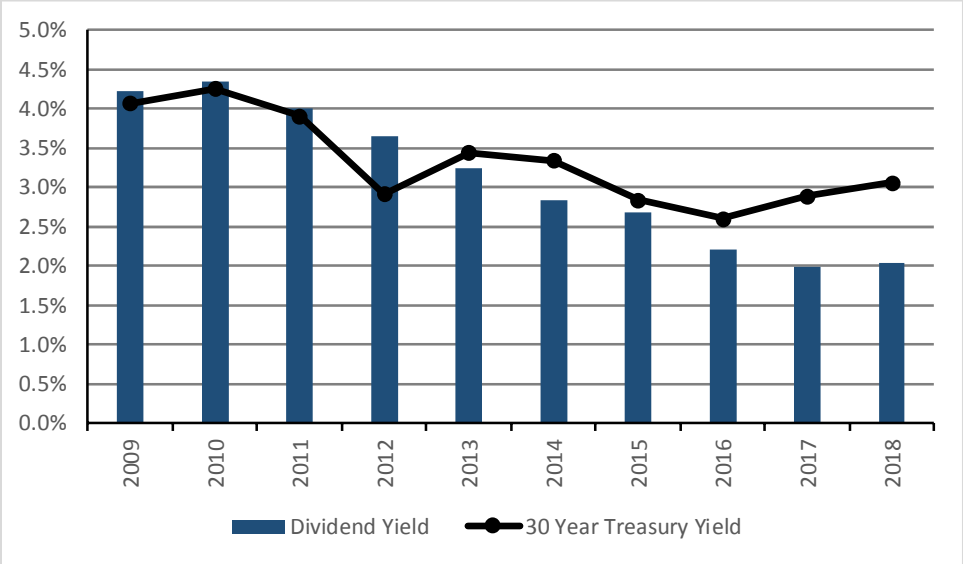
A. Extraordinary and persistent federal intervention in capital markets artificially lowered government bond yields after the Great Recession of 2008-09, as the Federal Open Market Committee ("FOMC") used monetary policy (both reductions in short-term interest rates and purchases of Treasury bonds and mortgage-backed securities) to stimulate the U.S. economy. As a result of very low returns on short-term government bonds, yield-seeking investors have been forced into longer-term instruments, bidding up prices and reducing yields on those investments. As investors moved along the risk spectrum in search of yields that meet their return requirements, there has been increased demand for dividend-paying equities, such as water utility stocks.

Q. How has the period of abnormally low interest rates affected the valuations and dividend yields of water utility shares?

A. As shown in Figure 2, yields on 30-year Treasury bonds have declined by 101 basis points beginning in 2009 when the Federal Reserve began to actively manage interest rates as a result of the Great Recession, while dividend yields on water utilities have declined by 219 basis points over this period. However, in 2018, both Treasury bond yields and dividend yields have increased modestly. The yields on 30-year Treasury bonds are currently at 3.06 percent and dividend yields for water utilities have increased

to 2.04 percent. It is important to note that in spite of slight increases in 2018, the dividend yields for water utilities are still well below their historical average.

Figure 2: Dividend Yields for Water Utility Stocks[13]



The historical change in the position of water utility stocks in the market was recently noted by Value Line.

> Traditionally, investors have flocked to water utilities for the current income, dividend growth potential, low Beta-coefficients and well defined business prospects. These equities tended to trail the market averages during rallies and outperform in downturns. About three years ago, this correlation began to deteriorate. Total returns of this group started to do well in a bull market. It's only been over the past 12 months or so that the previous relationship has returned.[14]

[13] Source: SNL Financial. Figure 2 includes 2018 data through September 28, 2018.

[14] Value Line Investment Survey, Water Utility Industry, October 12, 2018 at 1783.

Q. How are higher stock valuations and lower dividend yields for utility companies affecting the results of the DCF model?

A. During periods when stock valuations and dividend yields are not being distorted by the level of interest rates, the DCF model adequately reflects market conditions and investor expectations. However, in the current market environment, the DCF model results are distorted by the historically low level of interest rates and the higher valuation of utility stocks.

In July 2018, Value Line noted that higher interest rates on Treasury bonds are creating competition for utility stock investments.

> The Federal Reserve increased the key federal funds rate by 25 basis points last month. Moreover, citing historically low unemployment, the Fed stated that it planned on increasing rates in a gradual manner through 2020. How does this impact water utilities? For starters, dividend paying stocks and fixed-income vehicles have always been in competition for income-oriented investors. Over the past decade, the extraordinary easy monetary policy (along with quantitative easing), had made dividend stocks much more appealing. This is no longer the case, however. The median yield on all dividend paying stocks in the *Value Line* universe is just about 2.0%. Individuals can now purchase an extremely secure three-month Treasury bill and get almost 2%, with as close to zero risk as possible. Moreover, should an investor be willing to extend slightly further out on the yield curve to one- or two-year Treasury notes, yields of 2.31% and 2.54% can be had. As the front end of the curve continues to rise over the next several years, utility stocks may continue to lose much of their former luster.[15]

[15] Value Line Investment Survey, Water Utility Industry, July 13, 2018 at 1783.

This view was affirmed in Value Line's October 2018 report on the water utility industry.

> The Federal Reserve continued to pursue a more-restrictive monetary policy last month. Treasury notes and bill compete with income stocks for investors' funds. Should the Fed hike short-term rates further, the more attractive they will become on a comparison basis to this group.[16]

In addition, Value Line has commented on the high valuations of water utilities:

> In general, water utility companies have done pretty well over the past few year[s]. However, the premium that these stocks trade at is starting to seem expensive. While part of this will always be due to the scarcity value (there are only a handful of large-cap stocks in this group), the recent flattening of the front end of treasury yield curve could prove to provide investors with a better alternative.[17]

> Despite several stocks being favorably ranked for Timeliness, investors should proceed with caution when evaluating this group. In general, almost all have poor long-term total-returns prospects. The changing interest rate environment is also a potential problem.[18]

As noted by Value Line, over the last few years, utility stocks have experienced high valuations and low dividend yields; however, those dynamics are changing. Value Line recognizes that as interest rates increase, bonds become a substitute for utility stocks. This implies that the ROE calculated using historical market data in the DCF model is understated.

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[16] Value Line Investment Survey, Water Utility Industry, October 12, 2018, at 1783.

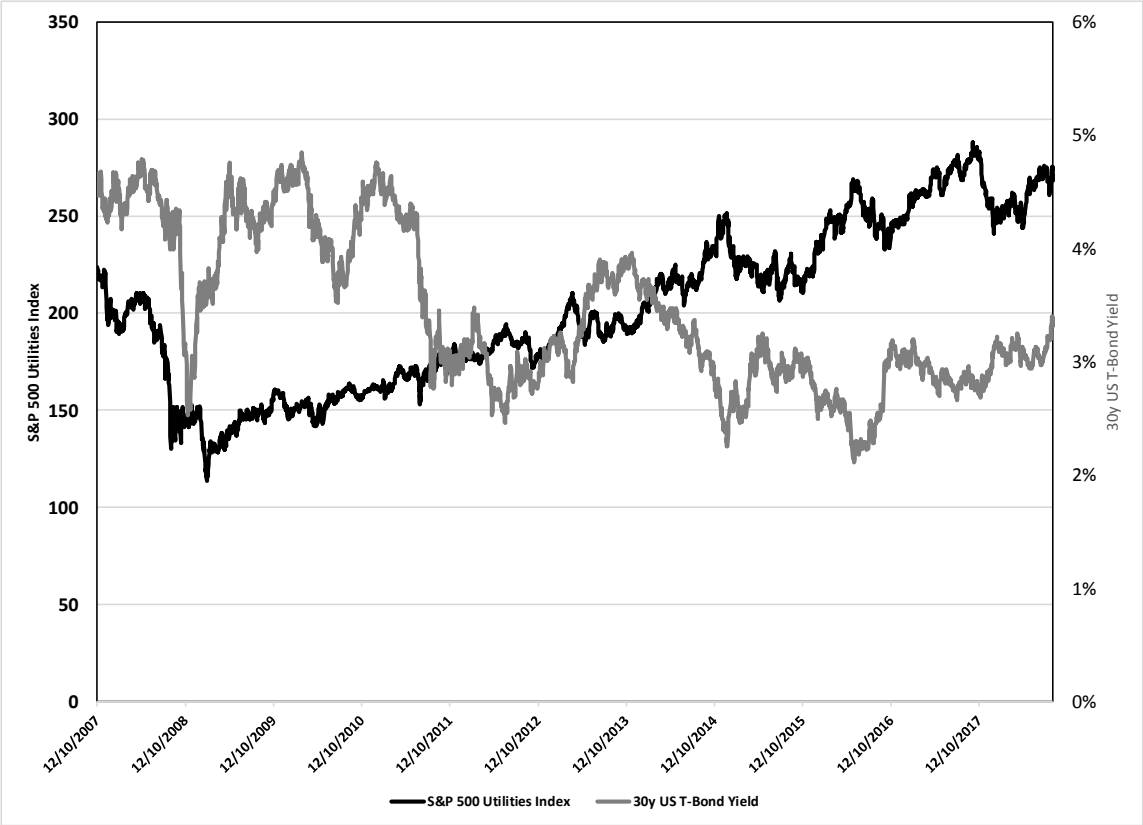
[17] Value Line Investment Survey, Water Utility Industry, January 12, 2018, at 1783.

[18] Value Line Investment Survey, Water Utility Industry, October 12, 2018, at 1783.

Q. How did the Standard & Poor's ("S&P") Utilities Index respond to the market conditions that existed following the Great Recession of 2008-2009?

A. Figure 3**Error! Reference source not found.**, demonstrates market conditions from 2007-2018 as measured by the S&P Utilities index and the yield on 30-year Treasury bonds. As shown in Figure 3, the S&P Utilities index increased steadily from the beginning of 2009 through early November 2017, as yields on 30-year Treasury bonds declined in response to accommodative federal monetary policy.

Figure 3: S&P Utilities Index and U.S. Treasury Bond Yields (2007-2018)



Source: Bloomberg Professional

Q. In 2018, have utility stock prices remained at the same levels that were experienced in 2017?

A. No. Recent market conditions however have been considerably different. Responding to changes in Federal tax reform and interest rates, since the House of Representatives approved the initial version of the tax reform legislation on November 16, 2017, the S&P Utilities Index has declined by approximately 5.90 percent, as yields on 30-year Treasury bonds have increased from 2.81 percent to 3.19 percent.[19] This change in stock valuations will affect the dividend yield in the DCF model. Furthermore, dividend yields that are based on the historical higher stock prices are likely understating the forward-looking cost of equity for utility companies.

Figure 4 summarizes the average historical and projected P/E ratios for the companies in the Combined Utility Proxy Group[20] calculated using data from Bloomberg Professional and Value Line.[21] As shown in Figure 4, the average P/E ratio for the proxy companies was higher in 2017 than at any other time in the last seventeen years and is significantly higher than the average projected P/E ratio for the group for the period from 2021-2023. In 2018 however, the average P/E ratio for the proxy companies has decreased slightly to 24.84 from the high in 2017 of 27.50. All else equal, if P/E ratios for the proxy

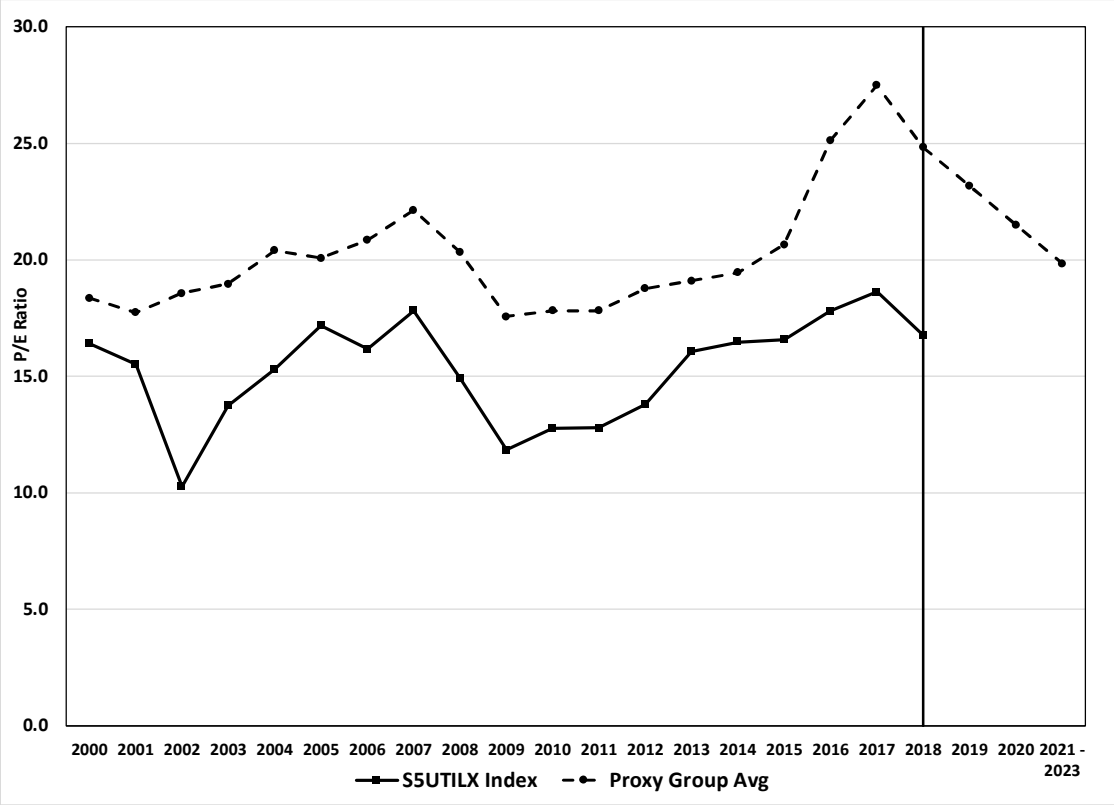
[19] Comparison as of September 28, 2018.

[20] The Combined Utility Proxy Group was used since the Water Proxy Group is a subset of the Combined Utility Proxy Group.

[21] Selection of the Proxy Companies is discussed in detail in Section V of my Testimony.

companies continue to decline, as Value Line projects, the ROE results from the DCF model would be higher. Therefore, the DCF model using historical market data is likely understating the forward-looking cost of equity for the proxy group companies.

Figure 4: Average Historical Proxy Group P/E Ratios



Note: Figure includes data through September 28, 2018.
Source: Bloomberg Professional

Q. How do equity investors view the utilities sector based on these recent market conditions?

A. Investment advisors have suggested that utility stocks may underperform as a result of market conditions. S&P recently discussed the effect that recent changes in the market have had on the utility sector.

> After keeping pace with broad equity markets for most of 2017, the S&P 500 Utilities index sharply diverged downward from the S&P 500 late in the year as corporate tax reform efforts accelerated and ultimately succeeded. While the gap narrowed somewhat in the second quarter this year and again early in the third quarter, the S&P 500 Utilities index was slightly in negative territory for the 12 months ended Sept. 28, versus an approximately 16% gain for the S&P 500.
>
> Tax reform, a rising interest rate environment amid strong economic indicators, and the prospect of more robust earnings growth in the broader market appear to be among the factors driving underperformance in the traditionally defensive utility sector.[22]

Regarding the effect of additional increases in the federal funds rate, S&P noted the following:

> Looking ahead, the Federal Reserve is expected to raise the federal funds rate one more time in 2018 and several times in 2019. Anticipated reasonably strong economic growth should help support utility stock prices, but the headwinds of rising interest rates may continue to dampen their performance compared to the broad market.[23]

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[22] S&P Global Market Intelligence, RRA Financial Focus: Utility relative performance and valuation. October 9, 2018, at 1.

[23] *Ibid.*

Similarly, a recent article by Zacks Investment Research noted:

> Bond yields rose on Sep 19, extending the week's climb, as investors took escalating trade related tensions in stride, and focused more on solid economic data and promising corporate outlook. The yield on the 10-year Treasury note, a benchmark for interest rates, has hit a four-month high. The Federal Reserve, in fact, has stepped up the pace of monetary tightening, with Chairman Jerome Powell vouching for a steady path of interest rate hikes.
>
> Investors have thus exited bond proxies, including utilities, real estate, telecom and consumer staples, to name a few. Meanwhile, banks rallied on expectations to benefit from a rise in benchmark bond yield.[24]

This view was further supported by Merrill Lynch who noted that:

> With respective dividend yields of 5.7%, 3.7% and 3.1%, the telecoms, utilities and consumer staples sectors have been the three lowest-returning sectors this year. All three are likely to come under increased competition from rising interest rates as the Fed tightens further, and bond yields breach 3% beyond 10-year maturities for the first time since 2011.[25]

Q. Have regulators responded to the historically low dividend yields for utility companies and the corresponding effect on the DCF model?

A. Yes. As I discuss in more detail later in my testimony, the Federal Energy Regulatory Commission ("FERC") has determined that anomalous capital market conditions have caused the DCF model to understate equity costs for regulated utilities at this time.[26]

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[24] Chakraborty, Tirthankar, "5 Top Bank Stocks to Buy on Surging Bond Yields", Zacks Investment Research, September 20, 2018.

[25] Merrill Lynch Chief Investment Office, "Capital Market Outlook", May 29, 2018, at 5.

[26] FERC Docket No. EL11-66-001, Opinion No. 531 (June 19, 2014), footnote 286. While Opinion No. 531 was recently remanded to the FERC by the D.C. Circuit Court on other grounds, that decision did not question the finding by the FERC that capital market conditions were anomalous. Additionally, the methodologies that were relied on by FERC to establish the range have not be challenged. *See also* Federal Energy Regulatory

In addition, the Illinois Commerce Commission ("ICC"), the Pennsylvania Public Utility Commission ("PPUC") and the Missouri Public Service Commission ("Missouri PSC") have all considered this in recent decisions. I discuss the response of these regulators to historically low dividend yields and the impact on the DCF model in detail later in my testimony.

B. The Current and Expected Interest Rate Environment

Q. What evidence is there that the interest rate environment is shifting?

A. Based on stronger conditions in employment markets, a relatively stable inflation rate, steady economic growth, and increased household spending, the Federal Reserve raised the short-term borrowing rate by 25 basis points at the March, June, and September 2018 meetings. Additionally, following the September 2018 meeting, the Federal Reserve removed from its press release the longstanding statement of the past few years that monetary policy remains accommodative.[27] Since December 2015, the Federal Reserve has increased interest rates seven times, bringing the federal funds rate to the range of 2.00 percent to 2.25 percent. As the economy continues to expand, the Federal Reserve is expected to continue increasing short-term interest rates to sustain the desired balance

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Commission, Docket No. EL 11-66-001, et al., Order Directing Briefs, issued October 16, 2018, at para. 32. This Order develops a proposed methodology to address the issues that were remanded to FERC. The proposed methodology includes an equal weighting of the DCF, CAPM, Expected Earnings and Risk Premium models to better reflect investor behavior and capital market conditions.

[27] FOMC, Federal Reserve press release, September 26, 2018.

between unemployment and consumer price inflation.[28] The Federal Reserve has indicated that it intends to raise short-term rates one more time in 2018.[29]

Furthermore, in October 2017, the FOMC started reducing the size of the Federal Reserve's $4.5 trillion bond portfolio by no longer reinvesting the proceeds of the bonds it holds. In response to the Great Recession, the Federal Reserve pursued a policy known as "Quantitative Easing," in which it systematically purchased mortgage-backed securities and long-term Treasury bonds to provide liquidity in financial markets and drive down yields on long-term government bonds. Although the Federal Reserve discontinued the Quantitative Easing program in October 2014, it continued to reinvest the proceeds from the bonds it holds. Under the new policy, the FOMC is gradually reducing the Federal Reserve's securities holdings by $10 billion per month initially, ramping up to $50 billion per month by the end of the first twelve months.[30] The Federal Reserve's announced unwinding plan provides additional support for investors' view that long-term interest rates will increase, as the Federal Reserve gradually reverses the Quantitative Easing program that reduced those long-term rates.

[28] FOMC, Federal Reserve press release, June 13, 2018.

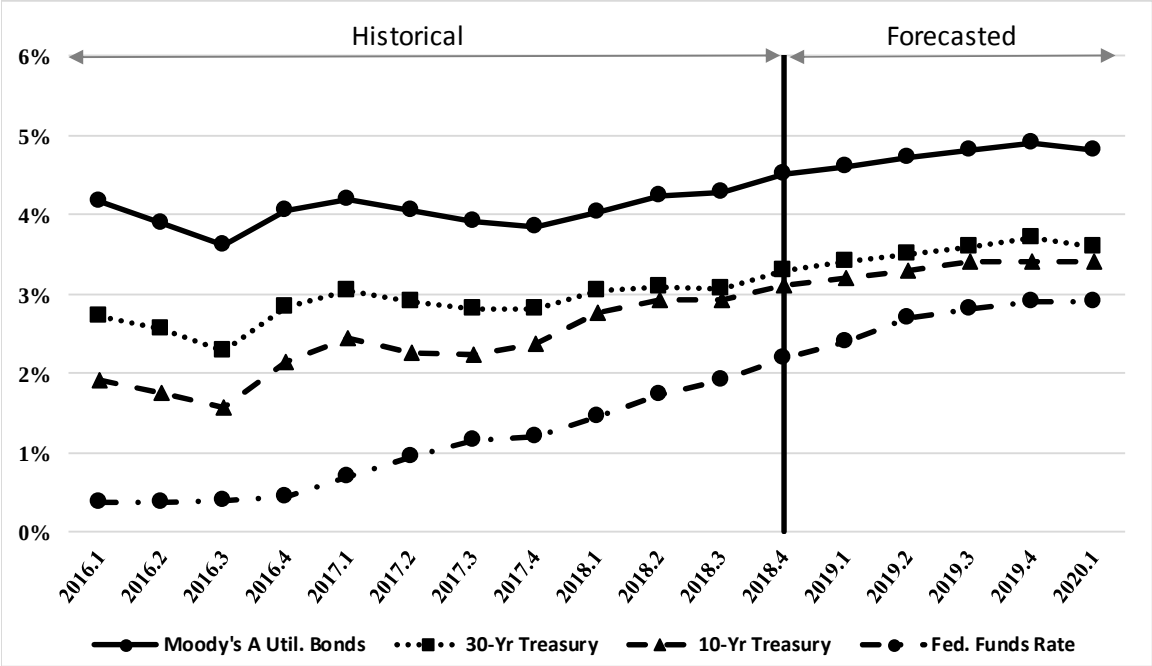
[29] Economic projections of Federal Reserve Board members and Federal Reserve Bank presidents under their individual assessments of projected appropriate monetary policy, September 2018.

[30] Federal Reserve press release, Addendum to the Policy Normalization Principles and Plans, June 14, 2017, implemented at FOMC meeting September 20, 2017.

Q. What is the financial market's perspective on the future path of interest rates?

A. As shown in Figure 5 below, investors expect continued increases in rates on both government and corporate/utility bonds over the next few years.

Figure 5: Interest Rate Conditions[31]



The context for setting the authorized ROE for KAWC should not be the low interest rate environment of the last few years. Rather, the Commission should consider recent evidence that interest rates have been increasing, and that capital costs over the period that rates will be in effect are expected to continue to increase as the Federal Reserve

[31] Source: Historical data from Bloomberg Professional. Forecast data from Blue Chip Financial Forecasts, Volume. 37, No. 10, October 1, 2018, at 2.

normalizes monetary policy and as the effects of the Tax Cuts and Jobs Act ("TCJA"), which is discussed later in my testimony, flow through the economy.

Q. What is the financial market's perspective on the future path of interest rates?

A. According to the October 2018 issue of Blue Chip Financial Forecasts, 93.20 percent of those surveyed expect the Federal Reserve will raise short-term interest rates again at the December 2018 meeting.[32] In response to the question regarding expected increases in interest rates in 2019 by the Federal Reserve, 15.90 percent of those surveyed expect an increase of 25 basis points, 25.00 percent expect an increase of 50 basis points, 36.40 percent expect an increase of 75 basis points, and 18.20 percent expect an increase of 100 basis points.[33] Finally, in response to the question regarding the terminal level[34] for the federal funds rate for the current tightening cycle, the consensus among those surveyed was 3.20 percent which indicates that economists still expect a number of federal funds rate increases over the coming years.[35]

Furthermore, data compiled by CME Group indicates that investors expect a high likelihood that the Federal Funds rate will increase. Figure 6 below summarizes the Federal Funds probabilities developed by CME Group. The probability of a rate hike is

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32 Blue Chip Financial Forecasts, Vol. 37, Issue No. 10, October 1, 2018, at 14.

33 *Ibid.*

34 The terminal federal funds rates also known as the natural or neutral rate is the level at which monetary policy is in equilibrium (i.e., stable prices and full employment).

35 Blue Chip Financial Forecasts, Vol. 37, Issue No. 10, October 1, 2018, at 14.

calculated by adding the probabilities of all target rate levels above the current target rate. The current target Federal Funds rate is 200 to 225 bps after the rate increase set at the September 2018 meeting. The market expects that there will be further rate increases in 2018 and 2019, shown by high expectations for target Federal Funds rates above the 200-225 bps range beginning in December of 2018.

Figure 6: Investor Expectation of Future Federal Funds Rate Increases[36]

Meeting Probabilities												
Meeting Date/(bps)	**100-125**	**125-150**	**150-175**	**175-200**	**200-225**	**225-250**	**250-275**	**275-300**	**300-325**	**325-350**	**350-375**	**375-400**
11/8/2018			0.0%	0.0%	96.1%	3.9%	0.0%					
12/19/2018	0.0%	0.0%	0.0%	0.0%	16.7%	80.1%	3.2%	0.0%	0.0%			
1/30/2019	0.0%	0.0%	0.0%	0.0%	15.9%	77.4%	6.5%	0.1%	0.0%	0.0%	0.0%	
3/20/2019	0.0%	0.0%	0.0%	0.0%	5.2%	36.1%	54.1%	4.4%	0.1%	0.0%	0.0%	0.0%
5/1/2019	0.0%	0.0%	0.0%	0.0%	4.5%	31.8%	51.6%	11.4%	0.7%	0.0%	0.0%	0.0%
6/19/2019	0.0%	0.0%	0.0%	0.0%	2.1%	17.2%	41.0%	32.8%	6.4%	0.4%	0.0%	0.0%
7/31/2019	0.0%	0.0%	0.0%	0.0%	1.8%	15.4%	38.1%	33.9%	9.7%	1.1%	0.1%	0.0%
9/18/2019	0.0%	0.0%	0.0%	0.0%	1.3%	11.6%	31.8%	35.0%	16.4%	3.5%	0.4%	0.0%
10/30/2019	0.0%	0.0%	0.0%	0.0%	1.2%	11.0%	30.5%	34.8%	17.6%	4.3%	0.6%	0.0%

Q. How do current interest rates compare to rates when the Commission issued its last decision for KAWC?

A. The Commission approved the settlement agreement in KAWC's last rate case on August 23, 2016.

[36] CME Group; FedWatch tool as of October 4, 2018.

Figure 7 compares the interest rates on government and A-rated utility bonds in August 2016 to those in September 2018 and the projected interest rates as of the fourth quarter of 2019.

Figure 7: Interest Rate Comparison[37]

	August 2016	September 2018	Change	Projected Q4 2019[38]
10-year Treasury	1.55%	2.95%	+1.40%	3.40%
30-year Treasury	2.26%	3.10%	+0.83%	3.70%
Moody's A Utility Bond	3.59%	4.29%	+0.70%	4.92%

As shown in Figure 7, average yields on 10-year Treasury bonds were substantially higher in September 2018 than in August 2016, while yields on 30-year Treasury bonds and Moody's A-rated Utility bonds are somewhat higher. Furthermore, the projected increase in interest rates throughout next year is significant. Therefore, while the Commission approved a settlement agreement that was silent with respect to the ROE, it is still important to note that the cost of capital has increased as expected since the Commission issued its decision in August 2016. In addition, interest rates are expected to continue to rise over the near-term indicating further increases in the cost of capital for utilities. Since the cost of equity for KAWC is being estimated for the future period in which KAWC's rates will be

[37] Source: Bloomberg Professional. All values are based on 30-day average yields.
[38] Source: Blue Chip Financial Forecast, Vol. 37, No. 9, September 1, 2018, at 2.

in effect, the Commission should consider the expected increases in interest rates when determining the authorized ROE for KAWC in this proceeding.

Q. What effect do rising interest rates have on the cost of equity?

A. As interest rates continue to increase, the cost of equity for the proxy companies using the DCF model is likely to be an overly conservative estimate of investors' required returns because the proxy group average dividend yield reflects the increase in stock prices that resulted from substantially lower interest rates. As such, rising interest rates support the selection of a return toward the upper end of a reasonable range of ROE estimates resulting from the DCF analysis. Alternatively, my CAPM and Bond Yield Plus Risk Premium analyses include estimated returns based on near-term projected interest rates, reflecting investors' expectations of market conditions over the period that the rates that are determined in this case will be set.

C. Effect of Tax Reform on the Return on Equity and Capital Structure

Q. Are there other market conditions that should be considered in determining the cost of equity for KAWC?

A. Yes. The effect of the recently passed TCJA should also be considered in the determination of the cost of equity. The credit rating agencies have commented on the effect of the TCJA on regulated utilities. In summary, the TCJA is expected to reduce utility revenues due to the lower federal income taxes and the requirement to return excess accumulated deferred income taxes ("ADIT"). This change in revenue is expected

to reduce funds from operations ("FFO") metrics across the sector, and absent regulatory mitigation strategies, is expected to lead to weaker credit metrics and negative ratings actions for some utilities.[39]

Q. Have credit or equity analysts commented on the effect of the TCJA on utilities?

A. Yes. Moody's Investors Services ("Moody's") indicated that while the TCJA was credit positive for many sectors, it has an overall negative credit impact on regulated operating companies of utilities and their holding companies due to the reduction in cash flow metrics that results from the change in the federal tax rate and the loss of bonus depreciation.

Moody's acknowledged that the rates that regulators allow utilities to charge customers are based on a cost-plus model, with tax expense being one of the pass-through items. Utilities will collect less taxes at the lower rate, reducing revenue. While the taxes are ultimately paid out as an expense, under the new law utilities lose the timing benefit, reducing cash that may have been carried over a number of years. The lower tax rate combined with the loss of bonus depreciation will have a negative effect on utility cash flows and will ultimately negatively affect the utilities' ability to fund ongoing operations and capital improvement programs.

[39] FitchRatings, Special Report, What Investors Want to Know, "Tax Reform Impact on the U.S. Utilities, Power & Gas Sector", January 24, 2018.

Q. How has Moody's responded to the increased risk for utilities resulting from the TCJA?

A. In January 2018, Moody's issued a report changing the rating outlook for several regulated utilities from Stable to Negative. Moody's noted that the rating change affected companies with limited cushion in their ratings for deterioration in financial performance. The rating for AWK, the parent company of KAWC, was reduced from Stable to Negative in this Moody's report.[40] In June 2018, Moody's issued a report in which the rating agency downgraded the outlook for the entire regulated utility industry from stable to negative for the first time ever. Moody's cites ongoing concerns about the negative effect of the TCJA on cash flows of regulated utilities. While noting that "[r]egulatory commissions and utility management teams are taking important first steps"[41] and that "we have seen some credit positive developments in some states in response to tax reform,"[42] Moody's concluded that "we believe that it will take longer than 12-18 months for the majority of the sector to show any material financial improvement from such efforts."[43]

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[40] Moody's Investors Services, Global Credit Research, Rating Action: Moody's changes outlooks on 25 US regulated utilities primarily impacted by tax reform, January 19, 2018.

[41] Moody's Investors Service, "Regulated utilities – US: 2019 outlook shifts to negative due to weaker cash flows, continued high leverage", June 18, 2018, at 3.

[42] Ibid.

[43] *Ibid.*

Q. What does it mean for Moody's to downgrade a credit outlook?

A. A Moody's rating outlook is an opinion regarding the likely rating direction over what it refers to as "the medium term." A Stable outlook indicates a low likelihood of a rating change in the medium term. A Negative outlook indicates a higher likelihood of a rating change over the medium term. While Moody's indicates that the time period for changing a rating subsequent to a change in the outlook form Stable will vary, on average Moody's indicates that a rating change will follow within a year of a change in outlook.[44]

Q. Have any utilities experienced a downgrade related to cash flow metrics resulting from tax reform?

A. Yes. In July 2018, OGE Energy Corp and subsidiary utility Oklahoma Gas and Electric Company were downgraded. Moody's noted that the negative cash flow impact of federal tax reform will overshadow the positive cash flow impact that was expected from a higher rate base. In addition, Moody's held its outlook for both companies at negative due to the potential for a sustained reduction in financial metrics beyond the next 12-18 months.[45]

In October 2018 Consolidated Edison, Inc. and its subsidiary companies, Consolidated Edison of New York and Orange and Rockland Utilities were all downgraded by

[44] Moody's Investors Service Rating Symbols and Definitions, July 2017, at 27.

[45] Moody's Investors Service Rating Action: Moody's downgrades OGE to Baa1 and Oklahoma Gas & Electric to A2; outlooks remain negative, July 5, 2018, at 2.

Moody's as a result of a weaker financial profile due to weaker cash flow metrics resulting from tax reform.[46] In addition, Southwestern Public Service was downgraded due to a weakening of the utility's credit metrics.[47]

Q. Have other rating agencies commented on the effect of the TCJA on credit ratings?

A. Yes. Standard and Poor's ("S&P") and FitchRatings ("Fitch") have also commented on the implications of the TCJA on utilities. S&P published a report on January 24, 2018 entitled "U.S. Tax Reform: For Utilities' Credit Quality, Challenges Abound" in which S&P concludes:

> The impact of tax reform on utilities is likely to be negative to varying degrees depending on a company's tax position going into 2018, how its regulators react, and how the company reacts in return. It is negative for credit quality because the combination of a lower tax rate and the loss of stimulus provisions related to bonus depreciation or full expensing of capital spending will create headwinds in operating cash-flow generation capabilities as customer rates are lowered in response to the new tax code. The impact could be sharpened or softened by regulators depending on how much they want to lower utility rates immediately instead of using some of the lower revenue requirement from tax reform to allow the utility to retain the cash for infrastructure investment or other expenses. Regulators must also recognize that tax reform is a strain on utility credit quality, and we expect companies to request stronger capital structures and other means to offset some of the negative impact.
>
> Finally, if the regulatory response does not adequately compensate for the lower cash flows, we will look to the issuers, especially at the holding

[46] Moody's Investors Service Rating Action: Moody's downgrades Coned to Baa1, CECONY to A3 and O&R to Baa1; outlooks stable October 30, 2018 at 1.

[47] Moody's Investors Service Rating Action: Moody's changes Xcel Energy's outlook to negative; downgrades Southwestern Public Service ratings to Baa2 with stable outlook, October 19, 2018 at 1.

> company level, to take steps to protect credit metrics if necessary. Some deterioration in the ability to deduct interest expense could occur at the parent, making debt there relatively more expensive. More equity may make sense and be necessary to protect ratings if financial metrics are already under pressure and regulators are aggressive in lowering customer rates. It will probably take the remainder of this year to fully assess the financial impact on each issuer from the change in tax liabilities, the regulatory response, and the company's ultimate response. We have already witnessed differing responses. We revised our outlook to negative on PNM Resources Inc. and its subsidiaries on Jan. 16 after a Public Service Co. of New Mexico rate case decision incorporated tax savings with no offsetting measures taken to alleviate the weaker cash flows. It remains to be seen whether PNM will eventually do so, especially as it is facing other regulatory headwinds. On the other hand, FirstEnergy Corp. issued $1.62 billion of mandatory convertible stock and $850 million of common equity on Jan. 22 and explicitly referenced the need to support its credit metrics in the face of the new tax code in announcing the move. That is exactly the kind of proactive financial management that we will be looking for to fortify credit quality and promote ratings stability.[48]

Fitch indicated that any ratings actions will be guided by the response of regulators and the management of the utilities. Fitch notes that the solution will depend on the ability of utility management to manage the cash flow implications of the TCJA. Fitch offers several solutions to provide rate stability and to moderate changes to cash flow in the near term, including increasing the authorized ROE and/or equity ratio as measures that can be implemented.[49]

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[48] Standard and Poor's Global Ratings, "U.S. Tax Reform: For Utilities' Credit Quality, Challenges Abound," January 24, 2018.

[49] FitchRatings, Special Report, What Investors Want to Know, "Tax Reform Impact on the U.S. Utilities, Power & Gas Sector", January 24, 2018.

Q. Have the rating agencies provided comments on the effect of tax reform on American Water?

A. Yes. In June 2018, S&P noted that the company's consolidated financial metrics will weaken over the next few years due to tax reform, the loss of bonus depreciation and capital spending.[50] As discussed above, Moody's downgraded the outlook for American Water to negative in January 2018 along with several other utilities in response to the TCJA. In February 2018, Moody's noted that the company's credit was constrained in part by the need for significant capex, debt funded growth and the effects of tax reform on financial metrics.[51]

Q. What conclusions do you draw from your analysis of capital market conditions?

A. The important conclusions resulting from capital market conditions are:

- The assumptions used in the ROE estimation models have been affected by the anomalous market conditions.

- Recent market conditions are not expected to persist as the Federal Reserve continues to normalize monetary policy. As a result, the recent historical market

[50] Standard and Poor's RatingsDirect, "American Water Works Co. Inc. and Subsidiaries 'A' Ratings affirmed; Outlooks Remain Stable," June 11, 2018.

[51] Moody's Investor Services, American Water Works Company, Inc. Update following negative outlook February 16, 2018.

conditions are not reflective of the market conditions that will be present when the rates for KAWC will be in effect.

- It is important to consider the results of a variety of ROE estimation models, using forward-looking assumptions to estimate the cost of equity.

- Without adequate regulatory support, the TCJA will have a negative effect on utility cash flows, which increases investor risk expectations for utilities.

V. PROXY GROUP SELECTION

Q. Why have you used a group of proxy companies to estimate the cost of equity for KAWC?

A. In this proceeding, I am estimating the cost of equity for KAWC, which is a rate-regulated subsidiary of AWK. Since the ROE is a market-based concept, and given the fact that KAWC's operations do not make up the entirety of a publicly-traded entity, it is necessary to establish a group of companies that is both publicly-traded and comparable to the Company in certain fundamental business and financial respects to serve as its "proxy" for purposes of the ROE estimation process. The proxy companies used in my analyses all possess a set of operating and financial risk characteristics that are substantially comparable to KAWC, and, therefore, provide a reasonable basis for deriving the appropriate ROE.

Q. Please provide a brief profile of KAWC.

A. KAWC, a wholly-owned subsidiary of AWK, provides water distribution service to approximately 130,000 customers throughout eleven central Kentucky counties.[52] The Company generally accesses debt markets through American Water Capital Corp. ("AWCC"). The current credit ratings on senior unsecured debt for AWK and AWCC are as follows: (1) S&P - A (Outlook: Stable); and (2) Moody's - A3 (Outlook: Negative).[53]

Q. How did you select the companies in your Water Proxy Group ("WPG")?

A. I began with the group of U.S. utilities that Value Line classifies as Water Utilities, and I simultaneously applied the following screening criteria to select companies that:

- pay consistent quarterly cash dividends because companies that do not cannot be analyzed using the Constant Growth DCF model;
- have positive long-term earnings growth forecasts from at least two sources;
- have investment grade long-term issuer ratings from either S&P or Moody's; and

[52] Direct Testimony of Ms. Melissa Schwarzell.

[53] Standard and Poor's RatingsDirect, "American Water Works Co. Inc. and Subsidiaries 'A' Ratings affirmed; Outlooks Remain Stable," June 11, 2018. Moody's Investor Services, American Water Works Company, Inc. Update following negative outlook February 16, 2018.

- derive more than 80 percent of their total operating income from regulated water operations.

Q. Did you include AWK in your analysis?

A. While my general practice is to exclude the subject company, or its parent holding company, from the proxy group, given the relatively small number of companies that met the screening criteria and given the fact that Kentucky is one of sixteen states served by AWK, I have presented my ROE results both including and excluding AWK.

Q. What is the composition of your Water Proxy Group?

A. The screening criteria discussed above resulted in a Water Proxy Group consisting of the companies in Figure 8.

Figure 8: Water Proxy Group

Company	Ticker
American States Water Company	AWR
American Water Works Company, Inc.	AWK
California Water Service Group	CWT
Middlesex Water Company	MSEX
York Water Company	YORW

Q. Did you develop any other proxy groups?

A. Yes, I did. As noted above, to develop the Water Proxy Group, I started with the group of utilities that Value Line classifies as Water Utilities which results in a list of nine

companies. However, there is currently a trend towards consolidation in the utility industry which has included water utilities.[54] For example of the nine water utilities covered by Value Line, three are currently engaged in M&A activity and must be removed from the proxy group. SJW Corporation has a pending agreement to acquire Connecticut Water Services[55] and Aqua America, Inc. has agreed to acquire Peoples Gas.[56] Therefore, there are a small number of companies that are available for inclusion in Water Proxy Group. As a result, I also developed a Combined Utility Proxy Group ("CUPG") that includes water utilities and natural gas distribution companies.

Q. Are natural gas distribution companies reasonably comparable to water utilities to be included in a proxy group used to estimate the cost of equity for a water utility?

A. Yes, they are. While, I recognize that the Commission has determined that it was inappropriate to use proxy groups that were entirely composed of natural gas distribution companies as proxies for water companies, I believe that it is reasonable to rely on a combined proxy group.[57,58] As noted above, due to consolidation in the water utility

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54 Chediak, Mark, et al. "Utility M&A Is So Hot Not Even Berkshire's Billions Won a Bid." Bloomberg.com, Bloomberg, 3 Jan. 2018, www.bloomberg.com/news/articles/2018-01-03/utility-m-a-is-so-hot-not-even-berkshire-s-billions-won-a-bid.

55 French, David, and Liana Baker. "SJW Group Makes $1.1 Billion All-Cash Offer for Connecticut Water." Reuters, Thomson Reuters, 6 Aug. 2018, www.reuters.com/article/us-connecticut-wtr-m-a-sjw-group/sjw-group-makes-11-billion-all-cash-offer-for-connecticut-water-idUSKBN1KR28Y.

56 "Aqua America Announces Agreement to Acquire Peoples." Aqua America, 23 Oct. 2018, ir.aquaamerica.com/news-releases/news-release-details/aqua-america-announces-agreement-acquire-peoples.

57 Kentucky-American Water Company, Application of Kentucky-American Water Company for an Adjustment of Rates Supported by a Fully Forecasted Test Year, Case No. 2012-00520, Order, October 25, 2013, at 51.

industry, there is only a small group of water companies that can be included in the proxy group. Therefore, considering the trend in mergers and the small universe of water utilities that can be relied on, as compared with the prior cases reviewed by the Commission, based on current market conditions, it is reasonable to include gas distribution companies as a proxy.

Q. How have you addressed the Commission's prior concerns about the comparability of natural gas distribution companies in the development of your current proxy group?

A. In Case No. 2010-00036, the Commission acknowledged that natural gas distribution companies and water utilities both have similar types of fixed investment and provide a similar service which is the delivery of a commodity through an underground main.[59] At that time, the Commission's concern with relying on natural gas distribution companies as a proxy for water utilities was related to a number of natural gas distribution companies engaging in operations that were non-regulated and non-distribution related.[60] As discussed below, in order to address this concern, the screening criteria relied on for my Combined Utility Proxy Group, require that a company derive more than 80 percent of their operating income from regulated operations. Therefore, the natural gas

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58 Kentucky-American Water Company, Application of Kentucky-American Water Company for an Adjustment of Rates Supported by a Fully Forecasted Test Year, Case No. 2010-00036, Order, December 14, 2010, at 70.

59 Kentucky-American Water Company, Application of Kentucky-American Water Company for an Adjustment of Rates Supported by a Fully Forecasted Test Year, Case No. 2010-00036, Order, December 14, 2010, at 70.

60 *Ibid.*

distribution companies included in my proxy group generate a large portion of their operating income from regulated operations similar to KAWC and the water utilities that will be included in both the WPG and CUPG. Finally, as shown in Figure 1 above, the range of DCF and CAPM results produced by both the WPG and the CUPG are very similar. As a result, I believe that it is appropriate to include natural gas distribution companies in my CUPG.

Q. Have other regulators considered the inclusion of natural gas distribution companies in the proxy group used to estimate the cost of equity for a water utility?

A. Yes. In Docket No. 170006-WS, the Florida Public Service Commission ("FPUC") determined that the ROE for water and wastewater utilities would be estimated using a proxy group of natural gas companies as opposed to water utilities since there was an insufficient number of water utilities to assemble an appropriately sized proxy group.[61] Specifically, the FPUC noted:

> This order continues to use the leverage formula methodology established in Order No. PSC-01-2514-FOF-WS and reaffirmed in Order No. PSC-08-0846-FOF-WS. This methodology uses ROEs derived from financial models applied to an index of natural gas utilities, as this Commission determined that there were an insufficient number of utilities that meet the requisite criteria to assemble an appropriate proxy group using only WAW utilities. Therefore, since 2001, we have used natural gas utilities as the proxy companies for the leverage formula. There are approximately 13

[61] Docket No. 170006-WS, In re. Water and wastewater industry annual reestablishment of authorize range of return on common equity for water and wastewater utilities pursuant to Section 367.081(4)(f),F.S., Order No. PSC-17-0249-PAA-WS, at 2.

natural gas utilities that have actively traded stocks and forecasted financial data. We use natural gas utilities that derive at least 50 percent of their revenue from regulated rates. These utilities have market power and are influenced significantly by economic regulation. As explained below, the model results based on natural gas utilities are adjusted to reflect the risks faced by Florida WAW utilities.[62]

Q. How did you establish this proxy group?

A. I began with all the companies that are classified by Value Line as natural gas distribution companies and water utilities operating in the U.S. This initial group included 18 companies. I then applied the following screening criteria:

- pay consistent quarterly cash dividends because companies that do not cannot be analyzed using the Constant Growth DCF model;
- have positive long-term earnings growth forecasts from at least two sources;
- have investment grade long-term issuer ratings from either S&P or Moody's; and
- derive more than 80 percent of their total operating income from regulated operations; and
- not involved in a transformative transaction.

[62] *Ibid.*

Q. Did you eliminate any other companies that otherwise met your Combined Utility Proxy Group screening criteria?

A. Yes. On September 13, 2018, Columbia Gas of Massachusetts, a wholly-owned subsidiary of NiSource Inc. experienced a significant event as a result of over pressured lines on their system. The incident resulted in immediate financial ramifications for NiSource Inc. ("NiSource") In fact, NiSource's stock price fell approximately 12 percent immediately following the incident. Given the impact the incident had on the stock price of NiSource, and the potential effect on the company's financial performance, it is appropriate to exclude NiSource from my Combined Utility Proxy Group.

Q. What is the composition of your Combined Utility Proxy Group?

A. There are twelve companies that met the screening criteria discussed above which are summarized in Figure 9 below:

Figure 9: Combined Utility Proxy Group

Company	Ticker
American States Water Company	AWR
American Water Works Company, Inc.	AWK
Atmos Energy Corporation	ATO
California Water Service Group	CWT
Middlesex Water Company	MSEX
New Jersey Resources Corporation	NJR
Northwest Natural Gas Company	NWN
ONE Gas, Inc.	OGS
South Jersey Industries, Inc.	SJI
Southwest Gas Corporation	SWX
Spire, Inc.	SR
York Water Company	YORW

VI. COST OF EQUITY ESTIMATION

Q. Please briefly discuss the ROE in the context of the regulated rate of return ("ROR").

A. The overall ROR for a regulated utility is based on its weighted average cost of capital, in which the costs of the individual sources of capital are weighted by their respective book values. While the costs of debt and preferred stock can be directly observed, the cost of equity is market-based and, therefore, must be estimated based on observable market data.

Q. How is the required ROE determined?

A. The required ROE is estimated by using multiple analytical techniques that rely on market-based data to quantify investor expectations regarding required equity returns, adjusted for certain incremental costs and risks. Quantitative models produce a range of reasonable results from which the market-required ROE is selected. That selection must be based on a comprehensive review of relevant data and information, and does not necessarily lend itself to a strict mathematical solution. The key consideration in determining the cost of equity is to ensure that the methodologies employed reasonably reflect investors' views of the financial markets in general and of the subject company (in the context of the proxy group) in particular.

Q. What methods did you use to estimate KAWC's cost of equity?

A. I considered the results of the Constant Growth DCF model and the CAPM. I also considered the Value Line projected ROEs for the companies in my Water Proxy Group, and the results of a forward-looking DCF analysis using projected dividend yields and projected share prices published by Value Line. I believe that a reasonable ROE estimate considers alternative methodologies, observable market data, and the reasonableness of their individual and collective results.

A. Importance of Multiple Analytical Approaches

Q. Why is it important to use more than one analytical approach?

A. Because the cost of equity is not directly observable, it must be estimated based on both quantitative and qualitative information. When faced with the task of estimating the cost of equity, analysts and investors are inclined to gather and evaluate as much relevant data as reasonably can be analyzed. Several models have been developed to estimate the cost of equity, and I use multiple approaches to estimate the cost of equity. As a practical matter, however, all of the models available for estimating the cost of equity are subject to limiting assumptions or other methodological constraints. Consequently, many well-regarded finance texts recommend using multiple approaches when estimating the cost of equity. For example, Copeland, Koller, and Murrin[63] suggest using the CAPM and Arbitrage Pricing Theory model, while Brigham and Gapenski[64] recommend the CAPM, DCF, and Bond Yield Plus Risk Premium approaches.

Q. Is it important given the current market conditions to use more than one analytical approach?

A. Yes. As discussed in Section IV above, the U.S. economy is beginning to emerge from an unprecedented period of low interest rates. Low interest rates, and the effects of the

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63 Tom Copeland, Tim Koller and Jack Murrin, Valuation: Measuring and Managing the Value of Companies, 3rd Ed. (New York: McKinsey & Company, Inc., 2000), at 214.

64 Eugene Brigham, Louis Gapenski, Financial Management: Theory and Practice, 7th Ed. (Orlando: Dryden Press, 1994), at 341.

investor “flight to quality” can be seen in high utility share valuations, relative to historical levels and relative to the broader market. Higher utility stock valuations produce lower dividend yields and result in lower cost of equity estimates from a DCF analysis. Low interest rates also impact the CAPM in two ways: (1) the risk-free rate is lower, and (2) because the market risk premium is a function of interest rates, (i.e., it is the return on the broad stock market less the risk-free interest rate), the risk premium should move higher when interest rates are lower. Therefore, it is important to use multiple analytical approaches to moderate the impact that the current low interest rate environment is having on the ROE estimates for the proxy group and, where possible, consider using projected market data in the models to estimate the return for the forward-looking period.

Q. Are you aware of any regulatory commissions who have recognized that the current anomalous conditions in capital markets are causing ROE recommendations based on DCF models to be unreasonable?

A. Yes, several regulatory commissions have addressed the effect of capital market conditions on the DCF model, including FERC, the ICC, the PPUC and the Missouri PSC.

Q. Please summarize how the FERC has responded to the effect of market conditions on the DCF.

A. Understanding the important role that dividend yields play in the DCF model, the FERC determined that anomalous capital market conditions have caused the DCF model to understate equity costs for regulated utilities. In Opinion No. 531, the FERC noted:

> There is 'model risk' associated with the excessive reliance or mechanical application of a model when the surrounding conditions are outside of the normal range. 'Model risk' is the risk that a theoretical model that is used to value real world transactions fails to predict or represent the real phenomenon that is being modeled.[65]

In Opinion No. 531, the FERC noted that the low interest rates and bond yields that persisted throughout the analytical period that was relied on (study period) resulted in anomalous market conditions and recognized the need to move away from the midpoint of the DCF analysis. In that case, the FERC relied on the CAPM and other risk premium methodologies to inform its judgment to set the return above the midpoint of the DCF results.

In Opinion No. 551, issued in September 2016, the FERC recognized that those same anomalous market conditions continued into the study period, and again concluded that it was necessary to rely on ROE estimation methodologies other than the DCF model to set the appropriate ROE:

[65] FERC Docket No. EL11-66-001, Opinion No. 531 (June 19, 2014), fn 286.

> Though the Commission noted certain economic conditions in Opinion No. 531, the principle argument was based on low interest rates and bond yields, conditions that persisted throughout the study period. Consequently, we find that capital market conditions are still anomalous as described above…[66]

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> Because the evidence in this proceeding indicates that capital markets continue to reflect the type of unusual conditions that the Commission identified in Opinion No. 531, we remain concerned that a mechanical application of the DCF methodology would result in a return inconsistent with *Hope* and *Bluefield*.[67]

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> As the Commission found in Opinion No. 531, under these circumstances, we have less confidence that the midpoint of the zone of reasonableness in this proceeding accurately reflects the equity returns necessary to meet the Hope and Bluefield capital attraction standards. We therefore find it necessary and reasonable to consider additional record evidence, including evidence of alternative methodologies…[68]

Finally, in October 2018, the FERC issued an Order in response to the remand from the U.S. Court of Appeals for the District of Columbia indicating plans to establish ROEs based on an equal weighting of the results of four financial models: the DCF, CAPM, Expected Earnings and Risk Premium. FERC explains its reasons for moving away from sole reliance on the DCF model as follows:

> Our decision to rely on multiple methodologies in these four complaint proceedings is based on our conclusion that the DCF methodology may no

[66] FERC Docket No. EL14-12-002, Opinion No. 551, at para. 121.
[67] *Id*., at para. 122.
[68] *Ibid*.

> longer singularly reflect how investors make their decisions. We believe that, since we adopted the DCF methodology as our sole method for determining utility ROEs in the 1980s, investors have increasingly used a diverse set of data sources and models to inform their investment decisions. Investors appear to base their decisions on numerous data points and models, including the DCF, CAPM, Risk Premium, and Expected Earnings methodologies. As demonstrated in Figure 2 below, which shows the ROE results from the four models over the four test periods at issue in this proceeding, these models do not correlate such that the DCF methodology captures the other methodologies. In fact, in some instances, their cost of equity estimates may move in opposite directions over time. Although we recognize the greater administrative burden on parties and the Commission to evaluate multiple models, we believe that the DCF methodology alone no longer captures how investors view utility returns because investors do not rely on the DCF alone and the other methods used by investors do not necessarily produce the same results as the DCF. Consequently, it is appropriate for our analysis to consider a combination of the DCF, CAPM, Risk Premium, and Expected Earnings approaches.[69]

Q. How have the PPUC, the ICC and the Missouri PSC addressed the effect of market conditions on the DCF?

A. In a 2012 decision for PPL Electric Utilities, while noting that the PPUC has traditionally relied primarily on the DCF method to estimate the cost of equity for regulated utilities, the PPUC recognized that market conditions were causing the DCF model to produce results that were much lower than other models such as the CAPM and Bond Yield Plus Risk Premium. The PPUC's Order explained:

> Sole reliance on one methodology without checking the validity of the results of that methodology with other cost of equity analyses does not

[69] Federal Energy Regulatory Commission, Docket No. EL 11-66-001, et al., Order Directing Briefs, issued October 16, 2018, at para. 40. [Figure 2 was omitted]

> always lend itself to responsible ratemaking. We conclude that methodologies other than the DCF can be used as a check upon the reasonableness of the DCF derived equity return calculation.[70]

The PPUC ultimately concluded:

> As such, where evidence based on the CAPM and RP methods suggest that the DCF-only results may understate the utility's current cost of equity capital, we will give consideration to those other methods, to some degree, in determining the appropriate range of reasonableness for our equity return determination.[71]

In a recent ICC case, Docket No. 16-0093, Staff relied on a DCF analysis that resulted in average returns for their proxy groups of 7.24 percent to 7.51 percent. The company demonstrated that these results were uncharacteristically too low, by comparing the results of Staff's models to recently authorized ROEs for regulated utilities and the return on the S&P 500.[72] In Order No. 16-0093, the ICC agreed with the Company that Staff's proposed ROE of 8.04 percent was anomalous and recognized that a return that is not competitive will deter investment in Illinois.[73] In setting the return in this proceeding the ICC recognized that it was necessary to consider other factors beyond the outputs of the financial models, particularly whether or not the return is sufficient to attract capital,

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70 Pennsylvania Public Utility Commission, PPL Electric Utilities, R-2012-2290597, meeting held December 5, 2012, at 80.

71 *Id.*, at 81.

72 State of Illinois Commerce Commission, Docket No. 16-0093, Illinois-American Water Company Initial Brief, August 31, 2016, at 10.

73 Illinois Staff's analysis and recommendation in that proceeding were based on its application of the multi-stage DCF model and the CAPM to a proxy group of water utilities.

maintain financial integrity, and is commensurate with returns for companies of comparable risk, while balancing the interests of customers and shareholders.[74]

Finally, in February 2018, the Missouri PSC issued a decision in Spire's 2017 gas rate case, in which the allowed ROE was set at 9.80 percent. In explaining the rationale for its decision, the Commission cited the importance of considering multiple methodologies to estimate the cost of equity and the need for the authorized ROE to be consistent with returns in other jurisdictions and to reflect the growing economy and investor expectations for higher interest rates.

> Based on the competent and substantial evidence in the record, on its analysis of the expert testimony offered by the parties, and on its balancing of the interests of the company's ratepayers and shareholders, as fully explained in its findings of fact and conclusions of law, the Commission finds that 9.8 percent is a fair and reasonable return on equity for Spire Missouri. That rate is nearly the midpoint of all the experts' recommendations and is consistent with the national average, the growing economy, and the anticipated increasing interest rates. The Commission finds that this rate of return will allow Spire Missouri to compete in the capital market for the funds needed to maintain its financial health.[75]

Q. What are your conclusions about the results of the DCF and CAPM models?

A. Recent market data that is used as the basis for the assumptions for both models have been affected by market conditions. As a result, relying exclusively on historical

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[74] State of Illinois Commerce Commission Decision, Docket No. 16-0093, Illinois-American Water Company, 2016 WL 7325212 (2016), at 55.

[75] File No. GR-2017-0215 and File No. GR-2017-0216, Missouri Public Service Commission, Report and Order, Issue Date February 21, 2018, at 34.

assumptions in these models, without considering whether these assumptions are consistent with investors' future expectations, will underestimate the cost of equity that investors would require over the period that the rates in this case are to be in effect. In this instance, relying on the historical average of abnormally high stock prices results in low dividend yields that are not expected to continue over the period that the new rates will be in effect. This, in turn, underestimates the ROE for the rate period.

The use of recent historical Treasury bond yields in the CAPM also tends to underestimate the projected cost of equity. Recent experience indicates that interest rates are increasing. The expectation that bond yields will not remain at currently low levels means that the expected cost of equity would be higher than is suggested by the CAPM using historical average yields. The use of projected yields on Treasury bonds results in CAPM estimates that are more reflective of the market conditions that investors expect during the period that the Company's rates will be in effect.

B. Constant Growth DCF Model

Q. Please describe the DCF approach.

A. The DCF approach is based on the theory that a stock's current price represents the present value of all expected future cash flows. In its most general form, the DCF model is expressed as follows:

$$P_0 = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \ldots + \frac{D_\infty}{(1+k)^\infty} \quad [1]$$

Where P_0 represents the current stock price, D1…D∞ are all expected future dividends, and k is the discount rate, or required ROE. Equation [1] is a standard present value calculation that can be simplified and rearranged into the following form:

$$k = \frac{D_0(1+g)}{P_0} + g \quad [2]$$

Equation [2] is often referred to as the Constant Growth DCF model in which the first term is the expected dividend yield and the second term is the expected long-term growth rate.

Q. What assumptions are required for the Constant Growth DCF model?

A. The Constant Growth DCF model requires the following assumptions: (1) a constant growth rate for earnings and dividends; (2) a stable dividend payout ratio; (3) a constant price-to-earnings ("P/E") ratio; and (4) a discount rate greater than the expected growth rate. To the extent any of these assumptions is violated, considered judgment and/or specific adjustments should be applied to the results.

Q. What market data did you use to calculate the dividend yield in your Constant Growth DCF model?

A. The dividend yield in my Constant Growth DCF model is based on the proxy companies' current annual dividend and average closing stock prices over the 30-, 90-, and 180-trading days as of September 28, 2018.

Q. Why did you use three averaging periods for stock prices?

A. It is important to use an average of trading days to calculate the price term in the DCF model to ensure that the calculated ROE is not skewed by anomalous events that may affect stock prices on any given trading day. The averaging period should be reasonably representative of expected capital market conditions over the long term. However, the averaging periods that I use rely on historical data which may not be consistent with the forward-looking expectation that interest rates will increase. Therefore, the results of my Constant Growth DCF model using historical data may underestimate the forward-looking cost of equity. As a result, I place more weight on the mean to mean-high results produced by my Constant Growth DCF model. In addition, I calculate an additional Constant Growth DCF analysis which relies on projected market data from Value Line to more reasonably approximate future market conditions.

Q. Did you make any adjustments to the dividend yield to account for periodic growth in dividends?

A. Yes. Since utility companies tend to increase their quarterly dividends at different times throughout the year, it is reasonable to assume that dividend increases will be evenly distributed over calendar quarters. Given that assumption, it is reasonable to apply one-half of the expected annual dividend growth rate for purposes of calculating the expected dividend yield component of the DCF model. This adjustment ensures that the expected first year dividend yield is, on average, representative of the coming twelve-month period, and does not overstate the aggregated dividends to be paid during that time.

Q. Why is it important to select appropriate measures of long-term growth in applying the DCF model?

A. In its Constant Growth form, the DCF model (i.e., Equation [2]) assumes a single long-term growth rate in perpetuity. In order to reduce the long-term growth rate to a single measure, one must assume that the dividend payout ratio remains constant and that earnings per share, dividends per share, and book value per share all grow at the same constant rate. Over the long run, however, dividend growth can only be sustained by earnings growth. Earnings growth rates tend to be least influenced by capital allocation decisions that companies may make in response to near-term changes in the business environment. Since such decisions may directly affect near-term dividend payout ratios,

estimates of earnings growth are more indicative of long-term investor expectations than are dividend or book value growth estimates.

Q. What sources of long-term growth rates did you rely on in your Constant Growth DCF model?

A. My Constant Growth DCF model incorporates the following sources of long-term earnings growth rates: 1) consensus estimates from Zacks Investment Research; 2) consensus estimates from Thomson First Call (provided by Yahoo! Finance); and 3) long-term earnings growth estimates from Value Line.

Q. How did you calculate the expected dividend yield?

A. I adjusted the dividend yield to reflect the growth rate that was being used in that particular scenario. This ensures that the growth rate used in the dividend yield calculation and the growth rate used as the "g" term of the DCF model are internally consistent.

Q. Did you make any adjustments to the results of the Constant Growth DCF analysis?

A. Yes. I eliminated any ROE estimate that is below the yield on the 30-year Treasury Bond plus a minimum equity risk premium. As discussed above, the lower boundary is based on a recent position established by the Minnesota Department of Commerce ("DOC") in

Docket No. E017/GR-15-1033.[76] The lower bound of 7.00 percent was established by reviewing the equity risk premium for the proxy group as calculated by my CAPM analysis. As shown in Attachments AEB-9 and AEB-10, the market risk premium ranged from 10.99 percent to 12.10 percent. Therefore, the implied equity risk premium for the proxy group is calculated as the market return times the proxy group average beta. For example, as shown in Attachment AEB-9, the Water Proxy Group including AWK had a Value Line beta of 0.770 which would result in a market risk premium for the proxy group ranging from 8.46 percent to 9.31 percent. However, an ROE estimate of 7.00 percent would result in an equity risk premium ranging from 2.80 percent to 3.91 percent which would result in an equity risk premium for the proxy group that is approximately 550 basis points less than the equity risk premium for the Water Proxy Group including AWK calculated using my CAPM analysis. Therefore, it is reasonable to conclude that an ROE of 7.00 percent would not sufficiently compensate investors for the additional risk of investing in utility stocks. As a result, I have excluded individual DCF estimates that are below 7.00 percent.

Q. Please summarize the results of your Constant Growth DCF analyses.

A. Figure 10 (see also Attachment AEB-1, columns 12, 13 and 14 and Attachment AEB-2, columns 12, 13 and 14) presents the range of results produced by my Water and

[76] Docket No. E017/GR-15-1033, In the Matter of the Application of Otter Tail Power Company for Authority to Increase Rates for Electric Service in the State of Minnesota (August 16, 2016), at 11.

Combined Utility Proxy Groups. As shown in Figure 10, for the Water Proxy Group (including and excluding AWK), the mean Constant Growth DCF results range from 8.27 percent to 9.23 percent and the mean high Constant Growth DCF results are in the range of 10.64 percent to 11.30 percent while for the Combined Utility Proxy Group (including and excluding AWK), the mean Constant Growth DCF results range from 9.19 percent to 9.58 percent and the mean high Constant Growth DCF results are in the range of 11.70 percent to 11.85 percent.

Figure 10: Summary of Constant Growth DCF Results[77]

	Median Low	Median	Median High
Water Proxy Group			
Including AWK			
30-Day Average	8.88%	9.23%	11.30%
90-Day Average	8.91%	9.16%	11.23%
180-Day Average	8.95%	9.16%	11.23%
Excluding AWK			
30-Day Average	8.02%	8.27%	10.64%
90-Day Average	8.00%	8.28%	10.65%
180-Day Average	8.02%	8.36%	10.74%
Combined Utility Proxy Group			
Including AWK			
30-Day Average	8.76%	9.42%	11.72%
90-Day Average	8.81%	9.45%	11.76%
180-Day Average	8.87%	9.58%	11.85%
Excluding AWK			
30-Day Average	8.65%	9.23%	11.70%
90-Day Average	8.70%	9.19%	11.73%
180-Day Average	8.80%	9.29%	11.77%

Q. How did you calculate the range of results for the Constant Growth DCF model?

A. I calculated the low DCF result using the minimum growth rate (i.e., the lowest of the Zacks, Thomson First Call, and Value Line earnings growth rates) for each of the proxy group companies. Thus, the low result reflects the minimum DCF result for the proxy group. I used a similar approach to calculate the high results, using the highest growth rate for each proxy group company. The mean results were calculated using the average growth rates from all sources.

[77] The results shown in Figure 10 reflect the 7.00 percent lower bound.

Q. What are your conclusions about the results of the Constant Growth DCF model?

A. As discussed previously, one primary assumption of the DCF model is a constant P/E ratio. That assumption is heavily influenced by the market price of utility stocks. To the extent utility valuations are high and may not be sustainable, it is important to consider the results of the DCF model with caution. As shown in Figure 2 above, the average dividend yield for the proxy group has declined from 4.23 percent in 2009 to 2.04 percent in 2018 due primarily to the low interest rate environment for government bonds. The median expected dividend yield for the Water Proxy Group including AWK on the 30-day average DCF analysis is 1.96 percent, which is very close to the minimum average dividend yields for water utilities since 2009. While I have given weight to the results of the Constant Growth DCF model, my recommendation also gives weight to the results of other ROE estimation models.

Q. Have you considered the results of any other analyses?

A. Yes, because of analysts' views that utility stocks may currently be at unsustainably high prices in a rising interest rate environment, I have also considered the results of a projected Constant Growth DCF model and the expected returns on equity for the companies in my Water Proxy Group. The projected DCF analysis relies on Value Line's projected average stock prices and dividends for the period from 2021 through 2023 and the five-year projected EPS growth rates. As shown in Attachments AEB-3 and AEB-4, the projected DCF analysis produces median DCF results for the WPG of

9.71 percent (including AWK) and 8.94 percent (excluding AWK) and median high results of 11.79 (including AWK) and 11.25 percent (excluding AWK). The median projected DCF results using the CUPG are 9.68 percent (including AWK) and 9.64 percent (excluding AWK). and the median high results are 12.10 (including AWK) and 12.10 percent (excluding AWK).

Q. What conclusions do you draw from this analysis?

A. As discussed previously, analysts expect that rising interest rates will have a negative effect on utility stock prices. This methodology demonstrates that if investors were to consider Value Line's projected dividend yields and share prices as of 2021-2023, the median results of the Constant Growth DCF model would increase. For example, as shown in Attachment AEB-3, the median results of the DCF model for the WPG increase by 48 basis points (i.e., 9.71 percent vs. 9.23 percent as shown in Attachments AEB-1). Using the CUPG as shown in Attachment AEB-4, the median results of the Constant Growth DCF model increase 26 basis points from 9.42 percent (Attachment AEB-2) to 9.68 percent.[78]

[78] This comparison includes all of the proxy group companies based on the 30-day average stock prices.

Q. What other analyses have you considered?

A. I have also considered the expected returns on equity as reported by Value Line for each of the companies in my Water Proxy Group in 2019 and for the period from 2021-2023, as shown in Figure 11 (also see Attachment AEB-5).

Figure 11: Value Line Projected Returns on Equity – Water Proxy Group[79]

Company	Ticker	2019	2021-2023
American States Water Co.	AWR	13.00%	14.00%
American Water Works Co. Inc.	AWK	10.50%	10.50%
California Water Service Group	CWT	11.00%	11.50%
Middlesex Water Company	MSEX	11.00%	12.50%
York Water Company	YORW	10.00%	13.50%
Median		11.00%	12.50%
Median excluding AWK		11.00%	13.00%

Q. What are your conclusions from these analyses?

A. As discussed previously, one primary assumption of the DCF models is a constant P/E ratio. That assumption is heavily influenced by the market price of utility stocks. To the extent that utility valuations are high and may not be sustainable, it is important to consider the results of the DCF models with caution. As I indicated previously, this is due to the high utility equity valuations that occurred in the lower interest rate environment as investors have sought higher returns. With the expectation of rising interest rates, such levels are not expected to be sustained in the upcoming years. Since the low dividend yields may result in the DCF model understating investors' expected

[79] Value Line Investment Survey, Water Utilities, July 13, 2018.

return, I have given primary weight to the median and median high-end DCF results. My overall recommendation also relies on the results of other ROE estimation models.

C. CAPM Analysis

Q. Please briefly describe the Capital Asset Pricing Model ("CAPM").

A. The CAPM is a risk premium approach that estimates the cost of equity for a given security as a function of a risk-free return plus a risk premium to compensate investors for the non-diversifiable or "systematic" risk of that security. Systematic risk is the risk inherent in the entire market or market segment. This form of risk cannot be diversified away using a portfolio of assets. Non-systematic risk is the risk of a specific company that can be mitigated through portfolio diversification.

The CAPM is defined by four components, each of which must theoretically be a forward-looking estimate:

$$K_e = r_f + \beta(r_m - r_f) \quad [3]$$

Where:

K_e = the required market ROE;

β = Beta coefficient of an individual security;

r_f = the risk-free ROR; and

r_m = the required return on the market as a whole.

In this specification, the term ($r_m - r_f$) represents the Market Risk Premium. According to the theory underlying the CAPM, since unsystematic risk can be diversified away, investors should only be concerned with systematic risk. Systematic risk is measured by Beta. Beta is a measure of the volatility of a security as compared to the market as a whole. Beta is defined as:

$$\beta = \frac{Covariance(r_e, r_m)}{Variance(r_m)} \quad [4]$$

The variance of the market return (i.e., Variance (r_m)) is a measure of the uncertainty of the general market. The covariance between the return on a specific security and the general market (i.e., Covariance (r_e, r_m)) reflects the extent to which the return on that security will respond to a given change in the general market return. Thus, Beta represents the risk of the security relative to the broad market.

Q. What risk-free rate did you use in your CAPM analyses?

A. I relied on three sources for my estimate of the risk-free rate: (1) the current 30-day average yield on 30-year U.S. Treasury bonds (i.e., 3.09%);[80] (2) the projected 30-year U.S. Treasury bond yield for 2018 through 2020 (i.e., 3.52%);[81] and (3) the projected 30-year U.S. Treasury bond yield for 2020 through 2024 (i.e., 4.20%).[82]

[80] Bloomberg Professional, as of September 28, 2018.
[81] Blue Chip Financial Forecasts, Vol. 37, No. 10, October 1, 2018, at 2.
[82] Blue Chip Financial Forecasts, Vol. 37, No. 6, June 1, 2018, at 14.

Q. What Beta coefficients did you use in your CAPM analyses?

A. As shown in Attachments AEB-6 and AEB-7, I used the average Beta coefficients for the companies in the Water and Combined Utility Proxy Groups as reported by Value Line and Bloomberg. Value Line's calculation is based on five years of weekly returns relative to the New York Stock Exchange Composite Index. The Bloomberg Betas are calculated based on two years of weekly returns relative to the New York Stock Exchange Composite Index.

Q. How did you estimate the Market Risk Premium in the CAPM?

A. I estimated the Market Risk Premium based on the expected total return on the S&P 500 Index less the 30-year Treasury bond yield. The expected total return on the S&P 500 Index is calculated using the Constant Growth DCF model for the companies in the S&P 500 Index. As shown in Attachment AEB-8, based on an estimated dividend yield of 1.88 percent and a long-term earnings growth rate of 13.18 percent, the estimated total market return for the S&P 500 Index is 15.19 percent. The implied Market Risk Premia over the current and projected yields on the 30-year U.S. Treasury bond range from 10.99 percent to 12.10 percent.

Q. Have other regulators endorsed the use of a forward-looking market risk premium?

A. Yes. In Opinion No. 531-B, the FERC specifically endorsed a method that is similar to the method I have used to calculate the forward-looking market risk premium (i.e.,

applying a Constant Growth DCF analysis to the S&P 500 and using the 30-year Treasury bond yields).[83]

In response to arguments against this methodology, the FERC stated:

> We are also unpersuaded that the growth rate projection in the NETOs' CAPM study was skewed by the NETOs' reliance on analysts' projections of non-utility companies' medium-term earnings growth, or that the study failed to consider that those analysts' estimates reflect unsustainable short-term stock repurchase programs and are not long-term projections. As explained above, the NETOs based their growth rate input on data from IBES, which the Commission has found to be a reliable source of such data. Thus, the time periods used for the growth rate projections in the NETOs' CAPM study are the time periods over which IBES forecasts earnings growth. Petitioners' arguments against the time period on which the NETOs' CAPM analysis is based are, in effect, arguments that IBES data are insufficient in a CAPM study.[84]
>
> ***
>
> While an individual company cannot be expected to sustain high short term growth rates in perpetuity, the same cannot be said for a stock index like the S&P 500 that is regularly updated to contain only companies with high market capitalization, and the record in this proceeding does not indicate that the growth rate of the S&P 500 stock index is unsustainable.[85]

Additionally, the Staff in Maine has also endorsed the use of a forward-looking market risk premium. In the Bench Analysis in Docket No. 2017-00198 for Emera Maine and Docket No. 2017-00065 for Northern Utilities, Staff accepted the approach proposed by

[83] 150 FERC ¶ 61,165, Docket Nos. EL11-66-002, Opinion No. 531-B (March 3, 2015), at para. 109-111.

[84] *Id.*, at para. 112.

[85] *Id.*, at para. 113.

the companies for calculating the market return.[86] In each case, the market return was the expected return for the S&P 500 which was calculated using a Constant Growth DCF model. In Docket No. 2017-00198, Staff noted the following:

> Staff has no issue with the methodology used by Mr. Perkins in calculating market parameters based on the S&P 500 and used the model provided by Mr. Perkins with the revised risk free rate to re-calculate the market risk premiums.[87]

Furthermore, the Maine Public Utilities Commission ("Maine PUC") in Docket No. 2017-0198 used the CAPM results calculated by Staff and Emera Maine as a check on the reasonableness of the DCF results in the case and did not dispute the use of the forward-looking market risk premium by the parties (i.e., Staff and Emera Maine).[88]

Q. What are the results of your CAPM analyses?

A. As shown in Figure 12 (*see* also Attachments AEB-9, and AEB-10), the CAPM model results for the Water and Combined Utility Proxy Groups produce a range of returns from 11.31 percent to 13.28 percent.

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[86] Emera Maine, Request for Approval of a Proposed Rate Increase, Docket No. 2017-00198, Bench Analysis at 71-72 (December 21, 2017); Northern Utilities, Inc. d/b/a UNITIL, Request for Approval of Rate Change Pursuant to Section 307, Docket No. 2017-00065, Bench Analysis, at 15-16 (October 6, 2017).

[87] Emera Maine, Request for Approval of a Proposed Rate Increase, Docket No. 2017-00198, Bench Analysis, at 71-72 (December 21, 2017).

[88] Emera Maine, Request for Approval of Proposed Rate Increase, Docket No. 2017-00198, June 28, 2018, at 41.

Figure 12: Forward-Looking CAPM Results

	Current Risk-Free Rate (3.09%)	2018-2019 Projected Risk-Free Rate (3.52%)	2020-2024 Projected Risk-Free Rate (4.20%)	Mean Result
Water Proxy Group				
Including AWK				
Bloomberg Beta	12.66%	12.74%	12.89%	12.76%
Value Line Beta	12.41%	12.50%	12.66%	12.52%
Excluding AWK				
Bloomberg Beta	13.09%	13.16%	13.28%	13.18%
Value Line Beta	12.77%	12.86%	12.99%	12.87%
Combined Utility Proxy Group				
Including AWK				
Bloomberg Beta	11.31%	11.45%	11.67%	11.47%
Value Line Beta	11.76%	11.88%	12.08%	11.91%
Excluding AWK				
Bloomberg Beta	11.35%	11.48%	11.70%	11.51%
Value Line Beta	11.84%	11.95%	12.14%	11.98%

VII. BUSINESS RISKS

Q. Do the mean DCF and CAPM results for the proxy group, taken alone, provide an appropriate estimate of the cost of equity for KAWC?

A. No. These mean results provide only a range of the appropriate estimate of KAWC's cost of equity. Several additional factors must be considered when determining where the Company's cost of equity falls within the range of results. These factors, discussed below, should be considered with respect to their overall effect on KAWC's risk profile relative to the proxy group.

A. Risks Associated with Capital Expenditure Program

Q. Please summarize KAWC's capital expenditure program.

A. KAWC projects that the Company will spend approximately $149.03 million on capital investments for the period from 2019-2023, including significant investment to replace aging infrastructure necessary to meet the needs of its customers and to comply with various state and federal regulations.

Q. How is KAWC's risk profile affected by its substantial capital expenditure program?

A. As with any utility faced with substantial capital expenditures, KAWC's risk profile is adversely affected in two significant and related ways: (1) the heightened level of investment increases the risk of under-recovery, or delayed recovery, of the invested capital; and (2) an inadequate return would put downward pressure on key credit metrics.

Q. Do credit rating agencies recognize the risks associated with elevated capital expenditures?

A. Yes. From a credit perspective, the additional pressure on cash flows associated with high levels of capital expenditures exerts corresponding pressure on credit metrics and, therefore, credit ratings. An S&P report explains:

> [T]here is little doubt that the U.S. electric industry needs to make record capital expenditures to comply with the proposed carbon pollution rules over the next several years, while maintaining safety standards and grid stability. We believe the higher capital spending and subsequent rise in

> debt levels could strain these companies' financial measures, resulting in an almost consistent negative discretionary cash flow throughout this higher construction period. To meet the higher capital spending requirements, companies will require ongoing and steady access to the capital markets, necessitating that the industry maintains its high credit quality. We expect that utilities will continue to effectively manage their regulatory risk by using various creative means to recover their costs and to finance their necessary higher spending.[89]

While this S&P report refers to electric utilities, the same applies to water utilities. To the extent that KAWC's rates do not permit it to recover its full cost of doing business, the Company will face increased recovery risk and thus increased pressure on its credit metrics. In an August 2016 report, S&P explained the importance of regulatory support for large capital projects:

> Broad support for all capital spending is the most credit-sustaining. Support for only specific types of capital spending, such as specific environmental projects or system integrity plans, is less so, but still favorable for creditors. Allowance of a cash return on construction work-in-progress or similar ratemaking methods historically were extraordinary measures for use in unusual circumstances, but when construction costs are rising, cash flow support could be crucial to maintain credit quality through the spending program. Even more favorable are those jurisdictions that present an opportunity for a higher return on capital projects as an incentive to investors.[90]

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[89] S&P, Ratings Direct, "U.S. Regulated Electric Utilities' Annual Capital Spending is Poised to Eclipse $100 Billion," July 2014.

[90] S&P Global Ratings, "Assessing U.S. Investor-Owned Utility Regulatory Environments," August 10, 2016, at 7.

Q. Have credit rating agencies commented specifically on AWK's capital spending program?

A. Yes, both S&P and Moody's have observed that AWK has significant capital spending requirements. S&P states:

> The Company's geographic diversity, reliability, and efficiency further support its business risk profile. AWK's elevated capital spending requirements for infrastructure replacement, increased compliance costs to meet water quality standards, and reliance on acquisitions to provide growth partially offset these strengths.[91]

As noted previously in my Direct Testimony, S&P and Moody's both noted recently that the large capex plan, in addition to the effects of tax reform had reduced AWK's credit metrics.[92]

Q. Does KAWC have a mechanism for timely recovery of infrastructure replacements?

A. No. KAWC is proposing a Qualified Infrastructure Program ("QIP") to recover the cost of infrastructure investments following the test year. As is discussed in more detail in the testimony of various other Company witnesses, the Company's proposed cost of infrastructure replacement is substantial and is expected to continue to increase over time. These investments include the replacement of aging production, transmission and distribution infrastructure. The recovery of costs would occur through the QIP surcharge

[91] S&P Global Ratings, "Summary: American Water Works Company, Inc.," August 10, 2016, at 3.

[92] Standard and Poor's RatingsDirect, "American Water Works Co. Inc. and Subsidiaries 'A' Ratings affirmed; Outlooks Remain Stable," June 11, 2018. Moody's Investor Services, American Water Works Company, Inc. Update following negative outlook February 16, 2018.

which would be established on an annual basis and would recover qualified plant additions for the upcoming year. The QIP rider will not include the costs of expansion projects. Additionally, the proposed QIP rider includes an annual reconciliation filing to ensure the recovery of project costs. The timely recovery of infrastructure replacement costs through the proposed QIP will reduce the regulatory lag that typically results from capital expenditures between rate proceeding which is important to maintain cash flow coverage ratios that are within the parameters established by the rating agencies.

Q. Do the proxy group companies also have the ability to recover capital investments through a distribution system infrastructure surcharge?

A. Yes, significant programs like KAWC's that drive capital expenditure requirements generally receive cost recovery through infrastructure and capital trackers.. As shown in Attachmentt AEB-11, the companies in the CUPG, excluding AWK, have infrastructure replacement recovery mechanisms comparable to the QIP in approximately 63.33 percent of their operating jurisdictions. Including AWK, the percentage of operating jurisdictions with infrastructure replacement recovery mechanisms is 63.04 percent. Therefore, if KAWC were not allowed to recover its infrastructure replacement investments through a capital tracking mechanism, its risk relative to the proxy group would be significantly increased.

Q. What are your conclusions regarding the effect of KAWC's capital spending program on its risk profile?

A. The Company's capital expenditure requirements as a percentage of net utility plant is significant. Timely cost recovery is needed in order to maintain credit metrics at a level consistent with the current credit ratings. The financial community recognizes the additional risks associated with substantial capital expenditures. In my view, those factors support an ROE above the proxy group mean.

B. Other Business and Operating Risks

Q. Does KAWC have protection against volumetric risk?

A. No. KAWC does not currently have a revenue decoupling mechanism that breaks the link between revenues and volume/demand.

Q. How does KAWC's volumetric risk compare to the proxy group?

A. As shown in Attachment AEB-11, the companies in the Combined Utility Proxy Group, excluding AWK, have protection against volumetric risk through either revenue stabilization mechanisms or revenue decoupling in approximately 63.33 percent of their operating jurisdictions, including AWK, the proxy companies have either a revenue decoupling or rate stabilization mechanism in 47.83 percent of the operating jurisdictions. However, KAWC does not currently have a similar mechanism nor is the Company proposing a revenue decoupling or rate stabilization mechanism in this proceeding. Therefore, those operating companies that have implemented a mechanism to protect

revenues against fluctuations in volume/demand have more stable revenues and cash flows and a better opportunity to achieve their authorized return than KAWC does. The returns for those proxy companies already reflect any risk-reducing benefits of these revenue decoupling mechanisms. As a result, KAWC has higher volumetric risk than companies with revenue decoupling or revenue stabilization mechanisms, which supports an ROE above the proxy group average.

Q. Please summarize KAWC's proposal with respect to test year convention.

A. KAWC is proposing to rely on a future test year ending June 30, 2020. The use of a future test year helps to mitigate the effect of regulatory lag so that KAWC has a better opportunity to earn its authorized return on equity. As shown in Attachment AEB-11, approximately 58.70 percent of the operating companies held by the CUPG, including AWK, use forward test periods, while 50.00 percent of the operating companies of the CUPG use a forward test year if AWK is excluded. In this regard, KAWC would have similar risk as the companies in the CUPG if the Company's proposed future test year is used to set rates.

Q. What is your conclusion regarding the business risk of KAWC relative to the proxy group as it relates to test year convention and volumetric risk?

A. My conclusion is that, if rates are set using a forecasted test year, KAWC has comparable risk in terms of test year convention, and higher risk than those proxy group companies that have implemented mechanisms to mitigate the effect on revenue and cash flows of

variations in volume/demand. Furthermore, KAWC has significant capital investment that is required to maintain the integrity of its system and to continue to provide high quality service to its customers. In the event that the Commission did not authorize the QIP, the Company would have higher risk than the proxy group due to the regulatory lag created as a result of these necessary investments.

XIII. CAPITAL STRUCTURE

Q. What is the Company's proposed capital structure?

A. KAWC is proposing a rate-making capital structure composed of 48.654 percent common equity, 49.324 percent long-term debt, 1.519 percent short-term debt and 0.503 percent preferred stock.[93]

Q. Have you conducted any analysis to determine a reasonable equity ratio for KAWC?

A. Yes, I reviewed the historical capital structure for KAWC and the capital structures of the companies in my Water and Combined Utility Proxy Groups.

Q. Why is it appropriate to consider the equity ratio for the proxy companies?

A. The determination of the ROE is based on the expected return for a proxy group of companies that are comparable in risk to KAWC. The equity ratio is a measure of the financial risk of the company, and the authorized ROE is the return to compensate

[93] Exhibit 37, Schedule J-1.

investors for that risk. If the Commission is going to rely on the ROE estimates for the proxy companies to establish the authorized ROE for KAWC, it is important that the financial risk of KAWC be similar to the financial risk of the proxy group. This is accomplished when the equity ratio of the subject company (in this case KAWC) is within the range established by the proxy group.

Q. How did you conduct your analysis of the proxy group capital structures?

A. I calculated the mean proportions of common equity, long-term debt and short-term debt in 2017 for each of the proxy group companies.[94] As shown in Attachmentt AEB-12, the mean common equity ratio for the WPG (excluding AWK) at December 31, 2017 was 54.27 percent, within a range from 46.22 percent to 58.22 percent. Including AWK, the mean equity ratio for the WPG is 51.63 percent. Considering the capital structures of the CUPG shown in Attachment AEB-13, the mean common equity ratio excluding AWK is 50.22 percent, while the mean result including AWK is 49.46 percent. Comparing KAWC's proposed common equity ratio of 48.654 percent to the equity ratios of the WPG and the CUPG, KAWC's equity ratio is slightly below the mean equity ratio established by the proxy groups.

[94] Long-term debt includes the current portion of long-term debt, assuming that the current portion would be refinanced with debt at maturity.

Q. Is there a relationship between the equity ratio and the authorized ROE?

A. Yes. There is a direct relationship between the equity ratio and the authorized ROE. In particular, the equity ratio is the primary indicator of financial risk for a regulated utility such as KAWC. To the extent the equity ratio is reduced, a corresponding increase is necessary in the authorized ROE to compensate investors for the greater financial risk associated with a lower equity ratio.

Q. What is your conclusion with regard to KAWC's proposed capital structure?

A. Based on my review of the equity ratios of the companies in my Water and Combined Utility Proxy Groups, and taking into consideration the views of the credit rating agencies regarding the effects of the TCJA on cash flow metrics for American Water, KAWC's proposed common equity ratio of 48.654 percent is reasonable, if not conservative.

IX. COST OF EQUITY AND CAPITAL STRUCTURE

CONCLUSIONS AND RECOMMENDATION

Q. What is your conclusion regarding a fair ROE and capital structure for KAWC?

A. Based on the various quantitative analyses discussed in my Direct Testimony and the qualitative analyses presented in my Direct Testimony, a reasonable range of ROE results for KAWC is from 10.00 percent to 10.80 percent. Within that range, I believe that an ROE of 10.80 percent is reasonable and appropriate. I recommend a return at the high end of the range of results because it takes into account KAWC's company-specific risks

relative to the proxy group, as discussed in my Direct Testimony. In addition, the recommended ROE of 10.80 percent takes into consideration the anomalous conditions in capital markets that are causing the DCF model to understate the cost of equity, including the effect of the current low interest rate environment on utility stock valuations and dividend yields, and the market's expectation for higher interest rates during the period in which the rates established in this proceeding would be in effect.

Furthermore, I also conclude that KAWC's proposed rate-making capital structure consisting of 48.654 percent common equity, 49.324 percent long-term debt, 3.274 percent short term debt and 0.503 percent preferred stock is reasonable when compared to the proxy group companies and taking in consideration the impact of the TCJA on the cash flows of American Water and therefore should be adopted.

Q. Does this conclude your Direct Testimony?

A. Yes.

VERIFICATION

STATE OF MASSACHUSETTS)
) **SS:**
COUNTY OF MIDDLESEX)

The undersigned, **Ann E Bulkley**, being duly sworn, deposes and says she is a Senior Vice President with Concentric Energy Advisors, Inc., that she has personal knowledge of the matters set forth in the foregoing testimony, and the answers contained therein are true and correct to the best of her information, knowledge, and belief.

Ann E Bulkley
ANN E. BULKLEY

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 15th day of November, 2018.

Deborah Jean McGonigal (SEAL)
Notary Public

My Commission Expires:

DEBORAH-JEAN MCGONIGAL
Notary Public
Commonwealth of Massachusetts
My Commission Expires
November 2, 2023

CONCENTRIC ENERGY ADVISORS

Ann E. Bulkley
Senior Vice President

Ms. Bulkley has more than two decades of management and economic consulting experience in the energy industry. Ms. Bulkley has extensive state and federal regulatory experience on both electric and natural gas issues including rate of return, cost of equity and capital structure issues. Ms. Bulkley has provided expert testimony on the cost of capital in more than 30 regulatory proceedings before regulatory commissions in Arizona, Arkansas, Colorado, Connecticut, Kansas, Massachusetts, Michigan, Minnesota, Missouri, New Jersey, New Mexico, New York, North Dakota, Oklahoma, Pennsylvania, Texas, South Dakota, West Virginia, and the Federal Energy Regulatory Commission. In addition, Ms. Bulkley has prepared and provided supporting analysis for at least forty Federal and State regulatory proceedings. In addition, Ms. Bulkley has worked on acquisition teams with investors seeking to acquire utility assets, providing valuation services including an understanding of regulation, market expected returns, and the assessment of utility risk factors. Ms. Bulkley has assisted clients with valuations of public utility and industrial properties for ratemaking, purchase and sale considerations, ad valorem tax assessments, and accounting and financial purposes. In addition, Ms. Bulkley has experience in the areas of contract and business unit valuation, strategic alliances, market restructuring and regulatory and litigation support. Prior to joining Concentric, Ms. Bulkley held senior expertise-based consulting positions at several firms, including Reed Consulting Group and Navigant Consulting, Inc. where she specialized in valuation. Ms. Bulkley holds an M.A. in economics from Boston University and a B.A. in economics and finance from Simmons College. Ms. Bulkley is a Certified General Appraiser licensed in the Commonwealth of Massachusetts and the State of New Hampshire.

REPRESENTATIVE PROJECT EXPERIENCE

Regulatory Analysis and Ratemaking

Ms. Bulkley has provided a range of advisory services relating to regulatory policy analysis and many aspects of utility ratemaking. Specific services have included: cost of capital and return on equity testimony, cost of service and rate design analysis and testimony, development of ratemaking strategies; development of merchant function exit strategies; analysis and program development to address residual energy supply and/or provider of last resort obligations; stranded costs assessment and recovery; performance-based ratemaking analysis and design; and many aspects of traditional utility ratemaking (e.g., rate design, rate base valuation).

Cost of Capital

Ms. Bulkley has provided expert testimony on the cost of capital in more than 30 regulatory proceedings before regulatory commissions in Arizona, Arkansas, Colorado, Connecticut,

Kansas, Massachusetts, Michigan, Minnesota, Missouri, New Jersey, New Mexico, New York, North Dakota, Oklahoma, Pennsylvania, Texas, South Dakota, West Virginia, and the Federal Energy Regulatory Commission. In addition, Ms. Bulkley has prepared and provided supporting analysis for at least forty Federal and State regulatory proceedings in which she did not testify.

Valuation

Ms. Bulkley has provided valuation services to utility clients, unregulated generators and private equity clients for a variety of purposes including ratemaking, fair value, ad valorem tax, litigation and damages, and acquisition. Ms. Bulkley's appraisal practices are consistent with the national standards established by the Uniform Standards of Professional Appraisal Practice. In addition, Ms. Bulkley has relied on other simulation based valuation methodologies.

Representative projects/clients have included:

- Northern Indiana Fuel and Light: Provided expert testimony regarding the fair value of the company's natural gas distribution system assets. Valuation relied on cost approach.
- Kokomo Gas: Provided expert testimony regarding the fair value of the company's natural gas distribution system assets. Valuation relied on cost approach.
- Prepared fair value rate base analyses for Northern Indiana Public Service Company for several electric rate proceedings. Valuation approaches used in this project included income, cost and comparable sales approaches.
- Confidential Utility Client: Prepared valuation of fossil and nuclear generation assets for financing purposes for regulated utility client.
- Prepared a valuation of a portfolio of generation assets for a large energy utility to be used for strategic planning purposes. Valuation approach included an income approach, a real options analysis and a risk analysis.
- Assisted clients in the restructuring of NUG contracts through the valuation of the underlying assets. Performed analysis to determine the option value of a plant in a competitively priced electricity market following the settlement of the NUG contract.
- Prepared market valuations of several purchase power contracts for large electric utilities in the sale of purchase power contracts. Assignment included an assessment of the regional power market, analysis of the underlying purchase power contracts, a traditional discounted cash flow valuation approach, as well as a risk analysis. Analyzed bids from potential acquirers using income and risk analysis approached. Prepared an assessment of the credit issues and value at risk for the selling utility.
- Prepared appraisal of a portfolio of generating facilities for a large electric utility to be used for financing purposes.
- Prepared an appraisal of a fleet of fossil generating assets for a large electric utility to establish the value of assets transferred from utility property.
- Conducted due diligence on an electric transmission and distribution system as part of a buy-side due diligence team.
- Provided analytical support for and prepared appraisal reports of generation assets to be used in ad valorem tax disputes.

- Provided analytical support and prepared testimony regarding the valuation of electric distribution system assets in five communities in a condemnation proceeding.
- Valued purchase power agreements in the transfer of assets to a deregulated electric market.

Ratemaking

Ms. Bulkley has assisted several clients with analysis to support investor-owned and municipal utility clients in the preparation of rate cases. Sample engagements include:

- Assisted several investor-owned and municipal clients on cost allocation and rate design issues including the development of expert testimony supporting recommended rate alternatives.
- Worked with Canadian regulatory staff to establish filing requirements for a rate review of a newly regulated electric utility. Analyzed and evaluated rate application. Attended hearings and conducted investigation of rate application for regulatory staff. Prepared, supported and defended recommendations for revenue requirements and rates for the company. Developed rates for gas utility for transportation program and ancillary services.

Strategic and Financial Advisory Services

Ms. Bulkley has assisted several clients across North America with analytically based strategic planning, due diligence and financial advisory services.

Representative projects include:

- Preparation of feasibility studies for bond issuances for municipal and district steam clients.
- Assisted in the development of a generation strategy for an electric utility. Analyzed various NERC regions to identify potential market entry points. Evaluated potential competitors and alliance partners. Assisted in the development of gas and electric price forecasts. Developed a framework for the implementation of a risk management program.
- Assisted clients in identifying potential joint venture opportunities and alliance partners. Contacted interviewed, and evaluated potential alliance candidates based on company-established criteria for several LDCs and marketing companies. Worked with several LDCs and unregulated marketing companies to establish alliances to enter into the retail energy market. Prepared testimony in support of several merger cases and participated in the regulatory process to obtain approval for these mergers.
- Assisted clients in several buy-side due diligence efforts, providing regulatory insight and developing valuation recommendations for acquisitions of both electric and gas properties.

PROFESSIONAL HISTORY

Concentric Energy Advisors, Inc. (2002 – Present)
Senior Vice President
Vice President
Assistant Vice President
Project Manager

Navigant Consulting, Inc. (1995 – 2002)
Project Manager

Cahners Publishing Company (1995)
Economist

EDUCATION

M.A., Economics, Boston University, 1995

B.A., Economics and Finance, Simmons College, 1991

Certified General Appraiser licensed in the Commonwealth of Massachusetts and the States of Michigan and New Hampshire

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Arizona Corporation Commission				
Tucson Electric Power Company	11/15	Tucson Electric Power Company	Docket No. E-01933A-15-0322	Return on Equity
UNS Electric	12/12	UNS Electric	Docket No. E-04204A-12-0504	Return on Equity
UNS Electric	05/15	UNS Electric	Docket No. E-04204A-15-0142	Return on Equity
Arkansas Public Service Commission				
Arkansas Oklahoma Gas Corporation	10/13	Arkansas Oklahoma Gas Corporation	Docket No. 13-078-U	Return on Equity
Colorado Public Utilities Commission				
Atmos Energy Corporation	05/13	Atmos Energy Corporation	Docket No. 13AL-0496G	Return on Equity
Atmos Energy Corporation	04/14	Atmos Energy Corporation	Docket No. 14AL-0300G	Return on Equity
Atmos Energy Corporation	05/15	Atmos Energy Corporation	Docket No. 15AL-0299G	Return on Equity
Connecticut Public Utilities Regulatory Authority				
Connecticut Natural Gas Corporation	06/18	Connecticut Natural Gas Corporation	Docket No. 18-05-16	Return on Equity
The Southern Connecticut Gas Company	06/17	The Southern Connecticut Gas Company	Docket No. 17-05-42	Return on Equity
The United Illuminating Company	07/16	The United Illuminating Company	Docket No. 16-06-04	Return on Equity
Yankee Gas Services Co. d/b/a Eversource Energy	06/18	Yankee Gas Services Co. d/b/a Eversource Energy	Docket No. 18-05-10	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Federal Energy Regulatory Commission				
Tallgrass Interstate Gas Transmission	10/15	Tallgrass Interstate Gas Transmission	RP16-137	Return on Equity
Indiana Utility Regulatory Commission				
Indiana and Michigan American Water Company	09/18	Indiana and Michigan American Water Company	IURC Cause No. 45142	Return on Equity
Indianapolis Power and Light Company	09/15	Indianapolis Power and Light Company	Cause No. 44576 Cause No. 44602	Fair Value
Indianapolis Power and Light Company	12/16	Indianapolis Power and Light Company	Cause No.44893	Fair Value
Kokomo Gas and Fuel Company	09/10	Kokomo Gas and Fuel Company	Cause No. 43942	Fair Value
Northern Indiana Fuel and Light Company, Inc.	09/10	Northern Indiana Fuel and Light Company, Inc.	Cause No. 43943	Fair Value
Northern Indiana Public Service Company	10/15	Northern Indiana Public Service Company	Cause No. 44688	Fair Value
Northern Indiana Public Service Company	09/17	Northern Indiana Public Service Company	Cause No. 44988	Fair Value
Kansas Corporation Commission				
Atmos Energy Corporation	08/15	Atmos Energy Corporation	Docket No. 16-ATMG-079-RTS	Return on Equity
Maine Public Utilities Commission				
Central Maine Power	10/18	Central Maine Power	Docket No. 2018-00194	Return on Equity
Maryland Public Service Commission				
Maryland American Water Company	06/18	Maryland American Water Company	Case No. 9487	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Commonwealth of Massachusetts Appellate Tax Board				
FirstLight Hydro Generating Company	06/17	FirstLight Hydro Generating Company	Docket No. F-325471 Docket No. F-325472 Docket No. F-325473 Docket No. F-325474	Valuation of Electric Generation Assets
Commonwealth of Massachusetts Department of Public Utilities				
Unitil Corporation	01/04	Fitchburg Gas and Electric	DTE 03-52	Integrated Resource Plan; Gas Demand Forecast
Berkshire Gas Company	05/18	Berkshire Gas Company	DPU 18-40	Rate Case
Michigan Public Service Commission				
Wisconsin Electric Power Company	12/11	Wisconsin Electric Power Company	Case No. U-16830	Return on Equity
Michigan Tax Tribunal				
Covert Township	07/14	New Covert Generating Co., LLC.	Docket No. 399578	Valuation of Electric Generation Assets
New Covert Generating Co., LLC.	03/18	The Township of New Covert Michigan	MTT Docket No. 000248TT and 16-001888-TT	Valuation of Electric Generation Assets
Minnesota Public Utilities Commission				
Minnesota Energy Resources Corporation	10/17	Minnesota Energy Resources Corporation	Docket No. G011/GR-17-563	Return on Equity
Missouri Public Service Commission				
Missouri American Water Company	06/17	Missouri American Water Company	Case No. WR-17-2085 Case No. SR-17-2086	Return on Equity
Montana Public Service Commission				
Montana-Dakota Utilities Co.	09/18	Montana-Dakota Utilities Co.	D0218.9.60	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
New Hampshire-Merrimack County Superior Court				
Northern New England Telephone Operations, LLC d/b/a FairPoint Communications, NNE	04/18	Northern New England Telephone Operations, LLC d/b/a FairPoint Communications, NNE	220-2012-CV-1100	Valuation of Utility Property
New Hampshire-Rockingham Superior Court				
Eversource Energy	05/18	Public Service Commission of New Hampshire	218-2016-CV-00899 218-2017-CV-00917	Return on Equity
New Mexico Public Regulation Commission				
Southwestern Public Service Company	06/15	Southwestern Public Service Company	Case No. 15-001398-UT	Return on Equity
Southwestern Public Service Company	10/15	Southwestern Public Service Company	Case No. 15-00296-UT	Return on Equity
Southwestern Public Service Company	12/16	Southwestern Public Service Company	Case No. 16-00269-UT	Return on Equity
Southwestern Public Service Company	10/17	Southwestern Public Service Company	Case No. 17-00255-UT	Return on Equity
New York State Department of Public Service				
Central Hudson Gas and Electric Corporation	07/17	Central Hudson Gas and Electric Corporation	Gas 17-G-0460 Electric 17-E-0459	Return on Equity
Corning Natural Gas Corporation	06/16	Corning Natural Gas Corporation	Case No. 16-G-0369	Return on Equity
KeySpan Energy Delivery	01/16	KeySpan Energy Delivery	Case No. 15-G-0059	Return on Equity
National Fuel Gas Company	04/16	National Fuel Gas Company	Case No. 16-G-0257	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
New York State Electric and Gas Company	05/15	New York State Electric and Gas Company	Case No. 15-G-0284	Return on Equity
Niagara Mohawk Power Corporation	04/17	National Grid USA	Case No. C-17-E-0238	Return on Equity
North Dakota Public Service Commission				
Northern States Power Company	12/10	Northern States Power Company	C-PU-10-657	Return on Equity
Northern States Power Company	12/12	Northern States Power Company	C-PU-12-813	Return on Equity
Oklahoma Corporation Commission				
Arkansas Oklahoma Gas Corporation	01/13	Arkansas Oklahoma Gas Corporation	Cause No. PUD 201200236	Return on Equity
Public Utility Commission of Pennsylvania				
American Water Works Company Inc.	04/17	Pennsylvania-American Water Company	Docket No. R-2017-2595853	Return on Equity
South Dakota Public Utilities Commission				
Northern States Power Company	06/14	Northern States Power Company	Docket No. EL14-058	Return on Equity
Public Utility Commission of Texas				
Southwestern Public Service Company	01/14	Southwestern Public Service Company	Docket No. 42004	Return on Equity
Virginia State Corporation Commission				
Virginia American Water Company, Inc.	11/18	Virginia American Water Company, Inc.	Docket No. PUR-2018-00175	Return on Equity
Public Service Commission of West Virginia				
West Virginia American Water Company	04/18	West Virginia American Water Company	Case No. 18-0573-W-42T Case No. 18-0576-S-42T	Return on Equity

30-DAY CONSTANT GROWTH DCF -- WATER PROXY GROUP

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]
													Excluding Low-End Outliers		
Company		Annualized Dividend	Stock Price	Dividend Yield	Expected Dividend Yield	Value Line Earnings Growth	Yahoo! Finance Earnings Growth	Zacks Earnings Growth	Average Growth Rate	Low ROE	Mean ROE	High ROE	Low ROE	Mean ROE	High ROE
American States Water Co	AWR	$1.10	$60.33	1.82%	1.87%	6.00%	4.00%	6.00%	5.33%	5.86%	7.21%	7.88%		7.21%	7.88%
American Water	AWK	$1.82	$88.33	2.06%	2.15%	10.00%	8.10%	7.80%	8.63%	9.94%	10.78%	12.16%	9.94%	10.78%	12.16%
California Water Service Group	CWT	$0.75	$41.39	1.81%	1.89%	9.50%	9.80%	7.00%	8.77%	8.88%	10.66%	11.70%	8.88%	10.66%	11.70%
Middlesex Water Company	MSEX	$0.90	$46.85	1.91%	1.96%	8.00%	2.70%	n/a	5.35%	4.64%	7.31%	9.99%		7.31%	9.99%
York Water Company	YORW	$0.67	$30.24	2.20%	2.28%	9.00%	4.90%	n/a	6.95%	7.16%	9.23%	11.30%	7.16%	9.23%	11.30%
Median				1.91%	1.96%	9.00%	4.90%	7.00%	6.95%	7.16%	9.23%	11.30%	8.88%	9.23%	11.30%
Median excluding AWK				1.87%	1.93%	8.50%	4.45%	6.50%	6.15%	6.51%	8.27%	10.64%	8.02%	8.27%	10.64%

Notes:
[1] Source: Bloomberg Professional
[2] Source: Bloomberg Professional, equals 30-day average as of September 28, 2018
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [8])
[5] Source: Value Line
[6] Source: Yahoo! Finance
[7] Source: Zacks
[8] Equals Average ([5], [6], [7])
[9] Equals [3] x (1 + 0.50 x Minimum ([5], [6], [7]) + Minimum ([5], [6], [7])
[10] Equals [4] + [8]
[11] Equals [3] x (1 + 0.50 x Maximum ([5], [6], [7]) + Maximum ([5], [6], [7])
[12] Equals [9] if greater than 7%
[13] Equals [10] if greater than 7%
[14] Equals [11] if greater than 7%

90-DAY CONSTANT GROWTH DCF -- WATER PROXY GROUP

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]
													Excluding Low-End Outliers		
Company		Annualized Dividend	Stock Price	Dividend Yield	Expected Dividend Yield	Value Line Earnings Growth	Yahoo! Finance Earnings Growth	Zacks Earnings Growth	Average Growth Rate	Low ROE	Mean ROE	High ROE	Low ROE	Mean ROE	High ROE
American States Water Co	AWR	$1.10	$59.01	1.86%	1.91%	6.00%	4.00%	6.00%	5.33%	5.90%	7.25%	7.92%		7.25%	7.92%
American Water	AWK	$1.82	$86.21	2.11%	2.20%	10.00%	8.10%	7.80%	8.63%	9.99%	10.84%	12.22%	9.99%	10.84%	12.22%
California Water Service Group	CWT	$0.75	$40.67	1.84%	1.92%	9.50%	9.80%	7.00%	8.77%	8.91%	10.69%	11.73%	8.91%	10.69%	11.73%
Middlesex Water Company	MSEX	$0.90	$44.82	2.00%	2.05%	8.00%	2.70%	n/a	5.35%	4.72%	7.40%	10.08%		7.40%	10.08%
York Water Company	YORW	$0.67	$31.22	2.13%	2.21%	9.00%	4.90%	n/a	6.95%	7.09%	9.16%	11.23%	7.09%	9.16%	11.23%
Median				2.00%	2.05%	9.00%	4.90%	7.00%	6.95%	7.09%	9.16%	11.23%	8.91%	9.16%	11.23%
Median excluding AWK				1.93%	1.99%	8.50%	4.45%	6.50%	6.15%	6.49%	8.28%	10.65%	8.00%	8.28%	10.65%

Notes:
[1] Source: Bloomberg Professional
[2] Source: Bloomberg Professional, equals 90-day average as of September 28, 2018
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [8])
[5] Source: Value Line
[6] Source: Yahoo! Finance
[7] Source: Zacks
[8] Equals Average ([5], [6], [7])
[9] Equals [3] x (1 + 0.50 x Minimum ([5], [6], [7]) + Minimum ([5], [6], [7])
[10] Equals [4] + [8]
[11] Equals [3] x (1 + 0.50 x Maximum ([5], [6], [7]) + Maximum ([5], [6], [7])
[12] Equals [9] if greater than 7%
[13] Equals [10] if greater than 7%
[14] Equals [11] if greater than 7%

180-DAY CONSTANT GROWTH DCF -- WATER PROXY GROUP

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]
													Excluding Low-End Outliers		
Company		Annualized Dividend	Stock Price	Dividend Yield	Expected Dividend Yield	Value Line Earnings Growth	Yahoo! Finance Earnings Growth	Zacks Earnings Growth	Average Growth Rate	Low ROE	Mean ROE	High ROE	Low ROE	Mean ROE	High ROE
American States Water Co	AWR	$1.10	$56.58	1.94%	2.00%	6.00%	4.00%	6.00%	5.33%	5.98%	7.33%	8.00%		7.33%	8.00%
American Water	AWK	$1.82	$83.98	2.17%	2.26%	10.00%	8.10%	7.80%	8.63%	10.05%	10.89%	12.28%	10.05%	10.89%	12.28%
California Water Service Group	CWT	$0.75	$39.86	1.88%	1.96%	9.50%	9.80%	7.00%	8.77%	8.95%	10.73%	11.77%	8.95%	10.73%	11.77%
Middlesex Water Company	MSEX	$0.90	$41.55	2.15%	2.21%	8.00%	2.70%	n/a	5.35%	4.88%	7.56%	10.24%		7.56%	10.24%
York Water Company	YORW	$0.67	$31.19	2.14%	2.21%	9.00%	4.90%	n/a	6.95%	7.09%	9.16%	11.23%	7.09%	9.16%	11.23%
Median				2.14%	2.21%	9.00%	4.90%	7.00%	6.95%	7.09%	9.16%	11.23%	8.95%	9.16%	11.23%
Median Excluding AWK				2.04%	2.10%	8.50%	4.45%	6.50%	6.15%	6.54%	8.36%	10.74%	8.02%	8.36%	10.74%

Notes:
[1] Source: Bloomberg Professional
[2] Source: Bloomberg Professional, equals 180-day average as of September 28, 2018
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [8])
[5] Source: Value Line
[6] Source: Yahoo! Finance
[7] Source: Zacks
[8] Equals Average ([5], [6], [7])
[9] Equals [3] x (1 + 0.50 x Minimum ([5], [6], [7]) + Minimum ([5], [6], [7])
[10] Equals [4] + [8]
[11] Equals [3] x (1 + 0.50 x Maximum ([5], [6], [7]) + Maximum ([5], [6], [7])
[12] Equals [9] if greater than 7%
[13] Equals [10] if greater than 7%
[14] Equals [11] if greater than 7%

30-DAY CONSTANT GROWTH DCF -- COMBINED UTILITY PROXY GROUP

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]
													Excluding Low-End Outliers		
Company		Annualized Dividend	Stock Price	Dividend Yield	Expected Dividend Yield	Value Line Earnings Growth	Yahoo! Finance Earnings Growth	Zacks Earnings Growth	Average Growth Rate	Low ROE	Mean ROE	High ROE	Low ROE	Mean ROE	High ROE
American States Water Co	AWR	$1.10	$60.33	1.82%	1.87%	6.00%	4.00%	6.00%	5.33%	5.86%	7.21%	7.88%		7.21%	7.88%
American Water	AWK	$1.82	$88.33	2.06%	2.15%	10.00%	8.10%	7.80%	8.63%	9.94%	10.78%	12.16%	9.94%	10.78%	12.16%
Atmos Energy Corporation	ATO	$1.94	$93.25	2.08%	2.15%	7.50%	6.95%	6.50%	6.98%	8.65%	9.14%	9.66%	8.65%	9.14%	9.66%
California Water Service Group	CWT	$0.75	$41.39	1.81%	1.89%	9.50%	9.80%	7.00%	8.77%	8.88%	10.66%	11.70%	8.88%	10.66%	11.70%
Middlesex Water Company	MSEX	$0.90	$46.85	1.91%	1.96%	8.00%	2.70%	n/a	5.35%	4.64%	7.31%	9.99%		7.31%	9.99%
New Jersey Resources Corporation	NJR	$1.17	$46.24	2.53%	2.63%	9.50%	7.10%	7.00%	7.87%	9.62%	10.50%	12.15%	9.62%	10.50%	12.15%
Northwest Natural Gas Company	NWN	$1.89	$66.31	2.85%	3.04%	30.50%	4.50%	4.30%	13.10%	7.21%	16.14%	33.79%	7.21%	16.14%	33.79%
ONE Gas, Inc.	OGS	$1.84	$80.44	2.29%	2.37%	10.50%	5.50%	5.70%	7.23%	7.85%	9.60%	12.91%	7.85%	9.60%	12.91%
South Jersey Industries, Inc.	SJI	$1.12	$34.14	3.28%	3.47%	9.50%	12.00%	12.20%	11.23%	12.94%	14.70%	15.68%	12.94%	14.70%	15.68%
Southwest Gas Corporation	SWX	$2.08	$79.47	2.62%	2.69%	9.00%	4.00%	4.00%	5.67%	6.67%	8.36%	11.74%		8.36%	11.74%
Spire, Inc.	SR	$2.25	$75.06	3.00%	3.07%	7.50%	3.53%	4.00%	5.01%	6.58%	8.08%	10.61%		8.08%	10.61%
York Water Company	YORW	$0.67	$30.24	2.20%	2.28%	9.00%	4.90%	n/a	6.95%	7.16%	9.23%	11.30%	7.16%	9.23%	11.30%
Median				2.25%	2.33%	9.25%	5.20%	6.25%	7.11%	7.53%	9.42%	11.72%	8.76%	9.42%	11.72%
Median excluding AWK				2.29%	2.37%	9.00%	4.90%	6.00%	6.98%	7.21%	9.23%	11.70%	8.65%	9.23%	11.70%

Notes:
[1] Source: Bloomberg Professional
[2] Source: Bloomberg Professional, equals 30-day average as of September 28, 2018
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [8])
[5] Source: Value Line
[6] Source: Yahoo! Finance
[7] Source: Zacks
[8] Equals Average ([5], [6], [7])
[9] Equals [3] x (1 + 0.50 x Minimum ([5], [6], [7]) + Minimum ([5], [6], [7])
[10] Equals [4] + [8]
[11] Equals [3] x (1 + 0.50 x Maximum ([5], [6], [7]) + Maximum ([5], [6], [7])
[12] Equals [9] if greater than 7%
[13] Equals [10] if greater than 7%
[14] Equals [11] if greater than 7%

90-DAY CONSTANT GROWTH DCF -- COMBINED UTILITY PROXY GROUP

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]
													Excluding Low-End Outliers		
Company		Annualized Dividend	Stock Price	Dividend Yield	Expected Dividend Yield	Value Line Earnings Growth	Yahoo! Finance Earnings Growth	Zacks Earnings Growth	Average Growth Rate	Low ROE	Mean ROE	High ROE	Low ROE	Mean ROE	High ROE
American States Water Co	AWR	$1.10	$59.01	1.86%	1.91%	6.00%	4.00%	6.00%	5.33%	5.90%	7.25%	7.92%		7.25%	7.92%
American Water	AWK	$1.82	$86.21	2.11%	2.20%	10.00%	8.10%	7.80%	8.63%	9.99%	10.84%	12.22%	9.99%	10.84%	12.22%
Atmos Energy Corporation	ATO	$1.94	$90.93	2.13%	2.21%	7.50%	6.95%	6.50%	6.98%	8.70%	9.19%	9.71%	8.70%	9.19%	9.71%
California Water Service Group	CWT	$0.75	$40.67	1.84%	1.92%	9.50%	9.80%	7.00%	8.77%	8.91%	10.69%	11.73%	8.91%	10.69%	11.73%
Middlesex Water Company	MSEX	$0.90	$44.82	2.00%	2.05%	8.00%	2.70%	n/a	5.35%	4.72%	7.40%	10.08%		7.40%	10.08%
New Jersey Resources Corporation	NJR	$1.17	$45.21	2.59%	2.69%	9.50%	7.10%	7.00%	7.87%	9.68%	10.56%	12.21%	9.68%	10.56%	12.21%
Northwest Natural Gas Company	NWN	$1.89	$63.82	2.96%	3.16%	30.50%	4.50%	4.30%	13.10%	7.33%	16.26%	33.91%	7.33%	16.26%	33.91%
ONE Gas, Inc.	OGS	$1.84	$76.73	2.40%	2.48%	10.50%	5.50%	5.70%	7.23%	7.96%	9.72%	13.02%	7.96%	9.72%	13.02%
South Jersey Industries, Inc.	SJI	$1.12	$33.42	3.35%	3.54%	9.50%	12.00%	12.20%	11.23%	13.01%	14.77%	15.76%	13.01%	14.77%	15.76%
Southwest Gas Corporation	SWX	$2.08	$77.91	2.67%	2.75%	9.00%	4.00%	4.00%	5.67%	6.72%	8.41%	11.79%		8.41%	11.79%
Spire, Inc.	SR	$2.25	$72.58	3.10%	3.18%	7.50%	3.53%	4.00%	5.01%	6.68%	8.19%	10.72%		8.19%	10.72%
York Water Company	YORW	$0.67	$31.22	2.13%	2.21%	9.00%	4.90%	n/a	6.95%	7.09%	9.16%	11.23%	7.09%	9.16%	11.23%
Median				2.27%	2.35%	9.25%	5.20%	6.25%	7.11%	7.64%	9.45%	11.76%	8.81%	9.45%	11.76%
Median excluding AWK				2.40%	2.48%	9.00%	4.90%	6.00%	6.98%	7.33%	9.19%	11.73%	8.70%	9.19%	11.73%

Notes:
[1] Source: Bloomberg Professional
[2] Source: Bloomberg Professional, equals 90-day average as of September 28, 2018
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [8])
[5] Source: Value Line
[6] Source: Yahoo! Finance
[7] Source: Zacks
[8] Equals Average ([5], [6], [7])
[9] Equals [3] x (1 + 0.50 x Minimum ([5], [6], [7]) + Minimum ([5], [6], [7])
[10] Equals [4] + [8]
[11] Equals [3] x (1 + 0.50 x Maximum ([5], [6], [7]) + Maximum ([5], [6], [7])
[12] Equals [9] if greater than 7%
[13] Equals [10] if greater than 7%
[14] Equals [11] if greater than 7%

180-DAY CONSTANT GROWTH DCF -- COMBINED UTILITY PROXY GROUP

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]
													Excluding Low-End Outliers		
Company		Annualized Dividend	Stock Price	Dividend Yield	Expected Dividend Yield	Value Line Earnings Growth	Yahoo! Finance Earnings Growth	Zacks Earnings Growth	Average Growth Rate	Low ROE	Mean ROE	High ROE	Low ROE	Mean ROE	High ROE
American States Water Co	AWR	$1.10	$56.58	1.94%	2.00%	6.00%	4.00%	6.00%	5.33%	5.98%	7.33%	8.00%		7.33%	8.00%
American Water	AWK	$1.82	$83.98	2.17%	2.26%	10.00%	8.10%	7.80%	8.63%	10.05%	10.89%	12.28%	10.05%	10.89%	12.28%
Atmos Energy Corporation	ATO	$1.94	$86.98	2.23%	2.31%	7.50%	6.95%	6.50%	6.98%	8.80%	9.29%	9.81%	8.80%	9.29%	9.81%
California Water Service Group	CWT	$0.75	$39.86	1.88%	1.96%	9.50%	9.80%	7.00%	8.77%	8.95%	10.73%	11.77%	8.95%	10.73%	11.77%
Middlesex Water Company	MSEX	$0.90	$41.55	2.15%	2.21%	8.00%	2.70%	n/a	5.35%	4.88%	7.56%	10.24%		7.56%	10.24%
New Jersey Resources Corporation	NJR	$1.17	$42.59	2.75%	2.86%	9.50%	7.10%	7.00%	7.87%	9.84%	10.72%	12.38%	9.84%	10.72%	12.38%
Northwest Natural Gas Company	NWN	$1.89	$60.69	3.11%	3.32%	30.50%	4.50%	4.30%	13.10%	7.48%	16.42%	34.09%	7.48%	16.42%	34.09%
ONE Gas, Inc.	OGS	$1.84	$72.34	2.54%	2.64%	10.50%	5.50%	5.70%	7.23%	8.11%	9.87%	13.18%	8.11%	9.87%	13.18%
South Jersey Industries, Inc.	SJI	$1.12	$31.21	3.59%	3.79%	9.50%	12.00%	12.20%	11.23%	13.26%	15.02%	16.01%	13.26%	15.02%	16.01%
Southwest Gas Corporation	SWX	$2.08	$74.21	2.80%	2.88%	9.00%	4.00%	4.00%	5.67%	6.86%	8.55%	11.93%		8.55%	11.93%
Spire, Inc.	SR	$2.25	$70.87	3.18%	3.25%	7.50%	3.53%	4.00%	5.01%	6.76%	8.26%	10.79%		8.26%	10.79%
York Water Company	YORW	$0.67	$31.19	2.14%	2.21%	9.00%	4.90%	n/a	6.95%	7.09%	9.16%	11.23%	7.09%	9.16%	11.23%
Median				2.39%	2.47%	9.25%	5.20%	6.25%	7.11%	7.80%	9.58%	11.85%	8.87%	9.58%	11.85%
Mean Excluding AWK				2.54%	2.64%	9.00%	4.90%	6.00%	6.98%	7.48%	9.29%	11.77%	8.80%	9.29%	11.77%

Notes:
[1] Source: Bloomberg Professional
[2] Source: Bloomberg Professional, equals 180-day average as of September 28, 2018
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [8])
[5] Source: Value Line
[6] Source: Yahoo! Finance
[7] Source: Zacks
[8] Equals Average ([5], [6], [7])
[9] Equals [3] x (1 + 0.50 x Minimum ([5], [6], [7]) + Minimum ([5], [6], [7])
[10] Equals [4] + [8]
[11] Equals [3] x (1 + 0.50 x Maximum ([5], [6], [7]) + Maximum ([5], [6], [7])
[12] Equals [9] if greater than 7%
[13] Equals [10] if greater than 7%
[14] Equals [11] if greater than 7%

PROJECTED CONSTANT GROWTH DCF -- WATER PROXY GROUP

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]
			Stock Price (2021 - 2023)												Excluding Low-End Outliers		
Company		Annualized Dividend (2021 - 2023)	High	Low	Mean	Dividend Yield	Expected Dividend Yield	Value Line Earnings Growth	Yahoo! Finance Earnings Growth	Zacks Earnings Growth	Average Growth Rate	Low ROE	Mean ROE	High ROE	Low ROE	Mean ROE	High ROE
American States Water Co	AWR	$1.45	$60.00	$45.00	$52.50	2.76%	2.84%	6.00%	4.00%	6.00%	5.33%	6.82%	8.17%	8.84%		8.17%	8.84%
American Water	AWK	$2.60	$115.00	$75.00	$95.00	2.74%	2.85%	10.00%	8.10%	7.80%	8.63%	10.64%	11.49%	12.87%	10.64%	11.49%	12.87%
California Water Service Group	CWT	$1.02	$50.00	$35.00	$42.50	2.40%	2.51%	9.50%	9.80%	7.00%	8.77%	9.48%	11.27%	12.32%	9.48%	11.27%	12.32%
Middlesex Water Company	MSEX	$1.11	$50.00	$35.00	$42.50	2.61%	2.68%	8.00%	2.70%	n/a	5.35%	5.35%	8.03%	10.72%		8.03%	10.72%
York Water Company	YORW	$1.00	$45.00	$30.00	$37.50	2.67%	2.76%	9.00%	4.90%	n/a	6.95%	7.63%	9.71%	11.79%	7.63%	9.71%	11.79%
Median						2.67%	2.76%	9.00%	4.90%	7.00%	6.95%	7.63%	9.71%	11.79%	9.48%	9.71%	11.79%
Median excl AWK						2.64%	2.72%	8.50%	4.45%	6.50%	6.15%	7.22%	8.94%	11.25%	8.56%	8.94%	11.25%

Notes:
[1] Source: Value Line Reports; dated July 13, 2018
[2] Source: Value Line Reports; dated July 13, 2018
[3] Source: Value Line Reports; dated July 13, 2018
[4] Source: Value Line Reports; dated July 13, 2018
[5] Equals [1] / [4]
[6] Equals [5] x (1 + 0.50 x [10])
[7] Source: Value Line
[8] Source: Yahoo! Finance
[9] Source: Zacks
[10] Equals Average ([7], [8], [9])
[11] Equals [5] x (1 + 0.50 x Minimum ([7], [8], [9]) + Minimum ([7], [8], [9])
[12] Equals [6] + [10]
[13] Equals [5] x (1 + 0.50 x Maximum ([7], [8], [9]) + Maximum ([7], [8], [9])
[14] Equals [11] if greater than 7%
[15] Equals [12] if greater than 7%
[16] Equals [13] if greater than 7%

PROJECTED CONSTANT GROWTH DCF -- COMBINED UTILITY PROXY GROUP

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]
															Excluding Low-End Outliers		
Company		Annualized Dividend (2021 - 2023)	Stock Price (2021 - 2023) High	Low	Mean	Dividend Yield	Expected Dividend Yield	Value Line Earnings Growth	Yahoo! Finance Earnings Growth	Zacks Earnings Growth	Average Growth Rate	Low ROE	Mean ROE	High ROE	Low ROE	Mean ROE	High ROE
American States Water Co	AWR	$1.45	$60.00	$45.00	$52.50	2.76%	2.84%	6.00%	4.00%	6.00%	5.33%	6.82%	8.17%	8.84%		8.17%	8.84%
American Water	AWK	$2.60	$115.00	$75.00	$95.00	2.74%	2.85%	10.00%	8.10%	7.80%	8.63%	10.64%	11.49%	12.87%	10.64%	11.49%	12.87%
Atmos Energy Corporation	ATO	$2.50	$120.00	$100.00	$110.00	2.27%	2.35%	7.50%	6.95%	6.50%	6.98%	8.85%	9.34%	9.86%	8.85%	9.34%	9.86%
California Water Service Group	CWT	$1.02	$50.00	$35.00	$42.50	2.40%	2.51%	9.50%	9.80%	7.00%	8.77%	9.48%	11.27%	12.32%	9.48%	11.27%	12.32%
Middlesex Water Company	MSEX	$1.11	$50.00	$35.00	$42.50	2.61%	2.68%	8.00%	2.70%	n/a	5.35%	5.35%	8.03%	10.72%		8.03%	10.72%
New Jersey Resources Corporatior	NJR	$1.24	$55.00	$45.00	$50.00	2.48%	2.58%	9.50%	7.10%	7.00%	7.87%	9.57%	10.44%	12.10%	9.57%	10.44%	12.10%
Northwest Natural Gas Company	NWN	$2.20	$65.00	$55.00	$60.00	3.67%	3.91%	30.50%	4.50%	4.30%	13.10%	8.05%	17.01%	34.73%	8.05%	17.01%	34.73%
ONE Gas, Inc.	OGS	$2.50	$125.00	$90.00	$107.50	2.33%	2.41%	10.50%	5.50%	5.70%	7.23%	7.89%	9.64%	12.95%	7.89%	9.64%	12.95%
South Jersey Industries, Inc.	SJI	$1.35	$40.00	$30.00	$35.00	3.86%	4.07%	9.50%	12.00%	12.20%	11.23%	13.54%	15.31%	16.29%	13.54%	15.31%	16.29%
Southwest Gas Corporation	SWX	$2.60	$105.00	$70.00	$87.50	2.97%	3.06%	9.00%	4.00%	4.00%	5.67%	7.03%	8.72%	12.11%	7.03%	8.72%	12.11%
Spire, Inc.	SR	$2.50	$105.00	$75.00	$90.00	2.78%	2.85%	7.50%	3.53%	4.00%	5.01%	6.36%	7.86%	10.38%		7.86%	10.38%
York Water Company	YORW	$1.00	$45.00	$30.00	$37.50	2.67%	2.76%	9.00%	4.90%	n/a	6.95%	7.63%	9.71%	11.79%	7.63%	9.71%	11.79%
Median						2.70%	2.80%	9.25%	5.20%	6.25%	7.11%	7.97%	9.68%	12.10%	8.85%	9.68%	12.10%
Median excl AWK						2.67%	2.76%	9.00%	4.90%	6.00%	6.98%	7.89%	9.64%	12.10%	8.45%	9.64%	12.10%

Notes:
[1] Source: Value Line Reports; dated July 13, 2018 (Water) and August 31, 2018 (Natural Gas)
[2] Source: Value Line Reports; dated July 13, 2018 (Water) and August 31, 2018 (Natural Gas)
[3] Source: Value Line Reports; dated July 13, 2018 (Water) and August 31, 2018 (Natural Gas)
[4] Source: Value Line Reports; dated July 13, 2018 (Water) and August 31, 2018 (Natural Gas)
[5] Equals [1] / [4]
[6] Equals [5] x (1 + 0.50 x [10])
[7] Source: Value Line
[8] Source: Yahoo! Finance
[9] Source: Zacks
[10] Equals Average ([7], [8], [9])
[11] Equals [5] x (1 + 0.50 x Minimum ([7], [8], [9]) + Minimum ([7], [8], [9])
[12] Equals [6] + [10]
[13] Equals [5] x (1 + 0.50 x Maximum ([7], [8], [9]) + Maximum ([7], [8], [9])
[14] Equals [11] if greater than 7%
[15] Equals [12] if greater than 7%
[16] Equals [13] if greater than 7%

VALUE LINE ROE PROJECTIONS -- WATER PROXY GROUP

Company	Ticker	2019	2021-2023
American States Water Co	AWR	13.00%	14.00%
American Water Works Co, Inc.	AWK	10.50%	10.50%
California Water Service Group	CWT	11.00%	11.50%
Middlesex Water Company	MSEX	11.00%	12.50%
York Water Company	YORW	10.00%	13.50%
	Median	11.00%	12.50%
	Median excl AWK	11.00%	13.00%

Source: Value Line Reports; dated July 13, 2018

WATER PROXY GROUP
BETAS

		[1]	[2]
		Bloomberg	Value Line
American States Water Co	AWR	0.73	0.80
American Water	AWK	0.65	0.65
California Water Service Group	CWT	0.88	0.80
Middlesex Water Company	MSEX	0.82	0.80
York Water Company	YORW	0.87	0.80
	Mean	0.791	0.770
	Mean excl AWK	0.826	0.800

Notes:
[1] Source: Bloomberg Professional, September 28, 2018
[2] Source: Value Line Reports; dated July 13, 2018

COMBINED UTILITY PROXY GROUP
BETAS

		[1]	[2]
		Bloomberg	Value Line
American States Water Co	AWR	0.73	0.80
American Water	AWK	0.65	0.65
Atmos Energy Corporation	ATO	0.54	0.60
California Water Service Group	CWT	0.88	0.80
Middlesex Water Company	MSEX	0.82	0.80
New Jersey Resources Corporation	NJR	0.70	0.70
Northwest Natural Gas Company	NWN	0.59	0.65
ONE Gas, Inc.	OGS	0.55	0.65
South Jersey Industries, Inc.	SJI	0.65	0.75
Southwest Gas Corporation	SWX	0.74	0.75
Spire, Inc.	SR	0.43	0.65
York Water Company	YORW	0.87	0.80
	Mean	0.679	0.717
	Mean excl AWK	0.682	0.723

Notes:
[1] Source: Bloomberg Professional, September 28, 2018
[2] Source: Value Line Reports; dated July 13, 2018 (Water) and August 31, 2018 (Natural Gas)

MARKET RISK PREMIUM DERIVED FROM ANALYSTS' LONG-TERM GROWTH ESTIMATES

[1] Estimated Weighted Average Dividend Yield	1.88%
[2] Estimated Weighted Average Long-Term Growth Rate	13.18%
[3] S&P 500 Estimated Required Market Return	15.19%

STANDARD AND POOR'S 500 INDEX

Name	Ticker	[4] Weight in Index	[5] Current Dividend Yield	[6] Cap-Weighted Dividend Yield	[7] Long-Term Growth Est.	[8] Cap-Weighted Long-Term Growth Est.
LyondellBasell Industries NV	LYB	0.16%	3.90%	0.01%	8.00%	0.0125%
American Express Co	AXP	0.36%	1.46%	0.01%	17.30%	0.0621%
Verizon Communications Inc	VZ	0.86%	4.51%	0.04%	5.54%	0.0479%
Broadcom Inc	AVGO	0.40%	2.84%	0.01%	13.10%	0.0523%
Boeing Co/The	BA	0.84%	1.84%	0.02%	15.37%	0.1286%
Caterpillar Inc	CAT	0.36%	2.26%	0.01%	25.28%	0.0897%
JPMorgan Chase & Co	JPM	1.49%	2.84%	0.04%	9.80%	0.1456%
Chevron Corp	CVX	0.92%	3.66%	0.03%	7.02%	0.0644%
Coca-Cola Co/The	KO	0.77%	3.38%	0.03%	7.82%	0.0602%
AbbVie Inc	ABBV	0.56%	4.06%	0.02%	10.84%	0.0608%
Walt Disney Co/The	DIS	0.68%	1.44%	0.01%	12.93%	0.0881%
FleetCor Technologies Inc	FLT	0.08%	n/a	n/a	n/a	n/a
Extra Space Storage Inc	EXR	0.04%	3.97%	0.00%	5.48%	0.0024%
Exxon Mobil Corp	XOM	1.41%	3.86%	0.05%	11.51%	0.1623%
Phillips 66	PSX	0.20%	2.84%	0.01%	5.50%	0.0113%
General Electric Co	GE	0.38%	4.25%	0.02%	3.67%	0.0141%
HP Inc	HPQ	0.16%	2.16%	0.00%	8.45%	0.0135%
Home Depot Inc/The	HD	0.93%	1.99%	0.02%	13.27%	0.1232%
International Business Machines Corp	IBM	0.54%	4.15%	0.02%	4.25%	0.0230%
Concho Resources Inc	CXO	0.12%	n/a	n/a	30.75%	0.0368%
Johnson & Johnson	JNJ	1.45%	2.61%	0.04%	7.49%	0.1087%
McDonald's Corp	MCD	0.51%	2.77%	0.01%	8.69%	0.0442%
Merck & Co Inc	MRK	0.74%	2.71%	0.02%	7.25%	0.0535%
3M Co	MMM	0.48%	2.58%	0.01%	8.70%	0.0421%
American Water Works Co Inc	AWK	0.06%	2.07%	0.00%	8.08%	0.0050%
Bank of America Corp	BAC	1.15%	2.04%	0.02%	14.10%	0.1625%
Brighthouse Financial Inc	BHF	0.02%	n/a	n/a	8.00%	0.0017%
Baker Hughes a GE Co	BHGE	0.05%	2.13%	0.00%	33.00%	0.0180%
Pfizer Inc	PFE	1.01%	3.09%	0.03%	6.88%	0.0696%
Procter & Gamble Co/The	PG	0.81%	3.45%	0.03%	7.19%	0.0583%
AT&T Inc	T	0.96%	5.96%	0.06%	4.85%	0.0463%
Travelers Cos Inc/The	TRV	0.14%	2.37%	0.00%	17.75%	0.0241%
United Technologies Corp	UTX	0.44%	2.00%	0.01%	10.59%	0.0464%
Analog Devices Inc	ADI	0.13%	2.08%	0.00%	9.53%	0.0128%
Walmart Inc	WMT	1.08%	2.21%	0.02%	6.29%	0.0677%
Cisco Systems Inc	CSCO	0.87%	2.71%	0.02%	7.18%	0.0625%
Intel Corp	INTC	0.85%	2.54%	0.02%	9.36%	0.0799%
General Motors Co	GM	0.19%	4.51%	0.01%	10.78%	0.0201%
Microsoft Corp	MSFT	3.44%	1.61%	0.06%	11.97%	0.4111%
Dollar General Corp	DG	0.11%	1.06%	0.00%	15.06%	0.0171%
Kinder Morgan Inc/DE	KMI	0.15%	4.51%	0.01%	12.00%	0.0184%
Citigroup Inc	C	0.71%	2.51%	0.02%	12.80%	0.0905%
American International Group Inc	AIG	0.19%	2.40%	0.00%	11.00%	0.0204%
Honeywell International Inc	HON	0.48%	1.99%	0.01%	15.22%	0.0729%
Altria Group Inc	MO	0.45%	5.31%	0.02%	4.87%	0.0217%
HCA Healthcare Inc	HCA	0.19%	1.01%	0.00%	13.58%	0.0256%
Under Armour Inc	UAA	0.02%	n/a	n/a	20.66%	0.0032%
International Paper Co	IP	0.08%	3.87%	0.00%	7.90%	0.0062%
Hewlett Packard Enterprise Co	HPE	0.09%	2.76%	0.00%	-6.50%	-0.0061%
Abbott Laboratories	ABT	0.50%	1.53%	0.01%	13.00%	0.0655%
Aflac Inc	AFL	0.14%	2.21%	0.00%	8.04%	0.0114%
Air Products & Chemicals Inc	APD	0.14%	2.63%	0.00%	12.14%	0.0174%
Royal Caribbean Cruises Ltd	RCL	0.11%	2.15%	0.00%	15.60%	0.0166%
American Electric Power Co Inc	AEP	0.14%	3.50%	0.00%	5.47%	0.0075%
Hess Corp	HES	0.08%	1.40%	0.00%	-21.61%	-0.0182%
Anadarko Petroleum Corp	APC	0.14%	1.48%	0.00%	17.00%	0.0230%
Aon PLC	AON	0.15%	1.04%	0.00%	11.42%	0.0167%
Apache Corp	APA	0.07%	2.10%	0.00%	2.04%	0.0015%
Archer-Daniels-Midland Co	ADM	0.11%	2.67%	0.00%	11.40%	0.0126%
Automatic Data Processing Inc	ADP	0.26%	1.83%	0.00%	13.50%	0.0349%
Verisk Analytics Inc	VRSK	0.08%	n/a	n/a	13.03%	0.0101%
AutoZone Inc	AZO	0.08%	n/a	n/a	11.91%	0.0096%
Avery Dennison Corp	AVY	0.04%	1.92%	0.00%	10.37%	0.0038%
MSCI Inc	MSCI	0.06%	1.31%	0.00%	13.45%	0.0083%
Ball Corp	BLL	0.06%	0.91%	0.00%	5.60%	0.0033%
Bank of New York Mellon Corp/The	BK	0.20%	2.20%	0.00%	7.80%	0.0156%
Baxter International Inc	BAX	0.16%	0.99%	0.00%	12.33%	0.0199%
Becton Dickinson and Co	BDX	0.27%	1.15%	0.00%	15.23%	0.0417%
Berkshire Hathaway Inc	BRK/B	1.15%	n/a	n/a	-5.60%	-0.0641%
Best Buy Co Inc	BBY	0.09%	2.27%	0.00%	12.46%	0.0106%

STANDARD AND POOR'S 500 INDEX

Name	Ticker	[4] Weight in Index	[5] Current Dividend Yield	[6] Cap-Weighted Dividend Yield	[7] Long-Term Growth Est.	[8] Cap-Weighted Long-Term Growth Est.
H&R Block Inc	HRB	0.02%	3.88%	0.00%	10.00%	0.0021%
Boston Scientific Corp	BSX	0.21%	n/a	n/a	22.04%	0.0460%
Bristol-Myers Squibb Co	BMY	0.40%	2.58%	0.01%	9.37%	0.0372%
Fortune Brands Home & Security Inc	FBHS	0.03%	1.53%	0.00%	12.83%	0.0037%
Brown-Forman Corp	BF/B	0.06%	1.25%	0.00%	9.44%	0.0058%
Cabot Oil & Gas Corp	COG	0.04%	1.07%	0.00%	44.61%	0.0174%
Campbell Soup Co	CPB	0.04%	3.82%	0.00%	2.30%	0.0010%
Kansas City Southern	KSU	0.05%	1.27%	0.00%	8.70%	0.0039%
Advanced Micro Devices Inc	AMD	0.12%	n/a	n/a	23.40%	0.0276%
Hilton Worldwide Holdings Inc	HLT	0.09%	0.74%	0.00%	11.20%	0.0106%
Carnival Corp	CCL	0.13%	3.14%	0.00%	13.47%	0.0177%
Qorvo Inc	QRVO	0.04%	n/a	n/a	12.62%	0.0048%
CenturyLink Inc	CTL	0.09%	10.19%	0.01%	-15.12%	-0.0136%
Cigna Corp	CI	0.20%	0.02%	0.00%	13.65%	0.0271%
UDR Inc	UDR	0.04%	3.19%	0.00%	5.38%	0.0023%
Clorox Co/The	CLX	0.08%	2.55%	0.00%	7.94%	0.0060%
CMS Energy Corp	CMS	0.05%	2.92%	0.00%	6.16%	0.0034%
Colgate-Palmolive Co	CL	0.23%	2.51%	0.01%	7.86%	0.0179%
Comerica Inc	CMA	0.06%	2.66%	0.00%	21.22%	0.0129%
IPG Photonics Corp	IPGP	0.03%	n/a	n/a	12.00%	0.0039%
CA Inc	CA	0.07%	2.31%	0.00%	3.20%	0.0023%
Conagra Brands Inc	CAG	0.05%	2.50%	0.00%	7.85%	0.0041%
Consolidated Edison Inc	ED	0.09%	3.75%	0.00%	3.60%	0.0033%
SL Green Realty Corp	SLG	0.03%	3.33%	0.00%	5.34%	0.0018%
Corning Inc	GLW	0.11%	2.04%	0.00%	8.98%	0.0101%
Cummins Inc	CMI	0.09%	3.12%	0.00%	9.16%	0.0086%
Danaher Corp	DHR	0.30%	0.59%	0.00%	7.13%	0.0212%
Target Corp	TGT	0.18%	2.90%	0.01%	6.97%	0.0127%
Deere & Co	DE	0.19%	1.84%	0.00%	7.33%	0.0139%
Dominion Energy Inc	D	0.18%	4.75%	0.01%	5.60%	0.0101%
Dover Corp	DOV	0.05%	2.17%	0.00%	12.50%	0.0064%
Duke Energy Corp	DUK	0.22%	4.64%	0.01%	5.04%	0.0113%
Eaton Corp PLC	ETN	0.15%	3.04%	0.00%	8.92%	0.0131%
Ecolab Inc	ECL	0.18%	1.05%	0.00%	13.03%	0.0231%
PerkinElmer Inc	PKI	0.04%	0.29%	0.00%	16.35%	0.0069%
Emerson Electric Co	EMR	0.19%	2.53%	0.00%	11.36%	0.0214%
EOG Resources Inc	EOG	0.29%	0.69%	0.00%	12.14%	0.0351%
Entergy Corp	ETR	0.06%	4.39%	0.00%	2.83%	0.0016%
Equifax Inc	EFX	0.06%	1.19%	0.00%	7.43%	0.0046%
EQT Corp	EQT	0.05%	0.27%	0.00%	17.50%	0.0080%
IQVIA Holdings Inc	IQV	0.10%	n/a	n/a	15.25%	0.0157%
Gartner Inc	IT	0.06%	n/a	n/a	15.00%	0.0085%
FedEx Corp	FDX	0.25%	1.08%	0.00%	15.60%	0.0388%
Macy's Inc	M	0.04%	4.35%	0.00%	0.50%	0.0002%
FMC Corp	FMC	0.05%	0.76%	0.00%	23.40%	0.0108%
Ford Motor Co	F	0.14%	6.49%	0.01%	-7.52%	-0.0107%
NextEra Energy Inc	NEE	0.31%	2.65%	0.01%	8.38%	0.0259%
Franklin Resources Inc	BEN	0.06%	3.03%	0.00%	10.00%	0.0063%
Freeport-McMoRan Inc	FCX	0.08%	1.44%	0.00%	-16.60%	-0.0131%
Gap Inc/The	GPS	0.04%	3.36%	0.00%	10.22%	0.0044%
General Dynamics Corp	GD	0.24%	1.82%	0.00%	11.28%	0.0268%
General Mills Inc	GIS	0.10%	4.57%	0.00%	6.43%	0.0064%
Genuine Parts Co	GPC	0.06%	2.90%	0.00%	5.68%	0.0032%
WW Grainger Inc	GWW	0.08%	1.52%	0.00%	14.87%	0.0117%
Halliburton Co	HAL	0.14%	1.78%	0.00%	74.00%	0.1034%
Harley-Davidson Inc	HOG	0.03%	3.27%	0.00%	10.00%	0.0030%
Harris Corp	HRS	0.08%	1.62%	0.00%	n/a	n/a
HCP Inc	HCP	0.05%	5.62%	0.00%	2.80%	0.0014%
Helmerich & Payne Inc	HP	0.03%	4.13%	0.00%	n/a	n/a
Fortive Corp	FTV	0.12%	0.33%	0.00%	13.63%	0.0157%
Hershey Co/The	HSY	0.06%	2.83%	0.00%	9.00%	0.0053%
Synchrony Financial	SYF	0.09%	2.70%	0.00%	7.35%	0.0066%
Hormel Foods Corp	HRL	0.08%	1.90%	0.00%	5.00%	0.0041%
Arthur J Gallagher & Co	AJG	0.05%	2.20%	0.00%	10.32%	0.0055%
Mondelez International Inc	MDLZ	0.25%	2.42%	0.01%	9.91%	0.0244%
CenterPoint Energy Inc	CNP	0.05%	4.01%	0.00%	6.17%	0.0033%
Humana Inc	HUM	0.18%	0.59%	0.00%	14.50%	0.0265%
Willis Towers Watson PLC	WLTW	0.07%	1.70%	0.00%	15.35%	0.0111%
Illinois Tool Works Inc	ITW	0.19%	2.83%	0.01%	10.13%	0.0188%
Ingersoll-Rand PLC	IR	0.10%	2.07%	0.00%	11.44%	0.0112%
Foot Locker Inc	FL	0.02%	2.71%	0.00%	4.91%	0.0011%
Interpublic Group of Cos Inc/The	IPG	0.03%	3.67%	0.00%	6.43%	0.0022%
International Flavors & Fragrances Inc	IFF	0.05%	2.10%	0.00%	9.20%	0.0045%
Jacobs Engineering Group Inc	JEC	0.04%	0.78%	0.00%	17.01%	0.0072%
Hanesbrands Inc	HBI	0.03%	3.26%	0.00%	5.04%	0.0013%
Kellogg Co	K	0.10%	3.20%	0.00%	8.42%	0.0080%
Broadridge Financial Solutions Inc	BR	0.06%	1.47%	0.00%	10.00%	0.0060%
Perrigo Co PLC	PRGO	0.04%	1.07%	0.00%	6.00%	0.0023%
Kimberly-Clark Corp	KMB	0.15%	3.52%	0.01%	6.26%	0.0097%
Kimco Realty Corp	KIM	0.03%	6.69%	0.00%	3.16%	0.0009%

STANDARD AND POOR'S 500 INDEX

Name	Ticker	[4] Weight in Index	[5] Current Dividend Yield	[6] Cap-Weighted Dividend Yield	[7] Long-Term Growth Est.	[8] Cap-Weighted Long-Term Growth Est.
Kohl's Corp	KSS	0.05%	3.27%	0.00%	7.23%	0.0035%
Oracle Corp	ORCL	0.77%	1.47%	0.01%	7.90%	0.0604%
Kroger Co/The	KR	0.09%	1.92%	0.00%	6.30%	0.0057%
Leggett & Platt Inc	LEG	0.02%	3.47%	0.00%	10.00%	0.0022%
Lennar Corp	LEN	0.05%	0.34%	0.00%	21.15%	0.0113%
Jefferies Financial Group Inc	JEF	0.03%	2.28%	0.00%	18.00%	0.0052%
Eli Lilly & Co	LLY	0.45%	2.10%	0.01%	11.73%	0.0530%
L Brands Inc	LB	0.03%	7.92%	0.00%	9.33%	0.0030%
Charter Communications Inc	CHTR	0.30%	n/a	n/a	45.75%	0.1354%
Lincoln National Corp	LNC	0.06%	1.95%	0.00%	n/a	n/a
Loews Corp	L	0.06%	0.50%	0.00%	n/a	n/a
Lowe's Cos Inc	LOW	0.36%	1.67%	0.01%	15.58%	0.0566%
Host Hotels & Resorts Inc	HST	0.06%	3.79%	0.00%	2.97%	0.0018%
Marsh & McLennan Cos Inc	MMC	0.16%	2.01%	0.00%	14.81%	0.0242%
Masco Corp	MAS	0.04%	1.31%	0.00%	15.72%	0.0069%
Mattel Inc	MAT	0.02%	n/a	n/a	10.00%	0.0021%
S&P Global Inc	SPGI	0.19%	1.02%	0.00%	11.60%	0.0223%
Medtronic PLC	MDT	0.52%	2.03%	0.01%	7.84%	0.0408%
CVS Health Corp	CVS	0.31%	2.54%	0.01%	11.66%	0.0366%
DowDuPont Inc	DWDP	0.58%	2.36%	0.01%	8.37%	0.0486%
Micron Technology Inc	MU	0.21%	n/a	n/a	0.27%	0.0005%
Motorola Solutions Inc	MSI	0.08%	1.60%	0.00%	7.45%	0.0062%
Cboe Global Markets Inc	CBOE	0.04%	1.29%	0.00%	12.92%	0.0054%
Mylan NV	MYL	0.07%	n/a	n/a	6.07%	0.0045%
Laboratory Corp of America Holdings	LH	0.07%	n/a	n/a	8.95%	0.0062%
Newell Brands Inc	NWL	0.04%	4.53%	0.00%	2.76%	0.0010%
Newmont Mining Corp	NEM	0.06%	1.85%	0.00%	-3.00%	-0.0019%
Twenty-First Century Fox Inc	FOXA	0.19%	0.78%	0.00%	9.95%	0.0191%
NIKE Inc	NKE	0.42%	0.94%	0.00%	18.11%	0.0769%
NiSource Inc	NI	0.04%	3.13%	0.00%	5.63%	0.0020%
Noble Energy Inc	NBL	0.06%	1.41%	0.00%	42.78%	0.0253%
Norfolk Southern Corp	NSC	0.20%	1.77%	0.00%	10.20%	0.0202%
Principal Financial Group Inc	PFG	0.07%	3.62%	0.00%	7.93%	0.0052%
Eversource Energy	ES	0.08%	3.29%	0.00%	6.03%	0.0046%
Northrop Grumman Corp	NOC	0.22%	1.51%	0.00%	15.18%	0.0329%
Wells Fargo & Co	WFC	0.99%	3.27%	0.03%	13.41%	0.1330%
Nucor Corp	NUE	0.08%	2.40%	0.00%	5.65%	0.0044%
PVH Corp	PVH	0.04%	0.10%	0.00%	10.98%	0.0048%
Occidental Petroleum Corp	OXY	0.25%	3.80%	0.01%	14.30%	0.0352%
Omnicom Group Inc	OMC	0.06%	3.53%	0.00%	5.44%	0.0033%
ONEOK Inc	OKE	0.11%	4.87%	0.01%	26.88%	0.0294%
Raymond James Financial Inc	RJF	0.05%	1.30%	0.00%	17.00%	0.0089%
PG&E Corp	PCG	0.09%	n/a	n/a	5.05%	0.0047%
Parker-Hannifin Corp	PH	0.10%	1.65%	0.00%	9.32%	0.0089%
Rollins Inc	ROL	0.05%	0.92%	0.00%	10.00%	0.0052%
PPL Corp	PPL	0.08%	5.60%	0.00%	8.10%	0.0065%
Exelon Corp	EXC	0.17%	3.16%	0.01%	4.45%	0.0074%
ConocoPhillips	COP	0.35%	1.47%	0.01%	6.00%	0.0211%
PulteGroup Inc	PHM	0.03%	1.45%	0.00%	21.34%	0.0059%
Pinnacle West Capital Corp	PNW	0.03%	3.51%	0.00%	4.56%	0.0016%
PNC Financial Services Group Inc/The	PNC	0.25%	2.79%	0.01%	9.79%	0.0243%
PPG Industries Inc	PPG	0.10%	1.76%	0.00%	8.06%	0.0083%
Praxair Inc	PX	0.18%	2.05%	0.00%	13.90%	0.0252%
Progressive Corp/The	PGR	0.16%	1.58%	0.00%	9.20%	0.0149%
Public Service Enterprise Group Inc	PEG	0.10%	3.41%	0.00%	6.76%	0.0071%
Raytheon Co	RTN	0.23%	1.68%	0.00%	14.87%	0.0343%
Robert Half International Inc	RHI	0.03%	1.59%	0.00%	17.10%	0.0058%
SCANA Corp	SCG	0.02%	1.27%	0.00%	-2.79%	-0.0006%
Edison International	EIX	0.09%	3.58%	0.00%	5.35%	0.0046%
Schlumberger Ltd	SLB	0.33%	3.28%	0.01%	20.00%	0.0661%
Charles Schwab Corp/The	SCHW	0.26%	1.06%	0.00%	21.63%	0.0562%
Sherwin-Williams Co/The	SHW	0.17%	0.76%	0.00%	11.42%	0.0190%
JM Smucker Co/The	SJM	0.05%	3.31%	0.00%	5.00%	0.0023%
Snap-on Inc	SNA	0.04%	1.79%	0.00%	7.95%	0.0032%
AMETEK Inc	AME	0.07%	0.71%	0.00%	11.81%	0.0085%
Southern Co/The	SO	0.17%	5.50%	0.01%	4.00%	0.0069%
BB&T Corp	BBT	0.15%	3.34%	0.00%	17.38%	0.0256%
Southwest Airlines Co	LUV	0.14%	1.02%	0.00%	7.87%	0.0110%
Stanley Black & Decker Inc	SWK	0.09%	1.80%	0.00%	10.65%	0.0093%
Public Storage	PSA	0.14%	3.97%	0.01%	5.37%	0.0074%
Arista Networks Inc	ANET	0.08%	n/a	n/a	26.03%	0.0203%
SunTrust Banks Inc	STI	0.12%	2.99%	0.00%	14.78%	0.0178%
Sysco Corp	SYY	0.15%	1.97%	0.00%	11.37%	0.0170%
Texas Instruments Inc	TXN	0.41%	2.87%	0.01%	11.05%	0.0451%
Textron Inc	TXT	0.07%	0.11%	0.00%	13.71%	0.0095%
Thermo Fisher Scientific Inc	TMO	0.39%	0.28%	0.00%	11.00%	0.0424%
Tiffany & Co	TIF	0.06%	1.71%	0.00%	12.54%	0.0078%
TJX Cos Inc/The	TJX	0.27%	1.39%	0.00%	11.10%	0.0302%
Torchmark Corp	TMK	0.04%	0.74%	0.00%	13.17%	0.0050%
Total System Services Inc	TSS	0.07%	0.53%	0.00%	14.62%	0.0103%

STANDARD AND POOR'S 500 INDEX

Name	Ticker	[4] Weight in Index	[5] Current Dividend Yield	[6] Cap-Weighted Dividend Yield	[7] Long-Term Growth Est.	[8] Cap-Weighted Long-Term Growth Est.
Johnson Controls International plc	JCI	0.13%	2.97%	0.00%	10.30%	0.0131%
Ulta Beauty Inc	ULTA	0.07%	n/a	n/a	20.50%	0.0135%
Union Pacific Corp	UNP	0.47%	1.97%	0.01%	14.20%	0.0670%
UnitedHealth Group Inc	UNH	1.00%	1.35%	0.01%	13.33%	0.1337%
Unum Group	UNM	0.03%	2.66%	0.00%	9.00%	0.0030%
Marathon Oil Corp	MRO	0.08%	0.86%	0.00%	5.00%	0.0039%
Varian Medical Systems Inc	VAR	0.04%	n/a	n/a	12.05%	0.0048%
Ventas Inc	VTR	0.08%	5.81%	0.00%	2.47%	0.0019%
VF Corp	VFC	0.15%	1.97%	0.00%	9.43%	0.0137%
Vornado Realty Trust	VNO	0.05%	3.45%	0.00%	3.88%	0.0021%
Vulcan Materials Co	VMC	0.06%	1.01%	0.00%	20.36%	0.0117%
Weyerhaeuser Co	WY	0.10%	4.21%	0.00%	16.20%	0.0155%
Whirlpool Corp	WHR	0.03%	3.87%	0.00%	9.46%	0.0028%
Williams Cos Inc/The	WMB	0.13%	5.00%	0.01%	-0.80%	-0.0010%
WEC Energy Group Inc	WEC	0.08%	3.31%	0.00%	3.23%	0.0027%
Xerox Corp	XRX	0.03%	3.71%	0.00%	2.05%	0.0006%
Adobe Systems Inc	ADBE	0.52%	n/a	n/a	16.88%	0.0871%
AES Corp/VA	AES	0.04%	3.71%	0.00%	8.59%	0.0031%
Amgen Inc	AMGN	0.53%	2.55%	0.01%	6.46%	0.0339%
Apple Inc	AAPL	4.27%	1.29%	0.06%	9.84%	0.4203%
Autodesk Inc	ADSK	0.13%	n/a	n/a	55.23%	0.0738%
Cintas Corp	CTAS	0.08%	0.82%	0.00%	11.85%	0.0100%
Comcast Corp	CMCSA	0.63%	2.15%	0.01%	14.85%	0.0942%
Molson Coors Brewing Co	TAP	0.05%	2.67%	0.00%	2.70%	0.0013%
KLA-Tencor Corp	KLAC	0.06%	2.95%	0.00%	7.37%	0.0045%
Marriott International Inc/MD	MAR	0.18%	1.24%	0.00%	14.46%	0.0260%
McCormick & Co Inc/MD	MKC	0.06%	1.58%	0.00%	8.80%	0.0055%
Nordstrom Inc	JWN	0.04%	2.47%	0.00%	8.43%	0.0033%
PACCAR Inc	PCAR	0.09%	1.64%	0.00%	6.03%	0.0056%
Costco Wholesale Corp	COST	0.40%	0.97%	0.00%	10.81%	0.0436%
Stryker Corp	SYK	0.26%	1.06%	0.00%	8.44%	0.0220%
Tyson Foods Inc	TSN	0.07%	2.02%	0.00%	5.90%	0.0041%
Applied Materials Inc	AMAT	0.15%	2.07%	0.00%	14.06%	0.0209%
American Airlines Group Inc	AAL	0.07%	0.97%	0.00%	16.93%	0.0126%
Cardinal Health Inc	CAH	0.06%	3.53%	0.00%	9.40%	0.0060%
Celgene Corp	CELG	0.25%	n/a	n/a	21.09%	0.0520%
Cerner Corp	CERN	0.08%	n/a	n/a	11.68%	0.0097%
Cincinnati Financial Corp	CINF	0.05%	2.76%	0.00%	n/a	n/a
DR Horton Inc	DHI	0.06%	1.19%	0.00%	20.70%	0.0129%
Flowserve Corp	FLS	0.03%	1.39%	0.00%	19.90%	0.0056%
Electronic Arts Inc	EA	0.14%	n/a	n/a	15.00%	0.0216%
Express Scripts Holding Co	ESRX	0.21%	n/a	n/a	6.49%	0.0136%
Expeditors International of Washington Inc	EXPD	0.05%	1.22%	0.00%	11.73%	0.0059%
Fastenal Co	FAST	0.07%	2.76%	0.00%	17.55%	0.0114%
M&T Bank Corp	MTB	0.09%	2.43%	0.00%	14.30%	0.0132%
Xcel Energy Inc	XEL	0.09%	3.22%	0.00%	5.80%	0.0055%
Fiserv Inc	FISV	0.13%	n/a	n/a	11.00%	0.0144%
Fifth Third Bancorp	FITB	0.07%	2.58%	0.00%	5.65%	0.0041%
Gilead Sciences Inc	GILD	0.39%	2.95%	0.01%	5.72%	0.0224%
Hasbro Inc	HAS	0.05%	2.40%	0.00%	8.13%	0.0043%
Huntington Bancshares Inc/OH	HBAN	0.06%	3.75%	0.00%	13.36%	0.0086%
Welltower Inc	WELL	0.09%	5.41%	0.01%	7.05%	0.0066%
Biogen Inc	BIIB	0.28%	n/a	n/a	5.66%	0.0158%
Northern Trust Corp	NTRS	0.09%	2.15%	0.00%	16.78%	0.0150%
Packaging Corp of America	PKG	0.04%	2.88%	0.00%	10.00%	0.0041%
Paychex Inc	PAYX	0.10%	3.04%	0.00%	9.13%	0.0095%
People's United Financial Inc	PBCT	0.02%	4.09%	0.00%	2.00%	0.0005%
QUALCOMM Inc	QCOM	0.41%	3.44%	0.01%	12.32%	0.0510%
Roper Technologies Inc	ROP	0.12%	0.56%	0.00%	13.40%	0.0161%
Ross Stores Inc	ROST	0.14%	0.91%	0.00%	10.43%	0.0151%
IDEXX Laboratories Inc	IDXX	0.08%	n/a	n/a	21.88%	0.0185%
Starbucks Corp	SBUX	0.30%	2.53%	0.01%	14.30%	0.0430%
KeyCorp	KEY	0.08%	3.42%	0.00%	16.21%	0.0133%
State Street Corp	STT	0.12%	2.24%	0.00%	12.36%	0.0154%
Norwegian Cruise Line Holdings Ltd	NCLH	0.05%	n/a	n/a	20.32%	0.0101%
US Bancorp	USB	0.34%	2.80%	0.01%	7.45%	0.0251%
AO Smith Corp	AOS	0.03%	1.35%	0.00%	11.50%	0.0035%
Symantec Corp	SYMC	0.05%	1.41%	0.00%	6.68%	0.0035%
T Rowe Price Group Inc	TROW	0.10%	2.56%	0.00%	12.08%	0.0126%
Waste Management Inc	WM	0.15%	2.06%	0.00%	11.61%	0.0176%
CBS Corp	CBS	0.08%	1.25%	0.00%	16.37%	0.0125%
Allergan PLC	AGN	0.25%	1.51%	0.00%	8.47%	0.0215%
Constellation Brands Inc	STZ	0.14%	1.37%	0.00%	11.19%	0.0159%
Xilinx Inc	XLNX	0.08%	1.80%	0.00%	7.57%	0.0060%
DENTSPLY SIRONA Inc	XRAY	0.03%	0.93%	0.00%	6.93%	0.0023%
Zions Bancorp NA	ZION	0.04%	2.39%	0.00%	10.30%	0.0039%
Alaska Air Group Inc	ALK	0.03%	1.86%	0.00%	6.93%	0.0023%
Invesco Ltd	IVZ	0.04%	5.24%	0.00%	6.08%	0.0022%
Intuit Inc	INTU	0.23%	0.83%	0.00%	16.11%	0.0371%
Morgan Stanley	MS	0.32%	2.58%	0.01%	16.88%	0.0537%

STANDARD AND POOR'S 500 INDEX

Name	Ticker	[4] Weight in Index	[5] Current Dividend Yield	[6] Cap-Weighted Dividend Yield	[7] Long-Term Growth Est.	[8] Cap-Weighted Long-Term Growth Est.
Microchip Technology Inc	MCHP	0.07%	1.85%	0.00%	14.55%	0.0106%
Chubb Ltd	CB	0.24%	2.19%	0.01%	10.83%	0.0263%
Hologic Inc	HOLX	0.04%	n/a	n/a	8.74%	0.0038%
Citizens Financial Group Inc	CFG	0.07%	2.80%	0.00%	21.50%	0.0155%
O'Reilly Automotive Inc	ORLY	0.11%	n/a	n/a	15.47%	0.0170%
Allstate Corp/The	ALL	0.13%	1.86%	0.00%	7.10%	0.0095%
FLIR Systems Inc	FLIR	0.03%	1.04%	0.00%	n/a	n/a
Equity Residential	EQR	0.10%	3.26%	0.00%	5.69%	0.0054%
BorgWarner Inc	BWA	0.04%	1.59%	0.00%	5.79%	0.0020%
Newfield Exploration Co	NFX	0.02%	n/a	n/a	19.17%	0.0043%
Incyte Corp	INCY	0.06%	n/a	n/a	52.58%	0.0302%
Simon Property Group Inc	SPG	0.21%	4.53%	0.01%	6.18%	0.0132%
Eastman Chemical Co	EMN	0.05%	2.34%	0.00%	5.90%	0.0031%
Twitter Inc	TWTR	0.08%	n/a	n/a	45.77%	0.0387%
AvalonBay Communities Inc	AVB	0.10%	3.25%	0.00%	6.74%	0.0066%
Prudential Financial Inc	PRU	0.17%	3.55%	0.01%	6.00%	0.0099%
United Parcel Service Inc	UPS	0.32%	3.12%	0.01%	8.97%	0.0284%
Apartment Investment & Management Co	AIV	0.03%	3.44%	0.00%	6.20%	0.0017%
Walgreens Boots Alliance Inc	WBA	0.28%	2.41%	0.01%	10.18%	0.0288%
McKesson Corp	MCK	0.10%	1.18%	0.00%	5.83%	0.0061%
Lockheed Martin Corp	LMT	0.39%	2.54%	0.01%	21.41%	0.0826%
AmerisourceBergen Corp	ABC	0.08%	1.65%	0.00%	10.05%	0.0079%
Capital One Financial Corp	COF	0.18%	1.69%	0.00%	16.00%	0.0285%
Waters Corp	WAT	0.06%	n/a	n/a	9.10%	0.0053%
Dollar Tree Inc	DLTR	0.08%	n/a	n/a	10.94%	0.0083%
Darden Restaurants Inc	DRI	0.05%	2.70%	0.00%	10.54%	0.0057%
NetApp Inc	NTAP	0.09%	1.86%	0.00%	15.95%	0.0139%
Citrix Systems Inc	CTXS	0.06%	1.26%	0.00%	9.00%	0.0053%
Goodyear Tire & Rubber Co/The	GT	0.02%	2.39%	0.00%	n/a	n/a
DXC Technology Co	DXC	0.10%	0.81%	0.00%	6.36%	0.0065%
DaVita Inc	DVA	0.05%	n/a	n/a	18.00%	0.0084%
Hartford Financial Services Group Inc/The	HIG	0.07%	2.40%	0.00%	9.50%	0.0067%
Iron Mountain Inc	IRM	0.04%	6.81%	0.00%	10.10%	0.0039%
Estee Lauder Cos Inc/The	EL	0.13%	1.05%	0.00%	16.20%	0.0206%
Cadence Design Systems Inc	CDNS	0.05%	n/a	n/a	12.00%	0.0060%
Stericycle Inc	SRCL	0.02%	n/a	n/a	10.00%	0.0020%
Universal Health Services Inc	UHS	0.04%	0.31%	0.00%	7.93%	0.0034%
E*TRADE Financial Corp	ETFC	0.05%	n/a	n/a	28.39%	0.0151%
Skyworks Solutions Inc	SWKS	0.06%	1.68%	0.00%	12.04%	0.0077%
National Oilwell Varco Inc	NOV	0.06%	0.46%	0.00%	41.00%	0.0265%
Quest Diagnostics Inc	DGX	0.06%	1.85%	0.00%	9.20%	0.0053%
Activision Blizzard Inc	ATVI	0.25%	0.41%	0.00%	15.13%	0.0376%
Rockwell Automation Inc	ROK	0.09%	1.96%	0.00%	12.34%	0.0112%
Kraft Heinz Co/The	KHC	0.26%	4.54%	0.01%	5.60%	0.0147%
American Tower Corp	AMT	0.25%	2.17%	0.01%	16.10%	0.0404%
HollyFrontier Corp	HFC	0.05%	1.89%	0.00%	7.14%	0.0034%
Regeneron Pharmaceuticals Inc	REGN	0.17%	n/a	n/a	14.03%	0.0236%
Amazon.com Inc	AMZN	3.83%	n/a	n/a	47.42%	1.8147%
Ralph Lauren Corp	RL	0.03%	1.82%	0.00%	6.87%	0.0020%
Boston Properties Inc	BXP	0.07%	3.09%	0.00%	6.03%	0.0045%
Amphenol Corp	APH	0.11%	0.98%	0.00%	11.81%	0.0131%
Arconic Inc	ARNC	0.04%	1.09%	0.00%	16.00%	0.0067%
Pioneer Natural Resources Co	PXD	0.12%	0.18%	0.00%	27.13%	0.0315%
Valero Energy Corp	VLO	0.19%	2.81%	0.01%	17.15%	0.0327%
Synopsys Inc	SNPS	0.06%	n/a	n/a	n/a	n/a
L3 Technologies Inc	LLL	0.07%	1.51%	0.00%	12.64%	0.0082%
Western Union Co/The	WU	0.03%	3.99%	0.00%	4.20%	0.0014%
CH Robinson Worldwide Inc	CHRW	0.05%	1.88%	0.00%	10.23%	0.0054%
Accenture PLC	ACN	0.43%	1.72%	0.01%	10.40%	0.0444%
TransDigm Group Inc	TDG	0.08%	n/a	n/a	12.53%	0.0096%
Yum! Brands Inc	YUM	0.11%	1.58%	0.00%	12.83%	0.0145%
Prologis Inc	PLD	0.17%	2.83%	0.00%	6.81%	0.0114%
FirstEnergy Corp	FE	0.07%	3.87%	0.00%	-0.35%	-0.0002%
VeriSign Inc	VRSN	0.08%	n/a	n/a	10.40%	0.0080%
Quanta Services Inc	PWR	0.02%	n/a	n/a	8.00%	0.0016%
Henry Schein Inc	HSIC	0.05%	n/a	n/a	6.65%	0.0034%
Ameren Corp	AEE	0.06%	2.89%	0.00%	8.24%	0.0050%
ANSYS Inc	ANSS	0.06%	n/a	n/a	13.83%	0.0085%
NVIDIA Corp	NVDA	0.67%	0.21%	0.00%	11.23%	0.0751%
Sealed Air Corp	SEE	0.02%	1.59%	0.00%	3.89%	0.0010%
Cognizant Technology Solutions Corp	CTSH	0.18%	1.04%	0.00%	14.03%	0.0246%
SVB Financial Group	SIVB	0.06%	n/a	n/a	8.50%	0.0055%
Intuitive Surgical Inc	ISRG	0.26%	n/a	n/a	14.02%	0.0359%
Affiliated Managers Group Inc	AMG	0.03%	0.88%	0.00%	10.85%	0.0031%
Aetna Inc	AET	0.26%	0.99%	0.00%	10.69%	0.0278%
Take-Two Interactive Software Inc	TTWO	0.06%	n/a	n/a	10.00%	0.0062%
Republic Services Inc	RSG	0.09%	2.06%	0.00%	11.92%	0.0110%
eBay Inc	EBAY	0.13%	n/a	n/a	10.21%	0.0131%
Goldman Sachs Group Inc/The	GS	0.33%	1.43%	0.00%	12.69%	0.0421%
SBA Communications Corp	SBAC	0.07%	n/a	n/a	27.15%	0.0196%

STANDARD AND POOR'S 500 INDEX

Name	Ticker	[4] Weight in Index	[5] Current Dividend Yield	[6] Cap-Weighted Dividend Yield	[7] Long-Term Growth Est.	[8] Cap-Weighted Long-Term Growth Est.
Sempra Energy	SRE	0.12%	3.15%	0.00%	16.39%	0.0200%
Moody's Corp	MCO	0.13%	1.05%	0.00%	8.00%	0.0101%
Booking Holdings Inc	BKNG	0.37%	n/a	n/a	13.73%	0.0506%
F5 Networks Inc	FFIV	0.05%	n/a	n/a	10.27%	0.0049%
Akamai Technologies Inc	AKAM	0.05%	n/a	n/a	11.28%	0.0055%
Devon Energy Corp	DVN	0.08%	0.80%	0.00%	14.46%	0.0115%
Alphabet Inc	GOOGL	1.41%	n/a	n/a	18.22%	0.2576%
Red Hat Inc	RHT	0.09%	n/a	n/a	18.93%	0.0179%
Allegion PLC	ALLE	0.03%	0.93%	0.00%	11.23%	0.0038%
Netflix Inc	NFLX	0.64%	n/a	n/a	41.07%	0.2621%
Agilent Technologies Inc	A	0.09%	0.84%	0.00%	10.35%	0.0091%
Anthem Inc	ANTM	0.28%	1.09%	0.00%	12.27%	0.0343%
CME Group Inc	CME	0.23%	1.65%	0.00%	11.80%	0.0268%
Juniper Networks Inc	JNPR	0.04%	2.40%	0.00%	9.40%	0.0038%
BlackRock Inc	BLK	0.29%	2.66%	0.01%	9.81%	0.0289%
DTE Energy Co	DTE	0.08%	3.23%	0.00%	6.03%	0.0047%
Nasdaq Inc	NDAQ	0.06%	2.05%	0.00%	9.68%	0.0054%
Philip Morris International Inc	PM	0.50%	5.59%	0.03%	10.13%	0.0503%
salesforce.com Inc	CRM	0.47%	n/a	n/a	26.12%	0.1231%
Huntington Ingalls Industries Inc	HII	0.04%	1.12%	0.00%	27.50%	0.0119%
MetLife Inc	MET	0.18%	3.60%	0.01%	13.58%	0.0247%
Under Armour Inc	UA	0.02%	n/a	n/a	26.97%	0.0046%
Tapestry Inc	TPR	0.06%	2.69%	0.00%	10.96%	0.0063%
Fluor Corp	FLR	0.03%	1.45%	0.00%	25.82%	0.0083%
CSX Corp	CSX	0.25%	1.19%	0.00%	11.96%	0.0298%
Edwards Lifesciences Corp	EW	0.14%	n/a	n/a	15.33%	0.0219%
Ameriprise Financial Inc	AMP	0.08%	2.44%	0.00%	n/a	n/a
Rockwell Collins Inc	COL	0.09%	0.94%	0.00%	11.60%	0.0105%
TechnipFMC PLC	FTI	0.06%	1.66%	0.00%	9.85%	0.0055%
Zimmer Biomet Holdings Inc	ZBH	0.10%	0.73%	0.00%	3.64%	0.0038%
CBRE Group Inc	CBRE	0.06%	n/a	n/a	9.75%	0.0057%
Mastercard Inc	MA	0.89%	0.45%	0.00%	21.33%	0.1907%
CarMax Inc	KMX	0.05%	n/a	n/a	13.21%	0.0068%
Intercontinental Exchange Inc	ICE	0.17%	1.28%	0.00%	8.82%	0.0148%
Fidelity National Information Services Inc	FIS	0.14%	1.17%	0.00%	4.40%	0.0062%
Chipotle Mexican Grill Inc	CMG	0.05%	n/a	n/a	19.11%	0.0095%
Wynn Resorts Ltd	WYNN	0.05%	2.36%	0.00%	18.30%	0.0099%
Assurant Inc	AIZ	0.03%	2.08%	0.00%	n/a	n/a
NRG Energy Inc	NRG	0.04%	0.32%	0.00%	16.81%	0.0075%
Monster Beverage Corp	MNST	0.13%	n/a	n/a	17.00%	0.0214%
Regions Financial Corp	RF	0.08%	3.05%	0.00%	12.14%	0.0096%
Mosaic Co/The	MOS	0.05%	0.31%	0.00%	7.00%	0.0034%
Expedia Group Inc	EXPE	0.07%	0.98%	0.00%	14.23%	0.0099%
Evergy Inc	EVRG	0.06%	3.35%	0.00%	8.19%	0.0048%
Discovery Inc	DISCA	0.02%	n/a	n/a	n/a	n/a
CF Industries Holdings Inc	CF	0.05%	2.20%	0.00%	15.30%	0.0076%
Viacom Inc	VIAB	0.05%	2.37%	0.00%	6.56%	0.0031%
Alphabet Inc	GOOG	1.64%	n/a	n/a	18.22%	0.2981%
TE Connectivity Ltd	TEL	0.12%	2.00%	0.00%	9.25%	0.0111%
Cooper Cos Inc/The	COO	0.05%	0.02%	0.00%	10.80%	0.0058%
Discover Financial Services	DFS	0.10%	2.09%	0.00%	10.17%	0.0104%
TripAdvisor Inc	TRIP	0.02%	n/a	n/a	18.29%	0.0046%
Visa Inc	V	1.04%	0.56%	0.01%	18.18%	0.1898%
Mid-America Apartment Communities Inc	MAA	0.04%	3.68%	0.00%	n/a	n/a
Xylem Inc/NY	XYL	0.06%	1.05%	0.00%	8.60%	0.0048%
Marathon Petroleum Corp	MPC	0.14%	2.30%	0.00%	n/a	n/a
Tractor Supply Co	TSCO	0.04%	1.36%	0.00%	13.54%	0.0059%
ResMed Inc	RMD	0.06%	1.28%	0.00%	12.15%	0.0078%
Garrett Motion Inc	GTX	0.00%	n/a	n/a	n/a	n/a
Mettler-Toledo International Inc	MTD	0.06%	n/a	n/a	11.95%	0.0072%
Copart Inc	CPRT	0.05%	n/a	n/a	10.00%	0.0047%
Albemarle Corp	ALB	0.04%	1.34%	0.00%	13.03%	0.0055%
Essex Property Trust Inc	ESS	0.06%	3.02%	0.00%	5.94%	0.0038%
Realty Income Corp	O	0.06%	4.65%	0.00%	4.36%	0.0028%
Seagate Technology PLC	STX	0.05%	5.32%	0.00%	-2.44%	-0.0013%
WestRock Co	WRK	0.05%	3.22%	0.00%	6.50%	0.0035%
IHS Markit Ltd	INFO	0.08%	n/a	n/a	13.37%	0.0111%
Western Digital Corp	WDC	0.07%	3.42%	0.00%	3.52%	0.0023%
PepsiCo Inc	PEP	0.62%	3.32%	0.02%	6.72%	0.0416%
Nektar Therapeutics	NKTR	0.04%	n/a	n/a	n/a	n/a
Church & Dwight Co Inc	CHD	0.06%	1.47%	0.00%	9.63%	0.0055%
Duke Realty Corp	DRE	0.04%	2.82%	0.00%	5.34%	0.0021%
Federal Realty Investment Trust	FRT	0.04%	3.23%	0.00%	5.03%	0.0018%
MGM Resorts International	MGM	0.06%	1.72%	0.00%	3.70%	0.0022%
Twenty-First Century Fox Inc	FOX	0.14%	0.79%	0.00%	9.95%	0.0143%
Alliant Energy Corp	LNT	0.04%	3.15%	0.00%	5.86%	0.0023%
JB Hunt Transport Services Inc	JBHT	0.05%	0.81%	0.00%	13.46%	0.0069%
Lam Research Corp	LRCX	0.09%	2.90%	0.00%	13.55%	0.0123%
Mohawk Industries Inc	MHK	0.05%	n/a	n/a	7.86%	0.0040%
Pentair PLC	PNR	0.03%	1.61%	0.00%	11.01%	0.0033%

STANDARD AND POOR'S 500 INDEX

Name	Ticker	[4] Weight in Index	[5] Current Dividend Yield	[6] Cap-Weighted Dividend Yield	[7] Long-Term Growth Est.	[8] Cap-Weighted Long-Term Growth Est.
Vertex Pharmaceuticals Inc	VRTX	0.19%	n/a	n/a	64.33%	0.1241%
Facebook Inc	FB	1.55%	n/a	n/a	16.87%	0.2620%
United Rentals Inc	URI	0.05%	n/a	n/a	23.52%	0.0125%
Alexandria Real Estate Equities Inc	ARE	0.05%	2.96%	0.00%	6.57%	0.0034%
ABIOMED Inc	ABMD	0.08%	n/a	n/a	36.00%	0.0285%
Delta Air Lines Inc	DAL	0.16%	2.42%	0.00%	17.81%	0.0279%
United Continental Holdings Inc	UAL	0.10%	n/a	n/a	14.56%	0.0138%
News Corp	NWS	0.01%	1.47%	0.00%	26.30%	0.0028%
Centene Corp	CNC	0.12%	n/a	n/a	15.27%	0.0178%
Regency Centers Corp	REG	0.04%	3.43%	0.00%	5.65%	0.0024%
Macerich Co/The	MAC	0.03%	5.35%	0.00%	6.72%	0.0021%
Martin Marietta Materials Inc	MLM	0.04%	1.06%	0.00%	14.08%	0.0063%
Envision Healthcare Corp	EVHC	0.02%	n/a	n/a	14.51%	0.0032%
PayPal Holdings Inc	PYPL	0.41%	n/a	n/a	18.93%	0.0771%
Coty Inc	COTY	0.04%	3.98%	0.00%	13.06%	0.0048%
DISH Network Corp	DISH	0.03%	n/a	n/a	-12.71%	-0.0041%
Alexion Pharmaceuticals Inc	ALXN	0.12%	n/a	n/a	16.34%	0.0198%
Everest Re Group Ltd	RE	0.04%	2.28%	0.00%	10.00%	0.0037%
WellCare Health Plans Inc	WCG	0.06%	n/a	n/a	16.54%	0.0104%
News Corp	NWSA	0.02%	1.52%	0.00%	26.30%	0.0052%
Global Payments Inc	GPN	0.08%	0.03%	0.00%	17.00%	0.0134%
Crown Castle International Corp	CCI	0.18%	3.77%	0.01%	19.23%	0.0348%
Aptiv PLC	APTV	0.09%	1.05%	0.00%	13.07%	0.0114%
Advance Auto Parts Inc	AAP	0.05%	0.14%	0.00%	18.46%	0.0090%
Michael Kors Holdings Ltd	KORS	0.04%	n/a	n/a	3.66%	0.0015%
Align Technology Inc	ALGN	0.12%	n/a	n/a	33.09%	0.0407%
Illumina Inc	ILMN	0.21%	n/a	n/a	19.34%	0.0409%
Alliance Data Systems Corp	ADS	0.05%	0.97%	0.00%	12.51%	0.0064%
LKQ Corp	LKQ	0.04%	n/a	n/a	13.15%	0.0052%
Nielsen Holdings PLC	NLSN	0.04%	5.06%	0.00%	12.00%	0.0046%
Garmin Ltd	GRMN	0.05%	3.03%	0.00%	5.98%	0.0031%
Cimarex Energy Co	XEC	0.03%	0.77%	0.00%	72.92%	0.0253%
Zoetis Inc	ZTS	0.17%	0.55%	0.00%	17.87%	0.0309%
Digital Realty Trust Inc	DLR	0.09%	3.59%	0.00%	7.28%	0.0066%
Equinix Inc	EQIX	0.13%	2.11%	0.00%	19.55%	0.0264%
Discovery Inc	DISCK	0.04%	n/a	n/a	n/a	n/a

Notes:
[1] Equals Sum ([6])
[2] Equals Sum ([8])
[3] Equals ([1] x (1 + (0.5 x [2]))) + [2]
[4] Equals weight in S&P 500 based on market capitalization
[5] Source: Bloomberg Professional
[6] Equals [4] x [5]
[7] Source: Bloomberg Professional
[8] Equals [4] x [7]

CAPITAL ASSET PRICING MODEL -- WATER PROXY GROUP INCLUDING AWK

$$K = R_f + \beta\,(R_m - R_f)$$

	[4]	[5]	[6]	[7]	[8]
	Risk-Free Rate (R_f)	Beta (β)	Market Return (R_m)	Market Risk Premium ($R_m - R_f$)	ROE (K)
Proxy Group Average Bloomberg Beta					
Current 30-day average of 30-year U.S. Treasury bond yield [1]	3.09%	0.791	15.19%	12.10%	12.66%
Near-term projected 30-year U.S. Treasury bond yield (Q4 2018 - Q1 2020) [2]	3.52%	0.791	15.19%	11.67%	12.74%
Projected 30-year U.S. Treasury bond yield (2020 - 2024) [3]	4.20%	0.791	15.19%	10.99%	12.89%
Average					12.76%
Proxy Group Average Value Line Beta					
Current 30-day average of 30-year U.S. Treasury bond yield [1]	3.09%	0.770	15.19%	12.10%	12.41%
Near-term projected 30-year U.S. Treasury bond yield (Q4 2018 - Q1 2020) [2]	3.52%	0.770	15.19%	11.67%	12.50%
Projected 30-year U.S. Treasury bond yield (2020 - 2024) [3]	4.20%	0.770	15.19%	10.99%	12.66%
Average					12.52%
Overall Average					**12.64%**

Notes:
[1] Source: Bloomberg Professional
[2] Source: Blue Chip Financial Forecasts, Vol. 37, No. 10, October 1, 2018, at 2
[3] Source: Blue Chip Financial Forecasts, Vol. 37, No. 6, June 1, 2018, at 14
[4] See Notes [1], [2], and [3]
[5] Source: Attachment AEB-6
[6] Source: Attachment AEB-8
[7] Equals [6] − [4]
[8] Equals [4] + [5] x [7]

CAPITAL ASSET PRICING MODEL -- WATER PROXY GROUP EXCLUDING AWK

$$K = R_f + \beta\,(R_m - R_f)$$

	[4]	[5]	[6]	[7]	[8]
	Risk-Free Rate (R_f)	Beta (β)	Market Return (R_m)	Market Risk Premium ($R_m - R_f$)	ROE (K)
Proxy Group Average Bloomberg Beta					
Current 30-day average of 30-year U.S. Treasury bond yield [1]	3.09%	0.826	15.19%	12.10%	13.09%
Near-term projected 30-year U.S. Treasury bond yield (Q4 2018 - Q1 2020) [2]	3.52%	0.826	15.19%	11.67%	13.16%
Projected 30-year U.S. Treasury bond yield (2020 - 2024) [3]	4.20%	0.826	15.19%	10.99%	13.28%
Average					13.18%
Proxy Group Average Value Line Beta					
Current 30-day average of 30-year U.S. Treasury bond yield [1]	3.09%	0.800	15.19%	12.10%	12.77%
Near-term projected 30-year U.S. Treasury bond yield (Q4 2018 - Q1 2020) [2]	3.52%	0.800	15.19%	11.67%	12.85%
Projected 30-year U.S. Treasury bond yield (2020 - 2024) [3]	4.20%	0.800	15.19%	10.99%	12.99%
Average					12.87%
Overall Average					**13.03%**

Notes:
[1] Source: Bloomberg Professional
[2] Source: Blue Chip Financial Forecasts, Vol. 37, No. 10, October 1, 2018, at 2
[3] Source: Blue Chip Financial Forecasts, Vol. 37, No. 6, June 1, 2018, at 14
[4] See Notes [1], [2], and [3]
[5] Source: Attachment AEB-6
[6] Source: Attachment AEB-8
[7] Equals [6] − [4]
[8] Equals [4] + [5] x [7]

CAPITAL ASSET PRICING MODEL -- COMBINED UTILITY PROXY GROUP INCLUDING AWK

$$K = R_f + \beta\,(R_m - R_f)$$

	[4]	[5]	[6]	[7]	[8]
	Risk-Free Rate (R_f)	Beta (β)	Market Return (R_m)	Market Risk Premium ($R_m - R_f$)	ROE (K)
Proxy Group Average Bloomberg Beta					
Current 30-day average of 30-year U.S. Treasury bond yield [1]	3.09%	0.679	15.19%	12.10%	11.31%
Near-term projected 30-year U.S. Treasury bond yield (Q4 2018 - Q1 2020) [2]	3.52%	0.679	15.19%	11.67%	11.45%
Projected 30-year U.S. Treasury bond yield (2020 - 2024) [3]	4.20%	0.679	15.19%	10.99%	11.67%
Average					11.47%
Proxy Group Average Value Line Beta					
Current 30-day average of 30-year U.S. Treasury bond yield [1]	3.09%	0.717	15.19%	12.10%	11.76%
Near-term projected 30-year U.S. Treasury bond yield (Q4 2018 - Q1 2020) [2]	3.52%	0.717	15.19%	11.67%	11.88%
Projected 30-year U.S. Treasury bond yield (2020 - 2024) [3]	4.20%	0.717	15.19%	10.99%	12.08%
Average					11.91%
Overall Average					**11.69%**

Notes:
[1] Source: Bloomberg Professional
[2] Source: Blue Chip Financial Forecasts, Vol. 37, No. 10, October 1, 2018, at 2
[3] Source: Blue Chip Financial Forecasts, Vol. 37, No. 6, June 1, 2018, at 14
[4] See Notes [1], [2], and [3]
[5] Source: Attachment AEB-7
[6] Source: Attachment AEB-8
[7] Equals [6] − [4]
[8] Equals [4] + [5] x [7]

CAPITAL ASSET PRICING MODEL -- COMBINED UTILITY PROXY GROUP EXCLUDING AWK

$$K = R_f + \beta (R_m - R_f)$$

	[4]	[5]	[6]	[7]	[8]
	Risk-Free Rate (R_f)	Beta (β)	Market Return (R_m)	Market Risk Premium ($R_m - R_f$)	ROE (K)
Proxy Group Average Bloomberg Beta					
Current 30-day average of 30-year U.S. Treasury bond yield [1]	3.09%	0.682	15.19%	12.10%	11.35%
Near-term projected 30-year U.S. Treasury bond yield (Q4 2018 - Q1 2020) [2]	3.52%	0.682	15.19%	11.67%	11.48%
Projected 30-year U.S. Treasury bond yield (2020 - 2024) [3]	4.20%	0.682	15.19%	10.99%	11.70%
Average					11.51%
Proxy Group Average Value Line Beta					
Current 30-day average of 30-year U.S. Treasury bond yield [1]	3.09%	0.723	15.19%	12.10%	11.84%
Near-term projected 30-year U.S. Treasury bond yield (Q4 2018 - Q1 2020) [2]	3.52%	0.723	15.19%	11.67%	11.95%
Projected 30-year U.S. Treasury bond yield (2020 - 2024) [3]	4.20%	0.723	15.19%	10.99%	12.14%
Average					11.98%
Overall Average					**11.74%**

Notes:
[1] Source: Bloomberg Professional
[2] Source: Blue Chip Financial Forecasts, Vol. 37, No. 10, October 1, 2018, at 2
[3] Source: Blue Chip Financial Forecasts, Vol. 37, No. 6, June 1, 2018, at 14
[4] See Notes [1], [2], and [3]
[5] Source: Attachment AEB-7
[6] Source: Attachment AEB-8
[7] Equals [6] − [4]
[8] Equals [4] + [5] x [7]

COMPARISON OF KAWC AND PROXY GROUP COMPANIES
REGULATORY FRAMEWORK - ADJUSTMENT CLAUSES

Company	Ticker	State	Infrastructure Replacement Surcharge	Future Test Year	Revenue Stabilization or Decoupling	Citations
American States Water Co	AWR					2017 10-K, page 55; American States Water 2017 Annual Report, page 10
		California		Yes	Yes	
American Water	AWK					Company provided data
		New Jersey	Yes	Yes		
		Pennsylvania	Yes	Yes		
		Illinois	Yes	Yes	Yes	
		Missouri	Yes	Yes		
		Indiana	Yes	Yes		
		California		Yes	Yes	
		West Virginia	Yes			
		Georgia				
		Hawaii		Yes		
		Iowa	Yes			
		Kentucky		Yes		
		Maryland		Yes		
		Michigan				
		New York	Yes	Yes	Yes	
		Tennessee	Yes	Yes		
		Virginia	Yes	Yes		
Atmos Energy Corporation	ATO					2017 10-K, pages 9-10; S&P Global Market Intelligence, Regulatory Focus: Adjustment Clauses, dated September 28, 2018.
		Colorado	Yes			
		Kansas	Yes		Yes	
		Kentucky	Yes	Yes	Yes	
		Louisiana	Yes		Yes	
		Mississippi	Yes		Yes	
		Tennessee		Yes	Yes	
		Texas	Yes		Yes	
		Virginia	Yes	Yes		
California Water Service Group	CWT					2017 10-K, page 9; SNL Financial; K'Anapali Division, Docket No. 2015-0230, Order No. 33953
		California		Yes	Yes	
		New Mexico				
		Washington				
		Hawaii		Yes		
Middlesex Water Company	MSEX					2017 10-K, page 6-7; SNL Financial; Company Tariffs
		New Jersey	Yes	Yes		
		Delaware	Yes			
		Pennsylvania	Yes	Yes		
New Jersey Resources Corporation	NJR					SNL Financial; S&P Global Market Intelligence, Regulatory Focus: Adjustment Clauses, dated September 28, 2018.
		New Jersey	Yes	Yes	Yes	
Northwest Natural Gas Company	NWN					SNL Financial; S&P Global Market Intelligence, Regulatory Focus: Adjustment Clauses, dated September 28, 2018.
		Oregon		Yes	Yes	
		Washington				
ONE Gas, Inc.	OGS					SNL Financial; S&P Global Market Intelligence, Regulatory Focus: Adjustment Clauses, dated September 28, 2018.
		Oklahoma			Yes	
		Kansas	Yes		Yes	
		Texas	Yes		Yes	
South Jersey Industries, Inc.	SJI					SNL Financial; S&P Global Market Intelligence, Regulatory Focus: Adjustment Clauses, dated September 28, 2018.
		New Jersey	Yes	Yes	Yes	
Southwest Gas Corporation	SWX					SWX 2017 10-K, Pages 2-3, 33, Rates and Regulatory Section
		Arizona	Yes		Yes	
		California	Yes	Yes	Yes	
		Nevada	Yes		Yes	
Spire, Inc.	SR					SR 2017 10-K pages 42 - 43; SNL Financial
		Alabama		Yes	Yes	
		Missouri	Yes	Yes		
		Mississippi			Yes	
York Water Company	YORW					
		Pennsylvania	Yes	Yes		York Water Company Tariff, SNL Financial
Total Number of Jurisdictions (Y)			29	27	22	
Total Number of Jurisdictions			46	46	46	
Percent of Jurisdictions			63.04%	58.70%	47.83%	
Total Number of Jurisdictions (excl. AWK) (Y)			19	15	19	
Total Number of Jurisdictions (excl. AWK)			30	30	30	
Percent of Jurisdictions (excl. AWK)			63.33%	50.00%	63.33%	

CAPITAL STRUCTURE OF THE WATER PROXY GROUP

		2017 (%)				
Company	Ticker	Common Equity	Preferred Equity	Long-Term Debt	Short-Term Debt	Total Capital
American States Water Co	AWR	58.22%	0.00%	35.30%	6.48%	100.00%
American Water	AWK	41.08%	0.06%	51.96%	6.90%	100.00%
California Water Service Group	CWT	46.22%	0.00%	35.44%	18.34%	100.00%
Middlesex Water Company	MSEX	56.51%	0.60%	35.98%	6.90%	100.00%
York Water Company	YORW	56.13%	0.00%	43.40%	0.47%	100.00%
WPG Including AWK						
Mean		51.63%	0.13%	40.42%	7.82%	100.00%
Minimum		41.08%	0.00%	35.30%	0.47%	100.00%
Maximum		58.22%	0.60%	51.96%	18.34%	100.00%
WPG Excluding AWK						
Mean		54.27%	0.15%	37.53%	8.05%	100.00%
Minimum		46.22%	0.00%	35.30%	0.47%	100.00%
Maximum		58.22%	0.60%	43.40%	18.34%	100.00%

Source: SNL Financial

CAPITAL STRUCTURE OF THE COMBINED UTILITY PROXY GROUP

		2017 (%)				
Company	Ticker	Common Equity	Preferred Equity	Long-Term Debt	Short-Term Debt	Total
American States Water Co	AWR	58.22%	0.00%	35.30%	6.48%	100.00%
American Water	AWK	41.08%	0.06%	51.96%	6.90%	100.00%
Atmos Energy Corporation	ATO	51.81%	0.00%	42.24%	5.95%	100.00%
California Water Service Group	CWT	46.22%	0.00%	35.44%	18.34%	100.00%
Middlesex Water Company	MSEX	56.51%	0.60%	35.98%	6.90%	100.00%
New Jersey Resources Corporation	NJR	46.25%	0.00%	43.80%	9.95%	100.00%
Northwest Natural Gas Company	NWN	47.10%	0.00%	49.46%	3.44%	100.00%
ONE Gas, Inc.	OGS	55.84%	0.00%	33.99%	10.18%	100.00%
South Jersey Industries, Inc.	SJI	43.58%	0.00%	43.76%	12.66%	100.00%
Southwest Gas Corporation	SWX	47.10%	0.00%	47.34%	5.57%	100.00%
Spire, Inc.	SR	43.63%	0.00%	45.91%	10.46%	100.00%
York Water Company	YORW	56.13%	0.00%	43.40%	0.47%	100.00%
CUPG Including AWK						
Mean		49.46%	0.06%	42.38%	8.11%	100.00%
Minimum		41.08%	0.00%	33.99%	0.47%	100.00%
Maximum		58.22%	0.60%	51.96%	18.34%	100.00%
CUPG Excluding AWK						
Mean		50.22%	0.05%	41.51%	8.22%	100.00%
Minimum		43.58%	0.00%	33.99%	0.47%	100.00%
Maximum		58.22%	0.60%	49.46%	18.34%	100.00%

Source: SNL Financial

KENTUCKY-AMERICAN WATER COMPANY
CASE NO. 2018-00358

DIRECT TESTIMONY OF
CONSTANCE E. HEPPENSTALL

CONCERNING
COST OF SERVICE ALLOCATION
AND
CUSTOMER RATE DESIGN

BEFORE THE

KENTUCKY PUBLIC SERVICE COMMISSION

November 28, 2018

BEFORE THE KENTUCKY PUBLIC SERVICE COMMISSION

RE: KENTUCKY-AMERICAN WATER COMPANY
CASE NO. 2018-00358

DIRECT TESTIMONY OF CONSTANCE E. HEPPENSTALL

Line
No.

QUALIFICATIONS

1. Q. Please state your name and address.

A. My name is Constance E. Heppenstall. My business address is 1010 Adams Avenue, Audubon, Pennsylvania

2. Q. By whom are you employed?

A. I am employed by Gannett Fleming Valuation and Rate Consultants, LLC.

3. Q. What is your position with Gannett Fleming Valuation and Rate Consultants, LLC, and briefly state your general duties and responsibilities.

A. My title is Senior Project Manager. My duties and responsibilities include the preparation of accounting and financial data for revenue requirement and cash working capital claims, the allocation of cost of service to customer classifications, and the design of customer rates in support of public utility rate filings.

4. Q. Have you presented testimony in rate proceedings before a regulatory agency?

A. Yes. I have testified before the Kentucky Public Utility Commission, the Public Service Commission of West Virginia, the Pennsylvania Public Service Commission, the Virginia State Corporation Commission, the Arizona Corporate Commission, the Missouri Public Service Commission, the State of Hawaii Public Utility Commission and the Indiana Utility Regulatory Commission concerning revenue requirements, cost of service allocation, rate design and cash working capital claims. A list of the cases in which I have testified is provided at the end of my direct testimony.

5. Q. What is your educational background?

A. I have a Bachelor of Arts Degree in Economics from the University of Virginia, Charlottesville, Virginia and a Master of Science in Industrial Administration from the Carnegie-Mellon University's Tepper School of Business, Pittsburgh, Pennsylvania.

6. Q. Would you please describe your professional affiliations?

A. I am a member of the American Water Works Association, the Pennsylvania Municipal Authorities Association and the National Association of Water Companies.

7. Q. Briefly describe your work experience.

A. I joined the Valuation and Rate Division of Gannett Fleming, Inc. (now Gannett Fleming Valuation and Rate Consultants, LLC) in August 2006, as a Rate Analyst and was promoted to my current position in 2018. Prior to my employment at Gannett Fleming, I was a Vice President of PriMuni, LLP where I developed financial analyses to test proprietary software in order to ensure its pricing accuracy in accordance with securities industry's conventions. From 1987 to 2001, I was employed by Commonwealth Securities and Investments, Inc. as a public finance professional where I created and implemented financial models for public finance clients in order to create debt structures to meet clients' needs. From 1986 to 1987, I was a public finance associate with Mellon Capital Markets.

COST OF SERVICE ALLOCATION

8. Q. What is the purpose of your testimony in this proceeding?

A. My testimony is in support of the cost of service allocation and rate design study conducted under my direction and supervision for the Kentucky-American Water Company, (the "Company").

9. Q. Have you prepared an exhibit presenting the results of your study?

A. Yes. Exhibit No. 36 presents the results of the allocation of the pro forma cost of service to the several customer classifications, and the proposed rate design.

10. Q. Briefly describe the purpose of your cost allocation study.

A. The purpose of the study was to allocate the total cost of service, which is the total revenue requirement, to the several customer classifications. The cost of service includes operation and maintenance expenses, depreciation expense and amortizations, taxes other than income, income taxes and income available for return. In the study, the total costs were allocated to the residential, commercial, industrial, public authority, sales for resale, private fire protection and public fire protection classifications in accordance with generally-accepted principles and procedures. The cost of service allocation results in indications of the relative cost responsibilities of each class of customers. The allocated cost of service is one of several criteria appropriate for consideration in designing customer rates to produce the required revenues.

11. Q. Please describe the method of cost allocation that was used in your study.

A. The base-extra capacity method, as described in the 2017 and prior Water Rates Manuals (M1) published by the American Water Works Association (AWWA), was used to allocate the pro forma costs. The method is a recognized method for allocating the cost of providing water service to customer classifications in proportion to the classifications' use of the commodity, facilities and services. It is generally accepted as a sound method for allocating the cost of water service and has been used by the Company in previous rate cases.

12. Q. Is the method described in Exhibit No. 36?

A. Yes. It is described on pages 3 and 4 of the exhibit.

13. Q. Please describe the procedure followed in the cost allocation study.

A. Each element of cost in the pro forma cost of service was allocated to cost functions and customer classifications through the use of appropriate allocation factors. This allocation is presented in Schedule B on pages 8 through 14 of Exhibit No. 36. The customer classifications include residential, commercial, industrial, public authority, sales for resale and private and public fire protection classifications. The items of cost, which include operation and maintenance expenses, depreciation and amortization expenses, taxes and

income available for return, are identified in column 1 of Schedule B. The cost of each item, shown in column 3, is allocated to the several customer classifications based on allocation factors referenced in column 2. The development of the allocation factors is presented in Schedule C of the exhibit.

The four basic cost functions are base, extra capacity, customer and fire protection costs. Base Costs are costs that tend to vary with the quantity of water used, plus costs associated with supplying, treating, pumping and distributing water to customers under average load conditions, without the elements necessary to meet peak demands. Base costs are allocated to customer classifications based on average daily usage.

Extra Capacity Costs are costs associated with meeting usage requirements in excess of average. They include the operating and capital costs for additional plant and system capacity beyond that required for average use. Extra capacity costs were subdivided into costs to meet maximum day extra capacity and maximum hour extra capacity requirements. Extra capacity costs are allocated to customer classifications based on estimated maximum day and hour demands in excess of average use for each classification.

Customer Costs are costs associated with serving customers regardless of their usage or demand characteristics. Customer costs are subdivided into customer facilities costs, which include meters and services, and customer accounting costs, which include billing and meter reading functions. Customer costs are allocated to classes based on the number and size of meters and the number of bills.

Fire Protection Costs are costs associated with providing the facilities to meet the potential peak demand of fire protection service as well as direct costs such as the cost for fire hydrants. The demand costs for fire protection are subdivided into costs for Private Fire Protection and Public Fire Protection on the basis of relative potential demands.

14. Q. Please provide examples of the cost allocation process.

A. I will use some of the larger cost items to illustrate the principles and considerations used in the cost allocation methodology. Water purchased for resale, purchased electric power, treatment chemicals and sludge handling costs are examples of costs that tend to vary with the amount of water consumed and are considered base costs. Thus, Factor 1 assigns these costs to customer classifications based on average daily usage.

Other source of supply, pumping, purification and transmission costs are associated with meeting usage requirements in excess of the average, generally to meet maximum day requirements. Costs of this nature are allocated partially as base costs, proportional to average daily consumption, partially as maximum day extra capacity costs, in proportion to maximum day extra capacity, and, in the case of certain pumping stations and transmission mains, partially as fire protection costs, through the use of Factors 2 and 3. The development of the allocation factors, referenced as Factors 2 and 3 shown in Schedule C, pages 15 through 18, is based on the system peak day ratio and the potential demand of fire protection.

Costs associated with distribution mains and storage facilities are allocated partly on the basis of average consumption and partly on the basis of maximum hour extra demand, including the demand for fire protection service, because these facilities are designed to meet maximum hour and fire demand requirements. The development of the factors, referenced as Factors 4 and 5, used for these allocations is shown in Schedule C, on pages 19 through 22, of Exhibit No. 36.

Factor 4 was modified to exclude the allocation of distribution mains to the sales for resale classification and a portion of the industrial classification. This recognizes that sales for resale customers and certain industrial customers are served from the transmission system and do not benefit from smaller distribution mains.

Fire demand costs are allocated to public and private fire protection service in proportion to the relative potential demands on the system by public fire hydrants as compared to the demands for private fire services and hydrants.

Costs associated with pumping facilities are allocated on a combined bases of maximum day, maximum day including fire and maximum hour extra capacity because pumping facilities serve these functions. The relative weightings of Factor 2 (maximum day), Factor 3 (maximum day with fire) and Factor 4 (maximum hour) for pumping facilities were based on the horsepower of the pumps serving these functions. The development of these weighted factors, referenced as Factor 6, is presented on page 23 of Exhibit No. 36.

Operation and maintenance costs for transmission and distribution mains are allocated on a combined bases of Factor 3 (maximum day with fire) for transmission mains and Factor 4 (maximum hour) for distribution mains. The weighting of the factors is based on the footage of mains and is referenced as Factor 7.

Costs associated with meters and services facilities are allocated to customer classifications based on meter and service equivalents using Factors 9 and 10. Billing and collecting costs and meter reading are assigned to customer classifications based on the number of bills using Factors 13 and 14. Uncollectible accounts are allocated based on net write-offs by class (Factor 20). Operating and capital costs associated with public fire hydrants were assigned directly to the public fire protection class (Factor 8).

Administrative and general costs are allocated on the basis of allocated direct costs excluding those costs such as purchased water, power and chemicals, which require little administrative and general expense. The development of factors for this allocation, referenced as Factor 15, is presented on page 31 of Exhibit No. 36. Factor 15A, used to allocate cash working capital, was based on the allocation of all operation and maintenance expenses.

Annual depreciation accruals are allocated on the basis of the function of the facilities represented by the depreciation expense for each depreciable plant account. The original cost less depreciation of utility plant in service is similarly allocated for the purpose of

developing factors, referenced as Factor 18, for allocating items such as income taxes and return. The development of Factor 18 is presented on pages 33 through 35 of Exhibit No. 36.

Factor 18, as well as Factors 15 and 15A discussed earlier, are composite allocation factors. Composite factors are generated internally in the cost allocation program based on the results of allocating other costs. Factors 11, 12, 16, 17 and 19 also are composite factors. Refer to Schedule C of Exhibit No. 36 for a description of the basis of each composite factor.

15. Q. What was the source of the total cost of service data set forth in column 3 of Schedule C of Exhibit No. 36?

A. The pro forma costs of service were furnished by the Company, and are set forth in Company Schedules B, D and E.

16. Q. Refer to Factors 2 and 3 and explain what factors were considered in estimating the maximum day extra capacity and maximum hour extra capacity demands used for the customer classifications.

A. The estimated demands were based on judgment which considered field studies of customer class demands conducted for the Company, field observations of the service areas of the Company, the class factors used in the last cost of service study, the system maximum day ratio, and generally-accepted customer class maximum day and maximum hour demand ratios. The estimated demands are the same demands used in the Company's prior rate cases.

17. Q. Have you summarized the results of your cost allocation study?

A. Yes. The results are summarized in columns 1, 2 and 3 of Schedule A on page 6 of Exhibit No. 36. The total allocated pro forma cost of service as of June 30, 2020, for each customer classification identified in column 1 is brought forward from Schedule B and shown in column 2. Column 3 presents each customer classification's cost responsibility as a percent of the total cost.

18 Q. Have you compared these cost responsibilities with the proportionate revenue under existing rates for each customer classification?

A. Yes. A comparison of the allocated cost responsibilities and the percentage of revenue under existing rates can be made by comparing columns 3 and 5 of Schedule A of Exhibit No. 36. A similar comparison of the percentage cost responsibilities (relative cost of service) and the percentage of pro forma revenues (relative revenues) under proposed rates can be made by comparing columns 3 and 7 of Schedule A of Exhibit No. 36. The proposed increase and the percent increase by class are shown in columns 8 and 9, respectfully.

CUSTOMER RATE DESIGN

19. Q. Are you responsible for the design of the rate schedules proposed by the Company in this proceeding?

A. Yes, I am.

20. Q. Is the proposed rate structure presented in an exhibit?

A. Yes. A comparison of the present and proposed rate schedules is presented in Schedule G on pages 41 to 43 of Exhibit No. 36.

21. Q. What are the appropriate factors to be considered in the design of the rate structure?

A. In preparing a rate structure, one should consider the allocated costs of service, the impact of radical changes from the present rate structure, the understandability and ease of application of the rate structure, community and social influences, and the value of service. General guidelines should be developed with management to determine the extent to which each of these criteria is to be incorporated in the rate structure to be designed, inasmuch as the pricing of a commodity or service ultimately should be a function of management.

22. Q. Did you discuss rate design guidelines with Company management?

A. Yes, I did. The guidelines established were: (1) maintain the Service Area 1 rate structure and make it applicable to all divisions. The rate structure includes a service charge by meter size which would be applicable to all classes of customers and a separate one-block

volumetric charge for each classification, (2) increase customer charges to recover a greater percentage of customer costs including ready to serve costs, (3) increase public fire service class to move toward cost of service, (4) adjust revenues among the remaining classes in conformity with or toward the indicated cost of service and (5) move the rates for East Rockcastle and North Middletown to Service Area 1 rates.

23. Q. Do the proposed rates comply with the guidelines enumerated in the answer to question 22?

A. Yes, they do.

24. Q. Do you support the concept of single-tariff pricing and to maintain the consolidation of the rate divisions achieved in prior cases?

A. Yes, I do.

25. Q. Please explain the development of the service charges.

A. The development of the service charges is set forth on Schedule F on page 40 of the Exhibit. Service charges should recover the cost of customer facilities such as meters and services and the cost of customer accounting including billing and collecting and meter reading costs and readiness to serve costs.

Schedule F shows the cost of service for these cost functions in column 2. These amounts were taken from an analysis of customer costs generated within the cost allocation study as well as a minimum system analysis for the readiness to serve portion of the service charge. The costs associated with meters are divided by the total 5/8-inch meter equivalents and by 12 months to determine the monthly cost related to a 5/8-inch meter. The costs associated with services are divided by 3/4-inch service equivalents and by 12 months to determine the monthly cost related to a 3/4-inch service. Costs associated with billing and collecting, meter reading and readiness-to-serve are divided by the number of customers and metered customers, respectively, and by 12 months to determine the monthly cost per customer for these functions. Also, the unrecovered portion of public fire costs are included as a part of the customer costs since these costs are fixed and do not vary with water usage.

The sum of the monthly customer costs for a 5/8-inch meter is $19.67. In the interest of gradualism, the Company is requesting a 5/8-inch meter charge of $15.00, less that the supported $19.67. Meter capacity ratios were used to determine the larger-sized service charges under the existing rate structure.

26. Q. How were the volumetric rates determined?

A. After the proposed service charges were applied to the bill analysis, the existing volumetric rates for each classification were increased so that revenues from each class moved toward the indicated cost of service and that total revenues equaled the proposed revenue requirement.

27. Q. Does that conclude your direct testimony?

A. Yes, it does.

VERIFICATION

COMMONWEALTH OF PENNSYLVANIA)
) **SS:**
COUNTY OF CUMBERLAND)

The undersigned, **Constance E. Heppenstall**, being duly sworn, deposes and says she is Senior Project Manager, Rate Studies, Gannett Fleming Valuation and Rate Consultants, LLC, that she has personal knowledge of the matters set forth in the foregoing testimony, and the answers contained therein are true and correct to the best of her information, knowledge, and belief.

Constance E. Heppenstall

CONSTANCE E. HEPPENSTALL

Subscribed and sworn to before me, a Notary Public in and before said County and Commonwealth, this 16th day of November, 2018.

Cheryl Ann Rutter (SEAL)
Notary Public

My Commission Expires:
February 20, 2019

COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
Cheryl Ann Rutter, Notary Public
East Pennsboro Twp., Cumberland County
My Commission Expires Feb. 20, 2019
MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES

CONSTANCE E. HEPPENSTALL – LIST OF CASES TESTIFIED

	Year	Jurisdiction	Docket No.	Client/Utility	Subject
1.	2010	AZ CC	W-01303A-09-0343 and SW-01303A-09-0343	Arizona American Water Company	Rate Consolidation
2.	2010	Pa PUC	R-2010-2179103	City of Lancaster – Bureau of Water	Revenue Requirements
3.	2012	Pa PUC	R-2012-2311725	Hanover Borough	Cost of Service/Rev Requirements
4.	2012	Pa PUC	R-2012-2310366	City of Lancaster – Sewer Fund	Revenue Requirements
5.	2013	Pa PUC	R-2013-2350509	City of DuBois – Bureau of Water	Revenue Requirements
6.	2013	Pa PUC	R-2013-2390244	City of Bethlehem – Bureau of Water	Revenue Requirements
7.	2014	Pa PUC	R-2014-2418872	City of Lancaster – Bureau of Water	Revenue Requirements
8.	2014	Pa PUC	R-2014-2428304	Hanover Borough	Revenue and Revenue Requirements
9.	2015	KY PSC	Case No.2015-000143	Northern Kentucky Water District	Cost of Service
10.	2016	Pa PUC	R-2016-2554150	City of DuBois – Bureau of Water	Cost of Service/Revenue Requirements
11.	2016	AZ CC	WS-01303A-16-0145	EPCOR Water Arizona, Inc.	Cost of service/Rate Design
12.	2017	MO PSC	WR-2017-0285	Missouri-American Water Company	Cost of Service/Rate Design
13.	2017	MO PSC	SR-2017-0286	Missouri-American Water Company	Cost of Service/Rate Design
14.	2017	VA SCC	PUR-2017-00082	Aqua Virginia, Inc.	Cost of Service/Rate Design
15.	2017	AZ CC	WS-01303A-17-0257	EPCOR Water Arizona, Inc.	Cost of Service/Rate Design
16.	2017	HI PUC	2017-0446	Hana Water Systems LLC – North	Cost of Service/Rate Design
17.	2017	HI PUC	2017-0447	Hana Water Systems LLC – South	Cost of Service/Rate Design
18.	2018	PA PUC	2018-3000834	SUEZ Water Pennsylvania, Inc.	Revenue Requirements
19.	2018	KY PSC	2018-00208	Water Service Corp. of KY	Cost of Service
20.	2018	WV PSC	18-0573-W-42T	West Virginia American Water Company	Cost of Service
21.	2018	IN IRC	50208	Indiana American Water Company	Cost of Service/Demand Study
22.	2018	KY PSC	Case No. 2018-00291	Northern Kentucky Water District	Cost of Service

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF:	**)**	
	)	
THE APPLICATION OF KENTUCKY-	**)**	**CASE NO. 2018-00358**
AMERICAN WATER COMPANY FOR AN	**)**	
ADJUSTMENT OF RATES	**)**	

DIRECT TESTIMONY OF KURT KOGLER

November 28, 2018

Q. Please state your name and business address.

A. My name is Kurt Kogler. My office address is 2300 Richmond Road, Lexington, KY 40502.

Q. By whom are you employed and in what capacity?

A. I am a Director of Human Resources ("HR") Business Partners for American Water Works Service Company, Inc. ("Service Company" or "AWWSC"). My responsibilities include serving as the primary HR leader for Kentucky-American Water Company ("Kentucky American Water" or "Company"). I also support Tennessee, California and Hawaii to ensure alignment of human resources and business strategies.

Q. Please state your educational and professional background.

A. I graduated from the University of Wisconsin – Madison with a Masters of Business Administration in Management and the University of Wisconsin – Milwaukee with a Bachelors of Business Administration in Marketing.

Prior to joining AWWSC in February 2016, I was the Human Resources Director for Joy Global, Inc. a worldwide mining equipment and services company. Prior to that, I was Human Resources Director for LaMacchia Enterprises, a travel and travel technology company. Prior to that, I performed a variety of HR roles at Grede Foundries, Inc. In total, I have more than twenty-five years' experience in Human Resource management.

Q. What topics will your testimony address?

A. I will discuss the structure of our workforce, our collective bargaining agreement, overall reasonableness of our employee expenses, including fixed and variable compensation and benefits programs.

Structure of Our Workforce

Q. Please identify the various employee classifications at Kentucky American Water and briefly describe how each group is compensated.

A. There are currently three primary classifications of employees: exempt, hourly non-union and hourly union employees. Hourly union and hourly non-union employees receive base pay, overtime pay and are eligible for performance pay. Exempt employees receive base pay and are eligible for performance pay. Therefore, total compensation for each classification of employees includes fixed pay (base pay) and variable pay.

Q. How does the Company forecast its staffing levels?

A. As Company witness Kevin Rogers discusses in his direct testimony, the Company regularly evaluates operational staffing levels to most effectively serve our customers in the long term. In so doing the Company has identified seven additional positions to perform line locates, leak detection and respond to additional customer orders in the field. Kentucky American Water also performs annual succession planning and talent reviews to assess bench strength, skill gaps and probable voluntary turnover from retirement.

As of August 31, 2018, the Company had 138 employees. Of that amount, approximately 14.5% of workers at Kentucky American Water are age 55 to 59 and 8.7% of workers are age 60 or older and could retire in the next several years.

Q. Is competitive total compensation important?

A. Yes, very much so. Recruitment of skilled workers, as well as the retention of existing trained workers, is critical to providing safe drinking water and performing satisfactory customer service. Without the ability to provide competitive and customary compensation and benefits, the Company could be hampered in its efforts to attract new

employees and retain existing employees, especially when competing with other utilities and other industries for this talent.

Collective Bargaining Agreement

Q. Please describe the unionized workforce at the Company.

A. Our union employees are represented by Service Employees International Union/National Conference of Firemen and Oilers Union Local 320. Union employees comprise close to 50% of our workforce.

Q. Please discuss the status and features of the current collective bargaining agreement.

A. On November 1, 2017, a new four-year collective bargaining agreement went into effect. Our approach to negotiations included identifying strategies that will have a favorable impact on the service to our customers. In the latest collective bargaining agreement, we also incorporated worker safety provisions, such as drug testing and rehabilitation and maximum continuous working hours per day. Our worker safety efforts promote safe work practices and employee engagement. Safe workers result in fewer disruptions to customer service and avoidance of costs associated with worker injuries. Kentucky American Water negotiated wages in the agreement that are competitive within the market, and commensurate with our non-union hourly employees. Our most recent agreement calls for annual pay increases of 2.6% on 11/1/2017, 2.65% on 11/1/2018, 2.75% on 11/1/2019 and 2.75% on 11/1/2020.

Compensation

Q. Please describe Kentucky American Water's approach to its employee compensation program.

A. The Company aims to offer compensation that is on par with other companies that Kentucky American Water competes with for talent. Therefore, the Company targets its total direct compensation (base and variable compensation) for each role near the market median (50th percentile). Offering market-level total compensation ensures that Kentucky American Water's compensation is not only competitive, but also reasonable. Kentucky American Water offers variable compensation targets to incentivize high performance and customer satisfaction. We believe this approach of using base and performance pay is superior to setting base compensation targets at market median and not offering variable compensation.

Q. How is variable compensation provided to employees?

A. Variable compensation may be awarded under two plans – the Annual Performance Plan ("APP") and the Long Term Performance Plan ("LTPP"). All full time employees participate in the Annual Performance Plan. Eligibility for the Long Term Performance Plan is limited to certain exempt employees.

Q. Please discuss the Company's rationale for offering both fixed and variable pay to employees.

A. American Water's compensation program is designed to provide employees with a total compensation package on par with those offered by companies with which it competes for employees. By using a combination of fixed and variable compensation, Kentucky American Water satisfies a dual objective of reasonably compensating our employees

while incentivizing them to achieve goals that improve performance and efficiency to benefit our customers. As further discussed below, our compensation plans, therefore, emphasize customer service, environmental compliance, a safe work environment, and other operational goals, as well as certain financial goals. Please describe the key performance objectives underlying the APP.

Management and hourly non-union employees' performance pay is based on a combination of individual performance and achievement of plan goals. Union employees' performance pay was established through collective bargaining and is based on the achievement of plan goals.

For 2018, the APP goals are as follows:

STRATEGY	GOAL	TARGET	WEIGHT
SAFETY & PEOPLE	OSHA Recordable Incident Rate	1.46	7.5%
	DART Rate (Days Away Restricted or Transferred)	1.12	7.5%
CUSTOMER	Customer Satisfaction Survey	First Quartile in Industry Benchmarking	15%
ENVIRONMENTAL LEADERSHIP	Drinking Water Quality	20x over Industry Average	10%
TECHNOLOGY & OPERATIONAL EFFICIENCY	Operational Efficiency Improvement	34.9%	10%
GROWTH	Financial/Earnings Per Share	$3.22-$3.32* (see below)	50%

Customers benefit from the APP participant's individual performance objectives being met and achievement of plan goals, because operational performance is improved by controlling costs, capturing efficiencies, promoting effective safety and risk management practices, and enhancing customer service. Performance is determined by goals that

directly benefit customers by creating a more productive workforce that is focused on customer satisfaction and achieving efficiency, environmental and safety goals.

Q. Please describe the LTPP.

A. American Water provides restricted stock units ("RSUs") and performance stock units ("PSUs") as long-term variable compensation under the LTPP. American Water's RSUs and PSUs are based on three-year vesting periods. RSUs are based on time-based vesting and PSUs are based on performance vesting conditions.[1]

Q. Is providing appropriate levels of compensation to employees critical to ensure the Company can provide safe and adequate service?

A. Yes, it is. Competition among companies to attract and retain the best and highest performing employees is keen. In recruiting new employees or retaining existing employees, both the Company and American Water compete with general industry in surrounding regions and nationally. For Kentucky American Water, the region includes companies in the manufacturing and service industries in addition to other utilities and construction companies. The Company's compensation program seeks to provide employees with a total compensation package on par with those offered by companies with which it competes for employees. The plan emphasizes customer service, environmental compliance, a safe work environment, and other operational goals, as well as certain financial goals focusing on efficient operation.

[1] American Water uses a combination of compounded EPS growth and relative total shareholder return ("TSR") ranking over a three-year performance period as the basis for measuring performance for PSU awards. For the portion of American Water's PSUs that are contingent on relative TSR percentile performance, American Water compares performance to its peer group.

Q. Has Kentucky American Water commissioned an independent review of its compensation levels?

A. Yes. The Company retained the services of Willis Towers Watson ("WTW") to perform a total compensation study and review of the competitiveness and reasonableness of Kentucky American Water's compensation program. The findings of WTW's compensation study are described in the testimony of Robert V. Mustich (summary below). WTW's findings regarding the comparability of benefits offered by the Company are presented in the testimony of Timothy Willig.

Q. What conclusions did WTW reach with respect to its review of the Company's compensation?

A. WTW's study reached the following conclusions:

- Compensation philosophy: American Water's total compensation philosophy of targeting the 50th percentile of the market, including greater earning opportunity for exceptional performance, is consistent with the large majority of utility peer companies examined, and WTW's consulting experience suggests it is the most prevalent practice across general industry.

- Competitiveness of target total remuneration: When compared to available published survey data, Kentucky American Water's compensation and benefit levels are at the low end or below the competitive range of the market based on the Company's stated compensation philosophy for base salary, target total cash compensation (Target TCC = base salary + target short-term variable compensation), target total direct compensation (Target TDC = target TCC + long-term variable compensation) and target total remuneration (Target Total Remuneration = target TDC + benefits).

- Short-term and long-term variable program design: American Water's strategy to provide short-term and long-term variable compensation is consistent with most investor owned utilities and publically traded general industry companies. While the specific design elements of variable compensation programs may differ among utility peers, American Water's design differences are limited. Overall, WTW found the Company's short-term and long-term variable compensation program designs to be

comparable to the designs of utility peers.

- Employee benefits program design: American Water's benefit program design is competitive with peer companies both inside and outside the energy/utilities industry. The same is true for the cost share between American Water and its employees.

In summary, WTW found the short-term variable compensation design, long-term variable compensation design, and employee benefits are within the range of market practices, based on the multiple market perspectives that were examined. WTW also found, however, that Kentucky American Water's overall total remuneration – which includes base compensation and all performance compensation and benefits – is at the low end or below the competitive market range.

Q. Did WTW reach any conclusions regarding the Company's APP?

A. Yes. WTW found that overall, American Water's short-term at-risk compensation program is comparable to and competitive with plan designs of other investor owned utilities and publicly held general industry companies. They found the use of a balanced scorecard approach is the most prevalent practice and it is common for companies to use one to two financial metrics and to consider the operational metrics of safety, reliability, and customer satisfaction. Earnings per share ("EPS") is the most prevalent financial metric used at both the Large Utility Peer Group and the Small Utility Peer Group and the majority of companies with short-term at-risk compensation programs use various forms of operational goals, such as safety, customer satisfaction, reliability, regulatory compliance, and service quality in their annual performance program metrics.

Q. Did WTW reach any conclusions regarding the Company's LTPP?

A. Yes, they did. WTW found that long-term at-risk compensation programs are used by most investor owned utilities and publicly traded general industry companies to help

attract, motivate and retain critically skilled employees needed to successfully run the business. This type of program focuses employees on attainment of results over longer-term horizons. Therefore, American Water's strategy to provide long-term at-risk compensation is consistent with the market perspectives examined by WTW. Among peers providing long-term at-risk compensation, WTW found that 73% of the Large Utility Peer Group and 36% of the Small Utility Peer Group companies use more than one vehicle to make awards, similar to American Water. Overall, WTW found that American Water's long-term at-risk compensation is comparable to and competitive with plan designs of other similarly sized utilities.

Q. Does the Company's compensation program benefit customers?

A. Yes. The Company's total compensation plan is designed to provide pay for performance and to focus participants in the plan on the performance results that can most directly influence customer satisfaction, health and safety, and environmental performance. Customers derive benefits from the focus provided by the Company's compensation program, as customer service remains a key measure with the goal of delivering operational service excellence. Further, well-grounded financial measures keep the organization focused on improved performance at all levels of the organization, particularly in increasing efficiency, decreasing waste, and boosting overall productivity. All of these aspects of overall performance benefit customers by rewarding superior performance in every function. This superior performance supporting our improved O&M efficiency is the result of having a workforce that is incented to find smarter, more efficient ways to deliver water service. In addition, a financially healthy utility focused on efficiency and customer satisfaction is able to attract the capital investments necessary

to provide safe and reliable service and to maintain the technological expertise necessary to operate the Company and comply with increasing water quality standards. A financially healthy utility is very much in the interest of Kentucky American Water's customers, as it helps ensure the Company has the ability to provide safe and reliable service at the lowest reasonable cost.

Moreover, the various comparative studies performed by WTW show that our total compensation packages, across the entirety of our employee structure, produce employee compensation expenses that are reasonable because, in part, they are at the lower end of the competitive range. Therefore, on a total compensation basis – meaning with performance pay included – our customers clearly are not overpaying for employee expenses in rates. In fact, if performance pay is excluded, the Company's compensation expense would fall below the median range of compensation paid by other companies and would place Kentucky American Water at a clear disadvantage in attracting and retaining qualified employees. Several neighboring Commissions, including West Virginia, Virginia, and Illinois have found the value in such programs by granting cost recovery of some form of variable compensation.

Benefits

Q. Please describe the Company's group insurance programs.

A. The Company's group insurance program consists of medical/prescription, dental, vision, life insurance, short-term and long-term disability. The Company's group insurance program is competitive in both value and its cost-sharing structure with those of benchmark companies.

Mr. Willig's testimony shows that WTW reviewed American Water's employee benefit program and compared the value and cost share of its various plans to market benchmarks. They found the following cost share comparisons:

- American Water = 24% employee, 76% employer cost share
- Median, full BENVAL database[2] = 22% employee, 78% employer cost share
- Median, Energy industry = 23% employee, 77% employer cost share

Q. Please discuss the efforts the Company has made to control the costs of providing the Company's group insurance program and retiree medical benefits program.

A. Medical, dental and vision coverage feature cost sharing provisions such as employee payroll contributions, deductibles and co-pays. While historical health care cost trends routinely outstripped general inflation, the Company's medical, prescription, dental and vision insurance costs have remained below general industry trends as shown in the chart below.

We have achieved these results through various efforts. Non-union retiree health contributions from the Company were frozen in 2017 for those non-union employees eligible for retiree health coverage. Note: only union employees hired before January 1, 2006 and non-union employees hired before January 1, 2002 are eligible for post-retirement medical coverage.

American Water also completed proactive and aggressive negotiations with our vendor partners and revisions to plan design (such as the addition of a PPO deductible in 2019

[2]The database is Willis' proprietary method to determine the value of benefits provided by participating companies by applying a standard set of actuarial methods and assumptions to a common employee population. The 2018 Willis Towers Watson BENVAL survey had 859 participants.

and expanding the eligibility for a High Deductible/Consumer Directed Health Plan (CDHP) to union employees in 2019). American Water's wellness program, Healthy Solutions, also helps mitigate our employee health risks and claims expense through awareness, education and condition management programs.

On August 1, 2018, American Water reached a five-year national benefits agreement with our labor unions (including union members in Kentucky). The agreement resulted in competitive alignment on our benefit package while providing choice, value and quality for employees. Beginning in 2019, participants in the PPO plan will be required to pay a deductible ($175 single/$350 non-single) for in-network services prior to their 20% co-pay. Another outcome from the national benefits agreement was achieving cost controls on future retiree healthcare expense through a freeze of the Company's contribution toward union retiree health care premiums going forward (2019 and beyond) for those union employees eligible for retiree health benefits.

Medical/ Rx/Dental/Vision Cost Trends[3]					
	2013->2014	**2014->2015**	**2015->2016**	**2016->2017**	**2017->2018**
Market Trend	8.00%	8.00%	6.40%	6.40%	6.75%
AW Nonunion Trend	1.10%	8.70%	-6.30%	0.00%	-2.30%
AW Union Trend	-5.60%	4.70%	1.60%	6.40%	4.90%

3 Proprietary AON study of market trends for medical, dental and vision plans commissioned by American Water.

Q. Please discuss American Water's ongoing efforts to mitigate future cost increases.

A. American Water is a founding member of an innovative cross industry alliance (Health Transformation Alliance ("HTA")) to leverage data, purchasing power and networks. The HTA is an alliance comprising large employers working together to find innovative ways to provide high-value and high-quality health care benefits to their employees. Twenty major corporations have joined to create the HTA to help them take a much more active role in the health and health care of their employees and beneficiaries, approximately four million people. The HTA's goal is to improve the way corporations provide health care benefits in an effort to create better health care outcomes for their employees by aggregating its members' purchasing power and using it to gain additional leverage with care providers.

Q. Generally describe the Company's retirement benefits.

A. The Company has a defined benefit "pension" plan for employees hired prior to 2006. Employees eligible for the defined benefit plan receive a monthly benefit based on length of service and final average earnings upon retirement. Retirement benefits underwent a significant change in 2006 when a defined contribution (401(k)) plan replaced the defined benefit plan for employees hired after January 1, 2006. Employees in the defined contribution plan can receive matching contributions of 100% of first 3% and 50% of next 2% of qualifying pay deferred. The Company also provides a fixed contribution of 5.25% of qualifying pay to employees in the defined contribution plan. Employees in the defined benefit plan are eligible to participate in the defined contribution plan and receive the matching provision on their contributions, although a lower matching formula (50% of first 5% of qualifying pay saved) is applied. Employees in the defined benefit plan do

not receive the 5.25% fixed contribution offered in the defined contribution plan. In addition, employees hired before January 1, 2006 are eligible to receive retiree life insurance.

Q. Please generally describe the Company's employee stock purchase plan ("ESPP").

A. The ESPP is open to all active, full- or part-time employees of American Water and its subsidiaries, including Kentucky-American, through payroll deductions. Employees who choose to participate in a purchase period elect a contribution of after-tax compensation, subject to a maximum of $25,000 per year. Under the ESPP plan, participants currently acquire shares of American Water common stock at a 10% discount. Beginning with stock purchases made in May 2019, participants acquire shares of American Water common stock at a 15% discount.

Q. Is the Company's benefits program reasonable?

A. Yes. When determining the reasonableness of the Company's benefit expenses, the Commission should view the benefits and compensation expense in total. WTW found the Company's total benefit value is competitive with those entities inside and outside the energy industry with which we compete for employee talent. In terms of employee/employer cost share, American Water's structure is roughly in line as well. Consequently, the overall benefits and compensation expense is demonstrably reasonable. In addition, employees look at total remuneration when comparing compensation and benefits with other firms when deciding to join or stay with an organization. Companies also look at the aggregate when deciding the make-up of their benefits program. When we set compensation and benefit options, we look at the overall comparability with market. Element to element, there will be variations, with some

elements slightly above market and others slightly below. Individual variations are less important as long as the overall levels in aggregate are aligned with market.

Q. Does this conclude your direct testimony?

A. Yes.

VERIFICATION

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF FAYETTE)

SS:

The undersigned, **Kurt Kogler**, being duly sworn, deposes and says he is the Director, Human Resources Business Partner for American Water Works Service Corporation that he has personal knowledge of the matters set forth in the foregoing testimony, and the answers contained therein are true and correct to the best of his information, knowledge, and belief.

KURT KOGLER

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 15 day of November, 2018.

Notary Public (SEAL)

My Commission Expires:

8/6/2022

BEFORE THE KENTUCKY
PUBLIC SERVICE COMMISSION

Case No: 2018-00358

KENTUCKY-AMERICAN WATER COMPANY

DIRECT TESTIMONY OF
ROBERT V. MUSTICH

I. Introduction

Q. Please provide your name, position and business address.

A. My name is Robert V. Mustich. I am Managing Director and East Region Rewards Business Leader for Willis Towers Watson. Willis Towers Watson is a leading global professional services company which has 42,000 associates throughout the world, and offers solutions in the areas of corporate risk and broking; human capital and benefits; health care exchange solutions; and investment, risk, and reinsurance. My business address is 800 North Glebe Road, Arlington, VA 22203.

Q. Please explain Willis Towers Watson's experience in providing compensation and benefits consulting services to organizations like Kentucky American Water Company (KYAWC, Kentucky American Water, or the Company).

A. Willis Towers Watson has extensive experience serving clients in the utility industry, having served approximately 100 utilities in the U.S. within the last year. Because we invest so heavily in our utility industry capabilities, we have rich competitive industry compensation and benefits information that enables us to benchmark Kentucky American Water against similar companies in the U.S. Given Willis Towers Watson's breadth and depth of resources, we are frequently engaged by companies to evaluate the competitiveness of their compensation philosophy, compensation and benefit levels, variable compensation design and pay structures, and other consulting services. Willis Towers Watson and I have conducted similar competitive compensation studies for other utility clients.

Q. Please state your educational and professional background and experience.

A. I graduated from American University with a BS/BA in Human Resources Management. I have over 25 years of industry and compensation consulting services experience, have been with Willis Towers Watson for over 20 years, and have assisted management and Boards of Directors at numerous companies in designing and assessing total compensation programs. Since joining the firm in 1997, I have consulted with numerous utilities and serve as a senior member of our utilities industry practice. I have

conducted competitive assessments of total compensation for numerous public utilities throughout the U.S. Prior to joining Willis Towers Watson, I was a senior compensation consultant for PricewaterhouseCoopers (formally Coopers and Lybrand, LLP) performing similar compensation consulting services for clients. Prior to that, I held corporate senior staff compensation and benefits positions.

II. Purpose of Testimony

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to demonstrate that the target total remuneration provided to Kentucky American Water short-term variable compensation eligible employees, when viewed against the markets for talent for employees in similar positions, is at the low end or below the competitive range of market based on the company's stated compensation philosophy. Willis Towers Watson specifically focused on the following aspects of Kentucky American Water's program:

- Total compensation philosophy;
- Competitive market positioning of target total remuneration (base salary plus short-term variable compensation plus long-term variable compensation plus benefits)
- Design of short-term variable compensation program; and
- Design of long-term variable compensation program.

Q. Please define Target Total Cash Compensation.

A. Target Total Cash Compensation represents the sum of base salary plus target short-term variable compensation.

Q. Please define Target Total Direct Compensation.

A. Target Total Direct Compensation represents the sum of base salary, plus target short-term variable compensation, plus long-term variable compensation

Q. Please define Target Total Remuneration.

A. Target Total Remuneration represents the sum of base salary, plus target short-term variable compensation, plus long-term variable compensation, plus benefits

III. Overview of Total Compensation Philosophy

Q. Does Kentucky American Water have a defined compensation philosophy?

A. Yes, American Water Works Company, Inc. (American Water), KYAWC's parent, has a defined compensation philosophy that is utilized by Kentucky American Water.

Q. How would you define the parent company's compensation philosophy?

A. American Water's compensation philosophy is to generally pay compensation that is competitive with those of comparable organizations for jobs of similar responsibility. To carry out this philosophy, American Water's objective is to target total direct compensation (base, short-term variable compensation, and long-term variable compensation) at the median (50th percentile) of the market with greater earning opportunity for exceptional performance for fully qualified individuals.

Q. How does this compensation philosophy compare with other utilities?

A. It is comparable. Willis Towers Watson examined the proxy statements for two peer groups: (1) Large Utility Peer Group, 15 publicly-traded utilities comparable in size to American Water (revenues range from ½ to 2.5 times American Water's 2017 revenues of $3.4 billion), as disclosed in the company's March 27, 2018 proxy statement, and (2) Small Utility Peer Group, 11 publicly-traded utilities comparable in size to Kentucky American Water (revenues range from $49-$810M, compared to Kentucky American Water's 2017 revenue of $222M). Based on our review, we believe American Water's compensation philosophy is well-aligned with utility peers, as a majority of both Large Utility Peer Group companies (14 of 15, 93%) and Small Utility Peer Group companies (8 of 11, 73%) target the market median (50th percentile) for some or all pay elements. Our consulting experience also suggests that American Water's median (50th percentile) pay philosophy is comparable to typical market practice found in general industry.

IV. Summary of Willis Towers Watson's Total Remuneration Study

Q. Did you conduct a compensation study of Kentucky American Water's total remuneration program?

A. Yes, and a copy of the Study is included as **Exhibit RVM-1** to my testimony.

Q. Please describe how the study was conducted.

A. Willis Towers Watson utilized three data sources to assess Kentucky American Water's total remuneration program. As we did in assessing American Water's total compensation philosophy, we assessed the design of its short-term variable and long-term variable compensation programs using proxy disclosures of groups of public utilities referred to as the Large Utility Peer Group and the Small Utility Peer Group. Competitive market positioning of Kentucky American Water's target total remuneration levels was compared to Willis Towers Watson published compensation and benefits surveys.

Q. How did you define "competitive" for the purposes of your study?

A. Willis Towers Watson and typical market practice define an element of total remuneration as being competitive if it falls in a range that extends between 10% below to 10% above market median of total remuneration.

Q. Please describe how you assessed the competitiveness of Kentucky American Water's target total remuneration levels?

A. Willis Towers Watson assessed the competitiveness of target total remuneration provided by Kentucky American Water to its variable eligible population based on a selection of Kentucky American Water jobs ("benchmark jobs"). Benchmark jobs are those positions that are common across comparable organizations and for which compensation data are available from published surveys.

To conduct this analysis we reviewed compensation data provided to us by Kentucky American Water and examined Willis Towers Watson's compensation and benefits surveys. These surveys are comprised of compensation and benefits data from over

1,000 U.S. based companies, and Willis Towers Watson has been conducting these surveys for over 25 years.

Kentucky American Water's current compensation and benefit levels were compared to the market 50th percentile (market median) for two different market perspectives to determine the competitiveness of total remuneration and to validate the alignment with American Water's current compensation philosophy (targeting compensation at the 50th percentile of market).

To derive 50th percentile (median) market values, Willis Towers Watson weighted energy services and general industry survey data 60% and 40%, respectively, to place a greater weight on the energy services market data since this includes regulated entities most similar to Kentucky American Water for positions that are not industry specific. Given that these positions can be recruited or lost to companies in any industry, the use of general industry survey data ensures that non-industry specific positions are being compensated competitively. Industry specific positions were compared only to energy services industry data.

Willis Towers Watson's assessment of benchmark jobs represents approximately 63% of the population of Kentucky American Water employees as of September 28, 2018, who are eligible for variable compensation. Specific details regarding our study, which includes a detailed description of the study methodology, are included in **Exhibit RVM-1**.

Q. Please describe how you determined the competitiveness of Kentucky American Water's target total remuneration?

A. Two different market perspectives were examined to validate the competitiveness of Kentucky American's target total remuneration.

A national market perspective was examined which consisted of the entire population of survey participants in Willis Towers Watson's Energy Services and General Industry databases. This perspective represents a U.S. national total remuneration perspective and is aligned with American Water's compensation philosophy.

A Midwest regional perspective including Arkansas, Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Missouri, Nebraska, Ohio, Oklahoma, Tennessee, Wisconsin, and West Virginia labor markets was also examined, which consisted of the same entire survey participant population from Willis Towers Watson's Energy Services Industry and General Industry databases but was customized to identify a Midwest-specific geographic dataset. This dataset identified employees who work in the fourteen states listed above for companies headquartered anywhere in the United States.

Q. What were the results from the national perspective?

A. Kentucky American Water's target total remuneration as reported in Exhibit 1 (below) is below the range of competitive market median by being 13% (represents a weighted average of all positions reviewed) below the market median. Again, we consider market competitiveness to fall within a plus or minus 10% of median range.

Exhibit 1

Summary of Kentucky American Water Target Total Remuneration vs. Market Median (National Market Perspective)			
Base Pay	**Target Total Cash Compensation**	**Target Total Direct Compensation**	**Target Total Remuneration**
-13%	-14%	-14%	-12%

Q. What were the compensation study results from the Midwest Regional perspective?

A. Kentucky American Water's target total remuneration as reported in Exhibit 2 (below) is within the range of competitive market median by being 8% (represents a weighted

average of all positions reviewed) below the market median.

Exhibit 2

Summary of Kentucky American Water Target Total Remuneration vs. Market Median (Mid-West Regional Market Perspective)			
Base Pay	**Target Total Cash Compensation**	**Target Total Direct Compensation**	**Target Total Remuneration**
-10%	-11%	-11%	-8%

Q. What would be the impact on the competitiveness of Kentucky American Water's total remuneration program if short-term and long-term variable compensation were not part of that compensation program?

A. If we compare Kentucky American Water's compensation program excluding variable compensation (that is, base salary and benefits alone) to market pay levels that include variable compensation, Kentucky American Water's total remuneration would not be competitive because it would fall 17% below median from a national perspective, and 13% below median from a Midwest regional market perspective, as reported in Exhibits 3 and 4.

Exhibit 3

Summary of Kentucky American Water Base Salary (excludes variable compensation) vs. Market Median Total Remuneration (National Market Perspective)			
Base Pay	**Target Total Cash Compensation**	**Target Total Direct Compensation**	**Target Total Remuneration**
-13%	-20%	-20%	-17%

Exhibit 4

Summary of Kentucky American Water Base Salary (excludes variable compensation) vs. Market Median Total Remuneration (Mid-West Regional Market Perspective)			
Base Pay	**Target Total Cash Compensation**	**Target Total Direct Compensation**	**Target Total Remuneration**

-10%	-17%	-17%	-13%

Q. In your opinion and based on the results of the study, are Kentucky American Water employees overcompensated?

A. No. Kentucky American Water employees are generally within or below the typical range (+/- 10%) of market median for each element of total remuneration.

V. Summary of Willis Towers Watson's Short-Term Variable Program Assessment

Q. Did you conduct an assessment of American Water's short-term variable compensation program?

A) Yes.

Q. What was the purpose of this assessment?

A) This assessment was completed to compare the design of American Water's short-term variable compensation program (that is applicable to Kentucky American Water) and its various elements to market practice.

Q. What were the findings of the assessment?

A. Overall our review indicates that American Water's short-term variable compensation program is comparable to and competitive with designs of utility peers, based on a review of the Large Utility Peer Group and Small Utility Peer Group referenced earlier. Like American Water, practically every company reviewed has a short-term variable compensation program that is used to help attract, motivate and retain critically skilled employees needed to successfully run the business. Companies design their short-term variable compensation programs to align with their business strategies and circumstances, so there tends to be a range of practices regarding how the programs are designed.

American Water's short-term variable compensation program assesses performance using a balanced scorecard approach, incorporating financial, safety, customer

satisfaction, environmental, and operational efficiency metrics to determine a corporate funding pool. American Water's program requires the achievement of at least 90% of target earnings per share performance (EPS) to ensure the financial viability of the plan before any short-term variable compensation payment can be made to any participant. It has very little impact on employee behavior since American Water has consistently achieved the financial viability threshold over the past decade.

American Water's short-term program design is within the range of market practice for utilities. Specific details regarding our assessment are included in **Exhibit RVM-1**.

VI. Summary of Willis Towers Watson's Long-Term Variable Program Assessment

Q. Did you conduct an assessment of American Water's long-term variable compensation program?

A) Yes.

Q. What was the purpose of this assessment?

A) This assessment was completed to compare the design of American Water's long-term variable compensation program (that is applicable to Kentucky American Water) and its various elements to market practice.

Q. What were the findings of the assessment?

A. Overall, our review indicates that American Water's long-term variable compensation program is comparable to and competitive with designs of utility peers, based on a review of the Large Utility Peer Group and Small Utility Peer Group referenced earlier. Like American Water, every company in both the Large Utility Peer Group and Small Utility Peer Group has a long-term variable compensation program that is used to help attract, motivate and retain key senior level employees needed to successfully run the business. Companies design their long-term variable compensation programs to align with their business strategies and circumstances, so there tends to be a range of practices regarding how the programs are designed. American Water's long-term

variable compensation program design is within the range of market practice for utilities. Specific details regarding our assessment are included in **Exhibit RVM-1**.

VII. Overall Findings

Q. What are the conclusions of your analysis?

A) Overall, our analysis indicates that Kentucky American Water's total remuneration programs are comparable to and competitive with market practices of other similarly-sized utilities and are therefore reasonable. Kentucky American Water, like all the companies it competes with for talent, has to provide a competitive total remuneration opportunity delivered via programs that benefit employees, customers and shareholders. Kentucky American Water attempts to achieve this goal with its balanced and competitive base salary, short-term and long-term variable compensation programs and benefits. My experience working with both utilities and general industry companies and the results of this study included as **Exhibit RVM-1** indicate the programs at Kentucky American Water are within a broad range of market norms and are not excessive in design or level of pay.

Q. Does this conclude your testimony?

A) Yes, it does.

VERIFICATION

STATE OF MARYLAND)
(RR))
~~**MONTGOMERY**~~ **COUNTY**)
FREDERICK

SS:

The undersigned, **Robert V. Mustich**, being duly sworn, deposes and says he is the Managing Director and Rewards Line of Business Leader, East Region for Willis Towers Watson, that he has personal knowledge of the matters set forth in the foregoing testimony, and the answers contained therein are true and correct to the best of his information, knowledge, and belief.

ROBERT V. MUSTICH

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 19 day of November, 2018.

RAQUEL E UMANA
NOTARY PUBLIC
FREDERICK COUNTY, MARYLAND
MY COMMISSION EXPIRES JUNE 29, 2021

Notary Public (SEAL)

My Commission Expires:
06/29/2021

EXHIBIT RVM-1 TO KAW_DT_RVM_112818
FILED UNDER SEAL PURSUANT TO THE PETITION FOR CONFIDENTIAL TREATMENT FILED ON NOVEMBER 28, 2018

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF:	**)**	
	)	
THE APPLICATION OF KENTUCKY-AMERICAN WATER COMPANY FOR AN ADJUSTMENT OF RATES	**)**	**CASE NO. 2018-00358**

DIRECT TESTIMONY OF BRENT E. O'NEILL, P.E.

November 28, 2018

Q. Please state your name and business address.

A. My name is Brent E. O'Neill and my business address is 2300 Richmond Road, Lexington, Kentucky 40502.

Q. By whom are you employed and in what capacity?

A. I am employed by the American Water Works Service Company, Inc. ("Service Company") as Director of Engineering for, Kentucky-American Water Company ("KAWC" or "Company") and Tennessee-American Water Company ("TAWC").

Q. Have you previously filed testimony before this commission?

A. Yes. I have provided written testimony in Case No. 2015-00418, which was KAWC's most recent rate case. I also provided written testimony in Case No. 2017-00313, the Application of Kentucky-American Water Company for a Qualified Infrastructure Program Rider and Case No. 2014-00258, the Application of Kentucky-American Water Company for a Certificate of Convenience and Necessity Authorizing the Construction of Richmond Road Station Filter Building Improvements.

Q. Please state your educational and professional background.

A. I received a B.S. degree in Civil Engineering from the University of Illinois in Urbana, Illinois in 1991. I completed a Masters of Business Administration from Eastern Illinois University in Charleston, Illinois in 2002. I am a registered Professional Engineer in the State of Illinois, State of Iowa, State of Tennessee, and Commonwealth of Kentucky.

I have been employed by American Water Works Company, Inc. ("AWW") or one of its subsidiaries since 1996. I began as a Staff Engineer for Northern Illinois Water Company until 1999 when I was promoted to Engineering Manager for Illinois-American Water Company ("ILAWC"). In July 2004, I accepted the position of Network

Operations Manager for the Champaign County District of ILAWC. In June 2005, I accepted the position of Senior Asset Manager with AWW and worked in Reading, England in a joint project with Thames Water. In 2006, I became the ILAWC Project Manager for the construction of a new 15 million gallons per day ("MGD") ground water softening treatment plant, wells, and transmission main in Champaign, Illinois. In March 2008, I became the Engineering Manager – Capital Delivery with ILAWC with responsibilities for the delivery of capital projects for the Central and Southern portions of Illinois. In April 2013, I accepted my current position as Director of Engineering for KAWC and TAWC with the Service Company. I currently serve on the Commonwealth of Kentucky Geographic Information Advisory Council. I am an active member of the American Water Works Association ("AWWA") and American Society of Civil Engineers ("ASCE").

Q. What are your duties as director of engineering?

A. I am responsible for the coordination of the Engineering Departments for both KAWC and TAWC, which includes the planning, development, and implementation of all aspects of construction projects. This includes new main extensions and working with developers, replacement mains, water treatment plant upgrades, new construction and network facilities improvements. I coordinate technical assistance to all other Company departments as needed and oversee the capital budget development and implementation. I report to the Presidents of KAWC and TAWC.

Q. What will you be addressing in your testimony?

A. My testimony will discuss the capital investment planning process, explain the reasons for the construction projects, discuss the Company's request for an alternative investment

replacement rider, describe the calculation of tap fees as submitted in the case, and discuss the risks associated with furnishing public water service.

CAPITAL INVESTMENT PLANNING PROCESS

Q. Please describe the Company's capital investment planning process.

A. KAWC conducts planning studies that forecast improvement projects and prioritize those projects within the study area. These planning studies provides a forward looking review of the needs of the system and the infrastructure to allow the Company to continue to operate safely, efficiently and meet current and future regulations. KAWC uses the Comprehensive Planning Study ("CPS"), which evaluates the distribution system, storage facilities and production capacities as an important piece of planning for construction processes. The study identifies projects for construction over a fifteen-year planning horizon, with immediate needs identified for construction within five years. KAWC's most recent formal study was completed in 2013 and was filed with the Kentucky Public Service Commission. Construction project needs that arise between CPS cycles are evaluated, developed, and estimated to the same degree as a CPS project prior to being considered and placed within the portfolio of planned projects. The Engineering group works with the Vice President Operations, Operations Superintendents and Operations Supervisors to prioritize these emerging projects and compare them against projects that were identified in the CPS. All capital investment programs and projects are then prioritized within an overall strategic planning process, utilizing drivers associated with various asset investment strategies (such as regulatory compliance, capacity, customer satisfaction, etc.), to formulate a three-year Strategic Capital Expenditure Plan ("SCEP"), a copy of which is attached as KAW_DT_ONeill_Exhibit_1. More detailed design

engineering is conducted, and implementation plans are developed for those projects that are contained in the SCEP. The Company's annual capital construction plan is based upon projects and programs contained in the SCEP. On an annual basis, main replacement projects are prioritized on a state-wide basis. Numerous factors are considered when determining funding allocations for infrastructure investment, such as current and future service needs, assessments of the physical condition of existing plant, economic and risk factors, performance characteristics, regulatory compliance, and the potential to coordinate with municipalities and other utilities in joint improvement projects.

Q. Please describe the general project categories in the Company's capital investment plan.

A. The Company's capital investment plan can be divided into two distinct areas: 1) Recurring Projects and 2) Major projects identified as Investment Projects. Typically, major projects are those having a Company investment of $250,000 or greater.

Q. Please describe the recurring projects that are included within the Company's capital investment plan.

A. Normal recurring construction includes water main installation for new development, smaller main projects for reinforcement and replacement, service line and meter setting installation, meter purchases, projects to replace and maintain treatment equipment and the purchase of tools, furniture, equipment and vehicles.

Q. Please describe the factors used in the preparation of the forecast period as it relates to the recurring projects that are included within the Company's capital investment plan.

A. Recurring construction project costs are trended from historical and forecasted data. Estimates are prepared for the installation of new mains and service lines, meter settings, and the purchase of new meters based on preliminary plats from the appropriate governmental planning agencies and consultations with developers, homebuilders and engineering firms.

The purchase of tools, furniture, equipment and vehicles are based on requirements. KAWC reviews each item independently and prepares an itemized list of expenditures. Estimates are made based on current year pricing.

These investments will enable KAWC to continue to provide safe, adequate and reliable service to its customers to meet their domestic, commercial and industrial needs, provide flows adequate for fire protection, and satisfy all regulatory requirements. The criteria for evaluating the priority of the recurring projects are: engineering requirements; consideration of national, state and local trends; environmental impact evaluations; and water resource management.

KAWC uses engineering criteria based on accepted engineering standards and practices that provide adequate capacity and appropriate levels of reliability to satisfy residential, commercial, industrial, and public authority needs, and provide flows for fire protection. The criteria are developed from regulations, professional standards and KAWC engineering policies and procedures.

Pipelines are designed to meet two conditions of service. They are expected to deliver projected peak hour customer demands while maintaining system pressures at 30 psi or greater in accordance with the Public Service Commission ("PSC") regulations, and to provide adequate fire flow identified by the Insurance Service Office Fire Ratings while maintaining distribution system pressure at 20 psi or greater.

Q. Please describe how investment projects are included within the Company's capital investment plan.

A. Investment Projects are typically projects greater than $250,000 that the Company describes as major projects. These projects represent investments made to meet environmental or water quality regulations, infrastructure capacity expansion or rehabilitation. These projects allow the Company to meet the service demands of the community, ensure regulatory compliance and reduce asset failure.

This determination whether to include an Investment Project within the investment plan starts with the development of the anticipated demand projections of the system, the identification of improvements needed to meet those demands and the adoption of strategies designed to bring about the correct prioritization and distribution of capital spending for the various requirements of the business. Specific capital planning requirements are addressed in both the short term (one year) and the longer term (five years). Projects are prioritized using objective criteria that validate the need for a project and assess the risk of not doing the project. A key aspect of this planning technique is that it is flexible and can be adjusted as needed to address new priorities, such as unplanned equipment failures, large or sudden growth of a service area, or new regulatory requirements. KAWC develops a proposed capital budget, which it then

shares with the Service Company for review. Although the Service Company may make suggestions, KAWC ultimately determines its budget. This process is the basis for the capital expenditures reflected in the Company's Capital Investment Plan.

Q. Does KAWC focus on control of capital expenditure costs in its normal day-to-day activities?

A. Yes. All significant construction work performed by independent contractors and significant purchases are completed pursuant to a bid solicitation process. We maintain a list of qualified bidders, and we believe that our construction costs are very reasonable. The Service Company annually takes competitive bids for material and supplies that are either manufactured or distributed regionally and nationally through its centralized procurement group. We have the advantage of being able to purchase these materials and supplies on an as-needed basis at favorable prices. In the past ten years, the Service Company also has undertaken procurement initiatives for services and materials to reduce costs through either streamlined selection or utilization of large volume purchasing power. Among the initiatives that have directly impacted capital expenditures include the use of master services agreements with pre-qualified engineering consultants, national vehicle fleet procurement, and national preferred vendor identification.

Q. How does KAWC manage its implementation of its capital investment plan?

A. The capital investment management process provides for formal approvals and consistent controls that optimize the effectiveness of asset investment and ensures that capital investment meets the Company's strategic goals. The process includes a regional Capital Investment Management Committee ("CIMC") to ensure capital expenditure plans meet the strategic goals of the business, which includes introducing new technologies that

result in efficiencies. In turn, this ensures that capital expenditure plans are integrated with operating expense plans and provides more effective controls on budgets and individual capital projects.

The CIMC includes KAWC's President, Vice President of Operations, Director of Engineering and Financial Lead. The CIMC meets monthly to review capital expenditures compared to budgeted levels and provides oversight on Investment Projects. The process includes five stages of project review: 1) a Preliminary Need Identification defining the project at an early stage; 2) a Project Implementation Proposal that confirms all aspects of the project are in a position to begin work; 3) Project Change Requests, if needed (if the cost changes more than 5% or $100,000); 4) a Post Project Review; and 5) Asset Management. KAWC handles each stage, with oversight by the CIMC. All projects, including normal recurring items, have an identified project manager responsible for managing the stages of the project and oversight of the project spending. The focus of the CIMC has allowed KAWC to be more flexible with changes that inevitably occur during the course of implementing large construction projects. KAWC made tremendous progress in its delivery of capital expenditures over the last ten years as to schedules, budgets, and quality of delivery.

As an added level of coordination, the Capital Administrator holds monthly meetings with the appropriate distribution and operations supervisors, water quality managers and project managers to discuss ongoing projects and emerging trends. The purpose of these discussions is to review projects that are moving forward to the next step of approval, or that require a change. This allows the project manager and operational area supervisors

to communicate monthly about the project and helps coordinate projects from initial development through in-service.

The CIMC meetings help KAWC deliver its capital plan on schedule and within budget.

Q. Please describe the Company's recent performance with respect to its capital investment plan.

A. KAWC has delivered its capital investment plan within 1.43% of the budget cumulatively over the past six years. Capital investment budgets, actual capital investment deliveries, and variances to budgets by year are shown in the table below

KAWC Net Capital Investment Budget vs Actual Capex for 2012 through 2017				
(Does not include Centrally Sponsored Projects)				
Year	Budget	Actual	Variance	
2012	$19,574,649	$17,982,728	($1,591,921)	-8.10%
2013	$23,746,110	$25,963,291	$2,217,181	9.30%
2014	$18,882,745	$18,585,688	($297,057)	-1.60%
2015*	$30,354,368	$30,751,906	$397,538	1.31%
2016**	$22,987,514	$23,110,940	$123,426	0.54%
2017	$23,619,450	$24,757,070	$1,137,620	4.82%
Cumulative	$139,164,836	$141,151,623	$1,986,787	1.43%

* An additional $5,066,000 was authorized and added to the capital budget

** An additional $3,500,000 was authorized and added to the capital budget

Q. Please explain the types of projects included in the capital plan that are considered recurring projects.

A. A brief description of the projects listed in the SCEP (KAW_DT_ONeill_Exhibit_1) follows.

Item DV (Projects Funded by Others) - This investment plan item is for the installation of new mains, valves, hydrants, and fire service connections that are funded entirely by others. This investment plan item may also include the replacement of existing components of water supply, water treatment, water pumping, water storage, and water pressure regulation facilities not funded by company expenditures. The majority of these expenditures are funded through deposit agreements and as non-refundable contributions. The projected expenditure amount is developed through discussions with home builders and developers as well as a review of plats.

Item A - This investment plan item is for new water mains, valves, and other appurtenances that are funded by the Company, including upsizing of developer initiated extensions; Company initiated and funded new mains that are not related to immediate growth, such as new mains that eliminate existing dead ends or provide new transmission capacity; and new customer - initiated extensions in accordance with tariffs that may include some customer contribution. This item may also include new mains that parallel existing mains to increase transmission capacity, provide reliability, or establish an additional pressure gradient.

Item B - This investment plan item is for the scheduled replacement, renewal or improvement of existing water mains including valves and other appurtenances.

Item C - This investment plan item is for the unscheduled replacement or restoration of existing water mains, including valves and other appurtenances. This item is primarily used for emergency replacements.

Item D - This investment plan item is for the relocation of existing water mains, including valves and other appurtenances, as required by municipal or state agencies.

This investment line item now includes replacement of services in conjunction with these projects, which was previously budgeted in the cost of service replacements. These costs are not reimbursable.

Item E - This investment plan item is for the installation of new hydrants, including hydrant assemblies and valves that are installed on existing mains or installed in conjunction with main extension projects, which are Company funded. This item generally includes all public hydrants.

Item F - This investment plan item is for the replacement of leaking, failed or obsolete hydrants, including hydrant assemblies and valves that are Company funded.

Item G - This investment plan item is for the installation of new water services or improvements, including corporation stops and shut-off valves.

Item H - This investment plan item is for the replacement of water services or improvements, including the replacement of corporation stops, or shut-off valves.

Item I - This investment plan item is for the installation of new meters and meter settings.

Item J - This investment plan item is for the replacement or improvement of existing customer meters and meter settings with or without technology changes.

Item K - This investment plan item is for the replacement of existing Information Technology System Equipment and systems due to failure or obsolescence and new items to achieve efficiency or address new requirements.

Item L - This investment item is for the installation or replacement of existing SCADA Equipment and Systems. The acronym SCADA can be defined in several slightly different ways, but KAWC generally defines it as System Control and Data Acquisition,

which is the computerized system for monitoring and operating the treatment plants and network facilities. We address these important investment costs separately from general Information Technology System Equipment costs.

Item M - This investment item is a division for Security Equipment and Systems. This may include fencing, alarm systems, cameras, barricades, electronic detection or locking systems, software, or other assets related directly to security.

Item N - This investment plan item is for the replacement or improvement of building systems, equipment or furnishings for offices and operations centers, including copy machines, and communication systems other than computers.

Item 0 - This investment plan item is for replacement of vehicles, including utility trucks, cars and light and medium trucks and accessories.

Item P - This investment plan item is for the replacement or purchase of construction, shop, garage, meter reading, and storeroom equipment.

Item Q - This investment plan item is for the new purchase or replacement of existing components of water supply, treatment, pumping, storage, and pressure regulation facilities, including associated building components and equipment. Replacements may be planned or made because of failure, or may include improvements. This item also includes laboratory equipment and replacement of filter media used in the treatment process if capitalized.

Item S - This investment item is for preliminary engineering studies primarily used for planning purposes. At the initiation of a project, these capital dollars are transferred to the appropriate construction project.

Q. Please describe some of the investments in the system made during 2017 and 2018.

A. Investments in the system made during parts of 2017 and 2018 include the following:

I12-020021 Jacobson – Hays Booster Station ($1,478,377) – This project created a new pressure zone within of the Hays/Andover/Winchester areas of the Lexington Central System. The new pressure zone allows for the improvement of system pressure by approximately 25 psi for roughly 10,000 customers within the southeastern portion of the system, where the system continues to experience growth. The creation of the zone and improvement of available water pressure position the system in this area to continue to provide adequate service as the growth continues. The project was placed in service during June 2017.

I12-020064 Kentucky River Station 1 High Service Pumps No. 12 and 14 Replacement ($1,517,260) – The project replaced high service pump 14 with a new high efficiency vertical turbine pump and repurposed the existing vertical turbine pump to replace high service pump 12. This work continued KAWC's selective replacement of high service pumps at Kentucky River Station 1 to improve both the operational and energy efficiency of the facility's high service pumps as recommended by the Hydraulic Efficiency Study that was commissioned by KAWC in 2016. The update of high service pump 14 included the installation of a new 95% efficient motor paired with a variable frequency drive that controls the new vertical turbine pump. The update of pump 14 allows the facility to better match flows with system demand and improves the efficiency

of the high service pumps to utilize power. The project was placed in service during August 2018.

I12-020069 Kentucky River Station Valve House 4 Rehabilitation ($1,050,546) – This project is the third phase of the renovation and rehabilitation of the Kentucky River Station Valve Houses. Renovations to Valve House 4 included the installation of new valves and actuators; improvement of access to piping and valves; relocation of electrical panels, boxes and SCADA; and improved safety for future maintenance work within the valve house. The renovations placed all of the operations of valves, actuators and water quality analyzers onto a single operating floor, eliminating the need of operators and maintenance personnel to climb up and down ladders and work in confined spaces. This renovation reduced the hazards of potential falls and improved access to equipment to allow for maintenance to be carried out without ladders and impact of a congested work environment.

I12-020086 Richmond Road Station WTP Sedimentation Basin Improvement ($1,410,171) – This project replaced the sedimentation basin weirs with a submerged weir system. This work improved the hydraulics and water quality for the Richmond Road Station facility. The submerged weir system reduced the amount of floating debris getting onto the filters and improved the performance of the sedimentation basin to provide optimal operation of the filters. The improvements also improved the hydraulic capabilities of the basins and ensured proper water levels during high demand periods for the facility. The project was placed in service during December 2017.

Q. Please explain the major projects proposed during 2019 and 2020.

A. The major capital projects that are designated as Investments Projects that are planned for completion during 2019 and 2020 are as follows:

I12-020037 Kentucky River Station Chemical Storage and Feed Improvements ($8,500,001) – This project incorporates several components of chemical storage and delivery to enhance the robustness and reliability of Kentucky River Station (KRS I) operations by minimizing the risk of plant shutdown due to insufficient chemical storage and feed. A major component of the project is the transition from chlorine gas and anhydrous ammonia to the safer liquid sodium hypochlorite and aqueous ammonia. The project is currently under design and expected to enter construction during 2019 and to be placed in service by March 2020.

I12-020055 New Circle Road Phase 2 ($1,000,001) – This project includes the relocation of approximately 1,300 lineal feet of 20 inch water main and 1,500 lineal feet of 12 inch water main in response to the Kentucky Department of Transportation's widening of New Circle Road to increase safety and improve the flow of traffic. The project is located along New Circle Road between Georgetown Road and Boardwalk Avenue in Lexington. It is expected the project will be placed in service by August 2019 in conjunction with Kentucky Department of Transportation's widening project schedule.

I12-020067 Richmond Road Station Chemical Facility Upgrade ($10,500,001) – This project incorporates several components of chemical storage and delivery to enhance the robustness and reliability of Richmond Road Station (RRS)

operations by minimizing the risk of plant shutdown due to insufficient chemical storage and feed. A major component of the project is the transition from chlorine gas and anhydrous ammonia to the safer liquid sodium hypochlorite and aqueous ammonia. The project will combine all of the chemicals used for the treatment of water at RRS, allowing for the consolidated storage and management of chemicals, which will lead to improved safety and efficiency for the operation of RRS. The project is currently under design and expected to enter construction during the end of 2018 and to be placed in service by July 2019.

I12-020074 Athens Boonesboro Main Extension – Phase II ($1,850,000) - This project will complete water system improvements along Athens-Boonesboro Road in Fayette County and make various improvements in Clark County to allow for the connection of KAWC customers to the Company's Central Service Area. The water main extension will occur along Athens-Boonesboro, Quisenberry, Waterworks, Old Stone Church and Combs Ferry roads and allow the Company to eliminate the use of purchased water for the customers in the area of the project and allow them to be served by KAWC's three water treatment facilities. The project will also enhance water pressures and water quality for customers in the area. The project is currently under construction and is expected to be placed in service by July 2019.

I12-020076 KRS1 Replace Incline Car ($1,500,007) - This project will replace the existing incline car at the KRS 1 that was installed in 1956. The incline car is the main means for operators and maintenance personnel to gain access the KRS 1 low service intake pumps and structure. The project will replace the existing

incline car with a new installation that will address safety concerns and increase the capacity for moving personnel and equipment to the low service intake pumps and structure. The project is expected to start construction during the early part of 2019 and be placed in service by September 2019.

I12-020079 Jacobson Reservoir Pump Station Improvements ($2,000,001) This project will include the construction of a powder-activated carbon storage and feed system at the Jacobson Reservoir. Currently the Jacobson Pump Station provides source water from Reservoir 4 to Richmond Road Station, where the raw water is treated for taste and odor through a bag feed system. The construction of the powder-activated carbon feed system at the Jacobson Reservoir will allow operations staff to feed appropriate amounts of powder-activated carbon and treat taste and odor in an efficient manner. The project is expected to be in service by June 2019.

I12-020094 Cox Street Booster ($1,000,000) – This project will replace the existing below-grade booster pump station with an at-grade pump station. The project will include review of the pumping requirements for the pump station, which supports both the 1 MG ground storage tank and the 1 MG elevated storage tank at Cox Street. The project will address safety concerns and enhance the reliability and efficiency of the pump station. This project is expected to be placed in service by December 2019.

I12-020095 Mercer Road Booster Station ($1,000,000) – This project will replace the existing below-grade booster pump station with an at-grade pump station. The project will include review of the pumping requirements for the

pump station, which supports the 2 MG elevated storage tank at Mercer Road. The project will address safety concerns and enhance the reliability and efficiency of the pump station. This project is expected to be placed in service by March 2020.

I12-020099 Kentucky River Station 1 High Service Pumps No. 13 Replacement ($1,517,260) – The project will replace high service pump 13 with a new high efficiency vertical turbine pump. This will enhance the ability of the KRS1 facility to match flows with system demand and improves the efficiency of the high service pumps to utilize power. The project is expected to be placed in service by June 2019.

I12-300008 Owenton Maintenance Garage ($1,400,000) – This project will provide for the construction of a new, 9,900 square-foot maintenance garage to support the field crews for the Northern Division. The building will contain nearly 6,600 square feet of garage space to allow for climate-controlled storage of all of the division's equipment as well as its perishable material. The maintenance garage building will also contain nearly 3,400 square feet of support area for restroom and shower facilities, a break room and areas for support and supervisorial personnel. The garage will occupy 0.23 acres of the 4-acre site, allowing for the centralized storage of large material and equipment, consolidation of staff and the ability to accept deliveries of material in a safer, more organized manner. The project is expected to be placed in service in the first quarter of 2020.

Q. What is the main reason for the chemical improvement projects at Richmond Road Station and Kentucky River Station 1?

A. KAWC currently utilizes chlorine gas for pre- and post-chlorination to meet the regulatory requirements for drinking water. The proposed project will replace the chlorine gas with sodium hypochlorite, also referred to as liquid bleach. The sodium hypochlorite is delivered in bulk liquid form and requires a bulk storage tank and day tank. It is safer to transport and store than gaseous chlorine due to its dilute, liquid form. It is not under pressure and therefore the storage tank does not have the same potential to rupture as do chlorine gas vessels.

Q. What additional gas is being removed during the chemical improvement projects at Richmond Road Station and Kentucky River Station 1?

A. KAWC currently utilizes anhydrous ammonia gas in conjunction with post chlorination to create chloramines as the main disinfectant to meet the regulatory requirements for drinking water. Like chlorine gas, anhydrous ammonia poses a safety risk, which is increased in the Company's urban setting described above. The proposed project will replace the anhydrous ammonia gas with aqua ammonia. The aqua ammonia is delivered in bulk liquid form and requires a bulk storage tank and day tank. It is safer to transport and store than gaseous anhydrous ammonia due to its dilute, liquid form. It is not typically under pressure and therefore does not have the same potential to rupture as anhydrous ammonia gas storage vessels. By removing both chlorine gas and anhydrous ammonia, the project will eliminate all toxic gas from the Richmond Road Station and Kentucky River Station.

Q. What else will the chemical improvement projects at Richmond Road Station and Kentucky River Station 1 address?

A. The Chemical Improvement Projects will address additional safety and operational issues at both Richmond Road Station and Kentucky River Station 1. At each location, the use of caustic soda will be replaced with liquid lime. This will eliminate the presence of a corrosive chemical that is a danger to the operations staff. The project will simplify operations, enhance security of chemical deliveries and stored chemicals, and enhance operational redundancy at both locations.

Q. Will the changes in chemicals have an impact on the water quality of the facilities?

A. No. The transition from the gaseous chlorine and anhydrous ammonia to sodium hypochlorite and aqua ammonia will not have an impact on the water quality at either facility. The use of both sodium hypochlorite and aqua ammonia are recognized as an industry standard and allows KAWC to maintain its ability to meet and usually exceed the water quality regulations of the Kentucky Department of Water. The transition from caustic soda to liquid lime will not impact the ability of the facilities to adjust pH and meet the water quality regulations of the Kentucky Department of Water.

Q. What effect will the change in chemicals have on chemical usage for the facilities?

A. Both Richmond Road Station and Kentucky River Station 1 will see an increase in the cost of chemicals used to meet the regulatory requirements for drinking water. Sodium hypochlorite, aqua ammonia, and liquid lime cost more than the chemicals that they are replacing. The move to aqua ammonia is expected to be about a 13 percent increase, while the move to liquid lime is expected to result in an increase of 100 percent. The largest impact to the cost of chemicals used will be the replacement of chlorine gas to

sodium hypochlorite. KAWC expects that the move to sodium hypochlorite will result in a 700 percent increase in the cost of chemicals used to meet the regulatory requirements.

QUALIFIED INFRASTRUCTURE PROGRAM

Q. What is the critical infrastructure issue facing KAWC?

A. Utilities, customers, and regulators across the country are facing the reality of infrastructure nearing the end of its useful life, especially buried pipes. Over the past 20 years, several studies have been published[1] that have documented the pending financial investments that the water and wastewater industries face based on the anticipated service life of the original mains. The preeminent reports are, "Dawn of the Replacement Era," and "Buried No Longer: Confronting America's Infrastructure Challenge," both published by AWWA.[2]

Q. Why is infrastructure replacement such an important issue?

A. In the summary of the "Buried No Longer" study, AWWA indicates that "the United States is reaching a crossroads and faces a difficult choice. We can incur the haphazard and growing costs of living with aging and failing drinking water infrastructure. Or, we can carefully prioritize and undertake drinking water infrastructure renewal investments to ensure that our water utilities can continue to reliably and cost-effectively support the public health, safety, and economic vitality of our communities."[3] The Qualified Infrastructure Program ("QIP") tariff KAWC is proposing in this case supports the careful prioritization and undertaking that AWWA recommends.

[1] E.g., Studies by American Water Works Association, the Water Research Foundation ("WRF"), the American Society of Civil Engineers, and the US Environmental Protection Agency.

[2] AWWA, 2001. *Dawn of the Replacement Era: Reinvesting in Drinking Water Infrastructure.* AWWA, Denver. www.scribd.com/document/39675402/AWWA-Dawn-of-the-Replacement-Era.

[3] AWWA, 2012. *Buried No Longer: Confronting America's Water Infrastructure Challenge.* AWWA, Denver. www.awwa.org/Portals/0/files/legreg/documents/BuriedNoLonger.pdf.

Q. How did AWWA determine the importance of addressing the current state of water and wastewater infrastructure?

A. AWWA has performed significant research on the issue of infrastructure replacement and published the two landmark studies. "Dawn of the Replacement Era" (May 2001) drew attention to the issue by benchmarking 20 utility systems from across the United States (Louisville Water, Cincinnati Water Works and West Virginia American Water were 3 of the 20 systems). This study looked at the factors that impacted infrastructure replacement as well as the financial impacts of the infrastructure that was constructed in waves and will fail in waves. The study developed "Nessie Curves" that illustrated the pending financial liabilities that the industry faced based on the anticipated service life of the original main. The Nessie Curve, so called because the graph follows an outline this is likened to a silhouette of the Loch Ness Monster, provided a visual representation of the capital needs during a defined time frame to rebuild the underground infrastructure of the 20 systems.

Ultimately, "Dawn of the Replacement Era" served as the initial call to action that our generation would need to rebuild the infrastructure that was built and provided to us by the previous generations. In the follow-up study "Buried No Longer" (2012), AWWA expanded on the previous study and took a detailed look at the distribution network and the factors that lead to failure. The study took a closer look at how demographics, material types, regions, and other factors affect the current system conditions that each utility faces. The study was nationwide in scope and was clear that each utility needed to determine their own needs based on the criteria provided in the study, but provided a

tremendous amount of data and understanding of the factors affecting the infrastructure that was not available prior to the study.

The "Buried No Longer" study provided important findings regarding the water infrastructure including:

- The Needs Are Large – investment needs for buried drinking water infrastructure total more than $1 trillion over the next 25 years;
- Household Water Bills Will Go Up – The level of the rate increases will depend on each system's composition, demographics and needs but significant increases should be expected to maintain the current level of service;
- There Are Important Regional Differences – The needs of infrastructure replacement affect different regions in different ways. Population growth in a community or population shift from one region to another along with the composition and configuration of a systems network are variables that impact each region and utility differently. In growing systems, new lines must be balanced with replacements to assure continuity of service. However, in declining population areas, the aging infrastructure still needs to be replaced even though there are fewer customers to support the effort;
- There are Important Differences Based on System Size - Small systems face different variables than larger systems but the overall impact to both is considerable;

- The Costs Keep Coming – based on the Nessie Curves, it should be expected that buried infrastructure replacement needs will continue to increase for the coming decades; and
- Postponing the Problem Only Makes It Worse – not making investments now only steepens the slope of investment required later as more distribution lines exceed their life expectancy, increasing leaks and breaks and eventually reducing the level of service to customer.

Q. What asset categories are included in the Company's requested QIP?

A. The Company's proposed QIP includes replacement of certain water distribution system assets that include approximately 2,038 miles of pipe ranging in sizes from 1.5 to 42 inches 22 water storage tanks, 15,970 main line valves, 8,029 public hydrants, and 18 distribution pump stations. The Company's proposed QIP also includes replacement of distribution system structures and improvements, supply mains, power generation equipment, pumping equipment, transmission and distribution mains, services, meter and meter installations and hydrants. Finally, the Company's proposed QIP includes replacement of aging treatment plant items or facilities, such as pumping equipment, generators, water quality sampling equipment, SCADA equipment, and treatment equipment, to better serve customers. Inclusion of these items would allow the installation of newer, more efficient infrastructure to continue to provide high-quality water service and ultimately lead to a more efficient operation of the system that benefits the customer with reduced costs.

Q. Have you evaluated the condition of KAWC's infrastructure?

A. Yes. Over the past several years, the Company completed a multiple method review of its pipeline asset replacement needs. The Company began its review with the recently published AWWA software analytics tool named "Buried No Longer Pipe Replacement Modeling Tool." The software uses system-specific pipe asset characteristics of pipe material type, decade of pipe installation, and pipe diameter to develop a multi-decade projection of pipe asset replacement needs. The model uses pipe failure probability distributions based on past research with typical pipe conditions at different ages and sizes coupled with the indicative costs to replace each size and type of pipe, as well as the cost to repair the projected number of pipe breaks over time. The model projects the "typical" useful service life of the infrastructure based on pipe inventories of the system and estimates how much pipe of each type should be replaced in each of the coming 40 years.

Kentucky American Water utilized the model to provide an insight into the replacement rate suggested during the 40 year planning horizon and the model indicated that pipe replacement needs for KAWC averaged 15 miles per year during the planning horizon. This translates to a projected annual replacement rate of 1.2%. The model shows that cast iron main is the material that needs to be replaced initially, followed by asbestos cement. During the 40 year period planning horizon, the model projects that during the first 20 years approximately $6 to $8 million each year is needed for cast iron main replacement declining to $3 million each year during the final 20 years for a total spend of $240 million on cast iron main replacement. At the same time, the model suggests that asbestos cement main be replaced at a rate of $3 to $7 million during the 40 year period.

The Company further enhanced its analysis by conducting additional review of its distribution system and producing the "Aging Infrastructure; A Review of the Water Distribution System" report, that is attached as Exhibit 2 ("KAWC Report").[4] The report conducted a review of the pipe infrastructure by reviewing such characteristics of the system as installation periods, expected life of pipe material, main break history, non-revenue water and current replacement efforts.

As discussed further below, KAWC's efforts have revealed critical information that will allow the Company to prioritize necessary replacements. KAWC has detailed plans for the types of projects that will constitute the majority of the work performed under the first years of the QIP Rider, realizing that the Company's distribution system is not static, and adjustments will likely occur as actual system conditions evolve.

Q. Does KAWC control when, and which, mains in the distribution system are replaced?

A. Frequently, no. While KAWC can target segments of its distribution system for replacement due to the age of the facilities or the type of material involved, replacements are often driven by main breaks, infrastructure relocation, and municipality paving programs.

Q. Please explain what you mean by "infrastructure relocation."

A. Most of KAWC's buried infrastructure is located within public rights-of-way. The governmental entities in control of these rights-of-way, such as the Kentucky Transportation Cabinet, various municipal governments, county highway departments, etc. require KAWC to relocate its water infrastructure to accommodate projects such as

[4] The original KAWC report was published in 2015. The report has been updated in 2017 and 2018 to account for improvements carried out in 2016 and 2017 and for improved data being utilized by the GIS maps.

road widening, sewer installation, storm drainage improvements, traffic signals, streetscapes, etc. Because the timing of these relocations is controlled by the governmental entities and not KAWC, the Company proposes to use the QIP mechanism to provide timely regulatory recognition of these relocation costs.

Q. Is KAWC able to predict when these relocations projects will occur?

A. Often, no. As such, it can be difficult for KAWC to accurately predict, and consequently budget for, the relocation of buried assets necessary to accommodate government projects. The total capital investment for such relocations varies significantly from year to year.

Q. In addition to infrastructure relocations, you also mentioned that KAWC cannot always predict when main breaks will occur. Did the Company's analysis provide key information regarding the types of materials that have an increased susceptibility for breaks?

A. Yes, it did. The Company analyzed main break history from January 2012 to December 2017. During this period the Company experienced 953 main breaks, averaging about 159 breaks per year. Based on the information reviewed by the Company and the data developed for the report, the Company determined that a majority of the mains that are susceptible to breaks are cast iron and galvanized steel. These material types represent 313.5 miles of the distribution system. Review of the reported breaks from January 2012 to December 2017 indicated that main breaks on cast iron main represented 63.2% of all of the breaks. Since cast iron main lined and unlined material only represents 15.3% of the total inventory of mains in the ground, the break rate on this type of material is significantly higher than the other material in the system. The break rate per mile of

main shows that cast iron main had a break rate of 1.9 breaks per mile of main compared to ductile iron, which saw a break rate of 0.06 breaks per mile of main from January 2012 to December 2017. The worst performing material was galvanized steel which had a break rate of 3.13 breaks per mile of main.

Q. What is the current pipeline replacement rate for the Company's distribution system?

A. Since 2009, the Company has replaced 32.4 miles of the system's cast iron main, primarily with ductile iron main. This represents a replacement rate for cast iron main of 2.7 miles per year during the nine year period, including the accelerated rate of 5.4 miles per year over the past four years from 2014 and 2017 or an average replacement rate of 0.3 percent per year. Even at this more recent accelerated replacement rate, it still would take approximately 57.4 years to replace all of the cast iron main in the distribution system and nearly 377 years to replace the entire main in the system. This is not the optimal level of infrastructure investment because our pipes will not last 377 years – they may last 60 to 100 years depending on a type of pipe material, soil conditions, and other factors. So, in order to close this gap, we would need to further accelerate the rate of investment to replace our water infrastructure.

Q. Please elaborate on the gap between the Company's current pipe replacement rate and the replacement rate projected by the Nessie Curves analysis you previously mentioned.

A. The "Nessie" analysis method was developed by the AWWA and is regarded as the best baseline indicator of long-term infrastructure replacement needs. The analysis indicates that depending on the pipe material, soil conditions, and other factors, a realistic pipe life

expectancy is 60 to 100 years. The Nessie analysis provided in KAW_DT_ONeill_Exhibit_2 projects a pipe replacement rate that closely matches the estimated useful life of the respective types of pipe material. The analysis indicates that to keep pace with the aging infrastructure, the replacement rate of KAWC's system will need to be significantly increased from its current level of 0.3% (5.4 miles per year) to as high as 0.9 percent (19 miles per year) by the year 2034. This replacement rate reflects the age and materials utilized in the original construction of the KAWC distribution system and current estimates of how long these materials will last. Because certain site-specific details such as weather conditions, corrosivity of soils, water alkalinity, pH, operating pressure, and installation practices also impact the useful life of the distribution system components, these projections may change over time and should be updated on a periodic basis. The model also provides an estimate of the annual investment necessary to meet the long-term replacement needs of the system. Without question, a significant gap exists between the Company's current pipeline replacement rate of 0.3% and the optimal projected annual pipe replacement rate of 0.9%. To keep pace with the infrastructure replacement needs predicted by the Nessie Curves analysis, average annual expenditures will need to grow to approximately $15.6 million by 2022, and up to more than $18.5 million by 2037 (in 2016 dollars).

Q. What consequences may result from maintaining KAWC's current rate of pipe replacement?

A. Buried pipes are a critical part of the infrastructure used by water utilities to deliver reliable service to customers. In fact, for many water utilities, buried pipes are the largest infrastructure category as a percentage of total infrastructure on an asset cost basis. This

is because pipes are required to extend along every block of every street in every neighborhood throughout the service area to deliver water to each address served.

KAWC will always make the needed investments to maintain or replace infrastructure. In other words, we continue to make necessary investments for adequate sources of supply, treatment, pumping, transmission and distribution facilities, as well as to comply with applicable laws and regulations. But the necessary rate of ongoing infrastructure investment to provide safe and adequate service is not the same as the rate of infrastructure investment that best serves the long term interests of our customers.

To the extent that pipe replacement is deferred into the future, service quality will suffer from an increasing number of pipe breaks and the resulting service disruptions, health risks from potential drinking water contamination, property damage, and opportunity costs related to community health and economic development. Deferral of pipe replacements year by year has a cumulative effect on the future cost to customers for replacing these pipes, leaving future customers with much larger bills and significant rate shocks. The phrase "tidal wave" has been used in AWWA studies on this subject to describe the significant and dramatic increase in replacement costs that will result tomorrow from deferring pipeline replacements today.

Q. Why is it important for water main replacement to keep pace with the useful life of the assets?

A. As the water distribution system begins to reach the end of its useful life, failures in the infrastructure begin to occur that impact the ability to provide safe and reliable service to the community. Neglecting this aging infrastructure will increase the frequency of water

main breaks and leaks, leading to the corrosion of surrounding utility pipes, disrupting automobile, pedestrian and public transportation, and stymieing local economic activity. Although most of these breaks are minor, serious ruptures can and do occur. With these serious breaks the impact can be catastrophic due to flooding of streets and sidewalks, and in some instances flooding of local businesses and basements of local residents. In rare instances, the loss of water can undermine pavement or building foundations that can lead to the failure of pavements or the loss of a building that can result in significant property damage. Failure of the water distribution system can result in delay of emergency response, and damage to other surrounding essential infrastructure.[5]

The impact of a water main break is mostly localized, with the exception of large main breaks that impact a large portion of the community or the loss of the service to the entire community. The loss of water through leaking pipe as the infrastructure ages affects the entire community, most of the time with no one knowing it is occurring. This loss of water typically manifests itself in an increase in "non-revenue water." A high level of non-revenue water affects the financial viability of water utilities through lost revenues and increased operational costs. Although KAWC's non-revenue water is at or below the industry standard, there is concern that over time the ability to manage non-revenue water would be reduced without a systematic approach for replacing aging infrastructure.

[5] In the American Society of Civil Engineers 2016 study, "Failure to Act: Closing the Infrastructure Investment Gap for American's Economic Future,", the authors estimated that remaining on the current track of under-investment in our water and wastewater infrastructure for just the next ten years will cause the U.S. to lose nearly 500,000 jobs, $896 in business sales, and $508 billion in gross domestic product. American Society of Civil Engineers, *"Failure to Act: Closing the Infrastructure Investment Gap for America's Economic Future"* (2016), available at https://www.infrastructurereportcard.org/wp-content/uploads/2016/05/2016-FTA-Report-Close-the-Gap.pdf (accessed November, 2018).

Q. Please discuss some of the customer benefits of accelerating the rate of pipe replacement.

A. From the perspective of long-term sustainable customer service and water rates, replacing pipes that are near the end of their useful life in a systematic, responsible manner now will result in lower costs to customers over time than waiting to repair and replace pipes as they break. This is because planned pipe replacements are much less costly on a unit cost basis than are the costs of increasing pipe breaks, with the attendant service disruptions, health risks from potential drinking water contamination, property damages, community health and economic development opportunity costs, and the steep increase in future pipe replacements resulting from prior deferrals. Revitalizing the distribution infrastructure installed by earlier generations is essential to meet the ongoing requirements of the communities and customers KAWC serves. Investing in the replacement of the infrastructure enhances the Company's ability to continue to meet customers' service expectations, and may improve fire protection. In addition, the replaced areas of the system will likely be more robust and resilient during periods of high demand.

Q. How is KAWC proposing to address the aging pipe infrastructure and replacement issues that you have identified?

A. KAWC has developed a Main Replacement Model that will be used to prioritize the mains that will be replaced during the replacement program. The model utilizes eight criteria that are crucial in determining if a main is providing reliable service, as well as an indicator for the condition of the main. These criteria are: Low Pressure; Number of Breaks/Leaks; Fire Flow; Age; Material Type; Size of Main; Water Quality; Customer

Impact. Due to the interrelationships of the eight criteria, the Company established relative weights for each criterion to ensure that the targeted drivers for the main are given greater consideration. Age, material type, low pressure, number of breaks and water quality are the primary criteria used to determine main replacement. These criteria allow the model to ensure that mains that are not meeting the needs of the community and customers are addressed quickly. As with any tool, there are still external drivers that influence the main replacement program. These external items such as roadway paving schedules, weather or construction considerations are combined with the results of the assessment tool to make adjustments in the replacement program. This combination of tools and subjective considerations allows for a more responsive replacement program that is in concert with the community and allows for efficient use of available resources.

Using this Model, the Company has identified the materials to target for replacement during the first years of the QIP. KAWC believes that the first materials that need to be replaced in the system is cast iron main and galvanized steel. These two materials represent approximately 15% of the distribution system but account for approximately 64.2% of all main breaks in a given year. The Company believes that the best course at this time is to target this type of pipe material over the next 25 years for replacement. The replacement of cast iron and galvanized mains allows the company to address underperforming mains and reduce the impact of main breaks in the areas served by this type of material.

Q. What components of the distribution system are included in the proposed QIP?

A. The proposed QIP includes the following distribution system components: structures and improvements, supply mains, power generation equipment, pumping equipment,

distribution reservoirs and standpipes, transmission and distribution mains, services, meter and meter installations and hydrants. The above would include main extensions to eliminate dead ends and the unreimbursed costs associated with relocations of mains, services, and hydrants occasioned by street or highway construction. Mains installed to provide service to new customers would not be included in the QIP.

Q. Why is distribution pumping equipment included in the proposed QIP?

A. Distribution pumping equipment, such as distribution pump stations, is integral to the provision of safe, reliable and affordable service while meeting the demands placed upon the system to provide adequate pressure, fire protection, and limited disruptions in service. KAWC has 18 distribution pump stations that allow it to move water through the distribution system. These pump stations working in concert with the 22 water storage tanks to smooth out the effects of fluctuating demands and provide capacity for fire suppression and other emergencies. Pressure management, including detecting and evaluating pressure surges, leads to targeted investment (such as variable frequency drive ("VFD") equipment or elevated tanks) to help reduce main break frequency. Similar to the aging water mains within the distribution system, the distribution pumping equipment is also aging and, as an integral part of the distribution system, is appropriate to include in the QIP Rider.

Q. Are there other potential benefits of the accelerated replacement of the distribution pump stations?

A. Yes. More efficient pumps will use less energy than older, less efficient pumps.[6] The Company monitors its pump efficiency and maintains, repairs and replaces pumps, motors and equipment to improve equipment performance and/or capacity, which is likely to result in reductions in energy use. VFDs allow the pump to be operated at varying speeds to meet the pressure needs of the system and allow the pump to be better utilized. Through the management of the system pressure helps the system to operate more efficiently and potentially reduce the frequency of main breaks. The use of VFDs allows not only for improved management of the water distribution system but also can reduce energy costs.

Q. Are there additional benefits to the accelerated replacement of the distribution pump stations?

A. Yes, several of the distribution pump stations are located below grade in underground vaults. The Company can eliminate the safety concerns associated with entering underground vaults for maintenance purposes through the replacement of these distribution pump stations with above grade pump stations. In addition, by placing the pump station above grade, future maintenance of the stations can be handled more efficiently.

[6] *See Accelerate Energy Productivity 2030: A Strategic Roadmap for American Energy Innovation, Economic Growth, and Competitiveness, Section 2.4 Water Utilities*, p.69-73 (Sep. 16, 2015), available at http://www.energy2030.org/wp-content/uploads/Part-2.pdf.

Q. Why is the QIP Rider needed to perform the accelerated Infrastructure Replacement Program?

A. With the approval of QIP, the Company anticipates investing an additional $4 to $6.9 million annually over the next 25 years to accelerate the replacement of cast iron main and galvanized steel in the distribution system. The Company also anticipates that it will invest $1 to $4 million annually over the same period to address aging distribution and water treatment infrastructure. Without an alternative cost recovery method such as QIP, the ability to sustain an accelerated infrastructure replacement program will be difficult. With the approval of the QIP, the Company can plan and manage the consistent deployment of Company and contractor resources to more efficiently and effectively attain and maintain a replacement program that better serves the long term interests of our customers. While it is possible to adjust capital spending on infrastructure replacement to coincide with rate case filings, experience indicates this is likely to result in higher construction costs. In addition, a sustained accelerated infrastructure replacement program allows the Company to take full advantage of the favorable weather for construction and a consistent labor supply. The QIP is an important component of the Company's efforts to replace its aging infrastructure in a fiscally prudent manner by supporting an accelerating rate of necessary infrastructure replacements, while moderating future rate increases on customers as discussed in greater detail in the testimony of Mr. Rowe.

Q. Will the scope and associated capital improvements under the QIP remain constant from year to year?

A. No, they will not. Based on the KAWC Report's review of system characteristics, such as installation periods, expected life of pipe material, main break history, non-revenue water and current replacement efforts, the rate of replacement will vary based on the type and number of targeted materials and projected projects in a given year. For example, KAWC plans to emphasize replacement of galvanized steel and cast iron in the QIP's first years. The Company also plans to prioritize the replacement of distribution pump stations that are located below grade in underground vaults.

Over time, KAWC expects to increase the replacement trajectory to close the gap between the current replacement rate and level of replacement of the system as indicated by the Nessie Curve analysis conducted in KAWC's Report (BEO Exhibit 2). As an example, the Company plans to begin replacing asbestos cement pipe, which is another material type targeted for replacement, while the replacement of galvanized steel and cast iron main is ongoing. Asbestos cement pipe comprises 16.8% of the KAWC's distribution system. KAWC's planned replacement trajectory will allow the Company to address underperforming mains and reduce the impact of main breaks in the areas served by these types of materials. The Company plans to identify and analyze main breaks and other system data on an ongoing basis in order to continue prioritizing replacements appropriately.

Q. Do you anticipate that an accelerated infrastructure replacement program will have an impact on operation and maintenance costs over time?

A. Yes, I do. An accelerated infrastructure replacement program that proactively replaces aging infrastructure will help to mitigate the increase in main breaks and other equipment failures the Company would otherwise expect as the system continues to age and deteriorate. While weather, system demands and pumping pressures, ground movement and other factors all contribute to main breaks, the age of water mains is typically the single largest root cause factor in the failure of main. As water mains and other distribution system components age, they deteriorate and become less durable to outside conditions that make them more susceptible to failure. In the absence of an accelerated infrastructure replacement program, the number of main breaks, leaks, and associated repair costs will increase and operational and maintenance costs will continue to increase accordingly.

Q. Are there additional operations and maintenance benefits that can result from infrastructure replacement?

A. Yes. As metal water mains age, their inside roughness tends to increase and their cross sectional area tends to decrease due to encrustation and tuberculation of corrosion products on the pipe walls. This increase in hydraulic roughness and decrease in effective diameter will increase the resistance to flow and reduce the hydraulic capacity of the aging mains. This constrains the system's ability to respond to fire flow demands and lowers the pressure available to the customers served by the aging main. The reduction in the hydraulic capacity can lead to a subsequent unwanted reduction in system pressure due to the higher head loss. In order to meet demand in such systems, higher pumping

rates are needed to overcome the higher head losses of tuberculated mains. This can result in a significant increase in energy consumption and operational and maintenance costs as the pumps and system compensate for the loss of capacity in the mains in order to maintain pressure for the area served by the main. The additional pumping can over-pressurize certain portions of the distribution system, thereby increasing leaks and breaks and increasing operational and maintenance costs.

Q. Are there additional benefits to the accelerated replacement of cast iron and galvanized water main?

A. Yes, the aging infrastructure also impacts the ability to continue to provide adequate service to our customers and the system's ability to meet fire flow requirements. A majority of this older infrastructure was installed during a period where the expectations or requirements for fire service and household appliances were not as great as we see it today. In some cases, deposits within the pipes have also reduced the water flow for customer uses and fire service.

Currently, approximately 46.7% of the 320 miles of cast iron and galvanized water main have a diameter of 6 inches or less. As this main is replaced, the area that the main serves is reviewed and the proper sized main is installed to provide adequate service to the surrounding area. Typically, water main equal to and greater than 6 inches is used to replace the older, smaller main. Replacing this aging infrastructure with larger mains allows the Company to provide improved service to the customer and usually improves fire protection. In most cases where hydrants are connected the main, the replacement main is sized equal to or greater than 8-inches as directed by the Lexington Fayette Urban County Government ("LFUCG"), the University of Kentucky and to support the LFUCG

recently obtained Class 1 Fire Protection Rating from the Insurance Service Organization. In addition, the areas of the system that are replaced are made more robust and are more resilient during periods of high demands and reduce the number service disruptions.

Q. You previously stated that the replacement of cast iron and galvanized steel main would require $6.9 to $12.6 million per year. How was this calculated?

A. The expected cost of $6.9 to $12.6 million per year was developed by using the replacement rate of 10 to 13 miles per year at average cost per foot for main replacement based on a review of main replacement projects over the past few years.

Q. What activities are included in the current estimated cost for main replacements?

A. A review of twelve different main replacement projects indicated an average cost of $153 per foot with approximately 53% ($79.7 per foot) of that cost coming from installing the replacement main via outside contractors. The second largest cost of a main replacement project is the cost to restore pavement and sidewalk following the project. The restoration of pavement is approximately 21% ($31.2 per foot) of the overall project cost. The remaining major costs are material cost at approximately 15% ($22.4 per foot) and Company Labor at 4% ($6.1 per foot).

Q. How will work be carried out on the accelerated pipe replacement program that is part of the QIP Rider?

A. KAWC will utilize both Company resources and consultant/contractor resources. The use of consultant resources will be used to augment the Company's capabilities of designing and inspecting the proposed main replacements. These services will be acquired through a competitive bid process that will consider proposed cost, available resources, experience and institutional knowledge. The use of contractor resources will

be used to augment Company capabilities in the installation of pipe and ancillary work. Similar to the consultant services, KAWC will use a competitive bid process that will consider proposed cost, safety record, available resources and knowledge of installation procedures.

Q. What are the estimated incremental costs of the Company's accelerated infrastructure replacement program?

A. The Company expects to incur an additional $6 to $10 million each year for the first 5 years of the QIP Rider. As explained above, these costs are primarily driven by cast iron and galvanized steel replacements but will include some replacement of aging distribution pump stations that would have a significant impact on the ability of the distribution system to provide reliable service and integrity of the system if they were to fail.

Q. Will alternative solutions to the replacement of main continued to be considered as part of the accelerated pipe replacement program.

A. Yes, KAWC will continue to look at different techniques or processes for a more efficient manner of replacing or rehabilitating the pipe infrastructure. KAWC will explore the use of different construction techniques to reduce the impact on the neighborhood where the replacement work is being performed and reduce the amount of pavement and ground repair. Where appropriate and where a different technique is utilized, KAWC will ensure that the life expectance of the main is increased and its ability to provide service to the community is maintained or improved.

Q. Does KAWC believe that the QIP should include more than accelerated replacement of distribution system assets?

A. Yes, KAWC believes that there are additional areas of infrastructure replacement where a QIP would be beneficial and assist in the Company's ability to direct capital dollars to the replacement of critical infrastructure.

Q. What types of projects, other than distribution system replacement projects, does the Company believe will benefit from inclusion in the QIP?

A. As indicated in the AWWA publication "Dawn of the Replacement Era," utilities are not only faced with an aging mains infrastructure but also with the need to replace water treatment infrastructure. Replacement of water treatment assets presents a different picture from that of the pipes. Treatment plants have a shorter life expectancy than pipes. Some structures in the treatment plant, such as concrete structures, have a life expectancy similar to the systems pipe infrastructure of 50 to 70 years. However, most of the treatment components themselves typically need to be replaced after 25 to 40 years or less. KAWC completed a Comprehensive Planning Study in 2012 that recommended capital projects at several of facilities that would address safety and compliance concerns observed during the development of the study. KAWC further expanded on the study by engaging in an independent review of the water treatment infrastructure at all three of the Company's treatment plants. The concurrent need to finance the replacement of mains and of treatment plants greatly increases the challenge facing utilities and increases the challenge to balance the capital needs of a system. Although, in most cases, transmission and distribution main will require attention first and will be the priority of a QIP, a pump

or treatment asset may require more immediate attention due to its effect on a larger portion of the service area.

Q. How will these projects be prioritized?

A. The Company uses a project prioritization model for prioritizing significant capital investment needs. The Company annually updates these models with newly identified investment needs identified through its comprehensive planning studies and related system evaluations. The Company prioritizes investment needs with these models using criteria categories and risk levels. Criteria categories include environmental regulatory compliance, system capacity, safety, water quality and pressure, asset efficiency and environmental sustainability. The Company will use this model to prioritize the projects that will be included in the QIP. In addition, the Company is in the process of updating the 2012 Comprehensive Planning Study that will include the project prioritization model and will provide project recommendations based on the most current operational knowledge of the system.

Q. What is the expected cost of the treatment plant replacement projects?

A. At this time, the Company believes that the treatment plant replacements projects that are identified as posing a threat to meet regulatory compliance, system reliability, documented structurally deficiencies, or have safety concerns could include projects that have an investment of a couple of millions of dollars to significant replacement work that can cost greater than $5 million.

Q. For significant replacement projects, will the Company continue to request a Certificate of Public Convenience and Necessity?

A. Yes, for replacement projects that have a significant impact on the operation or involves a substantial level of investment, the Company will request that the Commission, pursuant to the authority contained in KRS 278.020(1) and 807 KAR 5:001, Section 15, issue a certificate of public convenience and necessity and indicate that it should be considered as part of the QIP charge or be included as part of the Company's next rate case.

Q. Will the Company and its customers benefit from timely infrastructure replacement?

A. Yes, maintaining a steady and prudent long-term infrastructure replacement rate will have a positive effect on the cost of the replacement work and repair costs, meaning lower overall costs for our customers. A significant benefit of a defined replacement plan is that the Company is able to move away from a supply and demand market for the cost of construction to a defined program that allows the Company to take full advantage of favorable construction levels and a consistent labor supply from our contractors.

With the QIP, our contractors will be able to better right size for their organizations. The Company will benefit from a more talented and reliable work force and a potentially lower overhead being charged by the contractors. In addition, the Company will be able to bundle replacement projects to ensure that competition is consistent on all projects, whether the anticipated construction level by the contractor is considered difficult or easy.

Q. Are there other positive impacts from timely infrastructure replacement?

A. Yes, a robust and reliable water system is an important asset to the entire community. It protects the public health and enhances the ability of the communities that KAWC serves to compete for new businesses and industries, which is often an important economic benefit to the community.

In addition, the Commonwealth, as a whole, would benefit from the QIP. Jobs in water utilities are accessible to workers with a range of educational and training backgrounds, and offer opportunities for workforce development and advancement. Contractors, too, will hire Kentuckians to support the infrastructure replacement funded by the QIP. According to a 2008 study undertaken by the Clean Water Council, between 16 and 27 jobs are created for every $1 million spent on water and wastewater infrastructure.[7] The jobs created are not just in the construction industry, but in supporting fields such as architecture, engineering, industrial machinery, and truck transport. As such, not only would the increase in infrastructure investment maintain and improve service reliability, it would benefit the local economy as well. An improved water distribution system and the resulting customer benefits noted above can also attract new business to the area and support economic development goals.

Q. What additional evidence have you found that supports the positive economic impact of KAWC's proposed QIP?

A. There are many studies that show that increased spending on infrastructure investments produces positive economic development results. In a study released in 2016 on the economic impact of under-investing in our water and wastewater infrastructure, the

[7] Clean Water Council, "*Sudden Impact: An Assessment of Short Term Economic Impacts of Water and Wastewater Construction Projects in the United States*," 2008.

American Society of Civil Engineers estimated that remaining on the current track will cost American businesses $896 billion in sales between 2016 and 2025, and the cumulative loss to our gross domestic product ("GDP") will be $508 billion, directly due to deteriorating water infrastructure. A modest increase in investment would prevent 489,000 job losses during the same period.[8] Additionally, according to the U.S. Conference of Mayors, every dollar invested in water infrastructure adds $6.35 to the national economy.[9]

Additional studies show further economic benefit in infrastructure investment. Recent United States Environmental Protection Agency surveys tallied a 20-year need of over $650 billion for needed water and sewer infrastructure improvement projects[10]. This would create between 10.5 and 17.5 million jobs over 20 years or 525,000 – 875,000 jobs annually. That annual creation of jobs would be enough to annually employ one third of our nation's 1.8 million annual bachelor degree graduates.[11]

All of the above cited statistics would hold true for infrastructure investment in the Central Kentucky area and the Commonwealth of Kentucky. Not only would the increase in needed infrastructure investment maintain and improve service reliability, it would benefit the local economy as well. An improved water distribution system and the

[8] American Society of Civil Engineers, *"Failure to Act: Closing the Infrastructure Investment Gap for America's Economic Future"* (2016), available at https://www.infrastructurereportcard.org/wp-content/uploads/2016/05/2016-FTA-Report-Close-the-Gap.pdf (accessed November, 2018).

[9] U.S. Conference of Mayors, "*Local Government Investment in Municipal Water and Sewer Infrastructure: Adding Value to the National Economy*", issued August 14, 2008. Accessed November 2015, http://www.usmayors.org/urbanwater/documents/LocalGovt%20InvtInMunicipalWaterandSewerInfrastructure.pdf

[10] US EPA 2011 Drinking Water Infrastructure Needs Survey and Assessment Fifth Report to Congress ($384 billion of water needs) and US EPA Clean Watersheds Needs Survey 2012 Report to Congress ($271 billion of wastewater needs).

[11] U.S. Department of Education, National Center for Education Statistics. Accessed November 2015, http://nces.ed.gov/fastfacts/display.asp?id=372.

resulting customer benefits noted above can also attract new business to the area and support economic development goals.

PROPOSED TAP FEES

Q. Does KAWC propose to decrease its tap fees?

A. Yes, KAWC has experienced a decrease in the cost of the installation of new services as compared to the tap fee approved in Case No. 2015-00418. The Company has seen a decrease in material costs as it transitions to the installation of polyethylene service lines rather than copper tubing.

Absent consideration of federal tax law changes, the proposed tap fees would be:

¾" x $^{5}/_{8}$" meter	$1,223 (decrease from $1,280)
1" meter	$2,174 (decrease from $2,201)
2" meter	$4,002 (decreased from $4,238)

Q. How were the tap fees determined?

A. KAWC requested increased tap fees in Case No. 2015-00418, and they were approved for all customers in that proceeding. Historically, tap fees have been based on a three-year average cost of the installation of the new services. The three-year average was used to determine the average cost of installation in 2004, 2007 and 2008. During 2010 and 2012, a five-year average cost of installation was proposed and accepted due to an economic downturn during that period. KAWC proposed to return to the three-year average cost in Case 2015-00418 as the economic downtown abated. KAWC is proposing to continue utilizing the three-year average cost to be consistent with previous requests and to ensure that the tap fees better reflect the cost of installation that the Company is experiencing.

Q. Has the methodology used to calculate the tap fees changed in any other way?

A. No. The methodology used is the same as the one that was approved in the previous five rate cases. The proposed tap fees are based on a three-year average cost of the installation of new services during 2015 to 2017. The fees reflect the cost of the contractor's installation, KAWC oversight and material pricing.

Q. How is the contractor selected for the installation of the new services?

A. The contractor is selected annually through a competitive bid process.

RISKS ASSOCIATED WITH FURNISHING PUBLIC WATER SERVICE

Q. What regulations govern the quality and quantity of water provided by KAWC?

A. Water supply utilities are subject to a complex array of regulations at the federal, state and local levels with respect to water quantity, water quality and other environmental aspects of their facilities and operations. Drinking water quality is addressed by a combination of federal regulation under the Safe Drinking Water Act of 1973 and state regulation under Title 401 of the Kentucky Administrative Rules Chapter 8. The federal act established the U.S. Environmental Protection Agency ("EPA") as the federal regulatory body governing drinking water. Pursuant to that authority, EPA has established standards for contaminant levels in drinking water,[12] mandatory treatment methods, monitoring and reporting requirements, and public notification mandates in the event of contaminant level or treatment method noncompliance.[13] The EPA has granted "primacy" to the Kentucky Division of Water ("DOW") to administer the federal regulatory standards.

[12] *See* EPA - National Primary Drinking Water Regulations at https://www.epa.gov/sites/production/files/2016-06/documents/npwdr_complete_table.pdf (last visited Nov. 19, 2018).
[13] *See* 40 C.F.R. Parts 141-143.

Over the years, regulatory protection has been extended through the establishment of maximum contaminant levels (MCLs) or by treatment requirements that target additional contaminants. MCLs determine the maximum level of each covered substance within the drinking water that is deemed safe for the customer. They also include requirements for monitoring, remediation, and public notice when standards are exceeded. There are now MCLs for 88 individual organic and inorganic chemicals, including groups like trihalomethanes (THMs) and haloacetic acids, and E. coli bacteria indicator microorganisms. In addition, treatment technology requirements include specifications for surface water filtration and groundwater disinfection cover protozoa, viruses, and other bacteria.

In recent years there has been an increase in public concern over water quality standards and regulation. This increase has led to growth and increased stringency in EPA and state drinking water regulation.

Q. What are risks associated with furnishing safe and adequate water quality and water quantity is KAWC facing?

A. The EPA has continued to make its regulations concerning disinfection byproducts more stringent and may adopt of more stringent lead concentration requirements under the federal "Lead and Copper Rule."

Q. Please describe the EPA's efforts to make its disinfectant byproducts regulations more stringent.

A. Disinfection byproducts are produced by the interaction of disinfection agents (such as chlorine) with constituents (such as organic compounds) that naturally occur in source water. The Stage 2 Disinfectants and Disinfection Byproducts Rule ("Stage 2 DBPR")

adopted in 2006, coupled with increasingly stringent disinfection regulations of the Long Term Enhanced Surface Water Treatment Rules, requires a very careful balancing of treatment processes and source water monitoring to meet the twin goals of killing microbes (such as giardia and E. coli) while avoiding unacceptable concentrations of disinfection byproducts such as Chlorite, Bromate, THMs, and Halogenic acetic acids.

In addition to the Stage 2 DBPR, the EPA was required by the 1996 Amendments to the Safe Drinking Water Act to develop rules to balance the risks between microbial pathogens and disinfection byproducts ("DBPs"). The Long Term 2 Enhanced Surface Water Treatment Rule ("LT2"), adopted in 2006, is the second phase of rules required by Congress to address microbial pathogens. The purpose of the LT2 is to reduce illness linked to the contaminant Cryptosporidium and other pathogenic microorganisms in drinking water. The rule supplements existing regulations by targeting additional Cryptosporidium treatment requirements in facilities that take steps to decrease formation of disinfection byproducts that result from chemical water treatment. Cryptosporidium is a significant concern in drinking water because it contaminates most surface water used as drinking water sources, it is resistant to chlorine and other disinfectants, and it has caused waterborne disease outbreaks.

Q. What effects does KAWC expect these rules to have on its operations?

A. KAWC believes that both the Stage 2 DPBRand the LT2 will have major impacts on its operations in the near and long term. KAWC conducted recent facility-specific studies that indicate that major improvements at Kentucky River Station will be needed to allow the 45 million gallon treatment facility to meet the requirements of both rules as well as positioning it to meet future regulations. In addition, KAWC recently completed its

second round of source monitoring in accordance with the LT2 for all three of its water treatment facilities during 2016 and 2017. As a result, the Company expects to implement UV disinfection and other enhancements to the clearwell, including an additional 1-log treatment for Cryptosporidium removal and inactivation, in order to meet LT2 Cryptosporidium requirements during the period of 2022 to 2025. In addition, to consistently meet the Stage 2 DBPR, KAWC anticipates that the current ten (10) hydrotreator units will be replaced with a new treatment facility that incorporates up to date treatment technology that will allow the facility to efficiently meet the regulations on a consistent basis. These improvements, along with other improvements at its Richmond Road Station and Kentucky River Station No. 2 facilities over the next 10 to 15 years, will allow KAWC to mitigate the risks associated with these regulations and position each facility to meet future regulations such as those addressing algal toxins and emerging contaminants.

Q. Please describe the issue of lead concentrations in water systems and the potential adoption of more stringent requirements under the EPA "lead and copper rule."

A. As the result of conditions that arose in Flint, Michigan and other jurisdictions across the country, increased scrutiny is being placed at all levels concerning lead concentrations in water systems and potential adoption of more stringent requirements under the federal "Lead and Copper Rule." The lead issue typically arises not from constituents in source water, but rather from the leaching of lead from older pipes and joints into the water as it passes through household service lines and plumbing. While providing centralized treatment that adjusts the pH can, in many cases, help minimize lead corrosion, the fact is that the plumbing in many older areas of communities are older lead pipes or contain the

type of copper and galvanized pipes with solder joints where lead contamination is an increased risk.

In anticipation of Long Term Revisions to the Lead and Copper Rule, the EPA released, in October 2016, a whitepaper that provides examples of regulatory options to improve the existing rule. The EPA's Lead and Copper Rule Revisions White Paper contains a series of alternatives, including mandates that water systems establish lead service line replacement programs…." The white paper also examines options for more stringent corrosion control treatment requirements. Many of the options in the white paper, if adopted, could impose significant additional capital investment requirements and increased operating expenses on all water systems.

Q. Does climate variability pose additional risks for water supply utilities such as KAWC?

A. Yes. Whatever the debate may be concerning the causes of climate variability, water supply utilities face the reality of climatic variability and attendant stresses on water resources and system recovery. Although climate models for the Southeastern U.S. generally predict overall annual precipitation amounts to remain similar to average historical experience, increasingly intense storms and repeated, extended dry periods are anticipated.[14] That means we can expect more droughts of varying degrees of severity and more frequent and intense high-precipitation events and floods, along with high damaging storm events – which impact water utilities.

Water supply systems are fundamentally resource-dependent and, therefore, the effects of climate variability pose a significant on-going risk and create challenges with regard to

[14] Climate Change Impacts in the United States, ch. 17 – Southeast and the Caribbean, available at http://nca2014.globalchange.gov/.

maintaining a reliable water supply during the full range of potential future conditions, including even what might be assumed to be “normal” periods. The safe yields of water supply sources have historically been evaluated based on historical climatic patterns, data from so called “droughts of record” or dry period frequency analysis. However, changing climatic conditions suggest that historical hydrologic data (which in many cases only reflect 50-100 years of rainfall and stream flow measurement collection – a quite short period in geologic or climatic time) may not accurately predict future conditions. Thus, the calculated safe yield of streams, reservoirs and groundwater wells are put in question as the effects of climate variability are experienced across southeastern United States. Thus, in response to climate variability, water supply systems must address the risks posed to the reliability and resilience of their sources. While droughts are the major challenge for water supply systems, heavy precipitation and high-flow events are the concern of water systems.

The effects of climate variability impacts the resilience of a system to withstand an event without interruption of providing service to the customers or, if service is interrupted, to restoring the service in a timely manner. Like all large users dependent on electricity from the grid, water utilities must plan for power outages and develop plans for maintaining continuity of operations when such outages occur. Nonetheless, recent weather patterns combined with the issue of aging infrastructure are causing utilities to review traditional planning and design criteria. The design standards for supplies, treatment plants, pump stations and tanks are taken together to achieve a level of zero service outages. The so-called new normal has led experts to look beyond traditional reliability and emergency planning into a world that needs the speed of recovery and

resiliency for much more widespread and damaging events. Updating infrastructure to keep up with the increase in extreme weather and ensuring that adequate service can be maintained for extended time periods after an extreme event is just as important as addressing the aging infrastructure. As a result, KAWC plans to evaluate its system and systematically add additional standby power capacity, in addition to using a more diverse and reliable mix of emergency fuel supply to address this emerging threat.

Q. Does this conclude your testimony?

A. Yes.

VERIFICATION

COMMONWEALTH OF KENTUCKY)
) **SS:**
COUNTY OF FAYETTE)

The undersigned, **Brent O'Neill**, being duly sworn, deposes and says he is the Director of Engineering for Kentucky-American Water Company, that he has personal knowledge of the matters set forth in the foregoing testimony, and the answers contained therein are true and correct to the best of his information, knowledge, and belief.

BRENT O'NEILL

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 19th day of November, 2018.

Notary Public (SEAL)

My Commission Expires:

7/25/2020

STRATEGIC CAPITAL EXPENDITURE PLAN
PROGRAM

Business Unit	Kentucky
Revision Date	October 15, 2018
Description	KY BP 2018-2020 SCEP

Business Unit	Business Unit No.	Project Title	Est. In-Service Date	U.S. $ Total 2018	U.S. $ Total 2019	U.S. $ Total 2020
		RECURRING PROJECTS				
Kentucky	**DV**	**Projects Funded by Others**	**Various**	**$1,735,062**	**$2,500,000**	**$2,500,000**
Kentucky	A	Mains - New	12/31/2016	$813,940	$566,500	$545,000
Kentucky	B	Mains - Replaced / Restored	12/31/2016	$3,309,009	$4,500,000	$6,000,000
Kentucky	C	Mains - Unscheduled	12/31/2016	$727,367	$820,000	$900,000
Kentucky	D	Mains - Relocated	12/31/2016	$836,617	$987,550	$400,050
Kentucky	E	Hydrants, Valves, and Manholes - New	12/31/2016	$340,780	$217,000	$228,550
Kentucky	F	Hydrants, Valves, and Manholes - Replaced	12/31/2016	$304,562	$480,960	$498,960
Kentucky	G	Services and Laterals - New	12/31/2016	$782,994	$1,079,105	$1,079,105
Kentucky	H	Services and Laterals - Replaced	12/31/2016	$404,325	$532,500	$532,500
Kentucky	I	Meters - New	12/31/2016	$459,687	$800,000	$800,000
Kentucky	J	Meters - Replaced	12/31/2016	$3,742,841	$1,516,039	$1,142,700
Kentucky	K	ITS Equipment and Systems	12/31/2016	$376,957	$246,769	$255,552
Kentucky	L	SCADA Equipment and Systems	12/31/2016	$200,169	$233,000	$183,000
Kentucky	M	Security Equipment and Systems	12/31/2016	$133,321	$458,000	$55,000
Kentucky	N	Offices and Operations Centers	12/31/2016	$117,758	$150,000	$150,000
Kentucky	O	Vehicles	12/31/2016	$366,147	$680,000	$650,000
Kentucky	P	Tools and Equipment	12/31/2016	$370,874	$830,100	$403,000
Kentucky	Q	Process Plant Facilities and Equipment	12/31/2016	$1,628,310	$1,925,000	$2,100,000
Kentucky	S	Engineering Studies	12/31/2016	$150,871	$75,000	$75,000
		Total Recurring Projects		**$15,066,529**	**$16,097,523**	**$15,998,417**
		ACQUISITIONS				
Kentucky				$0	$0	$0
		Total Acquisitions		$0	$0	$0
		CENTRALLY SPONSORED PROJECTS				
Kentucky	R12-**K3	ITS Equipment and Systems - Centrally Sponsored	Various	$2,328,380	$3,390,750	$2,959,200
		Total Centrally Sponsored Projects		**$2,328,380**	**$3,390,750**	**$2,959,200**
		INVESTMENT PROJECTS				
Kentucky	I12-000001	Post Acquisition BD Capex		$0	$0	$0
Kentucky	I12-020037	KRS I Chemical Storage and Feed Imp	3/31/2020	$754,038	$1,227,706	$5,984,956
Kentucky	I12-020039	Delaplain Booster Station	9/30/2018	$673,611	$0	$0
Kentucky	I12-020055	New Circle Rd Main Relocation Phase 2	8/31/2019	$21,536	$833,325	$0
Kentucky	I12-020059	KRS2 Transfer Switch	3/31/2020	$0	$334,257	$600,000
Kentucky	I12-020067	RRS Chemical Facility Upgrade/Chlor	7/31/2019	$553,558	$9,761,231	$0
Kentucky	I12-020069	KRS1 Valve House #4 Rehabiliation	9/30/2018	$988,884	$0	$0
Kentucky	I12-020074	Athens Boonesboro Main Ext - Phase	7/31/2019	$515,509	$187,155	$0
Kentucky	I12-020076	KRS1 - Replace Incline Car	9/30/2019	$108,158	$1,021,255	$0

Kentucky	I12-020079	Jacobson Pump Station	6/30/2019	$79,400	$1,805,169	$0
Kentucky	I12-020099	KRS1 Pump #13 Replacement	6/30/2019	$1,020,667	$200,000	$0
Kentucky	I12-300008	Owenton Operations Garage	3/31/2020	$120,275	$573,170	$236,344
Kentucky	I12-020071	KRS1 Valve House Rehabilitation (Phase 5) - Reeves I	5/31/2019	$0	$1,500,000	$0
Kentucky	I12-020094	Cox Street Booster	12/31/2019	$0	$1,000,000	$0
Kentucky	I12-020095	Mercer Road Booster Station	3/31/2020	$0	$333,188	$666,812
Kentucky	I12-030001	ERWA Main Interconnection	6/30/2023	$0	$355,490	$250,000
Kentucky	I12-020035	KRS1 - Residual Improvements	9/30/2018	$473,187	$0	$0
Kentucky	I12-020088	Presure Zone Extension	9/30/2018	$1,383,828	$0	$0
		Total Investment Projects		$8,391,572	$19,131,946	$7,738,112
		Total Investment and Centrally Sponsored Projects		$10,719,952	$22,522,696	$10,697,312
		Contributions		($2,505,241)	($3,775,000)	($3,425,000)
		Advances		($1,777,150)	($2,000,000)	($2,000,000)
		Total Refunds		$1,089,800	$1,100,000	$1,100,000
				$0		$0
		Gross minus ITS CS		$25,193,163	$37,729,469	$26,236,529
				($3,192,591)	($4,675,000)	($4,325,000)
		Net minus ITS CS		$22,000,572	$33,054,469	$21,911,529
		Gross plus ITS CS		$27,521,544	$41,120,219	$29,195,729
				($3,192,591)	($4,675,000)	($4,325,000)
		Net plus ITS CS		$24,328,953	$36,445,219	$24,870,729

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KENTUCKY AMERICAN WATER

Replacement Program Report 2018

2018

Kentucky-American Water Company

Contents

Introduction

Kentucky-American Water Company's infrastructure provides a critical service in providing clean and safe water that is essential to our customers and the survival of the communities that we serve. Similar to other water utilities, the infrastructure of treatment plants, pipes, storage tanks and pumps are starting to age past their useful life. Kentucky-American Water has embarked on a plan to prioritize and undertake drinking water infrastructure renewal investments to ensure that our water utilities can continue to reliably and cost-effectively support the public health, safety, and economic vitality of our communities. If we do not effectively plan the investment in our infrastructure, we will incur the haphazard and growing costs of living with aging and failing drinking water infrastructure and place in jeopardy all of the work that past generations have undertaken in building our system and communities.

The water distribution system of Kentucky-American Water is beginning to reach the end of its expected life. Even though the company has made investments in the replacement of the aging infrastructure, existing infrastructure continues to reach the end of its useful life at a quicker pace than the work to replace the outdated mains and supporting facilities occurs.

One of the major challenges that water utilities face is that their distribution systems were installed to support community growth that varied over time. The mains installed during the high growth periods reach their life expectancy at the same time, resulting in sections of communities that need all of the mains replaced in a short time period.

In addition, during the periods of system expansions, different pipe materials were used as they were introduced as an alternative to the existing main materials. With each pipe material, the life expectancy of the main is different. Unfortunately, that results in periods when pipes of different materials that were installed at different times in the past reach the end of their useful lives at the same time, increasing the number of mains that need to be replaced throughout the system in a compressed timeframe.

Although Kentucky-American has made investments in the replacement of mains over the past decades, the amount of main replaced cannot keep up with the expected amount of main requiring replacement that will occur in the coming decades.

Along with aging infrastructure, Kentucky-American Water is facing the impact of climate variability and its effects on the resiliency of the system. Updating infrastructure to keep up with the increase in extreme weather and ensure that adequate service can be maintained for extended time periods after an extreme event is just as important as addressing the aging infrastructure.

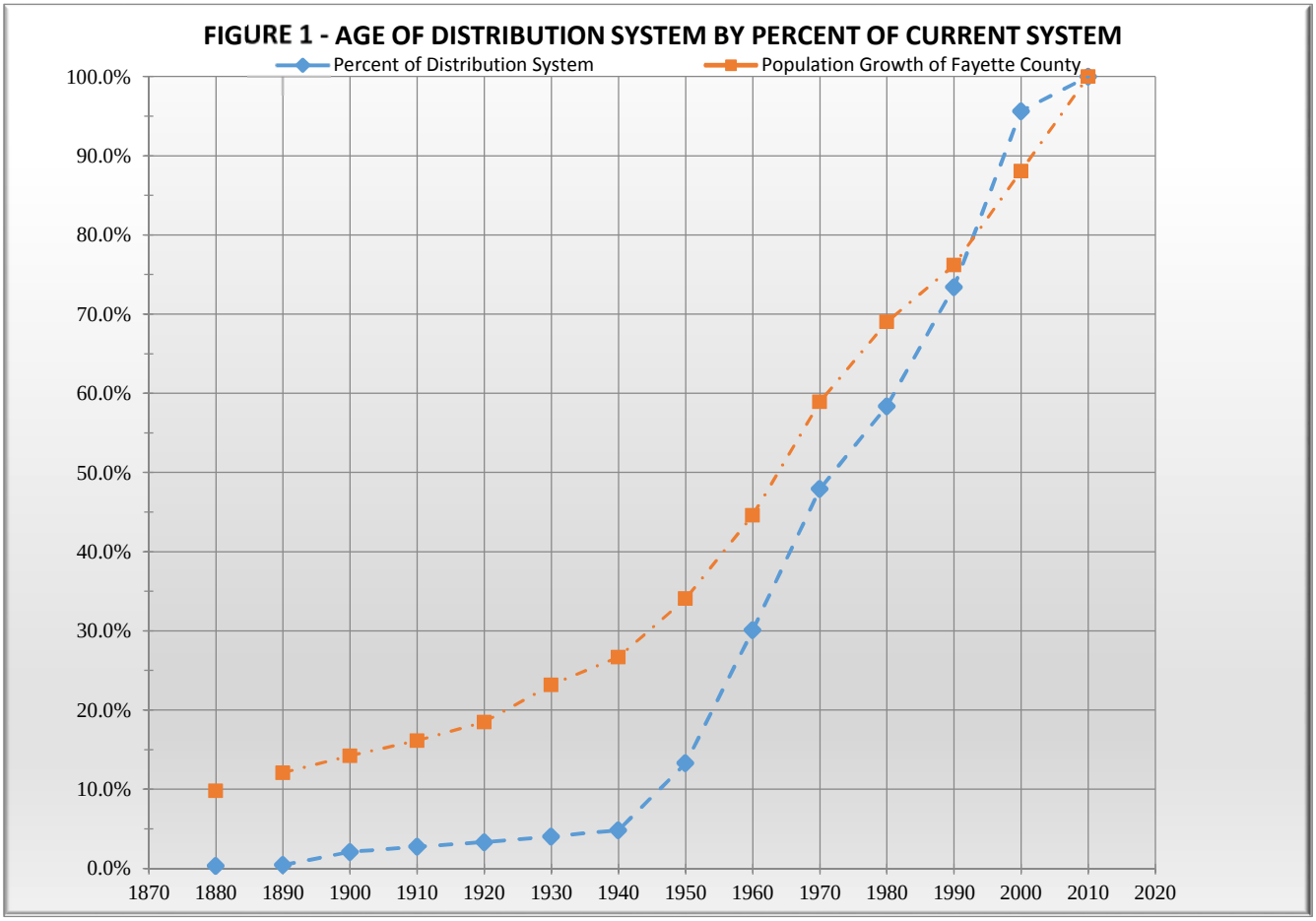
System Background

Kentucky-American Water first began operation as the Lexington Hydraulic and Manufacturing Company providing water to Lexington in 1885. The company was started by three local businessmen who saw a need for a water system to help fight fires and prevent disease. During the early 1970s the name changed from the Lexington Water Company to the current Kentucky-American Water Company.

Since 1885 the system has grown from serving approximately 200 customers to about 130,000 customers within 14 counties, including Fayette County. With that growth the distribution system has expanded to include approximately 2,038 miles of water mains various sizes and material types.

History of the Growth of the Distribution System

Kentucky-American's water distribution system growth mirrors the growth of the City of Lexington and Fayette County. Figure 1 shows the percent of the water distribution system that was installed within each of the decades from 1880 to present.



From the start of the system in 1885 through the 1940s, the area had predominately an agricultural economy and growth was steady. Main installed during that period was cast iron. Today, approximately 63 miles of the cast iron main that was installed during this period remains, representing approximately 3% of the current distribution system. This amount used to be greater; however, during the 1980s, 1990s and 2010s the Company undertook a concerted effort to replace this era of cast iron main.

Following World War II, Lexington experienced an increased growth rate due to the move away from agriculture and the baby boom. During the 1950s and 1960s, the distribution system also grew substantially to keep up with this expansion. Main installed during that period was cast iron, both cement lined and unlined. During this period, asbestos cement pipe was introduced for the first time into the distribution system. The main installed during this period represents 25% of the current distribution system (514 miles of main).

The Lexington system underwent its greatest growth from the 1970s through the housing boom of the first part of 2000. During this period, Lexington grew due to industry and service companies locating and growing in Fayette County. At the same time, Kentucky-American acquired several outlying systems by growing into the counties surrounding Fayette County. Also during this period, the main extension from Kentucky River Station Two to the Lexington distribution system was placed into service. During this period of time approximately 1,290 miles of main was installed, which represents 63% of the current distribution system. Asbestos Cement pipe was the predominate material installed during the first part of this period, with Ductile Iron pipe and PVC becoming the predominant materials during the 1980's.

From 2010 to present, the distribution system has seen a much slower growth rate, with additions representing little more than 3% (80 miles) of the current distribution system. Currently, the predominant materials installed are Ductile Iron with some PVC pipe.

Pipe Materials in Distribution System

The Kentucky-American distribution system contains mostly five major material types. Those types are Ductile Iron, PVC, Asbestos Cement, Cast Iron Lined and Cast Iron Unlined. The period that the system was growing determines the areas and the amount of each material type in the system. Table 2 provides a listing of the major material types in the distribution system along with the amount of each material in miles and percentage of that material within the system:

Table 2 – Distribution System Material Types		
	Miles of Material	Percentage of System
Ductile Iron	897.8	44.1
PVC	441.1	21.6
Asbestos Cement	338.2	16.6
Cast Iron Unlined	176.8	8.7
Cast Iron Lined	133.5	6.6
Prestressed Concrete	34.8	1.7
Galvanized	3.2	0.2
Other (Brass, Lead, Steel)	2.4	0.1
Unknown	10.0	0.5

Distribution of Pipe Material by Decade

When the material type is compared to the timeline of growth of the distribution system, certain periods were dominated by particular pipe materials. During the first part of the system development, from 1885 to 1950, Cast Iron Unlined and Lined were the predominant materials. During 1950 to 1980, Asbestos Cement pipe was used along with Cast Iron pipe, and Ductile Iron pipe was introduced into the system. After 1980, Ductile Iron pipe was the predominant material type used to meet system growth. PVC pipe use in new water main was not prevalent in the distribution system except for small diameter pipe. During the 1980s, 1990s and 2000s with the acquisition of systems, PVC was introduced into the Kentucky-American distribution system that included PVC that was installed during the 1960's and 1970's. Table 3 provides a breakdown by decade of the material types used in the expansion of the distribution system.

Table 3 – Miles of Existing Material Types Installed by Decade							
Decade	Material Types						
	Cast Iron Unlined	Cast Iron Lined	Asbestos Cement	PVC	Ductile Iron	Galvanized[2]	Other[1]
1881 - 1890	6.8						
1891 - 1900	1.9						
1901 - 1910	16.0	0.2					
1911 - 1920	11.9	0.7					
1921 - 1930	8.9	2.1					
1931 - 1940	7.7	6.4	0.1				
1941 - 1950	2.8	5.2	14.1				
1951 - 1960	21.4	51.6	76.6	4.7	0.5	1.7	9.2
1961 - 1970	50.9	64.1	102.2	64.7	51.9	1.4	13.9
1971 - 1980	48.2	3.3	130.6	140.1	40.3	0.1	24.1
1981 - 1990			14.6	37.6	171.7		
1991 - 2000				28.7	292.3	0.1	
2001 - 2010				149.4	274.7		
2011 -				15.9	66.5		

1 – Other represents Lead Pipe, Reinforced Concrete Pipe and PEP Pipe
2- In most cases the Galvanized Pipe indicated on this table occurred during acquisitions during these periods

Expected Life of Pipe Material

Based on information developed by the American Water Works Association for the "Buried No Longer" report released in February 2012, Table 4 provides an estimated expected service life for pipes of varying material. The expected life was determined based on operating experiences of water utilities and insight from research and professional experiences with typical pipe conditions, according to pipe material, at different ages and sizes.

Table 4 – Average Expected Life of Pipe Material

Material Types						
Cast Iron Unlined	Cast Iron Lined	Asbestos Cement	PVC	Ductile Iron	Galvanized	Concrete
110 yrs	100 yrs	90 yrs	55 yrs	80 yrs	70 yrs	105 yrs

This table is a simplification, since, in Kentucky-American's experience, pipe life depends on many variables, such as soil conditions, installation practices and climate conditions, in addition to the age of the pipe itself. The company has had many pipes last longer than the typical service life indicated, but it also has had other pipes fail sooner than expected. For the purpose of this report, in view of the lack of specific data that allows the company to develop an understanding of each condition that affects each pipe segment in the system, the average life expectancy provides a reasonable approximation of the replacement rate.

Using the average expected life for Kentucky-American's distribution system indicates that the pipe that has been installed over the past 130 years will need to be replaced over the next 85 years to ensure that the system is maintained within the expected life of the system's pipe material.

Importance of Replacing Mains

Access to clean, reliable water is critical for the communities served and has become an intrinsic responsibility of those who manage the water infrastructure throughout the world. Safe drinking water is important to the health and economic welfare of a community. The ability to obtain clean water, free of contaminants, reduces sickness and related health costs. In addition, the ability to access a sufficient supply creates economic opportunities throughout the community.

As portions of the water distribution system begins to reach the end of its useful life, failures in the infrastructure begins to occur that impact the ability to provide safe and reliable service to the community. Neglecting this aging infrastructure will increase the frequency of water main breaks and leaks, corroding surrounding utility pipes, disrupting automobile, pedestrian and public transportation and stymieing local economic activity.

Although most of these breaks are minor, serious ruptures can and do occur. With these serious breaks the impact can be catastrophic due to flooding of streets and sidewalks, and in some instances flooding of local businesses and residences. In rare instances, the leaking water can undermine pavement or building foundations, which can result in significant property damage and the risk of serious injuries.

We have seen numerous examples of serious failures over the past few years that have affected major metropolitan areas. On June 18, 2015 Louisville Water Company experienced a break on a 60-inch water main that impacted 33,000 customers and caused the road to buckle, breaking apart huge pieces of pavement that floated and damaged vehicles in the area. The break also caused damage in adjacent parking lots and disrupted the local residents' activities.

This break followed a 48-inch water main break during April 24, 2014 near the intersection of Eastern Parkway and Baxter Avenue, which caused the intersection to be closed for at least 6 days. The break sent water cascading down Baxter Avenue, flooding Tyler Parks and nearby yards. In addition, the break flooded athletic fields on the University of Louisville campus and caused concern for athletic camp participants that were on the fields at the time of the break.

Nationally, one of the most significant breaks of 2015 was a water main break near the University of California in Los Angeles on July 29 that caused massive street flooding and damage on the campus. The break caused the loss of more than 20 million gallons during the three and one half hours required to turn off the main. The water flooded into the university campus and entered numerous buildings and structures, causing significant damage. Firefighters saved up to five people who were stuck in underground parking structures. The water trapped more than 730 cars, with half of the vehicles being entirely submerged.

Kentucky-American Water has not experienced dramatic main breaks like these over the past few years, but it has had several main breaks that have not only caused impact to the adjacent area that is surrounding the break but have also caused traffic disruptions and inconveniences due to repair activities. Some of these breaks have resulted in business disruptions and economic impact to the community.

The American Society of Civil Engineers study, "Failure to Act Closing the Infrastructure Investment Gap," released in 2016, considered the economic impact of under-investing in our water and wastewater infrastructure. It estimated that remaining on the current track will cost American businesses and households $105 billion in increased costs to assist in filling the funding gap between 2016 and 2025, and the cumulative loss to our gross domestic product (GDP) will be $896 billion, all directly due to deteriorating water infrastructure. Without additional investment in the infrastructure, almost 489,000 jobs will be threatened due to unreliable water delivery and wastewater treatment services over the same period.

The impact of a water main break is mostly a localized impact, with the exception of large main breaks that impact a large portion of the community or cause the loss of the service to the entire community. In contrast, the loss of water through leaking pipe as the infrastructure ages affects the entire community, most of the time with no one knowing it is occurring. This loss of water typically manifests itself in an increase in "non-revenue water." A high level of non-revenue water affects the financial viability of water utilities through lost revenues and increased operational costs. Although Kentucky-American Water's non-revenue water is at or below the industry standard, there is concern that over time its ability to manage non-revenue water will deteriorate without a systematic approach to replacing aging infrastructure.

In addition to reducing pipe failure and loss of water, investing in the replacement of the infrastructure enhances the system's ability to meet the service expectations of the customers. The ability to replace this aging infrastructure allows the company to provide improved service to the customer and usually improves fire protection. In addition, the areas of the system that are replaced are made more robust and are more resilient during periods of high demands, reducing the number of service disruptions.

The investment in infrastructure replacement allows for a more robust system, which enhances the ability of the community to compete for new business and industries. This is an important economic benefit to the community. According to the U.S. Conference of Mayors, every dollar invested in water infrastructure adds $6.35 to the national economy.

Previous Review of Network

During 2009, Kentucky-American Water commissioned Gannett Fleming to conduct an Analysis of Non-Revenue Water for the system as ordered by the Commission as part

of Case No. 2007-00134. A part of that analysis was a determination if there was a correlation or trend in the occurrence of main breaks and leaks in the Central Division. The analysis was conducted on 1,927 main breaks reported from January 2000 to October 2008.

Review of the main break data indicated that a majority of breaks (82%) in the system during this period were reportedly caused by Ground Shift/Other. Age and Deterioration was reported to be the cause of approximately 10% of the breaks. Pressure Surge, Tree Roots, and Clamp Failure were reported to be collectively the cause of the remaining 8% of the breaks during the period of January 2000 to October 2008.

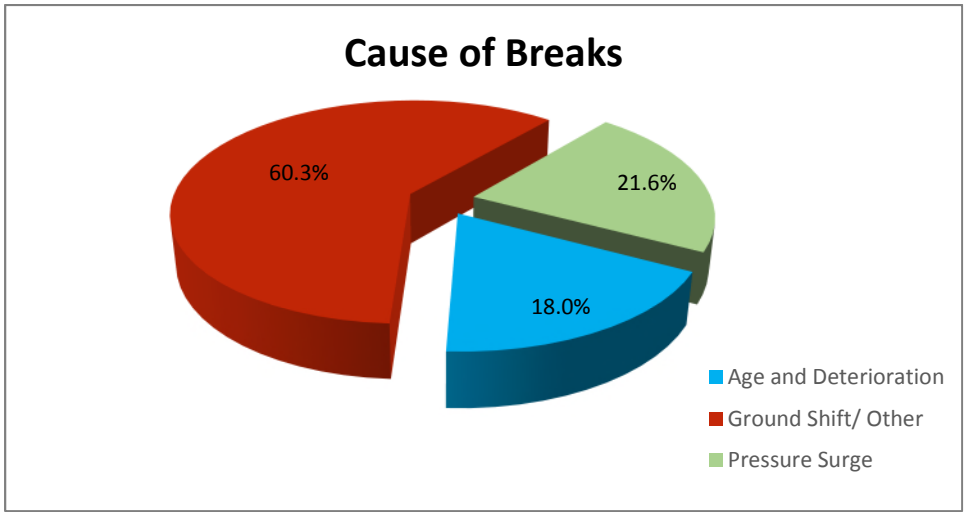
The main breaks that were reportedly caused by Age and Deterioration or Ground Shift/Other occurred on unlined cast iron main 53% of the time and, in particular, a significantly high percentage of reported breaks associated with Age and Deterioration -- 37% -- occurred on unlined cast iron mains. The analysis indicated that the highest percentage of breaks caused by Ground Shift/Other occurred on unlined cast iron main and asbestos cement main (34% and 26%, respectively).

The analysis by Gannett Fleming found that replacing specific main sizes or types of material that exhibit a high concentration of breaks would not have a substantial impact on reducing non-revenue water. Gannett Fleming concluded that other factors should be considered with regard to replacement of problematic main rather than trying to control non-revenue water. However, the study provided useful information regarding the types of main most susceptible to breaks.

During the review of the main break history, Gannett Fleming found that the highest concentration of reported main breaks occurred on unlined cast iron. The concentration of reported main breaks on galvanized steel main was also significantly higher than the system average of 0.9 breaks per mile of main. Gannett Fleming suggested that a main replacement program targeting unlined cast iron main and galvanized steel main, specifically those less than 4 inches in diameter, should be considered to reduce the occurrence of main breaks.

Current Review of Network

Review of the main break history from January 2012 to December 2017 indicated that there have been 953 breaks during this period, averaging about 159 per year. Similar to the finding of the 2009 Gannett Fleming report, the current break history indicates that 60% of the main breaks are caused by ground shift. This percentage decreased from 82%, while the age and deterioration breaks increased to 18% compared to 10% during the past review. Although the increase, it is an indication that the distribution system is aging, and we would expect to see an increase in these types of breaks as the age of the mains increase.

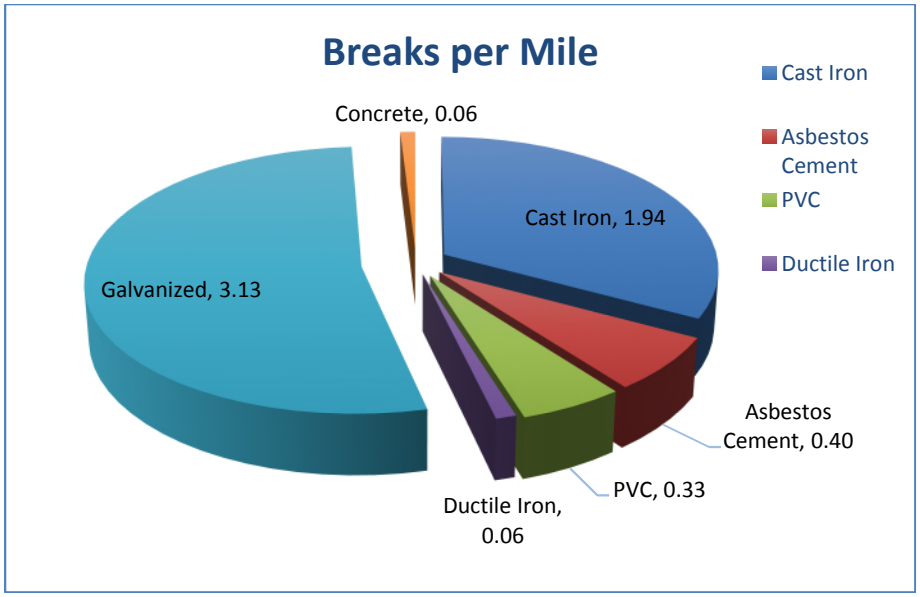


The average number of breaks per year has decreased from 222 per year for the period of January 2000 to October 2008 to 159 per year for January 2012 to December 2017. This reduction is indicative of the main replacement work conducted following 2008 that specifically targeted mains with numerous break incidents.

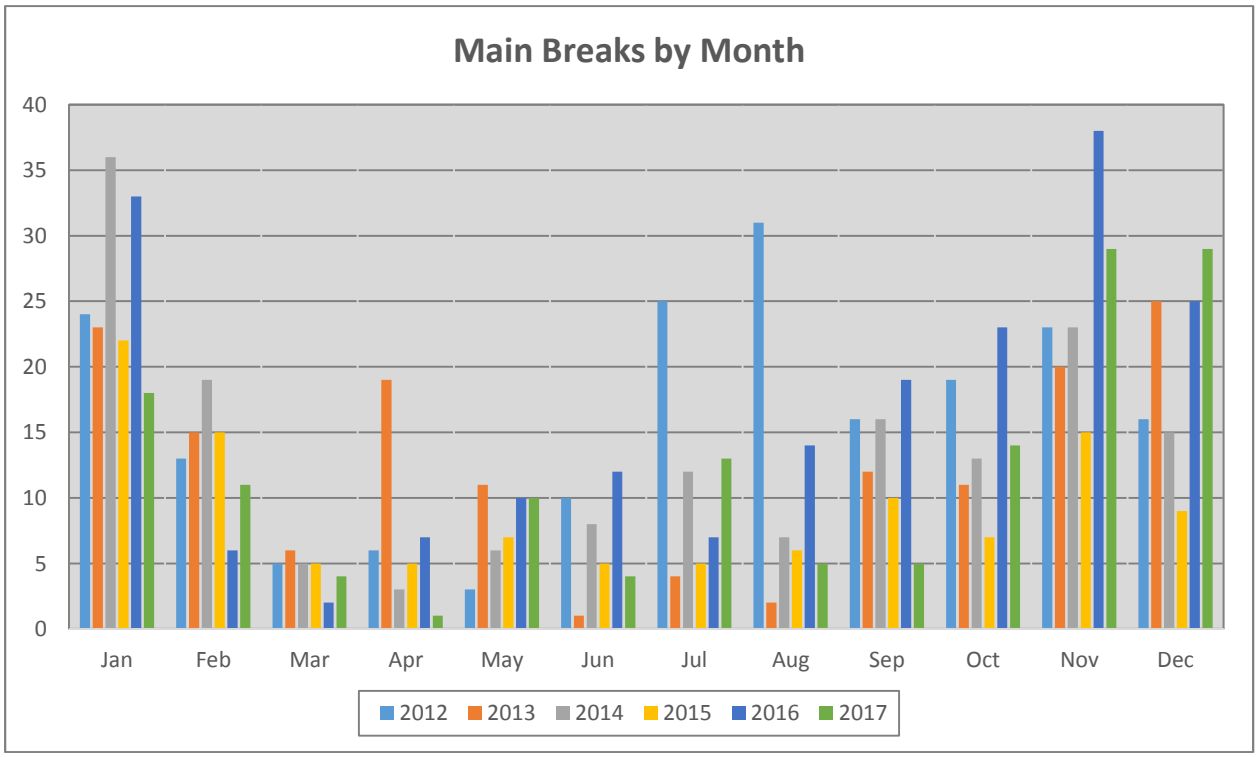
Review of the reported breaks from January 2012 to December 2017 indicated that main breaks on cast iron main represented 63.2% of all of the breaks. Since cast iron main lined and unlined material only represents 15.3% of the total inventory of mains in the ground, the break rate on this type of material is significantly higher than the other material in the system.

Table 5 – Breaks by Material					
Material Types					
Cast Iron	Asbestos Cement	PVC	Ductile Iron	Galvanized	Concrete
63.2%	14.3%	15.2%	6.1%	1.0%	0.5%

The break rate per mile of main shows that cast iron main had a break rate of 1.9 breaks per mile of main compared to ductile iron which saw a break rate of 0.06 breaks per mile of main from January 2012 to December 2017. The worst performing material was galvanized steel which had a break rate of 3.13 breaks per mile of main.



Another area reviewed in the main break data from January 2012 to December 2017 indicated that 52.7% of the breaks occur between November to February of each year with the lowest break period being during May and June. Analysis of the break reports would support that ground shift breaks cause the most failure of the pipe material and we would expect to see the ground shifts occur during the November to February time frame. It should be noted that the high break occurrence that is observed in July and August of 2012 is believed to be caused by ground shift breaks that occurred following high rain events during each of those months.



With ground shift breaks being 64% of the overall breaks that occurred during January 2012 to August 2015, this would correlate with pipe materials that are susceptible to ground movement or shifting being at greater risk than other materials. Cast iron and galvanized steel are not as resilient to the tension and bending forces that result from ground shifting, and this contributes to the higher break per mile numbers that the system has experienced.

Cast iron and galvanized steel are good at controlling internal forces and crushing forces that were generally used during the design stage when this material was placed into service. The industry gained the knowledge that cast iron and galvanized steel were susceptible to bending forces and encouraged the introduction of other materials. Materials such as ductile iron and PVC handle these types of forces and as such are more resilient to this type of ground movement. This resulted in the water utility industry moving away from cast iron and galvanized steel and standardizing on ductile iron and PVC.

Current Replacement Effort

Following the Gannett Fleming report in 2009, the replacement effort was predominantly driven by mains that exhibit high break frequency, relocations and requests by operations to replace mains to address multiple repair trips to the same main. During the period of 2009 to 2013 the average spend on main replacement projects was $2.6 million per year. The main replacement projects replaced all types of material that were experiencing high break frequencies, but the majority of the type of main replaced during this period was cast iron main. With this effort the amount of cast iron main replaced in the system was 10.7 miles with an average of 2.1 miles a year.

In 2014 there was a renewed effort to review the distribution infrastructure and start to address the aging infrastructure needs of the system. During 2014 and through 2017 the average spend on main replacement projects was $4.3 million per year. Based on this current effort the amount of cast iron main replaced in the system from January 2014 through December 2017 was 21.7 miles with an average of 5.4 miles per year.

Since 2009 the main replacement work has replaced 32.4 miles of cast iron main from the system and replaced it primarily with ductile iron main. This represents a replacement rate for cast iron main of 2.7 miles per year during the 9 year period including the accelerated rate of 5.4 miles per year over the past 4 years from 2014 and 2017. While this is making significant progress, it is still not enough to address the rapidly aging distribution system. At the current rate it would take approximately 57.4 years to replace the remaining 310 miles of the cast iron main in the distribution system. At the end of the 57 year period the possible age of a cast iron main could be nearly 200 years old or over twice the life expectancy for this type of material.

Main Replacement Criteria Development

With the renewed effort to review the distribution system in 2014, Kentucky-American Water analyzed the methodology for planning main replacement to ensure that the distribution system could meet the needs of its customers and strategize ways to reduce the failure rate of mains. The previous method of determining main replacement was based on break history and requests from the operations group on which mains to replace, and this was determined to be too limited in identifying the most critical mains to replace.

With the understanding that continued enhancement of the Kentucky-American Water system would require a systematic replacement plan to ensure that the right mains were being replaced at the right time, the company established a goal in 2013 to research and develop tools to assist in developing the plan.

The first step was to develop the criteria that would be used to assess the existing mains and develop a list of mains that were in critical need of being replaced. It was determined that a main replacement assessment standard would require adoption of several criteria to determine which mains would need to be replaced. Development of the assessment standard considered the inclusion of eight criteria that played a major role in providing reliable service and were a good indicator of the condition of the main. These criteria are included in Table 6.

During development of the criteria it was determined that several of the criteria had interrelationships with each other and contributed to the performance of a section of water main. One of the interrelationships was main size and fire flow. In addition, it was determined that leaks can also be related to the age and material of the mains, and material types can be related to the water quality aspect of the main.

Due to the interrelationships of the eight criteria, the team established relative weights for each criterion to ensure that the targeted drivers for the main are given greater consideration. Age, material type, low pressure, number of breaks and water quality were the primary criteria that would be used to determine main replacement. These criteria allowed the main replacement program to ensure that mains that were not meeting the needs of the community and customers were addressed quickly.

Along with the criteria weighting, the assessment contains a rating standard for each of the eight criteria. A numeric rating of between 1 and 5 was used for each criterion – with 1 being the better rating and 5 being the worst rating.

TABLE 6 - MAIN REPLACEMENT CRITERIA						
Criteria (Max. Points)	***Weight***	***Rating***				
		1	***2***	***3***	***4***	***5***
Low Pressure (75)	15x	50 psi or greater	50 psi to 45 psi	45 psi to 40 psi	40 psi to 35 psi	< 35 psi
Number of Breaks/Leaks (75)	15x	0 breaks/5-year avg.	1-2 breaks/5-year avg.	3-4 breaks/5-year avg.	5-6 breaks/5-year avg.	< 6 breaks/5-year avg.
Fire Flow (50)	10x	Greater than 1,500 gpm (Blue)	1,500 to 1,000 gpm (Green)	999 gpm to 500 gpm (Yellow)	Less than 500 gpm (Red)	Known problems
Age (75)	15x	1995 or later	1980 to 1994	1970 to 1979	1960 to 1969	1959 and prior
Material Type (75)	15x	DI/RCP	PVC/HDPE	Transite/AC	CI/CLCI	Gal. / Steel
Size of Main (50)	10x	8 inch and above	6 inch	4 inch	2 inch to 3 inch	Main smaller than 2 inch
Water Quality (75)	15x	Flushing but not routine	Monthly Flushing	Bi weekly Flushing	Weekly (or more frequent) Flushing	Continuous Flushing (w/ discussion)
Customer Impact (25)	5x	less than 2 customers	2 to 10 customers	11 to 20 customers	greater than 20 customers	School/Hospital (Critical Customer)

An electronic database was developed to assist in the assessment and prioritization of the replacement mains and subsequent development of replacement schedules. The database is designed to perform the necessary queries and calculations to determine the main section overall rating and ranking. Initially 62 mains were entered into the database as a pilot to ensure that the assessment tool was capturing the critical needs of the system and identified the more critical sections to replace.

During most of 2013 through 2016 this initial list has provided a schedule for which mains are in need of replacement and provided a schedule that has been used to guide the main replacement program.

As with any tool, there are still external drivers that influence the main replacement program. These external items such as roadway paving schedules, weather or construction considerations are combined with the results of the assessment tool to make adjustments in the replacement program. This combination of tools and subjective considerations allows for a more reactive replacement program that is in concert with the community and allows for efficient use of available resources.

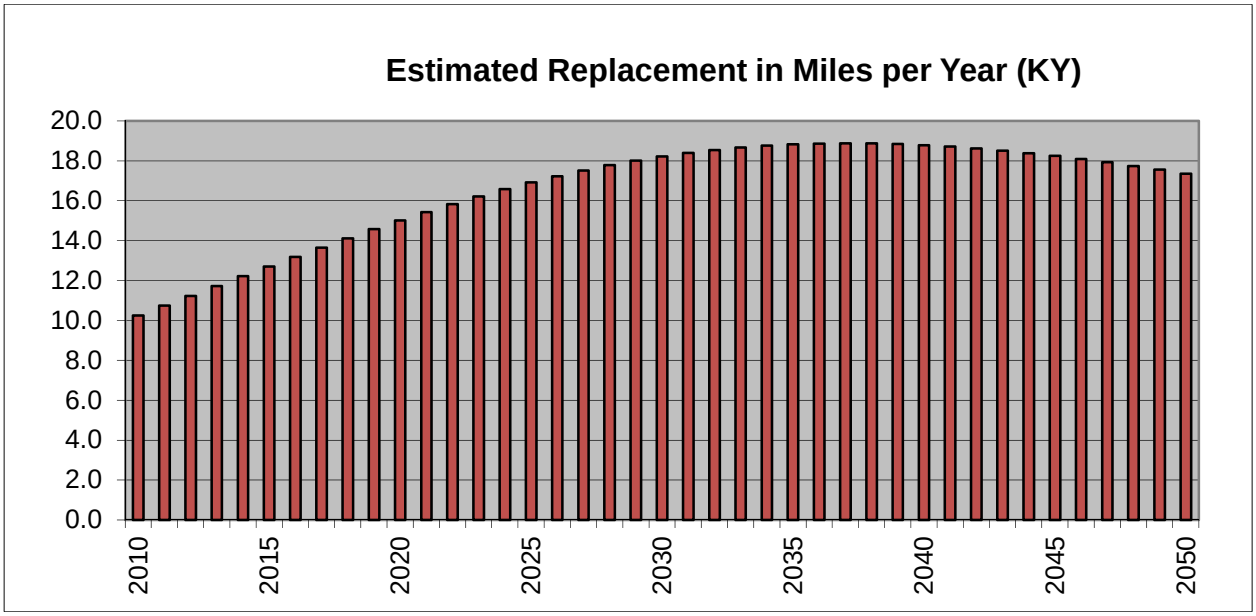
Nessie Model

While the assessment tool provides a numerical approach of determining the critical mains to replace, the company needed to determine the overall scope and financial impact over a longer planning horizon. The company looked for tools that could provide assistance in determining the capital needs for water main replacement in the coming years that considered the life expectancy of the infrastructure.

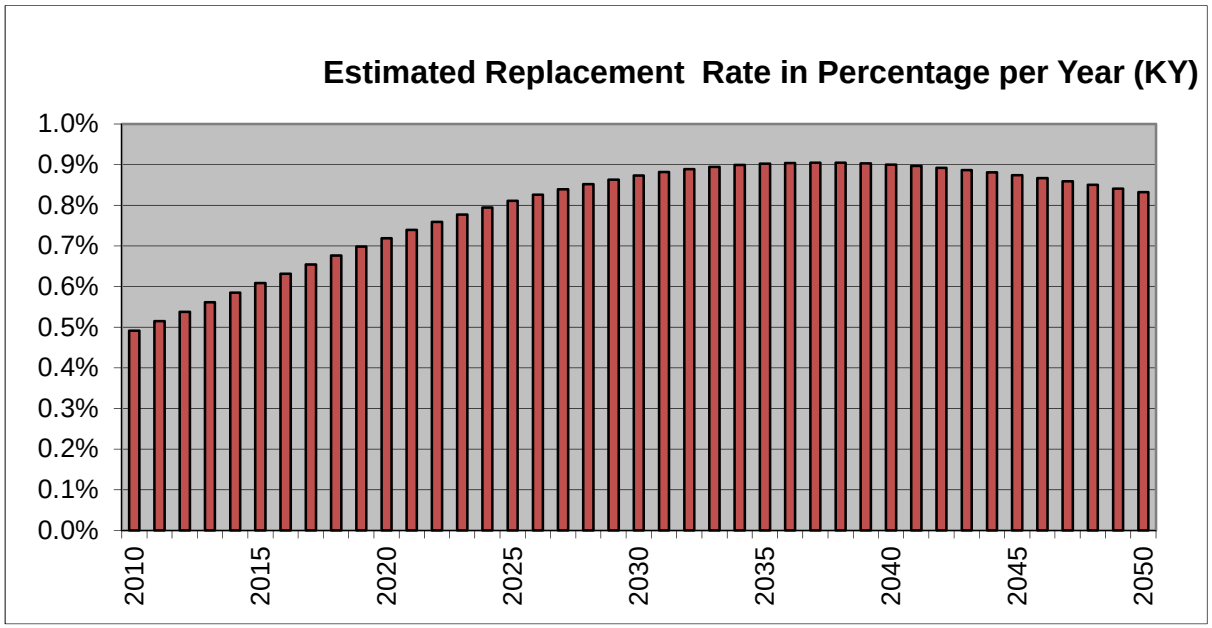
The American Water Works Association report "Dawn of the Replacement Era" developed a process that created a "Nessie Curve" for the 20 systems it reviewed in the report. The Nessie Curve, so called because the graph follows an outline this is likened to a silhouette of the Loch Ness Monster, provided a visual representation of the capital needs during a defined time frame to rebuild the underground infrastructure of the 20 systems. With the report "Buried No Longer," AWWA further developed the analysis of the underground infrastructure and developed the "Nessie Model."

The model uses pipe failure probability distributions based on past research with typical pipe conditions at different ages and sizes coupled with the indicative costs to replace each size and type of pipe, as well as the cost to repair the projected number of pipe breaks over time. The model projects the "typical" useful service life of the infrastructure based on pipe inventories of the system and estimates how much pipe of each type should be replaced in each of the coming 40 years.

Kentucky-American Water utilized the model to provide an insight into the replacement rate suggested during the 40 year planning horizon. The chart below provides the estimated replacement in miles of main per year that peaks to 19 miles per year by 2034.

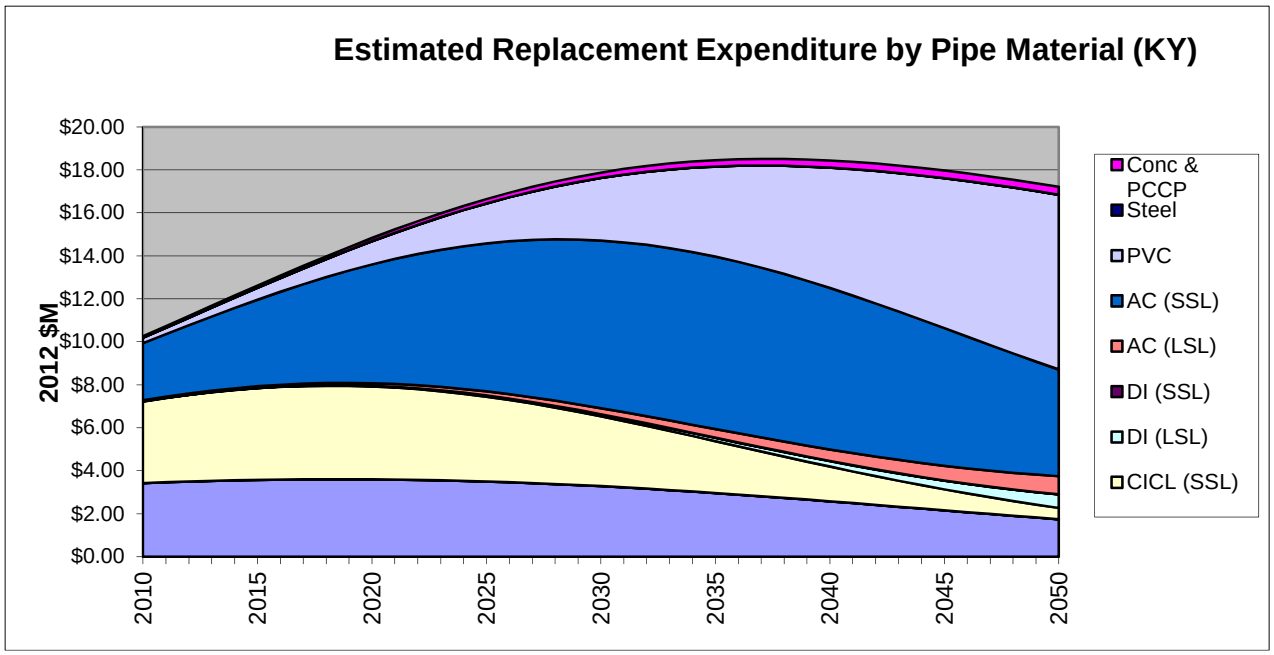


The analysis of the distribution system with the estimated replacement rate of 10 to 19 miles of main per year translates into a replacement rate of 0.49 to 0.90 as percent of the system per year. This estimated replacement rate in percentage of the distribution system per year from 2010 to 2050 is indicate on the chart below.



The model then combines the amount of infrastructure that should be replaced with the typical cost to replace the mains to create an estimate of the total investment cost for the 40 year planning horizon. The model represents this data through a series of Nessie Curves to depict the suggested amount of spending required to replace the main at the optimal life cycle for each material type.

The Nessie Model provides an insight on the amount of capital that is suggested to ensure that the distribution system is being replaced to account for the useful life of the distribution mains. The chart below provides the Nessie Curve developed by the model over a 40 year time frame of the estimated capital needed to replace the appropriate pipe material in the system based on the materials useful life.



The model identifies that cast iron main is the material that needs to be replaced initially followed by asbestos cement. During the 40 year period the model projects that during the first 20 years approximately $6 to $8 million each year is needed for cast iron main replacement declining to $3 million during the final 20 years. At the same time the model suggests that asbestos cement main be replaced at a rate of $3 to $7 million each year during the 40 year period. In the outer years of the planning horizon, replacement of PVC main and ductile main begin to be shown as a need in order to address the life expectancy of those material types.

The curve reflects an "echo" of the original trends that shaped the development of the system starting in 1885. The identified capital needs is a reflection of the main installed nearly a century ago that have created a future obligation to replace the mains as they reach their useful life that is now coming due.

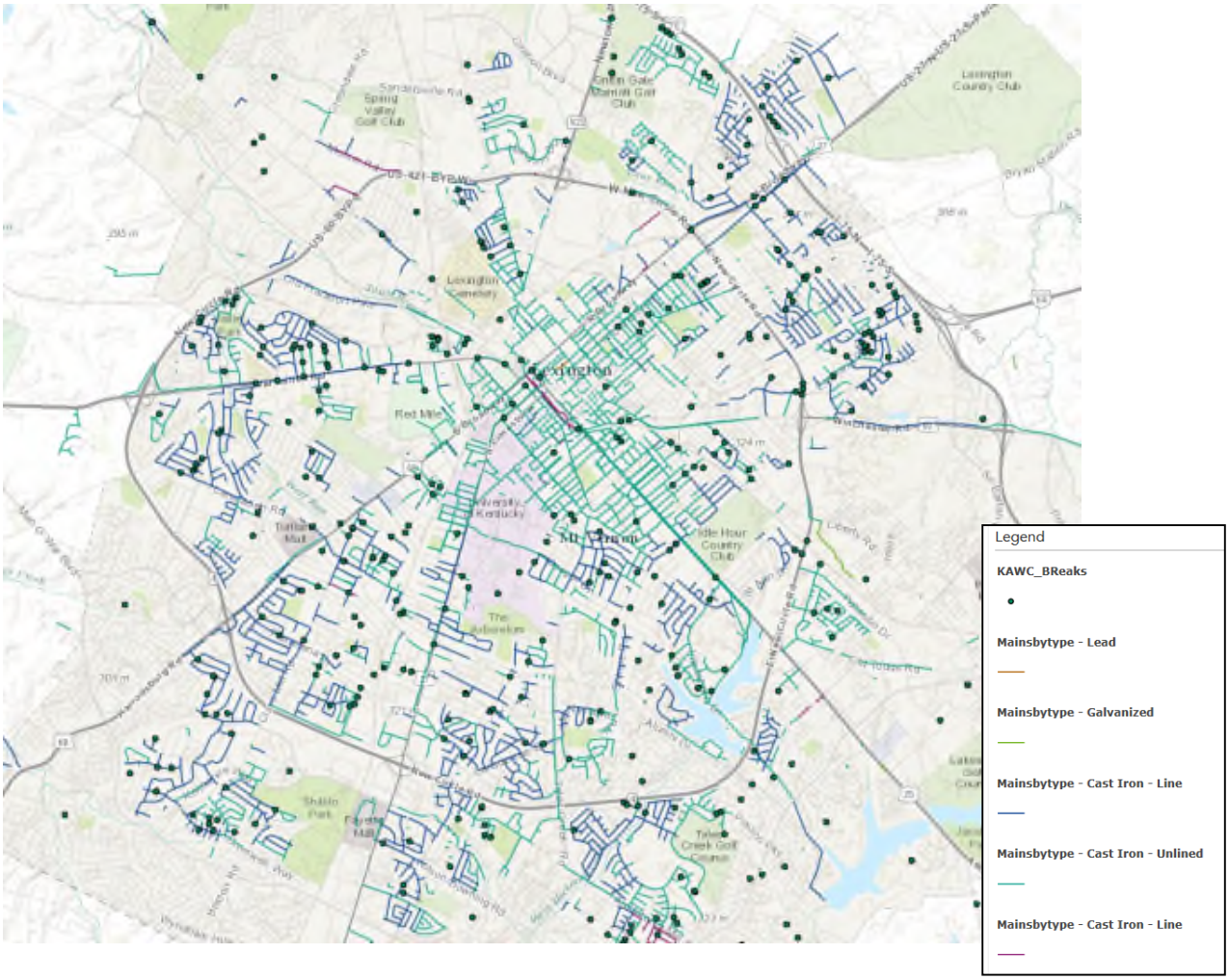
Proposed Accelerated Replacement Plan

Kentucky-American recognizes that the past rate of replacement of aging mains the company has employed is not sufficient to address the increased replacement rate that will be required over the coming decades. The need to begin to rebuild the distribution infrastructure that was bequeathed to us by earlier generations is essential to maintain the needs of the community and customers.

Upon review of the distribution system and the material types used in the development of the system, Kentucky-American believes that the first materials that need to be replaced in the system are cast iron main and galvanized steel. These two materials

represent approximately 16.1% of the distribution system but account for approximately 61.4% of all main breaks in a given year.

The company utilized its Graphical Information System (GIS) to query the main breaks during the period of January 2012 to August 2015 against the main types in the system and found that empirical data from the database is depicted graphically. The following map shows the main breaks during the 2012 to 2015 period against cast iron and galvanized steel main.



The map identifies two items rather definitively. The first is that a majority of the cast iron main was installed during the first half of the development of Lexington. The map clearly shows that a majority of downtown Lexington remains cast iron and to the most extent unlined cast iron. In addition, with the development of the community away from downtown, the map shows those subdivisions during this period that cast iron was used as the predominate material to serve these areas. It is interesting to note that a majority of the development during the time was within the inner circle, with only small pockets of development along the outside of the circle.

The second item that the map shows is the correlation of the main breaks within the areas that are predominately cast iron and galvanized steel. The remaining main breaks shown on the map are scattered throughout the system and have no indication that there are significant trouble spots from the other distribution system material types at this time.

Based on the information reviewed by the company over the past few years and the data developed for this report, a majority of the mains that are susceptible to breaks are cast iron and galvanized steel. Kentucky-American believes that the best course at this time is to target this type of pipe material over the next 25 years for replacement. The replacement of this type of material allows the company to address underperforming mains and reduce the impact of main breaks in the areas served by this type of material. A review of several replacement periods was reviewed and illustrated in Table 7, indicating that with a 15 year plan would cost $20.2 to $12.6 million annually and a 30 year period would cost $9.6 to $6.3 million per year.

TABLE 7 - POSSIBLE REPLACEMENT RATES FOR CAST IRON

Period Length	15 year	20 year	25 year	30 year
Miles Replaced per year	21 - 16	16 -12	13 - 10	10 - 8
Cost per year (million)	$20.3 to $12.6	$15.5 to $9.5	$12.6 to $6.9	$9.6 to $6.3

Analysis of the four possible replacement rates lead the company to believe that a 25 year replacement period was more realistic. The 30 year replacement rate would result in a greater overlap of replacement activity between the completion of the cast iron main replacement and the start of the asbestos cement main replacement period.

With the 15 year and the 20 year replacement periods, the removal of the cast iron is quicker and allows for the effort to replace asbestos cement to begin sooner. However, the amount of capital required per year was a concern with respect to support from the community. In addition, the level of capital commitment per year for the 15 year and 20 year replacement rates could have a negative impact on Kentucky-American to address other infrastructure replacement needs such as water treatment components at the water treatment plants that are also entering the end of their useful life.

Finally, the amount of miles of replacement main per year of 16 and 12 miles for the 15 year and 20 year replacement rates is a concern for the impact on available resources to complete the construction each year. The 15 year replacement rate is a fourfold increase in the amount of main replaced during 2014 to 2016. This increase would be a significant strain on the available company and contractor resources and would require a substantial increase in labor and equipment that Kentucky-American is concerned can be sustained over the period of the replacement program.

Through a 25 year replacement period, the 310 miles of cast iron main will be replaced at a rate of 10 to 13 miles per year at an expected cost of $6.9 to $12.6 million per year. At the conclusion of the 25 year replacement period for cast iron, the company will start to focus on the replacement of the 339 miles of asbestos cement pipe, which the earliest pipe installed during 1935, and at which point will be entering its 105th year of useful life.

Infrastructure Resilience

Whatever the debate may be concerning the causes of climate variability, it is hard to dispute that utilities face the reality of climatic variability and attendant stresses on water resources and system recovery. Although climate models for the Southwestern U.S. generally predict overall annual precipitation amounts to remain similar to average historical experience, increasingly intense storms and repeated, extended dry periods are anticipated. That means we can expect more droughts of varying degrees of severity and more frequent and intense high-precipitation events and floods, along with high damaging storm events – which impacts the ability of the distribution system to provide service.

As indicated in the Black & Veatch 2016 Strategic Directions: Water Industry Report, *"water utilities have a responsibility to anticipate and manage crises before they happen. Drought in the Southwestern U.S. and flooding in the Northeastern U.S. are two sides of the same coin. Changes in climate and weather patterns are highlighting the effects of why "kicking the can down the road" approaches to addressing infrastructure and maintenance needs do not work. Natural disasters in New Orleans and Houston, or the events in Flint, should serve as wake-up calls to water providers that resilience requires long term infrastructure, resources, financial planning, utility leadership and customer engagement."*

The effects of climate variability impacts the resilience of a system to withstand an event without interruption of providing service to the customers or, if service is interrupted, to restoring the service in a timely manner. Like all large users dependent on electricity from the grid, water utilities must plan for power outages and develop plans for maintaining continuity of operations when such outages occur. Nonetheless, recent weather patterns combined with the issue of aging infrastructure are causing utilities to review traditional planning and design criteria. The design standards for supplies, treatment plants, pump stations and tanks are taken together to achieve a level of zero service outages. The so-called new normal has led experts to look beyond traditional reliability and emergency planning into a world that needs the speed of recovery and resiliency for much more widespread and damaging events. Updating infrastructure to keep up with the increase in extreme weather and insuring that adequate service can be maintained for extended time periods after an extreme event is just as important as addressing the aging infrastructure.

Improvements for Infrastructure Resilience

The Kentucky-American Water's distribution system contains 22 storage facilities throughout its system with a combined volume of 27.25 million gallons. The system also contains 17 pump stations throughout the system that work in concert with the storage facilities to maintain the system's ability to meet the needs of the community.

A majority of the storage and pumping facilities were installed during its greatest growth during the 1970s through the housing boom of the first part of 2000. Ongoing maintenance and repainting of the storage facilities has allowed Kentucky-American to sustain its facilities, ensuring that the facilities will not need to be replaced until around 2050.

The pumping facilities are reaching a life of 20 to 40 years in service and are at or exceeding the typical useful life of 30 years. It is anticipated that over the next ten years, Kentucky-American water will be replacing the existing below grade pump stations and installing above grade pump stations. Through the systematic replacement of the pump stations Kentucky-American will be able to address the aging infrastructure and address work site conditions imposed by the existing below grade installations. In addition, Kentucky-American will be reviewing and adding or supplementing the standby generation to a majority of the pump stations to ensure adequate service can be maintained for extended time periods after an extreme weather events.

Conclusion

Thanks to the work of past generations that developed and built the water distribution system to support the growth of our community, we have enjoyed the access to clean water and economic advantages that it has provided. Because these water mains last a long time we have never had to replace a significant amount of pipe on a large scale. We are on the edge of the period when these mains are reaching the end of their useful life and future generations will need to undertake large scale replacement efforts to ensure that we continue to benefit from our access to clean water.

It is important that instead of a entering this period in with a careless plan that only addresses the system as it fails, we undertake a prioritized renewal of the mains to ensure that our water infrastructure can reliably and cost-effectively support the public health, safety, and economic vitality of our community.

Kentucky-American believes that the replacement of cast iron and galvanized steel main through a 25 year replacement period and its ability to replace other infrastructure facilities to address resilience issues within the system is important to ensure the company can responsibly enter into the period of water infrastructure renewal.

Through careful prioritization of projects and looking at emerging technology, the cost of replacing facilities just prior to failure will be of significant benefit to the community. Through the reduction of the number of failures the system experiences and the ability to recover from damaging events, we can reduce the negative effects of property damage, disruption of businesses and the community, and wasting of our water resources and thereby ensure our future generations continue to benefit from access to reliable clean water that will support the economic growth of the community.

Resources

ASCE, 2013. *Failure to Act: The Impact of Current Infrastructure Investment on America's Economic Future*. ASCE, Reston.

ASCE, 2013. *2013 Report Card for America's Infrastructure*. ASCE, Reston

ASCE, 2016. *Failure to Act: Closing the Infrastructure Investment Gap for America's Economic Future.* ASCE, Reston.

AWWA, 2012. *Buried No Longer: Confronting America's Water Infrastructure Challenge*. AWWA, Denver.

AWWA, 2006. *Water Infrastructure at a Turning Point: The Road to Sustainable Asset Management*. AWWA WITAF Report. Denver

AWWA, 2001. *Dawn of the Replacement Era: Reinvesting in Drinking Water Infrastructure*. AWWA, Denver.

Black & Veatch Insights Group, 2016. *2016 Strategic Directions: Water Industry Report.* Black & Veatch Corporation, Overland Park.

Giustolisi, O., D Laucelli and D A Savic, 2006. *Development of Rehabilitation Plans for Water Mains Replacement Considering Risk And Cost-Benefit Assessment*, Civil Engineering and Environmental Systems, Vol. 23, No. 3., pp 175-190.

Melillo, Jerry M., Terese (T.C.) Richmond, and Gary W. Yohe, Eds., *2014: Climate Change Impacts in the United States: The Third National Climate Assessment. U.S. Global Change Research Program*, 841 pp

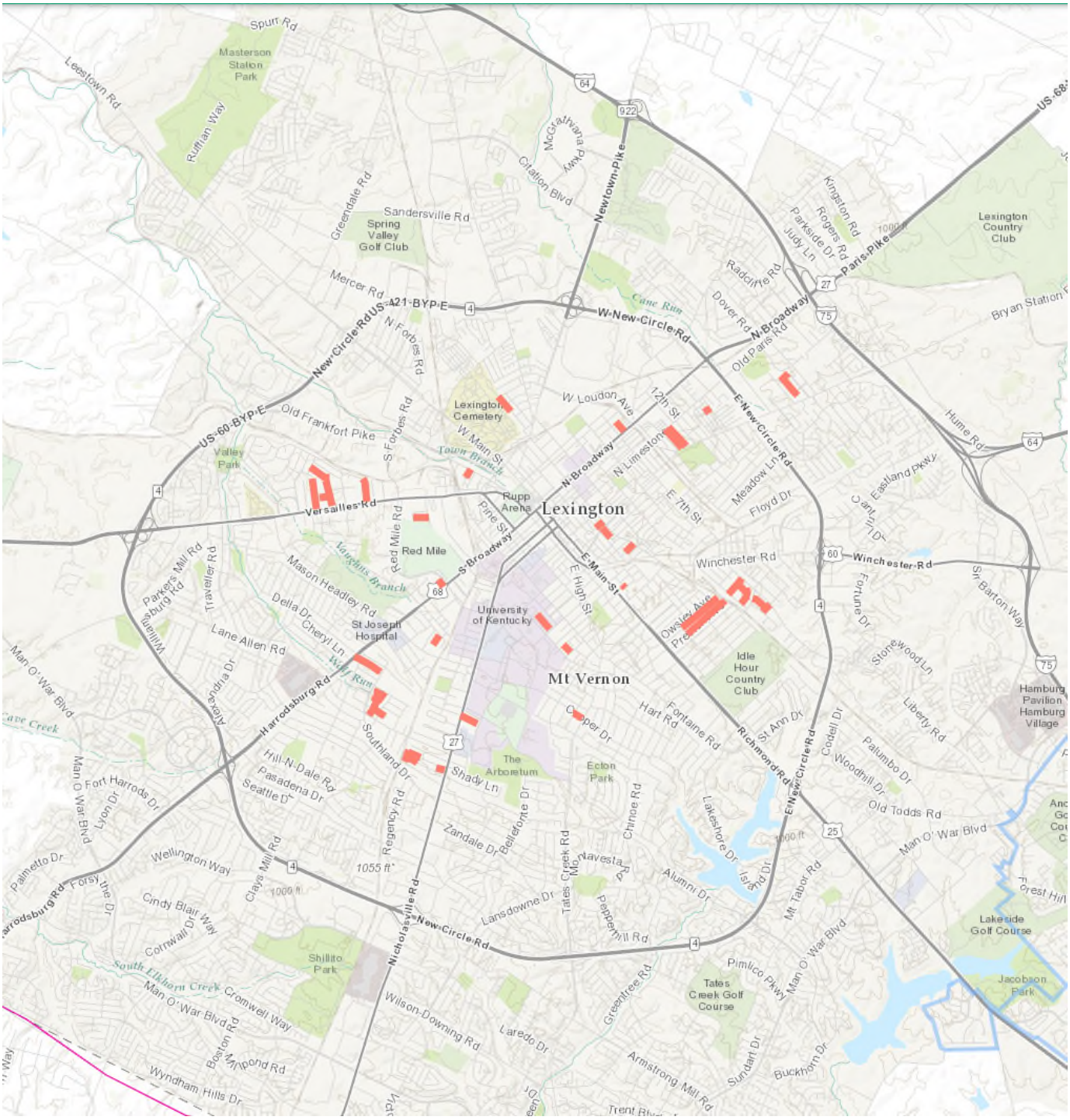
USEPA, 2002. The Clean Water Drinking Water Infrastructure Gap Analysis. EPA816-R-02-020. Office of Water, Washington.

USEPA, 2000. The Infrastructure Investment Gap Facing Drinking Water and Wastewater Systems. Office of Water, Washington.

APPENDIX

KENTUCKY AMERICAN WATER

Projected Year One Projects For Main Replacement Program

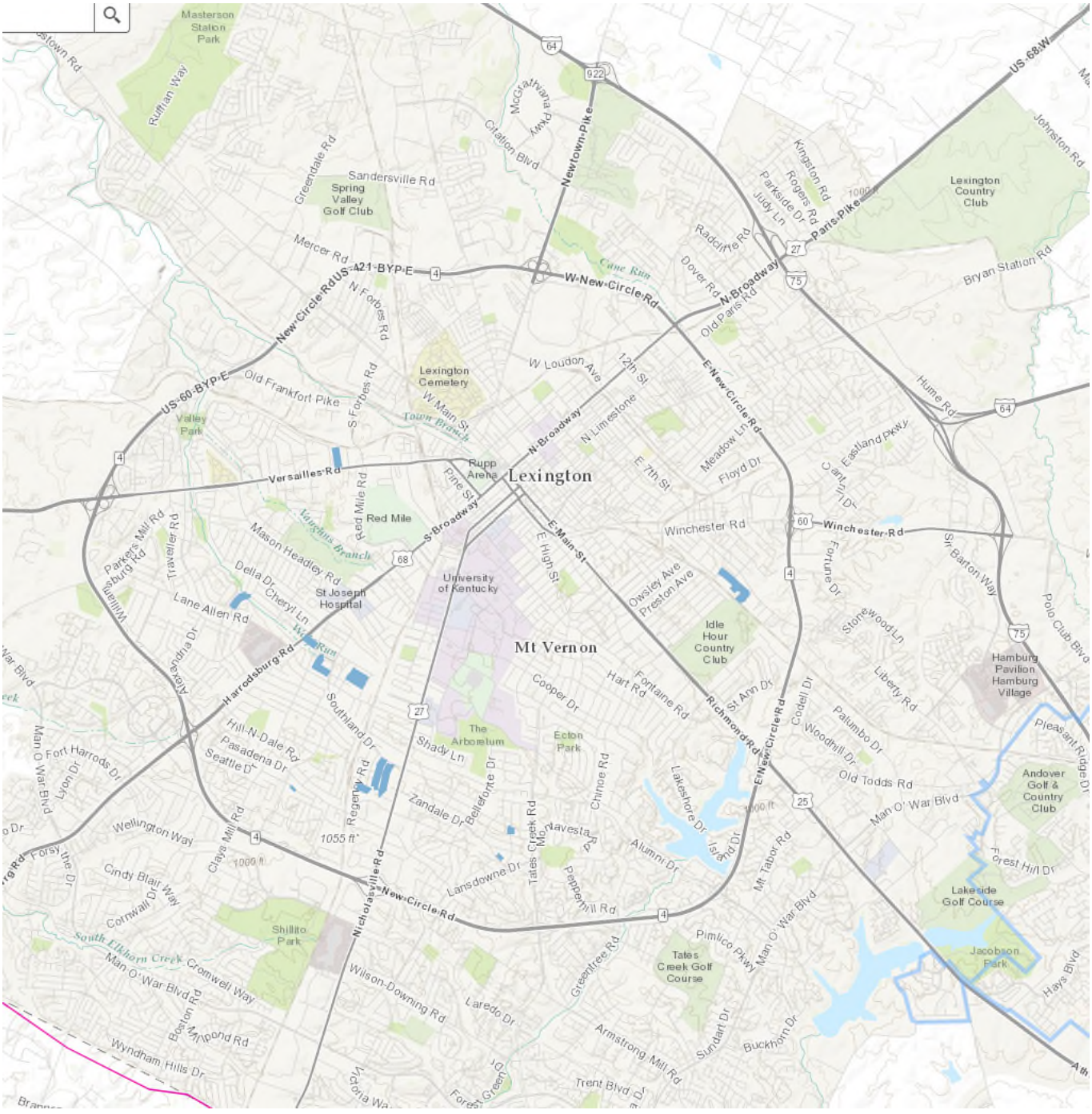


PROJECTED YEAR ONE PROJECTS FOR MAIN REPLACEMENT PROGRAM

PROJECT NUMBER	PROJECT LOCATION	AMOUNT OF MAIN TO BE REPLACED (FEET)	ANTICIPATED COST
1	600 BLOCK SAYRE AVE	212	$31,800
2	900 BLOCK WHITNEY AVE	1,030	$154,500
3	200 BLOCK PERRY ST	466	$69,900
4	1000 BLOCK KASTLE RD	512	$76,800
5	1200 BLOCK EMBRY AVE	536	$80,400
6	200 BLOCK SPRUCE ST	624	$93,600
7	200 BLOCK HAMILTON PARK	978	$146,700
8	300 BLOCK GUNN ST	184	$27,600
9	100 BLOCK SHAWNEE PL	568	$85,200
10	200 BLOCK WARNOCK ST	492	$73,800
11	600 BLOCK ORCHARD AVE	380	$57,000
12	100 BLOCK AVON AVE 100 BLOCK BURNETT AVE	1,340	$201,000
13	1400 BLOCK CAMDEN AVE	1,082	$162,300
14	100 BLOCK WABASH DR 1800 BLOCK PENSACOLA DR 200 BLOCK LACKAWANNA RD 180 WABASH DR 140 WABASH DR	3,160	$474,000
16	200 AND 300 BLOCK LINCOLN AVE	3,928	$589,200
17	200 TO 400 BLOCKS OF PRESTON AVE	2,452	$367,800
18	300 BLOCK RICHMOND AVE 200 BLOCK WHITE AVE	814	$122,100
19	300 BLOCK PENNSYLVANIA CT	1,422	$213,300
20	300 BLOCK STRATHMORE RD	1,436	$215,400
21	100 BLOCK GARRETT AVE	968	$145,200
22	200 BLOCK GARRETT AVE	1,508	$226,200
23	300 BLOCK N PICADOME PARK	1,648	$247,200
24	600 BLOCK COOPER DR	218	$32,700
25	1300 BLOCK WILLOWLAWN AVE	438	$65,700
26	400 BLOCK UHLAN CT	768	$115,200
27	100 DELMONT DR	1,052	$157,800
28	200 BLOCK E VISTA ST	1,260	$189,000
29	200 BLOCK W VISTA ST	1,204	$180,600
30	100 BLOCK E VISTA ST	1,502	$225,300
31	400 BLOCK MORRISON AVE	608	$91,200
32	200 BLOCK LINWOOD DR	948	$142,200
33	500 BLOCK MCCUBBING DR	2,290	$343,500
34	1100 BLOCK SPARKS RD	2,358	$353,700
35	600 BLOCK LAGONDA AVE	1,980	$297,000
36	7OO BLOCK APPLETREE LN	980	$147,000
37	1600 BLOCK CLAYTON AVE	1,644	$246,600
ANTICIPATED YEAR TOTAL		42,990	$6,448,500

KENTUCKY AMERICAN WATER

Projected Year Two Projects For Main Replacement Program

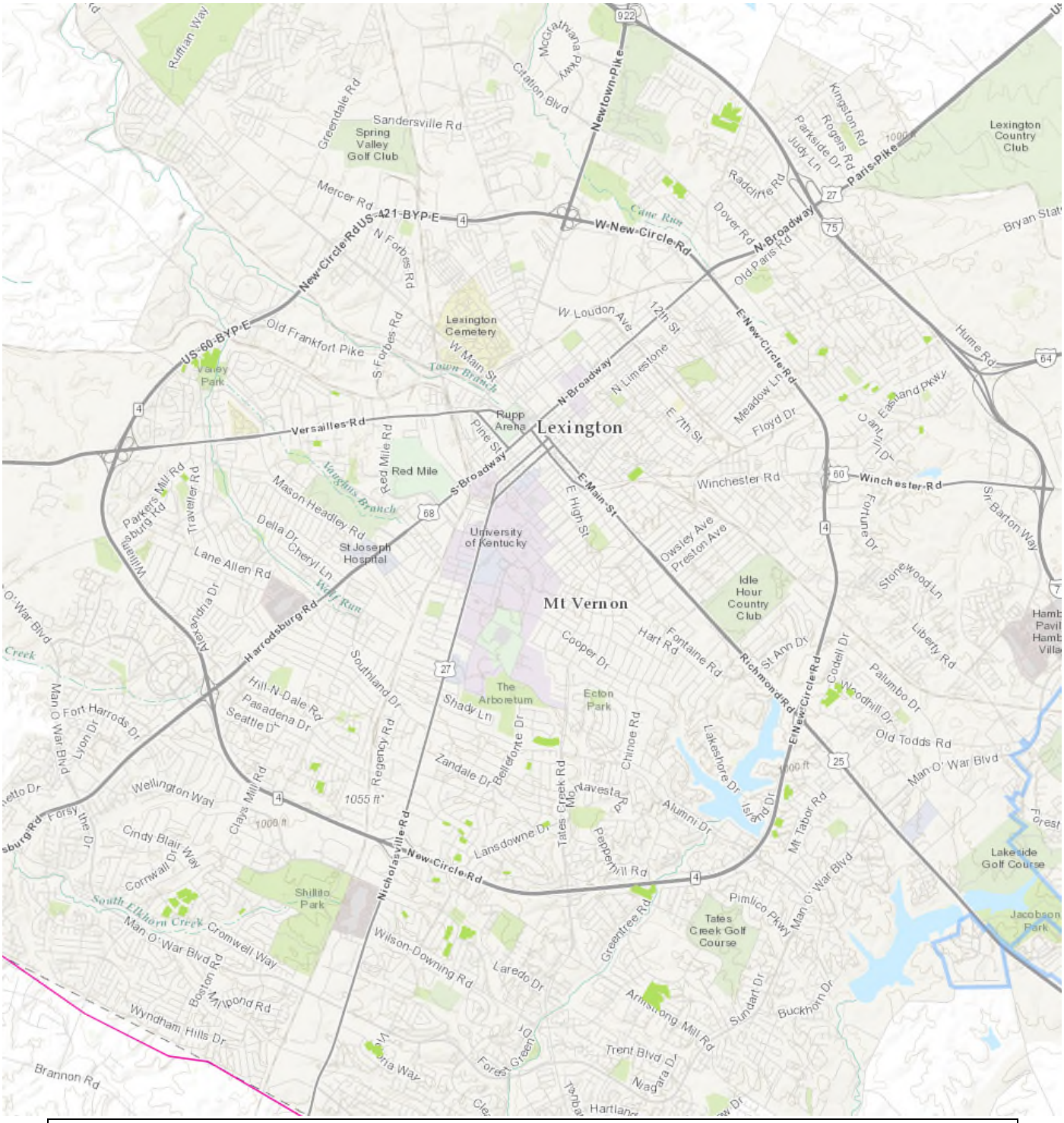


PROJECTED YEAR TWO PROJECTS FOR MAIN REPLACEMENT PROGRAM

PROJECT NUMBER	PROJECT LOCATION	AMOUNT OF MAIN TO BE REPLACED (FEET)	ANTICIPATED COST
1	1600 BLOCK COURTNEY AVE	1,490	$223,500
2	EMERY CT 1600 BLOCK COURTNEY AVE	2,058	$308,700
3	600 BLOCK BLUE ASH DR	940	$141,000
4	200 BLOCK KOSTER DR	1,860	$279,000
5	200 BLOCK NORWAY ST	1,702	$255,300
6	100 BLCOK HALLS LANE	1,626	$243,900
7	LONE OAK DR	3,468	$520,200
8	2000 BLOCK RAINBOW RD 200 BLOCK DERBY DR 2000 BLOCK REBEL RD	1,508	$226,200
9	4800 BLOCK BOONE LN	3,762	$564,300
10	1100 BLOCK N CLEVELAND RD	5,356	$803,400
11	5400 BLOCK BRIAR HILL RD	4,280	$642,000
12	4400 BLCOK HALEY RD	50	$7,500
13	4600 BLOCK TODDS RD	3,496	$524,400
14	3500 BLOCK ROLLING HILLS CT	610	$91,500
15	5000 BLOCK SULPHUR LN	1,462	$219,300
16	5200 BLOCK WINCHESTER RD	5,423	$813,450
17	5400 BLOCK WINCHESTER RD	230	$34,500
18	1900 BLOCK BEACON HILL RD	1,576	$236,400
19	3100 BLOCK BRECKENWOOD DR	356	$53,400
20	LAMONT CT	226	$33,900
21	700 BLOCK LANDSDOWNE CIR	314	$47,100
22	3500 BLOCK MADDOX LN	2,732	$409,800
ANTICIPATED YEAR TOTAL		44,525	$6,678,750

KENTUCKY AMERICAN WATER

Projected Year Three Projects
For Main Replacement Program



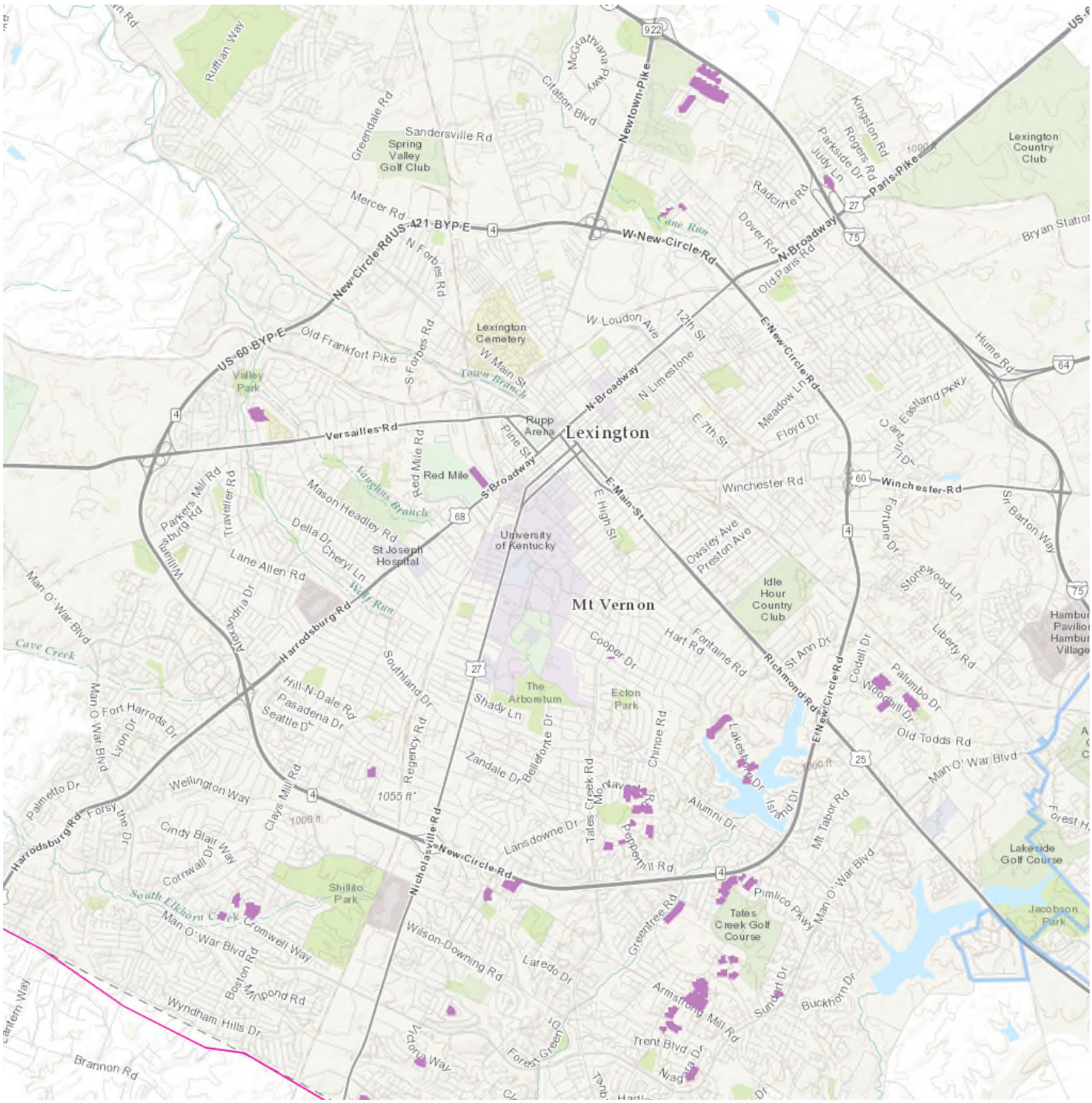
PROJECTED YEAR THREE PROJECTS FOR MAIN REPLACEMENT PROGRAM

PROJECT NUMBER	PROJECT LOCATION	AMOUNT OF MAIN TO BE REPLACED (FEET)	ANTICIPATED COST
1	100 BLOCK NEW ZION RD	2,302	$345,300
2	SAMUEL LN	1,156	$173,400
3	TILLYBROOK CT	624	$93,600
4	3200 BLOCK RAVEN CIRCLE	360	$54,000
5	MALABU CT	1,556	$233,400
	HUNTER CIRCLE		
	HEATHER CT		
	300 BLOCK BELVOIR DR		
6	200 BLOCK BRADFORD CIR	352	$52,800
7	SHIRLEE CT	372	$55,800
8	OLD DOBBIN RD	482	$72,300
9	DELMONT CT	168	$25,200
10	1300 BLOCK HIALEIAH CT	1,682	$252,300
	1300 BLOCK HOT SPRINGS CT		
	1300 BLOCK KEENELAND CT		
11	CROSS KEYS CT	490	$73,500
12	200 BLOCK LEWIS ST	260	$39,000
13	THISTLETON CIRCLE	522	$78,300
14	EDINBURGH CT	258	$38,700
15	CROYDEN CT	942	$141,300
	SHEFFIELD CT		
16	100 BLOCK GENTRY RD	176	$26,400
17	100 BLOCK N CLEVELAND RD	238	$35,700
18	7300 BLOCK OLD RICHMOND RD	646	$96,900
19	WILLIAMSBURG CT	368	$55,200
20	WOODSIDE CIRCLE	304	$45,600
21	600 BLOCK TATESWOOD DR	340	$51,000
22	RANGE CT	672	$100,800
23	GREENLAWN CT	1,438	$215,700
	JADE CIRCLE		
	KIMBERLITE CT		
	GRANITE CIRCLE		
24	DURHAM CT	504	$75,600
25	100 BLOCK COLLEGE ST	1,098	$164,700
26	GAYLE CIRCLE	388	$58,200
27	SAYBROOK CT	282	$42,300
28	WAYCROSSE CIRCLE	676	$101,400
	SHILOH CT		
29	KELSEY CT	1,694	$254,100
	KELSEY PL		
	YARMOUTH CT		
	1100 BLOCK KILRUSH DR		
30	CRICKLEWOOD CT	340	$51,000
31	1100 BLOCK APPIAN CROSSING WAY	978	$146,700
32	600 BLOCK CARDIGAN CT	1,416	$212,400
	3500 BLOCK BERWIN CT		
	3400 BL0CK IPSWICH CT		
33	3400 BLOCK FLINTRIDGE CIRCLE	426	$63,900
34	500 BLOCK FOLKSTONE DR	302	$45,300
35	1100 BLOCK GREENTREE CT	1,252	$187,800
	GREENTREE PL		
	GREENTREE CIRCLE		
PROJECTED YEAR THREE PROJECTS FOR MAIN REPLACEMENT PROGRAM			
PROJECT NUMBER	**PROJECT LOCATION**	**AMOUNT OF MAIN TO BE REPLACED (FEET)**	**ANTICIPATED COST**

36	KING ARTHUR CT	1,272	$190,800
	3400 BLOCK KING ARTHUR DR		
37	PADDOCK CT	436	$65,400
38	TANNER CT	438	$65,700
39	PENWAY CT	438	$65,700
40	400 BLOCK PLAINVIEW RD	248	$37,200
41	100 BLOCK TORONTO DR	1,286	$192,900
	4000 BLOCK VICTORIA WAY		
	4000 BLOCK VICTORIA WAY		
	200 BLOCK TORONTO RD		
42	2600 BLOCKI WINBROOKE LN	408	$61,200
43	2800 BLOCK MIDDLESEX CT	778	$116,700
44	700 BLOCK HILL RISE CT	542	$81,300
45	1500 BLOCK HALSTED CT	2,420	$363,000
	KILDARE CT		
	KIRK CT		
46	800 BLOCK GENTRY LN	1,236	$185,400
47	200 BLOCK MULBERRY RD	1,148	$172,200
	OSAGE CT		
	2500 BLOCK BUTTERNUT HILL CT		
48	BLACKARROW CT	730	$109,500
49	BARBADOS LN	2,508	$376,200
	3100 BLOCK TABAGO CT		
	2700 BLOCK MARTINIQUE LN		
50	1800 BLOCK COLCHESTER DR	2,484	$372,600
	FELTNER CT		
	1800 BLOCK BOWEN CT		
	1800 BLOCK BARKSDALE DR		
	1800 BLOCK COLCHESTER DR		
51	HAVELOCK CIR	1,614	$242,100
	600 BLOCK SAGINAW CT		
	3400 BLOCK ALDERSHOT DR		
52	KILKENNY CT	932	$139,800
ANTICIPATED YEAR TOTAL		43,982	$6,597,300

KENTUCKY AMERICAN WATER

Projected Year Four Projects
For Main Replacement Program



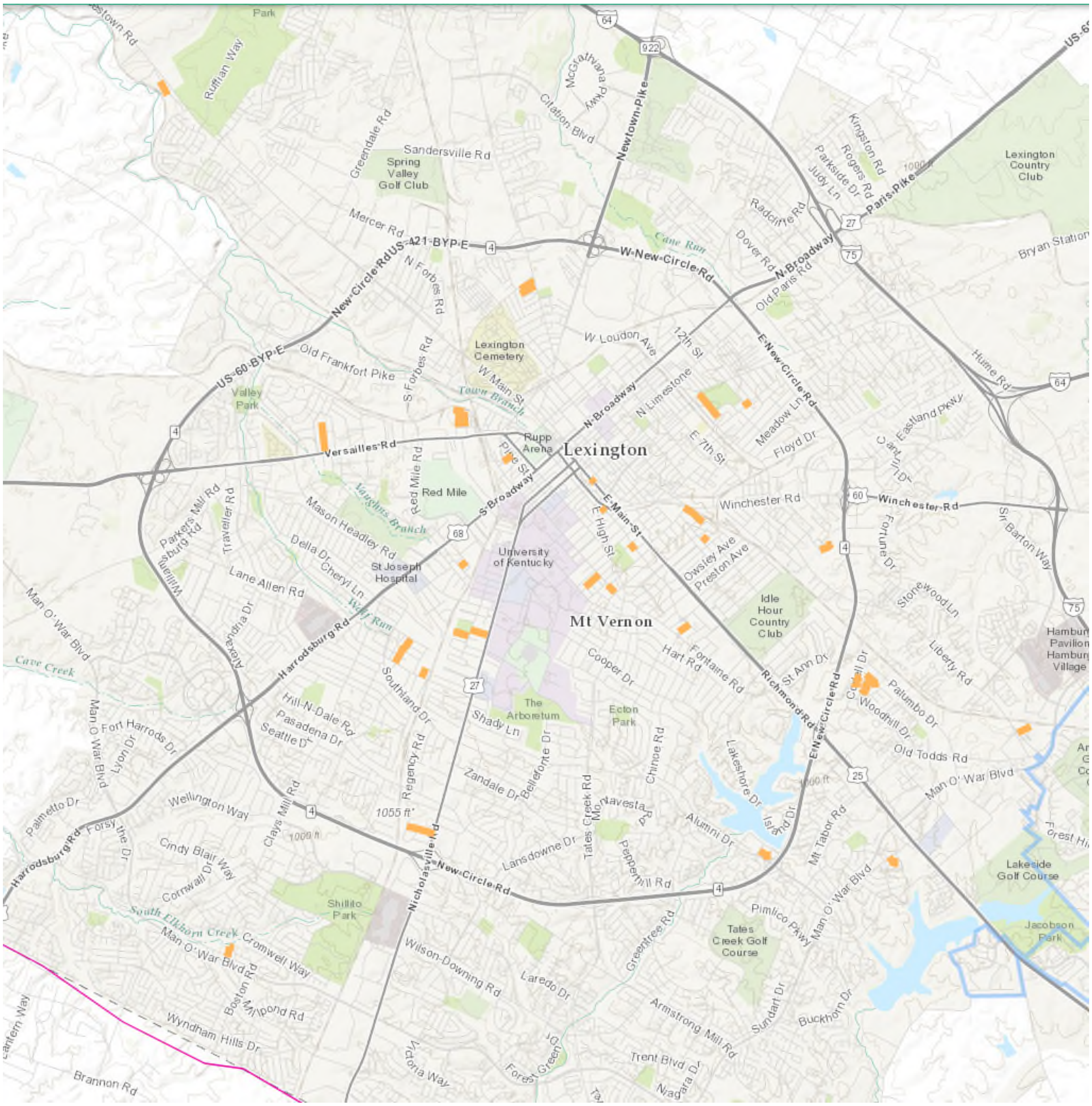
PROJECTED YEAR FOUR PROJECTS FOR MAIN REPLACEMENT PROGRAM

PROJECT NUMBER	PROJECT LOCATION	AMOUNT OF MAIN TO BE REPLACED (FEET)	ANTICIPATED COST
1	3100 BLOCK OLD CROW CT	1,916	$287,400
	3100 BLOCK CLAIR RD		
	MONTAVESTA CT		
2	2000 BLOCK CUMMINS CT	758	$113,700
	2000 BLOCK DANIEL CT		
3	400 BLOCK CURRY AVE	468	$70,200
4	4000 BLOCK LILYDALE CT	1,634	$245,100
	4000 BLOCK WHITEMARK CT		
5	3500 BLOCK ORMOND CIR	636	$95,400
6	1900 BLOCK RITTENHOUSE CT	328	$49,200
7	2400 BLOCK PLUMTREE CT	1,236	$185,400
	2400 BLOCK THORNBERRY CT		
8	1200 BLOCK MAYWOOD PARK	2,744	$411,600
	1200 BLOCK OAKLAWN PARK		
	1200 BLOCK TANFORAN DR		
	1200 BLOCK NARRAGANSETT PARK		
	LATONIA PARK		
	3200 BLOCK WATERFORD PARK		
9	200 BLOCK KELLY CT	1,352	$202,800
10	600 BLOCK FOGO CT	2,020	$303,000
	600 BLOCK CREWE CT		
	3400 BLOCK FRASERDALE CT		
	3400 BLOCK BIRKENHEAD CIR		
11	LOOKOUT CIR	866	$129,900
	2900 BLOCK MONTAVESTA RD		
12	WEM CT	562	$84,300
13	4100 BLOCK WINNIPE CT	630	$94,500
14	400 BLOCK WOODLAKE WAY	250	$37,500
15	3200 BLOCK WOOD VALLEY CT	256	$38,400
16	3500 BLOCK SUTHERLAND DR	1,020	$153,000
17	3500 BLOCK NIAGRA DR	688	$103,200
18	3300 BLOCK MOUNDVIEW CT	434	$65,100
19	LISA CIR	912	$136,800
	MONA CT		
20	MARGO CT	1,846	$276,900
	KAREN CT		
21	VERSIE CT	1,270	$190,500
	JANNELLE CT		
22	200 BLOCK HEDGEWOOD CT	512	$76,800
23	TAMMY CT	2,726	$408,900
	LAVERNE CT		
	GREVEY CT		
	HARRIS CT		
24	GRANT CT	1,034	$155,100
	HOLLOW CREEK CT		
	GRANT PL		
25	GRAIG CT	626	$93,900
26	LYNNWOOD CT	1,746	$261,900
	WOODSTON CT		
	CLEARWOOD CT		
27	3600 BLOCK CAYMAN LN	1,574	$236,100
	JAMAICA CT		
PROJECTED YEAR FOUR PROJECTS FOR MAIN REPLACEMENT PROGRAM			
PROJECT NUMBER	**PROJECT LOCATION**	**AMOUNT OF MAIN TO BE REPLACED (FEET)**	**ANTICIPATED COST**

28	WATERS EDGE PL	1,580	$237,000
	2000 BLOCK HARMONY CT		
	2100 BLOCK BRIDGEPORT DR		
29	1600 BLOCK COSTIGAN DR	3,536	$530,400
	1900 BLOCK LEITNER CT		
	1900 BLOCK BEDINGER CT		
	1900 BLOCK COBYVILLE CT		
	900 BLOCK VALLEY FARM DR		
	1900 BLOCK CHRIS DR		
30	3400 BLOCK BELLMEADE RD	884	$132,600
	3400 BLOCK WARWICK CT		
31	1300 BLOCK OX HILL DR	758	$113,700
	BASS CT		
32	1200 BLOCK ASCOT PARK	1,594	$239,100
	1200 BLOCK BEULAH PARK		
	1300 BLOCK ATOKAD PARK		
	1300 BLOCK GOLDEN GATE PARK		
	1200 BLOCK AK-SAR-BEN PARK		
33	BRANDON CT	418	$62,700
34	SWOONALONG CT	2,350	$352,500
	PERSONALITY CT		
	1300 BLOCK CANONERO DR		
	GUNBOW CT		
	PERSONALITY CT		
35	3500 BLOCK GINGERTREE CIR	484	$72,600
36	KENIL CT	138	$20,700
37	2000 BLOCK VON LIST WAY	2,156	$323,400
ANTICIPATED YEAR TOTAL		43,942	$6,591,300

KENTUCKY AMERICAN WATER

Projected Year Five Projects
For Main Replacement Program



PROJECTED YEAR FIVE PROJECTS FOR MAIN REPLACEMENT PROGRAM

PROJECT NUMBER	PROJECT LOCATION	AMOUNT OF MAIN TO BE REPLACED (FEET)	ANTICIPATED COST
1	TREPASSEY CT	808	$121,200
2	100 BLOCK WESTGATE DR	2,022	$303,300
3	100 BLOCK MOORE DR	170	$25,500
4	3300 BLOCK PITTMAN CREEK CT	634	$95,100
5	4700 BLOCK HUFFMAN MILL PIKE	56	$8,400
6	300 BLOCK ROBERTSON ST	3,476	$521,400
	1100 BLOCK MARTIN AVE		
	300 BLOCK FERGUSON ST		
	300 BLOCK ANDERSON ST		
	300 BLOCK ROBERTSON ST		
7	3200 BLOCK BRACKTOWN RD	1,946	$291,900
8	400 BLOCK BRADLEY CT	1,602	$240,300
9	100 BLOCK CASTLEWOOD DR	1,152	$172,800
10	800 BLOCK CAMPBELL LN	1,184	$177,600
11	600 BLOCK CENTRAL AVE	362	$54,300
12	100 BLOCK CHELAN CT	700	$105,000
13	700 BLOCK E EUCLID AVE	378	$56,700
14	200 BLOCK E MAIN ST	478	$71,700
15	200 BLOCK SOUTHPORT DR	2,672	$400,800
16	TIMBERHILL CT	858	$128,700
	ELDERBERRY CT		
17	HEATON CT	1,042	$156,300
	2400 BLOCK MIRAHILL DR		
	2400 BLOCK WINDWOOD CT		
18	1400 BLOCK ELIZABETH ST	2,352	$352,800
	100 BLOCK FOREST PARK RD		
19	200 BLOCK WESTWOOD CT	1,364	$204,600
20	100 BLOCK WESTWOOD DR	1,640	$246,000
21	1100 BLOCK FERN AVE	1,896	$284,400
22	1000 BLOCK FLOYD DR	232	$34,800
23	400 BLOCK GREENWOOD AVE	1,280	$192,000
24	800 BLOCK JOHNSDALE DR	552	$82,800
25	3200 BLOCK HALEY RD	1,616	$242,400
26	500 BLOCK LONGVIEW DR	94	$14,100
27	400 BLOCK MACADAM DR	2,604	$390,600
	600 BLOCK ROSEMILL DR		
28	3400 BLOCK MCFARLAND LN	3,650	$547,500
29	500 BLOCK MCKINLEY ST	308	$46,200
30	500 BLOCK MERINO ST	542	$81,300
31	300 BLOCK MEMORY LN	396	$59,400
32	600 BLOCK MONTGOMERY AVE	226	$33,900
33	700 BLOCK NATIONAL AVE	1,242	$186,300
	900 BLOCK NATIONAL AVE		
34	1100 BLOCK OAK HILL DR	470	$70,500
35	300 BLOCK OLD VINE ST	162	$24,300
36	2100 BLOCK PAIGE CT	358	$53,700
37	400 BLOCK PARK AVE	634	$95,100
38	500 BLOCK PINE ST	382	$57,300
39	200 BLOCK RIDGEWAY RD	556	$83,400
40	1400 BLOCK RUSSELL CAVE RD	210	$31,500
ANTICIPATED YEAR TOTAL		42,306	$6,345,900

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF:	**)**	
	)	
THE APPLICATION OF KENTUCKY-AMERICAN WATER COMPANY FOR AN ADJUSTMENT OF RATES	**)**	**CASE NO. 2018-00358**

DIRECT TESTIMONY OF JAMES S. PELLOCK

November 28, 2018

Q. Please state your name and business address.

A. My name is James S. Pellock, and my business address is 1 Water Street, Camden, NJ, 08102.

Q. By whom are you employed and in what capacity?

A. I am employed by American Water Works Service Company, Inc. ("Service Company") and my title is Principal Regulatory Analyst. The Service Company is a subsidiary of American Water Works Company, Inc. ("American Water") that provides support services to Kentucky-American Water Company ("KAWC," "Kentucky-American," or "Company") and its affiliates.

Q. Have you previously filed testimony before this or any other commission?

A. I have not presented testimony before the Kentucky Public Service Commission ("Commission"). I have previously participated in the preparation and filing of rate cases on behalf of American Water's regulated subsidiaries in Virginia and Maryland.

Q. Please summarize your educational and professional qualifications.

A. I have a Bachelor of Science in Business and Economics (major in accounting) from Lehigh University, and a Master of Business Administration from the Pennsylvania State University. I have completed the NARUC Utility Rate School. Professional certifications include Certified Public Accountant (CPA) in Pennsylvania, Chartered Global Management Accountant (CGMA), and Certified Internal Auditor (CIA).

I have been employed by Service Company since 1987. Prior to assuming my current role in May 2018, I most recently served as Director – Corporate Development to support the pursuit and integration of acquisition opportunities at both the state and corporate levels. Other previous roles with Service Company from 1997 through 2011 include

Senior Manager - Financial Valuation, and Director of Finance - Strategic Analysis. Before that, I served as Director Corporate Accounting (responsible for preparation of consolidated financial statements), after being promoted from the role of Senior Auditor in 1992.

Q. What are your current employment responsibilities?

A. My current duties as a Principal Regulatory Analyst include preparing exhibits, testimony and responses to data requests in support of rate applications and other regulatory filings for American Water's regulated subsidiaries. I also prepare, or assist with preparing, various reports required by regulatory commissions governing jurisdictions in which American Water operates.

Q. What is the purpose of your direct testimony in this proceeding?

A. The purpose of my direct testimony is to support and explain the following Company expense levels: labor and labor related, regulatory expense, contract services, maintenance and supplies, certain other operational expenses, and uncollectible expense.

Q. What is the base period in this case?

A. The Company has used a base period of the twelve months ending February 28, 2019. This base period data reflects six months of actual data (March 2018 – August 2018) and six months of projected data (September 2018 – February 2019). The Company has adjusted the base period for any known or projected increases or decreases to arrive at the forecasted year expenses and revenues on which KAWC proposes to base its rates.

Q. What is the forecasted year proposed in this case?

A. The Company has used a forecasted test period of the twelve months ending June 30, 2020 ("fully forecasted test period").

LABOR AND RELATED EXPENSES

Q. Please describe KAWC's labor and related expenses.

A. KAWC's labor and labor related expenses are associated with local employees who support KAWC exclusively. KAWC's labor force produces high quality drinking water, maintains the production facilities and distribution systems, monitors water quality, provides engineering services, and supports the efficient management of local operations. There are three classifications of employees at KAWC: union hourly employees, non-union hourly employees, and exempt employees. Union hourly employees receive base pay, overtime pay, and in some cases other compensation (such as wage premiums) and are eligible for performance pay. Non-union hourly employees receive base pay, overtime pay, and are eligible for performance pay. Exempt employees receive base pay and are eligible for performance pay. Therefore, total salaries and wages for each classification of employees includes fixed pay (base pay) and variable pay.

The costs associated with Company labor that are discussed in my testimony include:

1) Salaries and Wages
2) Group Insurance
3) Other Benefits, including:
    a. 401k
    b. Defined Contribution Plan ("DCP")
    c. Retiree Medical Expense
    d. Employee Stock Purchase Plan ("ESPP")

4) Annual and Long Term Performance Plans

5) Payroll Taxes

Additionally, some of KAWC's employees are eligible for Pension and Other Post-Employment Benefits (OPEBs). These costs are described in the testimony of Melissa Schwarzell. The pro forma fully forecasted test period labor and related expense can be found in KAWC Filing Exhibit 37, Schedules C, D and G.

Q. Please describe the overall approach to calculating labor and related expenses.

A. The fully forecasted test period labor and related expenses were calculated on a position-by-position basis, based on 152 full-time positions. Company witness Kevin Rogers provides additional information regarding the Company's employee levels.

Fully forecasted test period labor expense is based on the planned staffing level at hourly rates per contract for union employees and wage rates for non-union employees that reflect forecasted pay increases. Because some labor and labor related costs are capitalized with capital projects and programs, a capitalization percentage is used to assist in calculating net expense as described below. An adjustment is also made to remove costs appropriately charged to wastewater operations, as also further discussed below. As a result, O&M labor expense, as reflected in the filing, represents costs related to water operations that are charged to expense on the Company's income statement.

Q. Please describe how the various components of pro forma Salaries and Wages were calculated.

A. Salaries and wages expense is composed of four components: 1) base pay, 2) overtime expense, 3) wage premiums required by union contract, and 4) annual and long term performance compensation for eligible employees.

Base Pay - To calculate the gross regular-time cost, wage rates projected to be in effect for each month of the fully forecasted test period were applied to the working hours for each month, for a total of 2,088 base hours for all full time hourly employees. Wage rates for union employees were based on collective bargaining agreements ("CBAs") for each month of the fully forecasted test period. Fully forecasted test period wages for non-union employees were based on actual rates effective as of August 31, 2018, with prorated increases of 2.85% estimated for April 2019 and 2.90% estimated for April 2020.

Overtime - The second component of the labor expense is overtime expense. Overtime hours are based on the forecasted overtime per the Company's most recent forecast for each eligible position. Overtime hours are paid at three different multiples to base rates (1.5x, 2.0x, or 2.5x) which are determined based on the timing of the work performed (normal overtime, weekend, holiday, etc.). The overtime multiplier for the forecast is based on a three year average through August 31, 2018. Each employee's overtime gross expense is calculated by multiplying the employee's hourly rate of pay by the overtime multiplier, then by the overtime hours.

Wage Premiums – Union employees' CBAs include provisions for certain wage premiums for work completed on second or third shifts, per the negotiated CBA. The average annual gross shift premium for groups of positions was calculated over the three years ending August 31, 2018 and allocated by position according to payroll history.

Performance Pay – The last component of labor expense is the annual and long term performance compensation expense. Performance pay was calculated on a position by position basis for each employee. It was based on each position's target percent for both

the Annual Performance Plan ("APP") and Long Term Performance Plan ("LTPP"). The target percent was multiplied by each eligible employee's pro forma base salary in the fully forecasted test period to determine APP and LTPP costs for that period.

Q. Once the gross costs are calculated, how are the fully forecasted test periods operations and maintenance ("O&M") Salaries & Wages expense derived?

A. To derive O&M Water Salaries & Wages, each position's gross costs are multiplied by both a "Water percentage" and an "O&M percentage." The "Water percentage" is assessed by position and is based on the average payroll charges to water operations over the three years ending August 31, 2018. Applying this percent has the effect of excluding projected labor utilized in support of the sewer operations. Because some labor and labor related costs are capitalized through capital projects and programs, a capitalization percentage is also used to calculate net expense, as applied based on the position type. The O&M percentage (calculated as 1 minus the capitalization percentage) is based on the average ratio of dollars charged to capital versus O&M for each position type over the three years ending August 31, 2018. This eliminates from expenses the labor and labor related costs which are appropriately charged to capital projects and programs. These are capitalized dollars deducted from the total cost to develop O&M labor and related expense. The allocation of management's salaries to sewer operations was based on the 0.985% factor that was determined in Case No. 2014-00390. When the gross costs are netted for Water percentage, O&M percentage (1 minus the capitalization percentage), and the management allocation percentage, the total forecast expense is $7,802,450. This results in adjustment of $618,326 to the base period total of $7,184,124 for O&M Salaries and Wages expense.

Q. Please discuss the adjustment to general tax expense for payroll taxes.

A. Payroll taxes are related to Salaries and Wages. Taxes must be paid to fund the Federal Insurance Contributions Act, which is divided into two pieces: Old Age Survivors & Disability Insurance ("OASDI," or more commonly "FICA"), and Hospital Insurance (or more commonly "FICA Medicare"). Payroll taxes must also be paid for Federal Unemployment Tax ("FUTA") and State Unemployment Tax ("SUTA"). Fully forecasted test period payroll taxes were calculated on a position-by-position basis, using 2018 tax rates and pro forma wages. Following a methodology similar to labor, each employee's gross payroll taxes are multiplied by their Water percentage and O&M percentage (1 minus the capitalization percentage) to arrive at water O&M payroll tax expense for each employee. When totaled, the water O&M payroll taxes expense for the fully forecasted test period is $596,010. This results in adjustment of $29,452 to the base period total of $566,558 for O&M payroll taxes. The pro forma payroll tax can be found in Exhibit 37, Schedules C, D and G.

Q. Please describe the components of Non-OPEB group insurance.

A. Non-OPEB group insurance includes certain coverages that Kentucky-American provides its employees. These can be grouped into two primary categories: 1) basic life, short-term disability, long-term disability and "AD&D" (accidental death and disability) insurance and 2) medical, dental, and vision insurance.

Q. Please describe the fully forecasted test period calculation for Non-OPEB group insurance expense.

A. Calculations are performed by position based on 152 full-time positions, using the latest available premium rates. Following a methodology similar to labor, each employee's

non-OPEB group insurance costs are multiplied by their Water percentage and O&M percentage (1 minus the capitalization percentage) to arrive at Water O&M-related expense for each employee.

- Basic life, short- and long-term disability and AD&D. The 2018 rates are applied on a position-by-position basis, according to the insurance plans and applying any differences for union and non-union positions.

- Medical, dental, and vision insurance. This category of insurance involves a Company cost net of employee contributions. The costs and contributions vary by plan type (e.g. family, employee, or employee plus spouse). Costs and contributions are calculated on a position-by-position basis, taking into account actual employee plan selections using estimated premium rates for 2019.

Non-OPEB group insurance expense for the fully forecasted test period is $1,720,314, with an adjustment of $304,797 compared to the base period total of $1,415,517. The forecast test period group insurance expense can be found in Exhibit 37, Schedules C, D and G.

Q. Please describe the components of Other Benefits and how they were calculated.

A. Other Benefits expense includes savings programs such as 401k, DCP, Retiree Medical and the Employee Stock Purchase Program ("ESPP"). It also includes other employee-related costs such as tuition aid and training. The 401k, DCP, Retiree Medical and ESPP costs were calculated on a position-by-position basis. Following a methodology similar to labor, each employee's gross benefits costs are multiplied by their Water percentage and O&M percentage (1 minus the capitalization percentage) to arrive at Water O&M-related expense for each employee. The calculations are described in further detail

below. The fully forecasted test period expense for each can be found in Exhibit 37, Schedules C, D and G.

401k - Kentucky-American incurs 401k expense when it matches employee contributions to 401k retirement accounts. The matching amounts are determined by each employee's benefit group or hire date. For union employees hired before 2001 and non-union employees hired before 2006, the Company matches 50% of the first 5% of the employee's contribution (for a maximum of 2.5%). For the remaining employees, the Company matches 100% of the first 3%, and 50% of the next 2% of the employee's contributions (for a maximum of 4%). Pro forma 401k costs were calculated for each position based on fully forecasted test period wages, current employee contribution levels, and the level of match for the benefit group. Expense for the fully forecasted year is $219,120, with an adjustment of $26,243 compared to the base period total of $192,877.

DCP – The Defined Contribution Plan is a retirement savings program for employees not eligible for the defined benefit pension program. Under the DCP, Kentucky-American contributes an amount equal to 5.25% of an employee's base pay into a retirement account. The pro forma DCP expense was calculated by multiplying the fully forecasted test period regular time pay of each eligible position by 5.25%. Expense for the fully forecasted test period is $262,375, with an adjustment of $35,512 compared to the base period total of $226,863.

Retiree Medical Expense - Union employees who are not eligible for OPEB are entitled to Company-provided retiree medical benefits. A trust (referred to as the Voluntary Employee Benefits Association, or VEBA) exists to fund this benefit in the amount of

$600 per eligible employee. Expense for the fully forecasted test period is $23,956, with an adjustment of $3,978 compared to the base year total of $19,978.

ESPP – Expense for the Employee Stock Purchase Plan (ESPP) relates to the Company funded discount on American Water stock purchases made by participating employees through voluntary payroll deductions. Under the ESPP plan, participants currently acquire shares of American Water common stock at a 10% discount. Beginning with stock purchases made in 2019, participants will acquire shares of American Water common stock at a 15% discount. The pro forma expense was calculated based on the fully forecasted test period base wages for each employee who participates in the plan, times their individual contribution amount, applied to the fifteen percent company discount. Expense for the fully forecasted test period is $17,549, with an adjustment of $2,712 compared to the base period total of $14,837.

Other Benefits – Various other expenses (e.g., training, tuition assistance, etc.) are reflected based on the Company's most recent forecast for these expenses. The pro forma other benefits expense for the fully forecasted test period is $125,763, with an adjustment of $2,181 compared to the base period total of $123,582.

REGULATORY EXPENSE

Q. Please explain the adjustment for regulatory expense.

A. The purpose of this adjustment is to annualize rate case expense for the costs related to this rate filing. Estimated costs related to this rate filing include internal labor expense, legal fees, consultants' costs, travel expenses, and other expenses. KAWC proposes that these costs be amortized over a three year period. Unamortized costs from KAWC's last depreciation study are also included. The Company proposes that the remaining unamortized costs be amortized over three years as well. Expense for the fully forecasted

test period is $410,186, with an adjustment of $120,466 compared to the base period total of $289,720. The fully forecasted test period regulatory expense can be found in Exhibit 37, Schedules C and D, and also Schedule F-6.

MAINTENANCE SUPPLIES AND SERVICES

Q. Please explain the adjustment for maintenance supplies and services.

A. The operating expense associated with maintenance supplies and services are those expenses such as plant maintenance, main breaks expense, and the amortization of deferred maintenance costs, including the painting and rehabilitation of intakes, strorage tanks, and hydrotreators. Expense for the fully forecasted test period is $2,321,200, an adjustment of $357,155 from the base period. The majority of this adjustment is due to the Company's proposed amortizations associated with $5.9 million of tank painting projects being completed, less the impact of four projects, totaling approximately $275,000, which are finishing their amortization. A fifteen year amortization is requested for the projects going into service, consistent with the amortization term for these types of projects from prior cases. Expense for the fully forecasted test period is $2,321,200. The remaining portion of the adjustment reflects the Company's most recent forecast of other costs plus an amount to recognize additional expense related to the North Middletown acquisition (calculated using the same per customer amount as the Company's forecast). The net effect of these items is an adjustment of $357,155 compared to the base period total of $1,964,045. The fully forecasted test period maintenance expense can be found in Exhibit 37, Schedules C and D.

CONTRACT SERVICES

Q. Please explain the adjustment for contract services.

A. The contract services expense includes costs associated with snow removal, lawn mowing and landscaping. Also included are lab testing, accounting, audit and legal fees (other than those associated with a rate case proceeding) and other certain services that are performed by a contracted third party. The contract services expense included in the fully forecasted test period is $944,448, based on the the Company's most recent forecasts for that period. This is an increase of $29,923 from the base period expenses of $914,525. The fully forecasted test period contract services expense can be found in Exhibit 37, Schedules C and D.

OTHER OPERATING EXPENSES

Q. Please describe the expenses associated with other operating expense.

A. Other operating expense includes expense adjustments for building maintenance and services, telecommunications, postage, office supplies, advertising and marketing, employee related expense, miscellaneous, customer accounting, rents and transportation.

Q. Please describe the operating expenses related to building maintenance and services expense.

A. The operating expense for building maintenance and services includes the cost of electricity and heating for office facilities, groundskeeping, janitorial services, building security, trash, and water and wastewater services. The building maintenance and services expense included in the fully forecasted test period is $708,870, based on the Company's most recent forecasts for that period. This is an increase of $15,701 from the base period expenses of $693,169. The fully forecasted test period building maintenance and services expense can be found in Exhibit 37, Schedules C and D.

Q. Please describe the operating expenses related to telecommunications expense.

A. The telecommunication expense includes those expenses associated with office phone and wireless services used by the Company. Expense for the fully forecasted test period is $249,651 based on the Company's most recent forecasts for that period, with a reduction of $1,151 compared to the base period total of $250,802. The fully forecasted test period telecommunications expense can be found in Exhibit 37, Schedules C and D.

Q. Please describe the operating expenses related to postage, printing and stationary.

A. The operating expense for postage and printing is inclusive of expenses related to certain shipping and mailings and postage expense, other than those included in the customer accounting expense. Expense for the fully forecasted test period is $32,148 based on the Company's most recent forecasts for that period, with an adjustment of $2,952 compared to the base period total of $29,196. The fully forecasted test period postage expense can be found in Exhibit 37, Schedules C and D.

Q. Please describe the operating expenses related to office supplies and services expense.

A. Office supplies and services are those expenses related to software licenses, bank fees and uniforms. Expense for the fully forecasted test period is $346,815 based on the Company's most recent forecasts for that period, with an adjustment of $61,556 compared to the base period total of $285,259. The fully forecasted test period office supplies expense can be found in Exhibit 37, Schedules C and D.

Q. Please describe the operating expenses associated with advertising and marketing.

A. Kentucky American is not seeking recovery of any advertising and marketing expense. Accordingly, the Company's fully forecasted test period expense is $0 and can be found in Exhibit 37, Schedules C and D.

Q. Please describe the operating expenses related to employee related expense.

A. Employee related expenses include those expenses associated with employee travel and relocation expense. Expense for the fully forecasted test period is $199,691 based on the Company's most recent forecasts for employee travel for that period along with the average annual relocation expense actually incurred by KAWC over the five years ending August 31, 2018. This results in an adjustment of $72,977 compared to the base period total of $126,714. The fully forecasted test period employee-related expense can be found in Exhibit 37, Schedules C and D.

Q. Please describe the operating expenses related to miscellaneous expense.

A. The operating expense described as miscellaneous expense includes expenses for customer education, community relations, and membership dues, directors' fees, hiring costs, office power, heating and oil, as well as other miscellaneous expenses such as laboratory supplies. Expense for the fully forecasted test period is $849,435 based on the Company's most recent projections for that period, except for charitable donations, penalties and account 52001000. An amount was added to recognize additional expense related to the North Middletown acquisition (calculated using the same per customer amount as used in the Company's most recent projections for that period). This results in an adjustment of $192,662 compared to the base period total of $656,773. The forecast test period miscellaneous expense can be found in Exhibit 37, Schedules C and D.

Q. Please describe the operating expenses related to customer accounting expense.

A. The customer accounting expense includes expense items such as: customer invoice mailings, bill inserts, collection notices, third party collection agency fees, lock box fees for payment collection, mailing of water quality reports, etc. Expense for the fully forecasted test period is $1,342,048 based on the Company's most recent projections for that period, with an adjustment to include third party collection fees to accommodate an increase in use of overflow agents. The Customer Service Center ("CSC") has increased its capacity to receive additional customer calls and has also improved our customers' ability to better serve themselves through a new Interactive Voice Response ("IVR") system. This allows our CSC agents to focus on more complex issues that increase call handling time; overflow agents help support the calls coming through the CSC to minimize customer hold times. The forecast also reflects an adjustment to include an amount to recognize additional expense related to the North Middletown acquisition (calculated using the same per customer amount as the Company's most recent forecasts for that period). This results in a total adjustment of $180,101 compared to the base period total of $1,161,947. The fully forecasted test period customer accounting expense can be found in Exhibit 37, Schedules C and D.

Q. Please describe the operating expenses related to rents.

A. Kentucky-American incurs expense for rental costs associated with copy machines and other miscellaneous items, as well as office space, and easements. Expense for the fully forecasted test period is $23,402 based on the Company's most recent projections for that period, with an adjustment of $1,280 compared to the base period total of $22,122. The fully forecasted test period rental expense can be found in Exhibit 37, Schedules C and D.

Q. Please describe the operating expenses related to transportation.

A. Transportation expense includes vehicle operation and maintenance, and fuel costs. Expense for the fully forecasted test period is $423,964 based on the Company's most recent projections for that period, with an adjustment of $50,370 compared to the base period total of $373,594. The fully forecasted test period transportation expense can be found in Exhibit 37, Schedules C and D.

UNCOLLECTIBLE

Q. Please explain the adjustment for uncollectible expense.

A. Uncollectible expenses are those costs associated with bad debt. A forecasted uncollectible percentage of revenue was developed utilizing historical uncollectible dollars to revenue ratio from 2015, 2016, and 2017 to determine an average uncollectible percentage. This percentage was then applied to pro forma revenue for the fully forecasted test period to arrive at the total uncollectible account expense. Expense for the fully forecasted test period is $804,093, which is a reduction of $55,046 compared to the base period total of $859,139. The fully forecasted test period uncollectible expense can be found in Exhibit 37, Schedules C and D.

Q. Does this conclude your direct testimony?

A. Yes.

VERIFICATION

STATE OF NEW JERSEY)
) **SS:**
COUNTY OF CAMDEN)

The undersigned, **James S. Pellock**, being duly sworn, deposes and says he is the Principal Regulatory Analyst for American Water Works Service Company, Inc., that he has personal knowledge of the matters set forth in the foregoing testimony, and the answers contained therein are true and correct to the best of his information, knowledge, and belief.

JAMES S. PELLOCK

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 20th day of November, 2018.

Notary Public (SEAL)

My Commission Expires:

ANN G. ALFANO
NOTARY PUBLIC OF NEW JERSEY
ID # 50014130
My Commission Expires 4/15/2020

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF:	**)**	
	)	
THE APPLICATION OF KENTUCKY-AMERICAN WATER COMPANY FOR AN ADJUSTMENT OF RATES	**)**	**CASE NO. 2018-00358**

DIRECT TESTIMONY OF GREGORY P. ROACH

November 28, 2018

Q. Please state your name and business address.

A. My name is Gregory P. Roach. My business address is 153 North Emerson Avenue, Greenwood, IN 46143.

Q. By whom are you employed and in what capacity?

A. I am employed by the American Water Works Service Company, Inc. ("Service Company") as the Senior Manager of Revenue Analytics. My responsibilities include leading the Revenue Analytics group, whose main area of focus is the analysis and forecasting of system delivery, customer usage and revenue for the American Water Works Company Inc. ("American Water") affiliate companies, including the Kentucky-American Water Company ("KAWC" or "the Company").

Q. Have you previously filed testimony before this or any other commission?

A. This is my first opportunity to testify before the Kentucky Public Service Commission ("Commission"). Previously, I have provided testimony in numerous regulatory proceedings before the Indiana Utility Regulatory Commission, the Missouri Public Service Commission, the Illinois Commerce Commission, the Public Service Commission of New York, the Pennsylvania Public Utility Commission, the State of New Jersey Board of Public Utilities, the Public Utilities Commission of Ohio, the Iowa Utilities Board, the Public Service Commission of West Virginia, the Public Service Commission of Louisiana, the Council of the City of New Orleans, the Public Utility Commission of Texas, the Arkansas Public Service Commission, the Common Pleas Court of Ohio, and the Federal Energy Regulatory Commission.

Q. Please summarize your educational and professional background.

A. I graduated from Indiana University in 1980 with a Bachelor of Arts degree in Economics and Political Science. I graduated from Butler University in 1982 with a Master's Degree

in Economics. I have over 25 years of experience working in the electric, gas and water utility sectors as both a consultant and utility employee, beginning with Public Service Indiana (now Duke Energy) in January 1980, continuing as an economist for a large consulting firm and a regulatory consultant through my own firm, and then joining the Service Company in 2011.

Q. Please describe your business experience.

A. My business experience is detailed in Appendix A.

SCOPE OF TESTIMONY

Q. What is the purpose of your direct testimony in this proceeding?

A. My testimony supports the testimony of Ms. Melissa Schwarzell regarding KAWC's Rate Year revenue. Specifically, I support the adjustment of Rate Year revenue for rate-setting purposes due to the impact of normalization of water usage by the Residential and Commercial Classes on an annual, per customer basis. My analysis indicates that KAWC will continue to experience declines in weather normalized residential and commercial usage per customer for the foreseeable future. My testimony discusses the analyses we have performed that identify and define the historic weather normalized usage trend and demonstrates that the trend will continue beyond the Rate Year. These analyses show there is a continuing annual trend in residential water use across all KAWC districts averaging a reduction of 2.02% or 987 gallons per customer per year ("gpcy") and a continuing annual trend in commercial water use across all KAWC districts averaging a reduction of 0.59% or 2,522 gallons per customer per year ("gpcy").

Q. Please identify the exhibits you will be sponsoring and for which you will be providing testimony.

A. I am sponsoring the following exhibits to my testimony:

- Exhibit GPR-1
  (US Water Fixture and Appliance Usage Specifications)
- Exhibit GPR-2
  (Reasonableness Test of KAWC Residential Consumption Trend)
- Exhibit GPR-3
  (State of Kentucky and Select County Housing Stock Data 2016)
- Exhibit GPR-4
  (City of Joplin Post Tornado Residential Usage Analysis)
- Exhibit GPR-5
  (AMW Affiliate 10 Year Residential Usage Trend Results 2018)

Q. Were each of Exhibits GPR-1 through GPR-5 prepared by you or under your direction and supervision?

A. Yes.

Q. What were the sources of the data used to prepare Exhibits GPR-1 through GPR-5?

A. The data used to prepare these exhibits was obtained from the Company's SAP system, the US Bureau of Economic Analysis, the US Bureau of Labor Statistics, the US Bureau of the Census and the National Oceanic and Atmospheric Administration.

Q. Do Exhibits GPR-1 through GPR-5, inclusive, accurately summarize such data and the results of analyses using such?

A. Yes they do.

Q. Have you prepared a Glossary of the Technical and Statistical Terms used in your testimony?

A. Yes, a Glossary of Technical and Statistical Terms is provided as Appendix B to my testimony.

RESIDENTIAL AND COMMERCIAL USAGE REGRESSION ANALYSIS

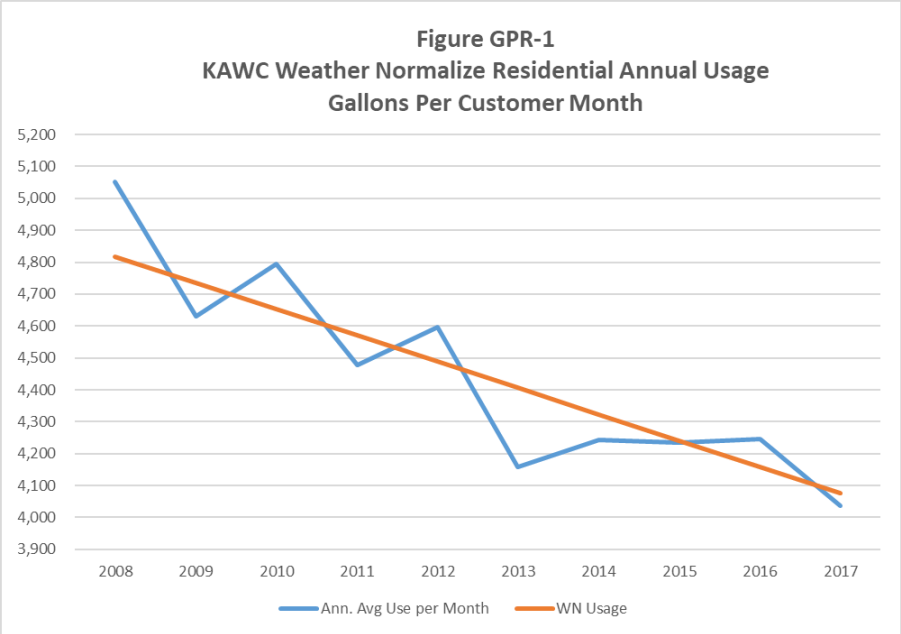
Q. Please describe your forecasting analyses.

A. We (my team members and myself) examined historical and forecasted sales by conducting regression analyses for the Residential and Commercial classes based on weather factors from the National Oceanic and Atmospheric Administration and the Palmer Drought Indices. We were able to model residential and commercial usage successfully using regression analysis. The Industrial, Sale for Resale and Other Public Authority classes' water usage is significantly more heterogeneous as compared to Residential and Commercial customer usage. Hence, it is difficult to apply statistical techniques to these classes as usage varies greatly from customer to customer in response to climatic conditions as well as efficiency improvements in water fixtures and appliances. In many cases, the use of water as part of a specific production process, such as with Industrial customers, tends to obscure the impact of either climate or water use efficiency standards on specific customers' usage patterns. Due to the heterogeneous customer usage mixtures of these groups, we have chosen a different forecast methodology. Please see the testimony of Melissa Schwarzell for a detailed discussion of that methodology. The discussion which follows, therefore, focuses on the normalized usage in the Residential and Commercial Classes. Ms. Schwarzell also discusses the translation of that normalized usage into a revenue forecast for the Residential and Commercial Classes based on, among other things, forecasted numbers of customers in that class.

A. Residential Forecast

Q. Please describe the analytical methodology you employed related to KAWC residential usage trends.

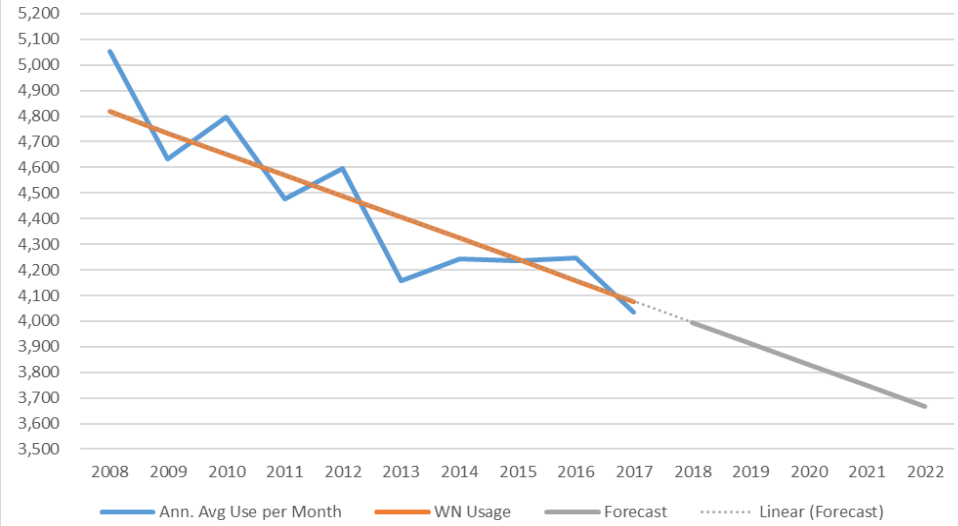
A. Our analysis examined the annual average of monthly per customer consumption by KAWC's residential customers over the past ten years. Presented in Figure GPR-1 is the residential usage per customer data that formed the basis of the analysis. To this data, we applied standardized statistically linear regression analysis a) to estimate the residential customer usage trend over time and b) to normalize the residential customer usage data for the impact of weather. We analyzed the impact of time, cooling degree-days (CDD), days with 90 degree maximums, Palmer Drought Indices and precipitation (precip) as independent explanatory variables for the trend of residential usage per customer over the time series analyzed. Figure GPR 1 illustrates the residential average usage per customer trend over that same time frame.



Q. What are the results of your analysis?

A. The results of our linear regression analysis based on the explanatory variables time and precipitation (May - Oct) indicate that weather normalized residential usage per customer is declining at a rate of approximately 2.02% or 987 gallons per customer per year, which is equivalent to 2.70 gallons per customer per day ("gpcd"). Figure GPR-2 graphically illustrates that residential average usage trend.

Figure GPR-2
KAWC Weather Normalize Residential Annual Usage Forecast
Gallons Per Customer Month



Our analysis employed the use of numerous regression models exploring varying combinations of potential explanatory variables including time and various climatic variables. Table GPR-1 below summarizes the types of models that we evaluated and their relative statistical merits. As delineated in Table GPR-1, all but one of the models resulted in a reasonable R-Square, meaning that each of the models explains in excess of 85% of the variance in KAWC residential usage per customer over the period of 2008-2017. Four of the climatic variables – precipitation annual, Apr-Oct, May-Oct and monthly maximum temperatures – were statistically significant or resulted in logically relevant explanatory

variables for KAWC residential average usage as delineated by the t-statistic results. For each of the other weather variables, the regression coefficients could not be estimated with anything less than a +/- 25% error or resulted in an illogical relationship with residential average usage (such as increases in precipitation illogically producing additional residential average usage when common knowledge would predict that water usage increases during periods of relatively lower precipitation). Hence variables with a positive coefficient related to precipitation and usage are both illogical from anecdotal experience and are statistically unsupportable. As a result, inclusion of these climatic variables in the final model was statistically unsupportable. Table GPR-1 shows these various statistical results.[1]

Table GPR-1
Kentucky American Water Company
Summary of Residential Usage Analysis

			T-Statistic					Durbin-Watson
	R-Square	F-Statistic	Time	CDD	PMDI	Precipitation	Tmax	Statistic
Time, May-Oct Precip	0.976	141.448	-12.618			-6.762		2.232
Time, Apr-Oct Precip	0.972	119.690	-12.616			-6.149		1.711
Time, Ann Precip	0.918	38.944	-8.082			-2.905		1.967
Time, Tmax	0.906	33.883	-7.651				2.563	1.982
Time, CDD*	0.880	25.555	-7.122	1.883				1.939
Time, Annual PMDI	0.868	23.110	-5.362		-1.631			2.101
Time, Summer PMDI	0.865	22.389	-5.260		-1.548	-0.579		2.059

Note: * indicates Annual Cooling Degree Days

In summary, the KAWC residential average use model based on statistically most significant explanatory variables was the one employing time and a single climatic explanatory variable – total precipitation defined by the May – Oct, April-Oct or Annual totals. Consequently, we have chosen to rely on a residential average use per customer

[1] The Durbin-Watson Statistic is a measure of autocorrelation of the error terms in regression analysis. The Durbin-Watson statistic and autocorrelation are defined and explained in Appendix B – Glossary of Technical Terms.

model where usage is dependent on time and total precipitation (May – Oct) due to this model's higher R-Square and F-Statistic.

Q. Does your model imply that the mere passage of time is the major driver of declining use per customer?

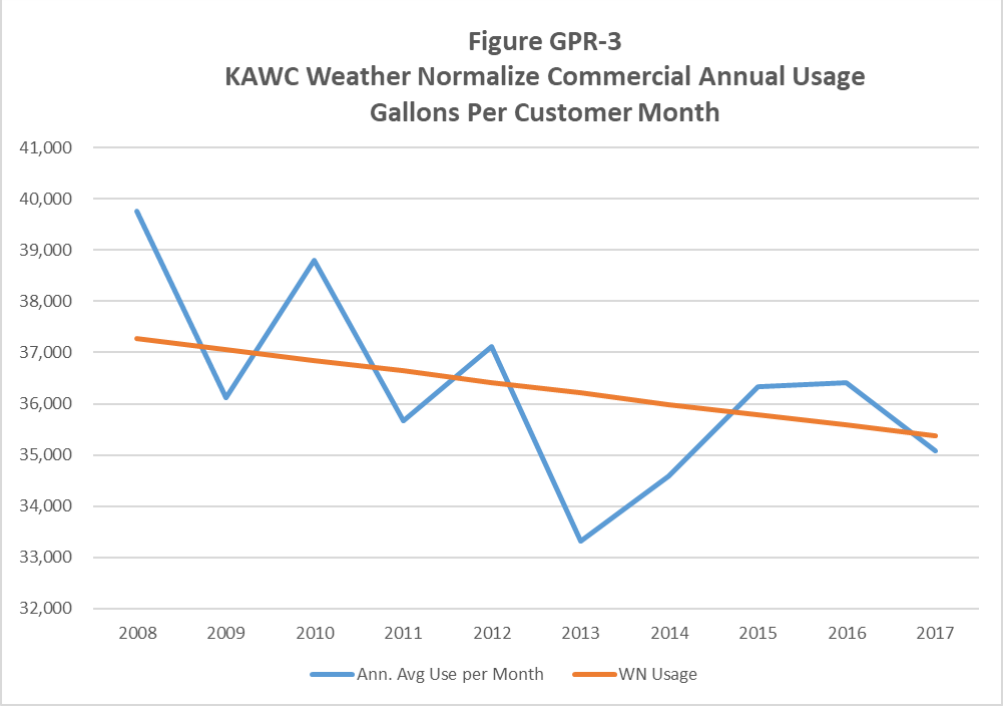
A. No. Time simply captures the range of conservation effects, such as the installation of more water efficient fixtures and appliances, that occur over time. Of course time, itself, is of no consequence, but it is a powerful variable because it is the medium for capturing the conservation effect after normalizing for weather. Further, as the models indicate, time is a very powerful statistical explanatory variable, as indicated by the high R-squared values. With the addition of the precipitation variable in the final model, we are able to normalize residential average usage per customer for climatic variations that occur from year to year. Later in my testimony, I will describe some of the reasons for the weather normalized trend in residential usage per customer, explain how they affect consumption and show that this trend will not diminish any time soon. Accordingly, the weather normalized trend of use per residential customer should be employed to forecast residential usage though the end of the fully forecasted test period in June 2020.

B. Commercial Forecast

Q. Please describe the analytical methodology you employed related to KAWC commercial usage trends.

A. As with the KAWC residential average usage analysis, we began our analysis of commercial usage by trying to model it through regression analysis. We executed an analysis focused on the annual average of monthly per customer consumption of KAWC's commercial customers over the past ten years. Presented in Figure GPR-3 is the

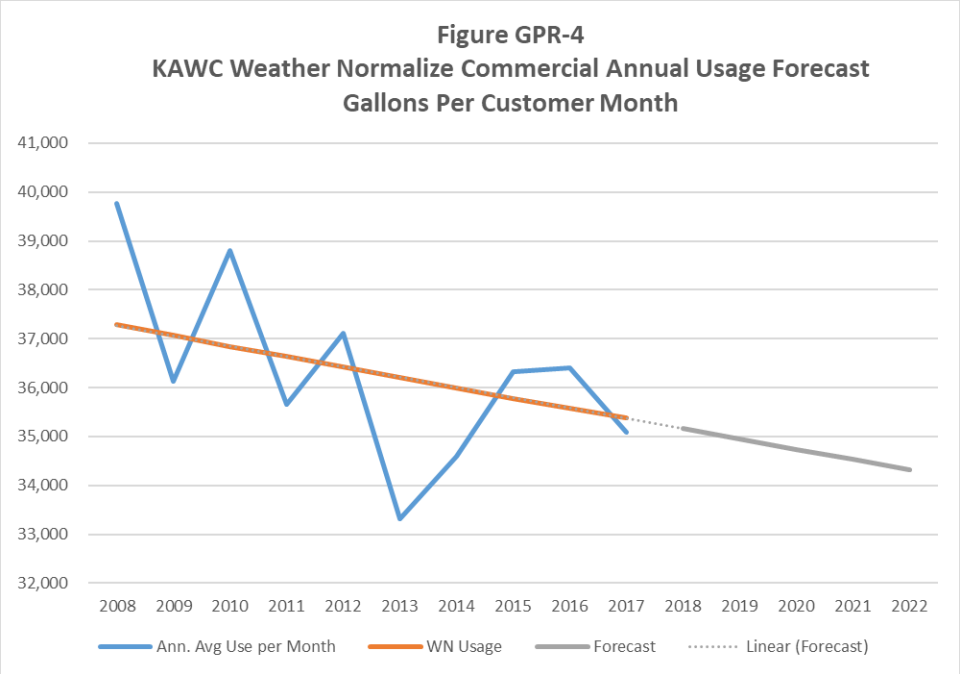
commercial usage per customer data that formed the basis of the analysis. To this data, we applied standardized statistically linear regression analysis in an effort a) to estimate commercial customer usage over time and b) to normalize the commercial customer usage data for the impact of weather. Our investigation involved analyzing the potential impact of time, cooling degree-days, heating degree-days, precipitation and personal income per capita as independent explanatory variables for the trend of commercial usage per customer over the time series analyzed. Figure GPR-3 illustrates the trend of commercial usage per customer over that historic time frame.



Q. What are the results of your analysis?

A. The results of our linear regression analysis based on the explanatory variables time and precipitation (May-October) indicate that commercial usage per customer is declining at a

rate of approximately 0.59% or 2,522 gallons per customer per year, which is equivalent to 6.91 gpcd. Figure GPR-4 graphically illustrates that commercial average usage trend.



Our analysis employed the use of numerous regression models exploring varying combinations of explanatory variables including time and weather normalizing climatic indices. As delineated in Table GPR-2, a limited number of models resulted in a reasonable R-Square, meaning that the models explains in excess of 75% of the variance in KAWC commercial usage per customer over the period of 2008-2017. Three of the climatic variables – precipitation annual, Apr-Oct, May-Oct – were statistically significant or resulted in logically relevant explanatory variables for KAWC commercial average usage as delineated by the t-statistic results. For each of the other weather variables, the regression coefficients could not be estimated with anything less than a +/- 25% error or resulted in an illogical relationship with commercial average usage (such as increases in precipitation illogically producing additional commercial average usage when common knowledge would predict that water usage increases during periods of relatively lower

precipitation). Hence variables with a positive coefficient related to precipitation and usage are both illogical from anecdotal experience and are statistically unsupportable. As a result, the inclusion of these climatic variables were statistically unsupportable. Table GPR-2 summaries these statistical results.

Table GPR-2
Kentucky American Water Company
Summary of Commercial Usage Analysis

			T-Statistic					Durbin-Watson
	R-Square	F-Statistic	Time	CDD	PMDI	Precipitation	Tmax	Statistic
Time, May-Oct Precip*	0.879	14.597	-1.651			-5.234		1.411
Time, May-Oct Precip	0.879	25.540	-2.447			-5.655		1.195
Time, April-Oct Precip	0.820	15.891	-2.591			-4.362		1.475
Time, Annual Precip	0.642	6.273	-2.591			-2.473		1.866
Time, Annual CDD	0.541	4.129	-2.726	1.800				1.798
Time, Annual PMDI	0.481	3.244	-1.340		-1.432			1.903

Note: * indicates Model Corrected for Autocorrelation of Error terms.

Q. How does the residential and commercial usage modeling you are sponsoring in this case compare to the analysis sponsored by KAWC's prior rate case?

The analyses in the two cases are very similar in terms of methodology. The 2018 analysis continues to demonstrate that time is the main statistically significant explanatory variable following normalization for weather impact. The approach used in the prior case was a cross sectional monthly analysis that relied on time and certain weather indices to simulate a weather normalized average usage per customer trend. The approach in this case is a time series model, based on monthly usage, which relies on time and certain weather indices to simulate a weather normalized average usage per customer trend. As such, both approaches rely on time and the normalization of average usage for climatic impacts. Table GPR-3 below provides a comparison of the results of the 2015 Rate Case approach to the approach I have used in this case. In summary of Table GPR-3, the results of our latest model produced a forecast of weather normalized usage similar to that sponsored in the 2015 Rate

Case. The Commercial forecast, due mainly to atypical customer usage in 2015 and 2016 impacting our modeling, resulted in a moderation of the Commercial customer usage forecast in this case.

Table GPR-3
Kentucky American Water Company
Comparison of Trend Results Prior vs. Revised Approach
Residential and Commercial Customer Models

Decline	Prior	Revised	Difference
		Residential	
%	-2.48%	-2.02%	0.46%
gpcy	-1,211	-987	224
gpcm	-100.92	-82.25	18.7
gpcd	-3.32	-2.70	0.61
		Commercial	
%	2.04%	0.59%	-1.45%
gpcy	8,084	2,522	-5,562
gpcm	673.67	210.17	-463.5
gpcd	22.15	6.91	-15.24

WATER USAGE CONSUMPTION TREND

Q. Does your 2018 analysis show a continuing decline in usage per customer for the residential and commercial classes?

A. Yes, following normalization for the impact of climatic factors, our analysis indicates a clear trend of underlying reductions in customer average use. The decline is demonstrable and significant. It will certainly continue through the fully forecasted test period and beyond that period for a number of years.

Q. What is the cause of this decline?

A. The reductions in water consumption among KAWC's residential customers is principally attributable to (1) an increasing prevalence of low flow (water efficient) plumbing fixtures

and appliances within residential households and (2) a growing water conservation ethic, prompted in part by conservation programs implemented by KAWC and water utilities generally.

Q. Please explain what you mean by the "prevalence of low flow fixtures and appliances."

A. Plumbing fixtures, such as toilets, showerheads, and faucets, are more water efficient today than they were in the past. Similarly, appliances, such as dishwashers and washing machines, are also more water efficient. When a customer replaces an older toilet, washing machine, or dishwasher with a new one, the new unit will likely use less water than the one it replaced. When new homes are built, they include water efficient fixtures. Likewise, every time a customer remodels or installs new appliances in his or her kitchen, bathroom or laundry room, he or she will consume less water in the future associated with the normal use of those appliances, all else equal.

Q. How much water do the new fixtures and appliances save?

A. The Energy Policy and Conservation Act of 1992 and 2005 ("EPAct92" and "EPAct05") mandated the manufacture of water efficient toilets, showerheads and faucet fixtures. For example, a toilet manufactured after 1994 uses 1.6 gallons per flush, compared to a pre-1994 toilet which uses 3.5 to 7 gallons per flush. In fact, toilets using only 1.28 gallons per flush or less are now becoming more prevalent in the marketplace. Replacing an old toilet with a new one can save from 2 to nearly 6 gallons per flush. The USEPA has estimated that there are more than 220 million toilets in the U.S.[2], and that approximately 10 million

[2] US EPA, WaterSense Tank-Type High-Efficiency Toilet Specification Supporting Statement, February 9, 2007.

new toilets are sold each year for installation in new homes and businesses or replacement of aging fixtures in existing homes and businesses.[3]

The increased conservation measures mandated by the Energy Independence & Security Act of 2007 (Public Law 110–140) ("EISA") have also reduced indoor water consumption. EISA established stringent efficiency standards for dishwashers and clothes washers. Dishwashers manufactured after 2009 and clothes washers manufactured after 2010 must use 54% and 30% less water, respectively. All other factors being equal, a typical residential household in a new home constructed in 2018, with water efficient toilets, clothes washers, dishwashers and other fixtures, would use approximately 35% less water for indoor purposes than a non-retrofitted home built prior to 1994. Exhibit GPR-1, pages 1-3 of 12, provides additional detail about the expected impact of water efficiency measures on residential water consumption.

Q. Please elaborate on the other factors causing the reductions in consumption.

A. Another element leading to water usage reductions are programs designed to raise customer awareness and interest in the benefits of conserving water and energy continue to increase. For example, WaterSense is a USEPA voluntary partnership program that seeks to protect the future of our water supply by offering people a simple way to use less water with water-efficient products, new homes, and services. These programs' specifications, as well as others, are detailed in Exhibit GPR-1, pages 4-12 of 12. This listing is a reproduction of the Alliance for Water Efficiency Water Products Standard Matrix, which was updated in

[3] D&R International, Plumbing Fixtures Market Overview: Water Savings Potential for Residential and Commercial Toilet and Urinals, September 30, 2005.

March 2010. As awareness of water efficiency increases, customers may decide to replace a fixture or appliance even before it has broken.

In addition to replacing fixtures and appliances, customers can also reduce water consumption merely by changing their household water use habits. As discussed above, KAWC's residential customers are reducing their base usage by about 2.7 gallons per customer per day. A 2.7 gallon per day decrease in water consumption may be achieved by subtle changes in customer behavior alone. For instance, a customer can reduce usage by about 2.7 gallons per day by:

- Taking a shower that is 1 minute shorter;
- Flushing a low-flow toilet instead of an older toilet just once per day;
- Running the dishwasher 5 times per week instead of 7; or
- Turning off the water for 1 minute while brushing teeth.

Q. Do you expect KAWC's customer usage trend to continue to reflect usage reductions in the future?

A. Yes. Water efficient fixtures and other drivers such as conservation education and federal government-mandated standards will continue to drive further water efficiency, and hence an ongoing reductions in water usage per customer. The rate of the continued trend depends on the pace of fixture replacement within the KAWC service footprint and is influenced by the broadening acceptance of a conservation ethic through raised customer and business awareness programs, government conservation policy, and similar behavior modification related programs.

According to an American Water Works Association ("AWWA") Journal article dated February 2012, technology is now available for newer, more water-efficient products that

further improve Energy Policy Act levels, and there is a growing movement to codify these more stringent specifications.[4] The recent introduction of progressive code modifications—such as the International Code Council's ("ICC's") International Green Construction Code ("IGCC") and the International Association of Plumbing and Mechanical Officials ("IAPMO") Green Plumbing and Mechanical Code Supplement (2011) support uniform implementation of increased water efficiency standards.[5] AWWA research also indicates that this decline in water consumption will continue. An article in the June 2012 issue of the AWWA Journal entitled "Insights Into Declining Single-family Residential Water Demands" states: "[r]educed residential demand is a cornerstone of future urban water resource management. Great progress has been made in the last 15 years and the industry appears poised to realize further demand reductions in the future."[6] The regulations mandating water efficient washing machines and dishwashers are relatively new. Based solely on the life expectancy of appliances, the replacement of existing appliances, and the corresponding reduction in water used, the trend in declining usage would likely continue to occur for at least the next 11 years or more (from compliance date for appliance manufactures to meet the new flow rates) if all appliances were replaced in their average life cycles.[7]

Q. Is the decline in residential water consumption showing any signs of reaching equilibrium?

[4] Hoecker, Jay and Bracciano, David. Tampa Bay Water. "Passive Conservation: Codifying the use of Water-Efficiency Technologies" February 2012, Journal AWWA. 104:2.
[5] Hoecker, Jay and Bracciano, David. Tampa Bay Water. "Passive Conservation: Codifying the use of Water-Efficiency Technologies" February 2012, Journal AWWA. 104:2
[6] DeOreo, William and Mayer, Peter. American Water Works Association Journal. Vol. 104. Issue 6. http://apps.awwa.org/WaterLibrary/showabstract.aspx?an=JAW_0076117. June 2012.
[7] The average life expectancy of a new dishwasher, clothes washer and gas water heater is 11 years. An electric water heater has an average life one year longer. http://www.statista.com/statistics/220020/average-life-expectancy-of-major-household-appliances/ Consequently, it should be obvious that the trend of declining use due to appliance replacement will continue for years to come.

A. No. New water efficiency technology and regulations are expected to continue to drive water use downward in the future. As explained by the American Council for Energy Efficiency:

> Home appliance manufacturers and energy efficiency advocates have recently agreed to improved efficiency standards and tax policies for refrigerators, freezers, clothes washers, clothes dryers, dishwashers, and room air conditioners. This agreement could save enough energy to meet the total energy needs of 40 percent of American homes for one year and the amount of water necessary to meet the current water needs of every customer in the City of Los Angeles for 25 years.[8]

These higher-efficiency dishwasher and washing machine standards include tax incentives for consumer purchases that became effective in January 2013 and January 2015, respectively.

Q. What about commercial usage – in your view, has the decline in consumption reached equilibrium for commercial customers?

A. No. The commercial customer group will see similar trends and parameters of water usage reductions due to the interplay of the same trends in fixture and appliance replacement that were noted as affecting residential class usage above. The main difference as compared to the residential trend is magnitude of the decline as we have noted in our analysis above.

Q. Have you performed an analysis of the likely future of the declining use trend for KAWC?

A. Yes, I have developed estimates of the impact of the WaterSense/Energy Star usage specifications for a family of four occupants' water usage. The results of that analysis are

[8] American Council for Energy Efficiency, Major Home Appliance Efficiency Gains to Deliver Huge National Energy and Water Savings and Help to Jump Start the Smart Grid, available at http://aceee.org/press/2010/08/major-home-appliance-efficiency-gains-deliver-huge-natio. Date Accessed: 8/7/2012.

depicted on Exhibit GPR-2, Page 1 of 1. Generally, the model multiplies the typical usage per capita by the estimated reduction for specific appliance usage from the pre-regulatory standard in place until 1994 to the WaterSense/Energy Star usage specifications in effect since 2010/2011 respectively, by the number of users in a proto-typical household (4 in this example), annualized. I then summed the various usage reductions for the sample four users across all fixtures that could be replaced to get an average total usage reduction. My analysis indicates that a set of four users would see a reduction of approximately 54,315 annual gallons over the course of a year, due to fixture and appliance replacement at the Water Sense/Energy Star specification levels.

Q. Do the validity and applicability of the four-user analysis require that all four of the theoretical users reside in the same household?

A. Not at all. The theoretical four user analysis is what economists and statisticians refer to as a stochastic analysis. A stochastic analysis implies that the data sample is randomly selected and distributed across the population of the data being analyzed. In this particular instance, stochastic selection means that the theoretical four users can be spread throughout multiple households across the KAWC service territory. In practical terms it means that the necessary number of toilet, water fixture, water heater, clothes washer, etc. replacements occur throughout the KAWC service territory to equal the number of replacements implied by the analysis and the annual amount of residential declining use. As an example, the analysis implies that on average 2,146 toilets (and similar number of other water using appliances/fixtures) are replaced annually amongst the 118,099 (1.82%) residential customers across the KAWC system. Hence this analytical exercise calculates the theoretical maximum usage reduction in a year for four residential users whose

consumption was modified by the replacement of 2,146 device/appliance combinations on the KAWC system.

Q. What does the estimated 54,315-gallon annual reduction in usage for a group of four users mean for the potential term of the declining use trend you have estimated for KAWC?

A. The estimated reduction in usage of the sample household of four analysis allows for the estimation of the length of time over which all appliances in the KAWC service territory will be converted to meet the Water Sense/Energy Star specifications. Dividing the total estimated annual usage decline for KAWC of 116 million gallons by the estimated annual usage decline for the sample household of four of 54,315 gallons, reveals that 2,146 residential customers, or 1.82% of the Year Ending 2017 average of 118,099 residential customers, would need to make these fixture changes to account for the estimated total annual residential declining usage. Further, taking the reciprocal of the 1.82% of residential customers needed to account for the annual usage decline reveals a theoretical term of 55 years to fully convert the installed fixture base to the Water Sense/Energy Star usage specifications, all other factors remaining equal.

Q. Haven't new federal regulations related to efficiency standards for water-using fixtures and appliances already had their full impact on KAWC residential customer usage?

A. No, not at all. Due to the age of the Kentucky residential housing stock, these water efficiency standards have only just begun to have an impact on residential usage. The potential impact of replacing these fixtures is significant as, according to the 2016 American Housing Survey, 82.0% of the homes in Kentucky were built prior to the year 2000. Further, making the same housing stock comparison for the City of Lexington Standard

Metropolitan Statistical and Fayette County where the greatest concentration of KAWC residential customers are located we find that approximately 79% and 80.6% of homes, respectively, were built prior to the year 2000. That housing stock data is detailed in Exhibit GPR-3 pages 1-3 of 3 and summarized in Table GPR-4 below. Both the state-wide level and the Fayette County data illustrate that approximately 80% or more of the housing stock was constructed with toilets, washing machines, and dishwashers that are much more water-intensive than newer fixtures and appliances now on the market which will eventually replace this existing fixture and appliance stock.

Table GPR-4
Kentucky American Water Company
Housing Stock Vintage
State of Kentucky, Lexington SMSA & Fayette County

Year Structure Built	State of Kentucky Units	State of Kentucky % Total	Lexington SMSA Units	Lexington SMSA % Total	Fayette County Units	Fayette County % Total
Built 2014 or later	6,151	0.3%	623	0.3%	296	0.2%
Built 2010 to 2013	41,359	2.1%	5,419	2.5%	3,498	2.5%
Built 2000 to 2009	298,498	15.3%	38,912	18.1%	23,128	16.7%
Built 1990 to 1999	337,490	17.3%	38,076	17.7%	22,602	16.3%
Built 1980 to 1989	249,316	12.8%	30,491	14.2%	20,124	14.5%
Built 1970 to 1979	331,419	17.0%	33,513	15.6%	21,566	15.5%
Built 1960 to 1969	213,707	11.0%	24,751	11.5%	18,572	13.4%
Built 1950 to 1959	184,791	9.5%	18,451	8.6%	13,996	10.1%
Built 1940 to 1949	92,386	4.7%	7,258	3.4%	4,641	3.3%
Built 1939 or earlier	195,973	10.0%	17,516	8.1%	10,435	7.5%
Total housing units	1,951,090	100.0%	215,010	100.0%	138,858	100.0%
Percentage Prior to 00		82.3%		79.1%		80.6%

Q. The base period in this case is the 12 months ending February 2019. Given that reductions in usage per customer have been progressing for nearly two decades, won't the majority of non-efficient fixtures and appliances already be replaced by the end of the base period?

A. No, as illustrated above in Table GPR-4, it will take many years to achieve complete implementation and saturation of fixtures and appliances consistent with current efficiency standards because the full implementation of the new standards only occurs with the replacement of older fixtures. As I noted previously, the two most recent federal statutes mandating efficiency in fixtures and appliances were only passed in 2005 and 2007, respectively. Their effect will occur over a very long timeframe as housing stocks are remodeled and appliances and fixtures wear out, break or become obsolete. As explained above, the decline in usage for the theoretical four-user analysis indicates a 55-year term to reach total implementation of the current fixture standards and realize the total impact in reduced water usage. As mentioned earlier in my testimony, to date we have observed a trend of declining residential usage on the KAWC system for approximately 15 years, leaving another approximate 40 years for further reductions.

Q. You have explained the laws and programs that drive the water conservation trend. Can you point to a "real world" example of how these laws and programs actually affect usage per customer?

A. Yes, in fact, there was a situation in the Missouri American Water Company ("MAWC") footprint that demonstrates this phenomenon in a rather dramatic fashion.

Q. Please describe it.

A. This phenomenon is illustrated by analyzing usage per customer in the MAWC Joplin district, before and after the devastating EF5 tornado of May 22, 2011 ("Joplin Tornado"). The impact of the Joplin Tornado was an immediate reduction of customer connections in the Joplin district by approximately 3,060 (14.4% of the May 2011 Joplin residential total). Given that the devastation caused by an EF5 tornado to residential housing is nearly absolute, it follows that the 14.4% of the Joplin district residential housing stock would

have to be completely rebuilt before being inhabited again. Such rebuilding would, in turn, be required to conform to the water use standards discussed earlier in my testimony and detailed in Exhibit GPR-1.

Q. Please describe your analysis of the pre- and post-2011 Joplin tornado residential customer usage.

A. I developed and compared the results of two regression models: the first estimates the trend in base residential usage per Joplin customer for the 10 years leading up to and including 2011; the second model estimates the trend in base residential usage per Joplin customer for the period 2012-2015. By comparing the results of those two regression models, we can see the impact on average residential customer usage due to the rebuilding of housing stock in Joplin to the enhanced water use standards.

Q. Please describe the statistical results of your analysis of the pre- and post-2011 Joplin tornado residential customer usage.

A. The result of the analysis is provided in Table GPR-5 below:

Table GPR-5
Joplin Declining Use Analysis
Usage Trend Pre / Post-2011 Tornado

Measure	Prior to 2011	Post 2011
R-Square	0.820	0.974
Usage Trend	-1.74%	-2.77%

Table GPR-5 illustrates the results of the regression analysis of average usage per customer both before and after the Joplin Tornado. It is clear from the statistical results of that regression analysis that the Joplin district's declining usage per customer trend has

accelerated because a substantial number of residential customers have rebuilt using water use fixtures that meet or exceed the contemporary water efficiency standards and have replaced older less efficient fixtures as part of the rebuilding process. The results show that the decline in the base residential usage per customer has increased from an annual rate of approximately -1.7% to approximately -2.8% due to the reconstruction of approximately 2,500 (13.8% of that system) residential dwellings since May 2011 in the Joplin district. This is an approximate 59% acceleration of the rate of decline in Joplin post May 2011. Exhibit GPR-4, Page 1 of 1, provides a graphic illustration of this accelerated trend.

Q. Has the rate of residential usage reductions in Joplin continued to be greater in 2016 as compared to the pre-2011 Joplin tornado levels?

A. Yes, even though a majority of the post tornado recovery rebuild was accomplished prior to 2016, the remaining residential structures added in 2016 contributed to a 26% sharper decline in usage for Joplin as compared to the pre-2011 levels. This emphasizes that due to the age of housing stock comprising the MAWC water system, there exists a great inventory of older, less efficient, water using fixtures and appliances currently in use. When those fixtures and appliances are replaced with newer fixtures and appliances meeting more stringent water use regulations, continued reductions in residential usage across the MAWC system will result.

Q. What do the results of the pre- and post-2011 Joplin tornado usage reveal about residential customers' usage and what do the data imply about future water usage declines?

A. The statistical results of the Joplin Tornado analysis, when combined with the results of the theoretical four-user analysis outlined in Exhibit GPR-2, offer compelling empirical evidence as to the potential scope and duration of continued reductions in customer water

use patterns. First, as discussed, the rebuilding of homes in the Joplin district resulted in a 59% acceleration of the annual usage per customer reduction from approximately -1.7% to approximately -2.8%. Second, those 2,500 rebuilt customer dwellings experienced an annual usage reduction of approximately 3,200 gallons, or roughly an 8.4% reduction in usage, from their 2011 pre-Joplin tornado levels. That 3,200-gallon annual average residential usage reduction by the rebuilt customers is nearly equal to the loss of an entire month's worth of water sales to a typical Joplin residential customer (based on average usage in Joplin post-2011).

Q. What is your conclusion about how the Joplin experience relates to the continuation of reductions in residential and commercial water usage on the KAWC system?

A. Typically, households and businesses replace appliances on a sporadic basis, as they break or become obsolete. The replacement appliances are more efficient, but because these installations occur over time, the reductions in usage due to increased efficiency also occur over time and it is difficult to isolate the impact of any increase in the efficiency of a single appliance on overall water usage. In contrast, a significant number of households affected by the Joplin Tornado replaced all of their appliances at a single point in time. Therefore, by analyzing the decline in usage in Joplin after the tornado, we can assess the total impact that installation of the most recent, efficient, available technology will have on usage over time. In other words, as KAWC customers replace their appliances, usage on the KAWC system is likely to decline at a similar rate as usage in Joplin declined after the tornado. On this basis, and in conjunction with the results of the theoretical family of four analysis, I conclude that residential and commercial water use reductions will continue to be significant well into the future for the KAWC system.

Q. Have you studied water consumption trends for other American Water subsidiaries besides KAWC?

A. Yes. We have studied the residential consumption patterns for other American Water regulated subsidiaries, and it has become clear that the trend exhibited by KAWC is very similar to the trends being experienced in other states. Exhibit GPR-5 shows a consistent pattern of residential water consumption reductions across a number of states spanning a wide range of geographic and demographic characteristics. On average, the states served by American Water regulated subsidiaries have experienced a decline averaging 2.0% per year over the last 10-year period analyzed (2008-2017). KAWC is experiencing residential customer average usage reductions that are amongst the mean of the American Water affiliated systems.

Q. Is this water usage trend occurring across the industry, beyond KAWC and other American Water affiliated companies?

A. Yes, residential consumption of water is declining across the country. The American Water regulated subsidiaries are neither unique nor exceptional when it comes to declining average usage of its residential customers. According to the 2010 Water Research Foundation report ("WRF Report"), "many water utilities across the United States and elsewhere are experiencing declining water sales among households." (WRF Report, p.1.) The report further states that "[a] pervasive decline in household consumption has been determined at the national and regional levels." (WRF Report, p. xxviii).

Q. What are the qualitative benefits of water efficiency investment to water consumers?

A. According to the Alliance for Water Efficiency in their December 2017 paper Transforming Water: Water Efficiency as Infrastructure Investment[9], those qualitative benefits of water efficiency investments to water consumers include:

1. Water efficiency programs connect directly to communities, necessitating citizen involvement.

2. Water efficiency programs empower water customers to control their water bills.

3. Water efficiency will be a 21st century growth industry, and these programs can firmly reinforce the position of U.S. manufacturers as leaders in water efficient technology innovation in product design.

4. Water efficiency programs directly address distressed communities, where water distribution infrastructure has not been adequately maintained or replaced and where household and commercial appliance stocks tend to be older and less efficient.

5. Water efficiency programs can help reduce long-term political conflicts between regions.

6. Water efficiency programs can vastly reduce the use of energy to pump, treat, and pressurize water systems.

7. Increasing water efficiency can forestall the need for energy-intensive new water supply development.

8. Reduced energy requirement results in an increase in national energy independence.

Q. Have KAWC customers received any benefit from this long-term decline in water usage per customer?

A. Yes. Customers share in numerous benefits from reduced water usage. These include both environmental and operational benefits. Reduced usage helps maintain source water supplies. Diversions from supply sources are lessened, leaving more water for passing flows, environmental benefit, or drought reserve. Reductions in power consumption,

[9] Transforming Water: Water Efficiency as Infrastructure Investment, Alliance for Water Efficiency, December 2017, page 4, http://www.allianceforwaterefficiency.org/

chemical usage, and waste disposal mitigate increases in water utility operating costs, and these benefits are passed on to the customers through the ratemaking process. Reduced customer usage also provides environmental benefits such as reduced carbon footprint and waste streams. Furthermore, reduced residential water consumption also reduces energy consumption on the customer's property, for instance, through lower hot water heating needs.

Q. Are there any negative impacts from decreased water consumption for the utility?

A. Yes. Regardless of the level of customer water consumption, the water utility must cover the fixed costs of water treatment and delivery and the rising costs of infrastructure repair and replacement. This disconnect between the decline in revenues and the increase in utility costs and capital needs has been labeled the "conservation conundrum" and is now being recognized by utilities, policy makers, and academics.

In August 2012, the non-profit Alliance For Water Efficiency convened twenty-five water rates experts for a summit entitled "Declining Water Sales and Utility Revenues: A Framework for Understanding and Adapting." The following is an excerpt from the "Summary of the Identified Problem" that was the subject of the summit:

> "Partly due to successful water conservation programs, improved water-saving fixtures and technology, and a number of other factors, both water sales and water-related revenues are falling on a national level. With sales and revenues declining, how can water utilities cover costs of water treatment and delivery? How can they cover the rising costs of infrastructure repair and replacement? More importantly, how can they meet these costs while still encouraging much-needed conservation efforts?
>
> This daunting question – dubbed the "conservation conundrum" – provided the backdrop and framing for the Declining Water Sales and Utility Revenues summit."

The impact of the "conservation conundrum" on utility customers is the need to spread fixed utility costs over smaller sales volumes, with consequent rate impacts. According to the Water Research Foundation Report, "while water conservation is normally seen as positive, this gradual erosion in residential consumption may force utilities to raise rates to provide sufficient revenues for . . . replacing old water mains and equipment." (WRF Report page xxi.) The WRF Report also explains that "pricing that recovers the costs of building, operating and maintaining the systems is absolutely essential to achieving sustainability. Drinking water and wastewater utilities must be able to price water to reflect the full costs of treatment and delivery." (WRF Report page 74-75.)

Q. In view of your analysis, what is your recommendation to the Commission?

A. The findings in this testimony confirm the ongoing trend of weather normalized reductions in residential and commercial consumption per customer identified in KAWC's most recent rate proceeding, Case No. 2015-00418. In this case, the Company recommends that the Commission use the projections of weather normalized residential and commercial consumption as projected through the fully forecasted test period based on our analysis of historic usage per customer as normalized for climatic influences.

Q. Does this conclude your prepared direct testimony?

A. Yes it does.

VERIFICATION

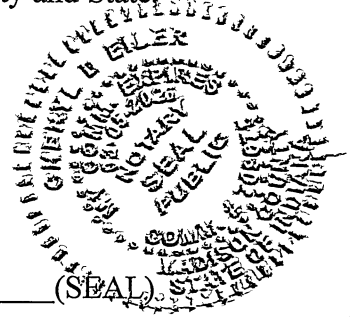
STATE OF VIRGINIA)
) **SS:**
ARLINGTON COUNTY)

The undersigned, **Gregory P. Roach**, being duly sworn, deposes and says he is the Senior Manager for Revenue Analytics with American Water Works Service Company, Inc., that he has personal knowledge of the matters set forth in the foregoing testimony, and the answers contained therein are true and correct to the best of his information, knowledge, and belief.

Gregory P. Roach

GREGORY P. ROACH

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 27th day of November, 2018.



Cheryl D Eiler (SEAL)

Notary Public

My Commission Expires:

CHERYL D EILER
Notary Public - Seal
Madison County - State of Indiana
Commission # 709675
My Commission Expires March 5, 2026

Appendix A

Professional Experience of Gregory P. Roach

I have over 25 years of experience working in the electric, gas and water utility sectors as both a consultant and utility employee, beginning with Public Service Indiana (now Duke Energy) in January 1980, where my responsibilities were focused on transforming PSI's load forecasting processes from time series to econometric based models. In May 1982, I accepted the position of Senior Economist with the management-consulting firm of R. W. Beck and Associates ("Beck") (now part of Science Applications International Corporation, "SAIC"). I received numerous promotions through my career with Beck to the eventual position of Principal Economist. During my career at Beck, I was responsible for the management of all rates/regulatory, load forecasting and financing feasibility client engagements managed by the Indianapolis office. As such, I delivered testimony on behalf of agency, municipal and co-op clients throughout the United States related to cost of service, rate design, load forecasting, system planning, electric and gas production plant economic feasibility, revenue requirement pro-forma adjustments, production cost optimization and cost of capital to state regulatory commissions and the Federal Energy Regulatory Commission.

In May 1991 I took the position of Principal Economist with the regulatory management consulting firm of SVBK Consulting Group ("SVBK"). In that position, I was responsible for all consulting engagements executed from the Indianapolis regional office on behalf of SVBK's national utility clients. In addition to the regulatory matters that I testified to while at SVBK, I offered testimony related to merger & acquisition cost reductions/synergies, large power pool generation and transmission dispatch strategies, power pool

generation/transmission pricing schemes, price elasticity sales adjustments and retail rate impact of specific power/transmission pooling cost minimization arrangements and payments.

In July 1993, I became owner and president of a retail operations holding company with three franchise store outlets. In that position, I was responsible for all management, operation, sales and financial functions of the firm.

In November 1998, I sold the retail holding company to begin operations of the Roach Consulting Group, Ltd as Principal Consultant. In that position I advised industrial and utility clients related to business intelligence systems, enterprise/manufacturing resource planning systems, customer information systems as well as general accounting systems. I also appeared as an expert witness providing testimony related to economic and punitive damages in personal injury and wrongful death legal proceedings. In July 2011, I joined the Service Company as Manager of Rates and Regulation, supporting Indiana-American and Michigan-American Water Company. In August 2014, I accepted the position of Manager of Revenue Analytics with the Service Company. In November 2017, I was promoted to the position of Senior Manager of Revenue Analytics with the Service Company.

Appendix B

Glossary of Technical and Statistical Terms

Autocorrelation - Autocorrelation is a characteristic of data in which the correlation between the values of the same variables is based on related objects. Informally, it is the similarity between observations as a function of the time lag between them. In regression modeling, the estimate errors follow a pattern, showing that something is wrong with the regression model. ... If this assumption is violated and the error term observations are correlated, autocorrelation is present.

Cooling Degree Day – ("CDD") A cooling degree day (CDD) is a measurement designed to quantify the demand for energy needed to cool a building. It is the number of degrees that a day's average temperature is above 65º Fahrenheit (18º Celsius), which is the temperature above which buildings need to be cooled. Annual CDD would be the sum of all CDD occurring in a calendar year.

Durbin-Watson Statistic - The Durbin Watson statistic is a number that tests for autocorrelation in the residuals from a statistical regression analysis. The Durbin-Watson statistic is always between 0 and 4. A value of 2 means that there is no autocorrelation in the sample.

F-Statistic - The F value is the ratio of the mean regression sum of squares divided by the mean error sum of squares. Its value will range from zero to an arbitrarily large number. The value of Probability (F) is the probability that the null hypothesis for the full model is true (i.e., that all of the regression coefficients are zero). The higher the F value, the greatest confidence that the null hypothesis can be rejected.

Heating Degree Day – ("HDD") A heating degree day (HDD) is a measurement designed to quantify the demand for energy needed to heat a building. It is the number of degrees that a day's average temperature is below 65 º Fahrenheit (18 º Celsius), which is the temperature below which buildings need to be heated. Annual HDD would be the sum of all HDD occurring in a calendar year.

R-Squared - In statistics, the coefficient of determination, denoted R2 or r2 and pronounced "R squared", is the proportion of the variance in the dependent variable that is predictable from the independent variable(s).

T- Statistic - The t statistic is the coefficient divided by its standard error. The standard error is an estimate of the standard deviation of the coefficient, the amount it varies across cases. It can be thought of as a measure of the precision with which the regression coefficient is measured. The higher the t statistic, the greater probability is that the regression coefficient has been estimated precisely.

The following regulations are listed in the "*Energy Independence & Security Act of 2007,"* Public Law 110–140 – Dec. 19, 2007:

1. A top-loading or front-loading standard-size residential clothes washers manufactured on or after January 1, 2011 shall have a water factor of not more than 9.5. (water factor is equal to gallons/cycle/cubic feet)

2. Dishwashers manufactured on or after January 1, 2010, shall—
   a. for standard size dishwashers (≥ 8 place settings + six serving pieces) not exceed **6.5 gallon per cycle**; and
   b. for compact size dishwashers (< 8 place settings + six serving pieces) not exceed **4.5 gallons per cycle**.

TABLE 1
Flow rates from typical fixtures and appliances before and after Federal Standards

Type of Use	Pre-Regulatory Flow*	New Standard (maximum)	Federal Standard	Year Effective	WaterSense / ENERGY STAR Current Specification+ (maximum)
Toilets	3.5 gpf	1.6 gpf	**U.S. Energy Policy Act**	1994	**1.28 gpf**
Clothes washers**	41 gpl (14.6 WF)	Estimated 26.6 gpl (9.5 WF)	**Energy Independence & Security Act of 2007**	2011	**Estimated 16.8 gpl (6.0 WF)**
Showers	2.75 gpm	2.5 gpm	**U.S. Energy Policy Act**	1994	**2.0 gpm**
Faucets***	2.75 gpm	2.5 gpm (1.5 gpm)	**U.S. Energy Policy Act**	1994	**1.5 gpm at 60 psi**
Dishwashers	14.0 gpc	6.5 gpc for standard; 4.5 gpc for compact	**Energy Independence & Security Act of 2007**	2010	**4.25 gpc for standard; 3.5 gpc for compact**
Commercial Pre Rinse Spray Valves	1.8 to 6 gpm	1.6 gpm	**U.S. Energy Policy Act of 2005**	2006	**1.28 gpm**

* Source: *Handbook of Water Use and Conservation*, Amy Vickers, May 2001
** Average estimated gallons per load and water factor (see calculations)
*** Regulation maximum of 2.5 gpm at 80 psi, but lavatory faucets available at 1.5 gpm maximum (see calculations)
+Source: http://www.epa.gov/watersense/ and http://www.energystar.gov websites

ABBREVIATIONS USED	
gpcd	gallons per capita per day
gpf	gallons per flush
gpl	gallons per load
gpm	gallons per minute
gpc	gallons per cycle
WF	water factor, or gallons per cycle per cubic feet capacity of the washer (the smaller the water factor, the more water efficient the clothes washer)

TABLE 2
Daily indoor per capita water use from various fixtures and appliances in a typical single family home before and after Federal Regulations

Type of Use	Pre-Regulatory Standards Amount** (gpcd)	Post-Regulatory Standards Amount** (gpcd)	Savings from Pre-Reg	Water Sense/ Energy Star Amount** (gpcd)	Additional Savings from Post-Reg
Toilets	17.9	8.2	54%	6.5	21%
Clothes washers*	15	9.8	35%	6.2	37%
Showers	9.7	8.8	9%	7.1	19%
Faucets	14.9	10.8	28%	8.1	25%
Dishwashers*	1.4	0.65	54%	0.43	34%
Total Indoor Water Use	**58.9**	**38.3**	**35%**	**28.3**	**26%**

Note: List only includes common household fixtures and appliances and excludes leaks and "other domestic uses" in order to be conservative.

*Regulatory Standards effective in 2010 and 2011. For calculations of amount in gpcd, refer to the calculation below.
**Source: *Handbook of Water Use and Conservation*, Amy Vickers, May 2001

CALCULATIONS

Clothes washer (pre-regulatory):

Number of times clothes washer used everyday *	= 0.37 loads per day
Clothes washer water use rate range *	= 39 gpl to 43 gpl
Average water use rate	= **41 gpl**
Water usage per capita	= 41 gpl * 0.37 loads/day = **15 gpcd**
Water factor (WF) as gallons/cycle/cu. ft	= 41 gpl / 2.8 cu. ft (assuming capacity of an average washer to be 2.8 cu. ft, most washers range between 2.7 – 2.9 cu. ft) = **14.6**

Clothes washer (new standard):

Number of times clothes washer used everyday *	= 0.37 loads per day
New regulatory standard	= **9.5 WF** = 9.5 gallons/per cycle/cubic feet

	= **26.6 gpl** (Assuming capacity of an average washer to be 2.8 cu. ft, most washers range between 2.7 – 2.9 cu. ft)
Therefore, new usage per capita	= 26.6 gpl * 0.37 loads/day
	= **9.8 gpcd**

Clothes washer (WaterSense/Energy Star):

Number of times clothes washer used everyday *	= 0.37 loads per day
New regulatory standard	= **6 WF**
	= 6 gallons/per cycle/cubic feet
	= **26.6 gpl** (Assuming capacity of an average washer to be 2.8 cu. ft, most washers range between 2.7 – 2.9 cu. ft)
Therefore, new usage per capita	= 16.8 gpl * 0.37 loads/day
	= **6.2 gpcd**

Dishwasher:

Number of times dishwasher used everyday*	= 0.10 times
New regulatory standard	= **6.5 gallons/per cycle** (for standard dishwashers only)
Therefore, new usage per capita	= 6.5 gallons/per cycle * 0.1
	= **0.65 gpcd**

Dishwasher (WaterSense/Energy Star):

Number of times dishwasher used everyday*	= 0.10 times
New regulatory standard	= **4.25 gallons/per cycle** (for standard dishwashers only)
Therefore, new usage per capita	= 4.25 gallons/per cycle * 0.1
	= **0.43 gpcd**

Faucet:

Actual faucet flow during use*	= 67% rated flow
Rated flow*	= **1.5 gpm** to **2.5 gpm**
Frequency of faucet use*	= 8.1 min/day
Range of usage per capita	= 8.1 gpcd to 13.5 gpcd
Assume average of range for estimated gpcd	= **10.8 gpcd**

Faucet (WaterSense/Energy Star):

Actual faucet flow during use*	= 67% rated flow
Rated flow*	= **1.5 gpm**
Frequency of faucet use*	= 8.1 min/day
Usage per capita	= 8.1 gpcd
Assume average of range for estimated gpcd	= **8.1 gpcd**

*Source: *Handbook of Water Use and Conservation,* Amy Vickers, May, 2001

Adapted from information provided by the U.S. EPA Office of Water, the Alliance for Water Efficiency, and other sources)

Fixtures and Appliances	EPAct 1992, EPAct 2005, ''Energy Independence and Security Act of 2007'' *(or backlog NAECA updates)*		WaterSense® or Energy Star®		Consortium for Energy Efficiency	
	Current Standard	**Proposed/Future Standard**	**Current Specification**	**Proposed/Future Specification**	**Current Specification**	**Proposed/Future Specification**
Residential Toilets	1.6 gpf[1]	1.28 gpf/ 4.8 Lpf proposed by efficiency advocates for tank-type only	Tank-type toilets: WaterSense = 1.28 gpf (4.8L) with at least 350 gram waste removal + LA Spec.		No specification	
Residential Lavatory (Bathroom) Faucets	2.2 gpm at 60 psi[2]	1.5 gpm/ 5.7 Lpm proposed by efficiency advocates	WaterSense = 1.5 gpm maximum & 0.8 gpm minimum at 20 psi		No specification	
Residential Kitchen Faucets				None proposed at this time	No specification	
Residential Showerheads	2.5 gpm at 80 psi		WaterSense = 2.0 gpm		No specification	
Residential Clothes Washers	MEF ≥ 1.26 ft^3/kWh/cycle *No specified water use factor Note: MEF measures energy consumption of the total laundry cycle (wash + dry). The higher the number, the greater the energy efficiency	Energy Independence and Security Act of 2007 specified effective in 2011: MEF ≥ 1.26 ft^3/kWh/cycle WF ≤ 9.5 gal/cycle/ft^3 Also specified: DOE shall publish final rule by Dec 31, 2011, determining if standards will change effective 1/1/2015.	Energy Star (DOE) effective July 1, 2009: MEF ≥ 1.8 ft^3/kWh/cycle WF ≤ 7.5 gal/cycle/ ft^3	Energy Star (DOE) To be effective Jan 1, 2011: MEF ≥ 2.0 WF ≤ 6.0 gal/cycle/ft^3	Tier 1: MEF ≥ 1.80 ft^3/kWh/cycle; WF ≤ 7.5 gal/cycle/ft^3 Tier 2: MEF ≥ 2.00 ft^3/kWh/cycle; WF ≤ 6.0 gal/cycle/ft^3 Tier 3: MEF ≥ 2.20 ft^3/kWh/cycle; WF ≤ 4.5 gal/cycle/ft^3	

[1] EPAct 1992 standard for toilets applies to both commercial and residential models.
[2] EPAct 1992 standard for faucets applies to both commercial and residential models.

DOE: Department of Energy
EPA: Environmental Protection Agency
EPAct 1992: Energy Policy Act of 1992
EPAct 2005: Energy Policy Act of 2005
EF: energy factor
ft^3: cubic feet
gal: gallons
gpm: gallons per minute
gpf: gallons per flush
kWh: kilowatt hour
MEF: modified energy factor
MaP: maximum performance
NAECA: National Appliance Energy Conservation Act
psi: pounds per square inch
WF: water factor
Lpf: Litres per flush

Updated March 2010
Koeller/Dietemann

National Efficiency Standards and Specifications for Residential and Commercial Water-Using Fixtures and Appliances

Adapted from information provided by the U.S. EPA Office of Water, the Alliance for Water Efficiency, and other sources)

Fixtures and Appliances	EPAct 1992, EPAct 2005, ''Energy Independence and Security Act of 2007'' *(or backlog NAECA updates)*		WaterSense® or Energy Star®		Consortium for Energy Efficiency	
	Current Standard	**Proposed/Future Standard**	**Current Specification**	**Proposed/Future Specification**	**Current Specification**	**Proposed/Future Specification**
Standard Size and Compact Residential Dishwashers[3]	*Standard models*: Energy Independence and Security Act of 2007 specified: effective 1/1/2010: Standard Size: 355 KWh/year (.62 EF + 1 watt standby) WF ≤ 6.5 gallons/cycle Compact Size: 260 kWh WF ≤ 4.5 gallons/cycle EF is the number of cycles the machine can run for each kWh of electricity	Also specified by the Act: DOE shall publish final rule by 1/1/2015 determining if dishwasher standards will change effective 1/1/2018.	Energy Star (DOE) Effective since July 1, 2009 Standard Size: 324 kWh/year WF ≤ 5.8 gallons/cycle Compact Size: 234 kWh/year WF ≤ 4.0 gallons/cycle kWH/yr is replacing EF since it includes the cycles the machine can run for each kWh, but also includes up to 8 kWh/yr of standby power (when the machine isn't cycling)	Energy Star effective July 1, 2011: Standard Size: 307 kWh/yr 5.0 gallons per cycle Compact Size: 222 kWh/yr 3.5 gallons per cycle	*Effective Aug. 11, 2009:* *Standard models*: EF; maximum kWh/year Tier 1: EF ≥ 0.72 cycles/kWh; and 307 max kWh/year; 5.0 gallons per cycle Tier 2: EF ≥ 0.75 cycles/kWh; 295 max kWh/year; 4.25 gallons per cycle *Compact models*: Tier 1: EF ≥ 1.0 cycles/kWh; 222 max kWh/year; 3.5 gallons per cycle	Could adjust Tiers after July 1, 2011 when new Energy Star becomes effective

[3] ***Standard models*:** capacity is greater than or equal to eight place settings and six serving pieces; ***Compact models*:** capacity is less than eight place settings and six serving pieces

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EPAct 2005: Energy Policy Act of 2005
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gpf: gallons per flush
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Fixtures and Appliances	EPAct 1992, EPAct 2005 *(or backlog NAECA updates)*		WaterSense® or Energy Star®		Consortium for Energy Efficiency	
	Current Standard	Proposed/ Future Standard	Current Specification	Proposed/Future Specification	Current Specification	Proposed /Future Specification
Commercial Toilets	1.6 gpf[4]/6.0 Lpf Except blow-out fixtures: 3.5-gpf/13 Lpf Note: Some states prohibit blow-out at 3.5 gpf	1.28 gpf/ 4.8 Lpf proposed by efficiency advocates for tank-type only	Tank-type only: WaterSense at 1.28 gpf (4.8L) with at least 350 gram waste removal + LA Spec.	Flushometer valve/ bowl combinations: WaterSense specification in development. No release date promised.	No specification	
Commercial Urinals	1.0 gpf	0.5 gpf/ 1.9 Lpf proposed by efficiency advocates	WaterSense = 0.5 gpf/1.9Lpf (flushing urinals only)		No specification	
Commercial Faucets	Private faucets: 2.2 gpm at 60 psi[5] Public Restroom faucets: 0.5 gpm at 60 psi[5] Metering (auto shut of) faucets: 0.25 gallons per cycle[6]			WaterSense draft specification now under consideration	No specification	

[4] EPAct 1992 standard for toilets applies to both commercial and residential models.

[5] In addition to EPAct requirements, the American Society of Mechanical Engineers standard for public lavatory faucets is 0.5 gpm at 60 psi (ASME A112.18.1-2005). This maximum has been incorporated into the national Uniform Plumbing Code and the International Plumbing Code for all except private applications, private being defined as residential, hotel guest rooms, and health care patient rooms. All other applications subject to the 0.5 gpm/1.9 Lpm flow rate maximum.

[6] Metering faucets not subject to flow rate maximum

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gpf: gallons per flush
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Fixtures and Appliances	EPAct 1992, EPAct 2005 *(or backlog NAECA updates)*		WaterSense® or Energy Star®		Consortium for Energy Efficiency	
	Current Standard	Proposed/ Future Standard	Current Specification	Proposed/Future Specification	Current Specification	Proposed /Future Specification
Commercial Clothes Washers (Family-sized)	MEF ≥ 1.26 ft^3/kWh; WF ≤ 9.5 gal/cycle/ft^3	New standards under development: DOE scheduled final action: January 2010; Rulemaking process postponed by DOE in 2008; began again in Dec. 2009.	Energy Star (DOE) MEF ≥ 1.72 ft^3/kWh/cycle; WF ≤ 8.0 gal/cycle/ft^3		Adopted Jan 1, 2007 (Note: this spec covers only normal capacity family washers, NOT large capacity commercial washers) Tier 1: 1.80 MEF 7.5 gal/cycle/ft^3 Tier 2: 2.00 MEF 6.0 gal/cycle/ft^3 Tier 3: 2.20 MEF 4.5 gal/cycle/ft^3	

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National Efficiency Standards and Specifications for Residential and Commercial Water-Using Fixtures and Appliances

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Fixtures and Appliances	EPAct 1992, EPAct 2005 *(or backlog NAECA updates)*		WaterSense® or Energy Star®		Consortium for Energy Efficiency	
	Current Standard	Proposed/ Future Standard	Current Specification	Proposed/Future Specification	Current Specification	Proposed /Future Specification
Commercial Dishwashers	No standard		Energy Star (EPA) using NSF/ANSI standards for water use and ASTM standards for energy use Effective **10/11/2007** *Under counter*: Hi Temp: 1.0 gal/rack; <= 0.90 kW; Lo Temp 1.70 gal/rack <= 0.5 kW *Stationary Single Tank Door*: Hi Temp: 0.95 gal/rack; <= 1.0 kW Lo Temp: 1.18 gal/rack; <= 0.6 kW *Single Tank Conveyor*: Hi Temp: 0.70 gal/rack; <= 2.0 kW; Lo Temp: 0.79 gal/rack; <= 1.6 kW *Multiple Tank Conveyor*: Hi Temp: 0.54 gal/rack; <= 2.6 kW Lo Temp: 0.54 gal/rack; <= 2.0 kW		No specification	

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EF: energy factor
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gal: gallons
gpm: gallons per minute
gpf: gallons per flush
kWh: kilowatt hour
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Fixtures and Appliances	EPAct 1992, EPAct 2005 *(or backlog NAECA updates)*		WaterSense® or Energy Star®		Consortium for Energy Efficiency	
	Current Standard	Proposed/ Future Standard	Current Specification	Proposed/Future Specification	Current Specification	Proposed /Future Specification
Automatic Commercial Ice Makers[7]	Effective 1/1/2010: Energy and condenser water efficiency standards vary by equipment type on a sliding scale depending upon harvest rate and type of cooling (see link to additional information at end of this table)		Energy Star (EPA) Energy and water efficiency standards vary by equipment type on a sliding scale depending upon harvest rate and type of cooling (see link to additional information at end of this table). Water cooled machines excluded from Energy Star		Energy and water (potable and condenser) standards are tiered and vary by equipment type on a sliding scale depending upon harvest rate and type of cooling (see link to additional information at end of this table)	
Commercial Pre-rinse Spray Valves (for food service appli-cations)	Flow rate ≤ 1.6 gpm (no pressure specified; no performance requirement)		No specification	Proposed Energy Star specification abandoned after standard established in EPAct 2005; WaterSense specification in development in conjunction with Energy Star	No specification (program guidance recommends 1.6 gpm at 60 psi and a cleanability requirement)	

[7] Optional standards for other types of automatic ice makers are also authorized under EPAct 2005.

DOE: Department of Energy
EPA: Environmental Protection Agency
EPAct 1992: Energy Policy Act of 1992
EPAct 2005: Energy Policy Act of 2005
EF: energy factor
ft^3: cubic feet
gal: gallons
gpm: gallons per minute
gpf: gallons per flush
kWh: kilowatt hour
MEF: modified energy factor
MaP: maximum performance
NAECA: National Appliance Energy Conservation Act
psi: pounds per square inch
WF: water factor
Lpf: Litres per flush

Updated March 2010
Koeller/Dietemann

National Efficiency Standards and Specifications for Residential and Commercial Water-Using Fixtures and Appliances

Adapted from information provided by the U.S. EPA Office of Water, the Alliance for Water Efficiency, and other sources)

Fixtures and Appliances	EPAct 1992, EPAct 2005 *(or backlog NAECA updates)*		WaterSense® or Energy Star®		Consortium for Energy Efficiency	
	Current Standard	Proposed/ Future Standard	Current Specification	Proposed/Future Specification	Current Specification	Proposed /Future Specification
Commercial Steam Cookers[8]	No standard		Energy Star (EPA) *Electric*: 50% cooking energy efficiency; idle rate 400–800 Watts *Gas*: 38% cooking energy efficiency; idle rate 6,250–12,500 British thermal units/hour *No specified water use factor		*Electric*: 50% cooking energy efficiency; idle rate 400–800 Watts *Gas*: 38% cooking energy efficiency; idle rate 6,250–12,500 British thermal units/hour Water Use Factor (for both electric and gas models): Tier 1A: ≤ 15 gal/hr Tier 1B: ≤ 4 gal/hr	

[8] Idle rate standards vary for 3-, 4-, 5-, and 6-pan commercial steam cooker models.

DOE: Department of Energy
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Information/materials on EPAct 2005/NAECA standards:

Schedule for development of appliance and commercial equipment efficiency standards:
http://www.eere.energy.gov/buildings/appliance_standards/2006_schedule_setting.html

Commercial Clothes Washers and Dishwashers (agenda/presentations at 4/27/06 DOE public meeting on rulemaking):
http://www.eere.energy.gov/buildings/appliance_standards/residential/home_appl_mtg.html

Automatic Commercial Ice Maker Standards:
http://www.eere.energy.gov/buildings/appliance_standards/pdfs/epact2005_appliance_stds.pdf (Page 18)

Pre-rinse Spray Valves
http://www.eere.energy.gov/buildings/appliance_standards/pdfs/epact2005_appliance_stds.pdf (Page 10)

Information/materials on WaterSense specifications:

Toilets
http://www.epa.gov/watersense/products/toilets.html

Urinals
http://www.epa.gov/watersense/products/urinals.html

Bathroom Lavatory Faucets
http://www.epa.gov/watersense/products/bathroom_sink_faucets.html

Information/materials on Energy Star specifications:

Residential Clothes Washers
http://www.energystar.gov/index.cfm?c=clotheswash.pr_crit_clothes_washers

Commercial Clothes Washers
http://www.energystar.gov/index.cfm?fuseaction=clotheswash.display_commercial_cw

Residential Dishwashers
http://www.energystar.gov/index.cfm?c=dishwash.pr_dishwashers

Commercial Dishwashers
http://www.energystar.gov/index.cfm?c=new_specs.comm_dishwashers

Automatic Commercial Ice Makers
http://www.energystar.gov/index.cfm?c=new_specs.ice_machines

Commercial Steam Cookers
http://www.energystar.gov/index.cfm?c=steamcookers.pr_steamcookers

Information/materials on CEE specifications:

Residential Clothes Washers
http://www.cee1.org/resid/seha/rwsh/rwsh-main.php3

Residential Dishwashers
http://www.cee1.org/resid/seha/dishw/dishw-main.php3

Commercial, Family-Sized Clothes Washers
http://www.cee1.org/com/cwsh/cwsh-main.php3

Commercial Ice-Makers
http://www.cee1.org/com/com-ref/ice-main.php3; Spec Table: http://www.cee1.org/com/com-kit/ice-specs.pdf

Pre-rinse Spray Valves
http://www.cee1.org/com/com-kit/prv-guides.pdf

Commercial Steam Cookers
http://www.cee1.org/com/com-kit/sc-hc-specs.pdf

Kentucky American Water Co.
Reasonableness of Consumption Decline Calculation
987 Gallons Per Customer Per Year

Illustrating: Replacement of Clothes Washing, Toilet, Fixtures and Dishwashers Based on Family of Four

Washer:			
Old: Usage per load - gallons	41	Average Use Per Capita Per Day	0.37
New: Usage per load - gallons	17	Average Loads per week - 4 People	10
Usage decline	24	Savings per week	251
		Savings per year - Gallons	**13,037**
Toilet:			
Old: Usage per flush - gallons	3.5	Flush per person per day	5
New: Usage per flush - gallons	1.3	Household number	4
Usage decline	2.2		
		Flush per day per household	20
		Flush per year per household	7,300
		Savings per year - Gallons	**16,206**
Fixtures (Showers):			
Old: Gallons/min flow	2.75	Flow Minutes Per Person Day	8
New: Gallons/min flow	2.00	Household Number	4
Usage Decline	0.75		
		Total Flow Minutes Per Day	32
		Total Flow Savings Per Day	24
		Savings per year - Gallons	**8,870**
Fixtures (Faucets):			
Old: Gallons/min flow	2.75	Flow Minutes Per Person Day	8
New: Gallons/min flow	1.50	Household Number	4
Usage Decline	1.25		
		Total Flow Minutes Per Day	32
		Total Flow Savings Per Day	41
		Savings per year - Gallons	**14,783**
Dish Washer:			
Old: Gallons/cycle	14	Average Use Per Capita Per Day	0.10
New: Gallons/cycle	4	Average Loads per week - 4 People	3
Usage decline	10	Savings per week	27
		Savings per year - Gallons	**1,420**

Total Impact of All Appliances:

Total Calculated Annual KAWC Decrease in Usage (Gallons)	116,563,713
Divided by: Total Estimate Water Usage Savings For Family of Four (Gallons)	**54,315**
Implied Number of Toilet, Clothes Washer, Fixture and Dish Washer Changes Accounting For Annual Usage Reduction KAWC (Number of Customers)	**2,146**
KAWC - Average Number of Residential Customers (2017)	118,099
Maximum number of Customers in a single year contributing to decline	**1.82%**
Implied Years For Complete Impact of Appliance Replacement	**55**

*1 Source: Handbook of Water Use and Conservation, Amy Vickers, May, 2001
*2 Source: www.home-water-works.org, A project of the Alliance for Water Efficency, 2011.

Advanced Search - Search all data in American FactFinder

DP04

SELECTED HOUSING CHARACTERISTICS
2012-2016 American Community Survey 5-Year Estimates

Tell us what you think. Provide feedback to help make American Community Survey data more useful for you.

Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities and towns and estimates of housing units for states and counties.

A processing error was found in the Year Structure Built estimates since data year 2008. For more information, please see the errata note #110.

Versions of this table are available for the following years:
2016
2015
2014
2013
2012
2011
2010

1 - 143 of 143

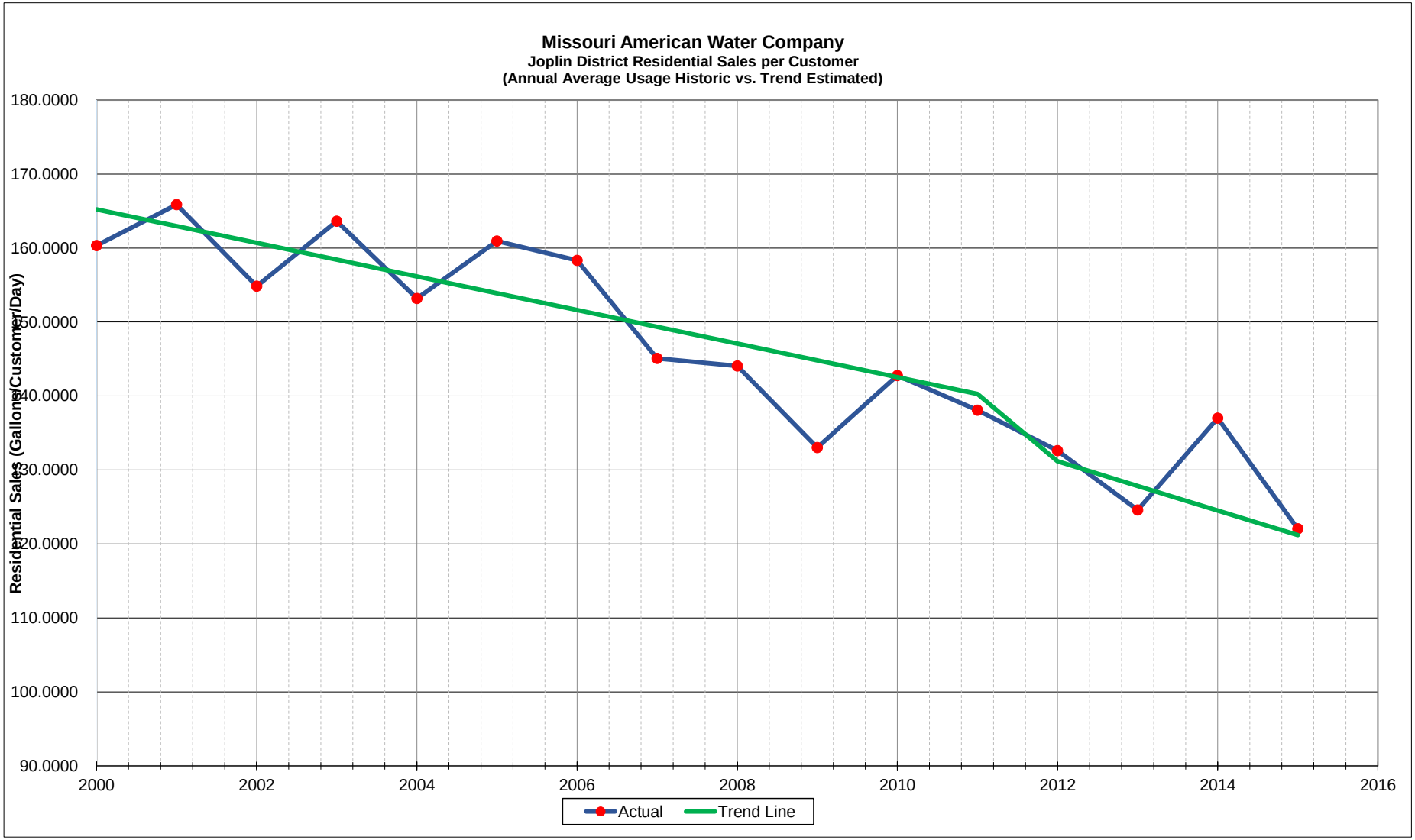
Subject	Kentucky				Fayette County, Kentucky				Lexington-Fayette, KY Metro Area			
	Estimate	Margin of Error	Percent	Percent Margin of Error	Estimate	Margin of Error	Percent	Percent Margin of Error	Estimate	Margin of Error	Percent	Percent Margin of Error
HOUSING OCCUPANCY												
Total housing units	1,951,090	+/-357	1,951,090	(X)	138,858	+/-364	138,858	(X)	215,010	+/-416	215,010	(X)
Occupied housing units	1,718,217	+/-4,613	88.1%	+/-0.2	126,439	+/-989	91.1%	+/-0.7	195,955	+/-1,199	91.1%	+/-0.5
Vacant housing units	232,873	+/-4,808	11.9%	+/-0.2	12,419	+/-976	8.9%	+/-0.7	19,055	+/-1,160	8.9%	+/-0.5
Homeowner vacancy rate	1.9	+/-0.1	(X)	(X)	1.7	+/-0.4	(X)	(X)	1.7	+/-0.3	(X)	(X)
Rental vacancy rate	6.0	+/-0.2	(X)	(X)	5.2	+/-0.8	(X)	(X)	5.1	+/-0.7	(X)	(X)
UNITS IN STRUCTURE												
Total housing units	1,951,090	+/-357	1,951,090	(X)	138,858	+/-364	138,858	(X)	215,010	+/-416	215,010	(X)
1-unit, detached	1,308,668	+/-4,231	67.1%	+/-0.2	83,338	+/-817	60.0%	+/-0.6	139,511	+/-1,169	64.9%	+/-0.6
1-unit, attached	48,190	+/-1,618	2.5%	+/-0.1	7,312	+/-543	5.3%	+/-0.4	10,794	+/-700	5.0%	+/-0.3
2 units	59,144	+/-1,587	3.0%	+/-0.1	6,040	+/-506	4.3%	+/-0.4	9,737	+/-658	4.5%	+/-0.3
3 or 4 units	79,614	+/-1,868	4.1%	+/-0.1	5,886	+/-510	4.2%	+/-0.4	8,598	+/-615	4.0%	+/-0.3
5 to 9 units	93,485	+/-2,191	4.8%	+/-0.1	10,686	+/-602	7.7%	+/-0.4	13,524	+/-665	6.3%	+/-0.3
10 to 19 units	65,520	+/-1,575	3.4%	+/-0.1	11,402	+/-765	8.2%	+/-0.6	12,904	+/-832	6.0%	+/-0.4
20 or more units	59,027	+/-1,314	3.0%	+/-0.1	12,635	+/-614	9.1%	+/-0.4	13,426	+/-635	6.2%	+/-0.3
Mobile home	236,440	+/-3,171	12.1%	+/-0.2	1,508	+/-198	1.1%	+/-0.1	6,465	+/-443	3.0%	+/-0.2
Boat, RV, van, etc.	1,002	+/-224	0.1%	+/-0.1	51	+/-50	0.0%	+/-0.1	51	+/-50	0.0%	+/-0.1
YEAR STRUCTURE BUILT												
Total housing units	1,951,090	+/-357	1,951,090	(X)	138,858	+/-364	138,858	(X)	215,010	+/-416	215,010	(X)
Built 2014 or later	6,151	+/-534	0.3%	+/-0.1	296	+/-119	0.2%	+/-0.1	623	+/-160	0.3%	+/-0.1
Built 2010 to 2013	41,359	+/-1,274	2.1%	+/-0.1	3,498	+/-361	2.5%	+/-0.3	5,419	+/-453	2.5%	+/-0.2
Built 2000 to 2009	298,498	+/-2,918	15.3%	+/-0.2	23,128	+/-762	16.7%	+/-0.6	38,912	+/-1,032	18.1%	+/-0.5
Built 1990 to 1999	337,490	+/-3,775	17.3%	+/-0.2	22,602	+/-736	16.3%	+/-0.5	38,076	+/-1,086	17.7%	+/-0.5
Built 1980 to 1989	249,316	+/-3,023	12.8%	+/-0.2	20,124	+/-768	14.5%	+/-0.5	30,491	+/-904	14.2%	+/-0.4
Built 1970 to 1979	331,419	+/-3,431	17.0%	+/-0.2	21,566	+/-910	15.5%	+/-0.7	33,513	+/-948	15.6%	+/-0.4
Built 1960 to 1969	213,707	+/-2,731	11.0%	+/-0.1	18,572	+/-561	13.4%	+/-0.4	24,751	+/-783	11.5%	+/-0.4
Built 1950 to 1959	184,791	+/-2,377	9.5%	+/-0.1	13,996	+/-502	10.1%	+/-0.4	18,451	+/-753	8.6%	+/-0.3
Built 1940 to 1949	92,386	+/-1,703	4.7%	+/-0.1	4,641	+/-433	3.3%	+/-0.3	7,258	+/-552	3.4%	+/-0.3
Built 1939 or earlier	195,973	+/-2,243	10.0%	+/-0.1	10,435	+/-585	7.5%	+/-0.4	17,516	+/-772	8.1%	+/-0.4
ROOMS												
Total housing units	1,951,090	+/-357	1,951,090	(X)	138,858	+/-364	138,858	(X)	215,010	+/-416	215,010	(X)
1 room	25,688	+/-1,133	1.3%	+/-0.1	2,917	+/-412	2.1%	+/-0.3	3,586	+/-417	1.7%	+/-0.2
2 rooms	32,221	+/-1,398	1.7%	+/-0.1	3,739	+/-403	2.7%	+/-0.3	4,252	+/-412	2.0%	+/-0.2
3 rooms	134,290	+/-2,184	6.9%	+/-0.1	15,023	+/-794	10.8%	+/-0.6	18,431	+/-840	8.6%	+/-0.4
4 rooms	324,768	+/-3,987	16.6%	+/-0.2	23,803	+/-1,004	17.1%	+/-0.7	35,616	+/-1,107	16.6%	+/-0.5
5 rooms	443,187	+/-4,163	22.7%	+/-0.2	27,285	+/-937	19.6%	+/-0.7	46,585	+/-1,146	21.7%	+/-0.5
6 rooms	368,517	+/-3,251	18.9%	+/-0.2	21,934	+/-849	15.8%	+/-0.6	35,414	+/-1,148	16.5%	+/-0.5
7 rooms	241,765	+/-3,297	12.4%	+/-0.2	14,945	+/-638	10.8%	+/-0.5	24,327	+/-825	11.3%	+/-0.4
8 rooms	163,316	+/-2,503	8.4%	+/-0.1	11,704	+/-682	8.4%	+/-0.5	18,458	+/-806	8.6%	+/-0.4
9 rooms or more	217,338	+/-2,961	11.1%	+/-0.2	17,508	+/-649	12.6%	+/-0.5	28,341	+/-887	13.2%	+/-0.4
Median rooms	5.5	+/-0.1	(X)	(X)	5.4	+/-0.1	(X)	(X)	5.5	+/-0.1	(X)	(X)
BEDROOMS												
Total housing units	1,951,090	+/-357	1,951,090	(X)	138,858	+/-364	138,858	(X)	215,010	+/-416	215,010	(X)
No bedroom	28,041	+/-1,115	1.4%	+/-0.1	3,230	+/-420	2.3%	+/-0.3	3,953	+/-417	1.8%	+/-0.2
1 bedroom	164,137	+/-2,425	8.4%	+/-0.1	18,554	+/-778	13.4%	+/-0.6	22,407	+/-894	10.4%	+/-0.4

2 bedrooms	529,245	+/-4,015	27.1%	+/-0.2	34,813	+/-1,202	25.1%	+/-0.9	51,874	+/-1,316	24.1%	+/-0.6
3 bedrooms	876,759	+/-4,783	44.9%	+/-0.2	51,323	+/-1,009	37.0%	+/-0.7	88,623	+/-1,229	41.2%	+/-0.6
4 bedrooms	283,575	+/-3,140	14.5%	+/-0.2	25,219	+/-913	18.2%	+/-0.7	38,453	+/-1,073	17.9%	+/-0.5
5 or more bedrooms	69,333	+/-1,717	3.6%	+/-0.1	5,719	+/-438	4.1%	+/-0.3	9,700	+/-563	4.5%	+/-0.3
HOUSING TENURE												
Occupied housing units	1,718,217	+/-4,613	1,718,217	(X)	126,439	+/-989	126,439	(X)	195,955	+/-1,199	195,955	(X)
Owner-occupied	1,147,903	+/-6,864	66.8%	+/-0.3	67,730	+/-1,091	53.6%	+/-0.8	113,307	+/-1,361	57.8%	+/-0.6
Renter-occupied	570,314	+/-4,248	33.2%	+/-0.3	58,709	+/-1,115	46.4%	+/-0.8	82,648	+/-1,327	42.2%	+/-0.6
Average household size of owner-occupied unit	2.55	+/-0.01	(X)	(X)	2.46	+/-0.03	(X)	(X)	2.51	+/-0.02	(X)	(X)
Average household size of renter-occupied unit	2.38	+/-0.02	(X)	(X)	2.25	+/-0.03	(X)	(X)	2.34	+/-0.03	(X)	(X)
YEAR HOUSEHOLDER MOVED INTO UNIT												
Occupied housing units	1,718,217	+/-4,613	1,718,217	(X)	126,439	+/-989	126,439	(X)	195,955	+/-1,199	195,955	(X)
Moved in 2015 or later	87,656	+/-1,910	5.1%	+/-0.1	10,275	+/-669	8.1%	+/-0.5	14,185	+/-708	7.2%	+/-0.4
Moved in 2010 to 2014	528,148	+/-4,126	30.7%	+/-0.3	50,629	+/-1,220	40.0%	+/-0.9	73,384	+/-1,402	37.4%	+/-0.7
Moved in 2000 to 2009	550,882	+/-4,643	32.1%	+/-0.2	37,331	+/-1,035	29.5%	+/-0.8	60,876	+/-1,273	31.1%	+/-0.6
Moved in 1990 to 1999	266,561	+/-3,070	15.5%	+/-0.2	15,525	+/-598	12.3%	+/-0.5	25,949	+/-834	13.2%	+/-0.4
Moved in 1980 to 1989	126,201	+/-2,087	7.3%	+/-0.1	6,143	+/-476	4.9%	+/-0.4	10,589	+/-594	5.4%	+/-0.3
Moved in 1979 and earlier	158,769	+/-2,307	9.2%	+/-0.1	6,536	+/-436	5.2%	+/-0.3	10,972	+/-570	5.6%	+/-0.3
VEHICLES AVAILABLE												
Occupied housing units	1,718,217	+/-4,613	1,718,217	(X)	126,439	+/-989	126,439	(X)	195,955	+/-1,199	195,955	(X)
No vehicles available	133,316	+/-2,577	7.8%	+/-0.1	10,138	+/-684	8.0%	+/-0.5	14,073	+/-782	7.2%	+/-0.4
1 vehicle available	574,983	+/-4,114	33.5%	+/-0.2	47,761	+/-1,086	37.8%	+/-0.8	68,503	+/-1,420	35.0%	+/-0.7
2 vehicles available	649,063	+/-4,742	37.8%	+/-0.2	49,377	+/-1,122	39.1%	+/-0.8	77,979	+/-1,420	39.8%	+/-0.7
3 or more vehicles available	360,855	+/-3,935	21.0%	+/-0.2	19,163	+/-727	15.2%	+/-0.6	35,400	+/-1,155	18.1%	+/-0.6
HOUSE HEATING FUEL												
Occupied housing units	1,718,217	+/-4,613	1,718,217	(X)	126,439	+/-989	126,439	(X)	195,955	+/-1,199	195,955	(X)
Utility gas	646,338	+/-4,438	37.6%	+/-0.2	54,639	+/-1,038	43.2%	+/-0.8	76,396	+/-1,251	39.0%	+/-0.7
Bottled, tank, or LP gas	108,049	+/-1,684	6.3%	+/-0.1	922	+/-181	0.7%	+/-0.1	4,598	+/-375	2.3%	+/-0.2
Electricity	884,842	+/-5,022	51.5%	+/-0.3	70,020	+/-1,219	55.4%	+/-0.8	111,877	+/-1,568	57.1%	+/-0.7
Fuel oil, kerosene, etc.	15,125	+/-779	0.9%	+/-0.1	148	+/-61	0.1%	+/-0.1	588	+/-120	0.3%	+/-0.1
Coal or coke	3,808	+/-339	0.2%	+/-0.1	15	+/-18	0.0%	+/-0.1	76	+/-63	0.0%	+/-0.1
Wood	48,927	+/-1,357	2.8%	+/-0.1	192	+/-75	0.2%	+/-0.1	1,454	+/-219	0.7%	+/-0.1
Solar energy	314	+/-111	0.0%	+/-0.1	25	+/-31	0.0%	+/-0.1	47	+/-38	0.0%	+/-0.1
Other fuel	5,823	+/-557	0.3%	+/-0.1	163	+/-72	0.1%	+/-0.1	385	+/-113	0.2%	+/-0.1
No fuel used	4,991	+/-432	0.3%	+/-0.1	315	+/-105	0.2%	+/-0.1	534	+/-138	0.3%	+/-0.1
SELECTED CHARACTERISTICS												
Occupied housing units	1,718,217	+/-4,613	1,718,217	(X)	126,439	+/-989	126,439	(X)	195,955	+/-1,199	195,955	(X)
Lacking complete plumbing facilities	8,116	+/-627	0.5%	+/-0.1	444	+/-134	0.4%	+/-0.1	637	+/-155	0.3%	+/-0.1
Lacking complete kitchen facilities	12,541	+/-762	0.7%	+/-0.1	824	+/-179	0.7%	+/-0.1	1,318	+/-240	0.7%	+/-0.1
No telephone service available	50,440	+/-1,210	2.9%	+/-0.1	2,838	+/-333	2.2%	+/-0.3	4,877	+/-486	2.5%	+/-0.2
OCCUPANTS PER ROOM												
Occupied housing units	1,718,217	+/-4,613	1,718,217	(X)	126,439	+/-989	126,439	(X)	195,955	+/-1,199	195,955	(X)
1.00 or less	1,686,310	+/-5,117	98.1%	+/-0.1	123,783	+/-981	97.9%	+/-0.3	192,055	+/-1,253	98.0%	+/-0.2
1.01 to 1.50	24,962	+/-1,225	1.5%	+/-0.1	1,935	+/-298	1.5%	+/-0.2	2,948	+/-377	1.5%	+/-0.2
1.51 or more	6,945	+/-507	0.4%	+/-0.1	721	+/-198	0.6%	+/-0.2	952	+/-215	0.5%	+/-0.1
VALUE												
Owner-occupied units	1,147,903	+/-6,864	1,147,903	(X)	67,730	+/-1,091	67,730	(X)	113,307	+/-1,361	113,307	(X)
Less than $50,000	170,337	+/-2,388	14.8%	+/-0.2	2,527	+/-268	3.7%	+/-0.4	5,485	+/-359	4.8%	+/-0.3
$50,000 to $99,999	262,861	+/-3,424	22.9%	+/-0.3	7,687	+/-388	11.3%	+/-0.6	13,678	+/-570	12.1%	+/-0.5
$100,000 to $149,999	252,316	+/-2,994	22.0%	+/-0.2	16,301	+/-683	24.1%	+/-0.8	28,079	+/-876	24.8%	+/-0.7
$150,000 to $199,999	184,532	+/-2,833	16.1%	+/-0.2	14,470	+/-689	21.4%	+/-0.9	23,584	+/-821	20.8%	+/-0.7
$200,000 to $299,999	160,539	+/-2,228	14.0%	+/-0.2	13,861	+/-558	20.5%	+/-0.9	21,579	+/-656	19.0%	+/-0.6
$300,000 to $499,999	84,276	+/-1,432	7.3%	+/-0.1	8,809	+/-492	13.0%	+/-0.7	13,971	+/-564	12.3%	+/-0.5
$500,000 to $999,999	26,190	+/-1,027	2.3%	+/-0.1	3,284	+/-285	4.8%	+/-0.4	5,483	+/-400	4.8%	+/-0.4
$1,000,000 or more	6,852	+/-515	0.6%	+/-0.1	791	+/-185	1.2%	+/-0.3	1,448	+/-227	1.3%	+/-0.2
Median (dollars)	126,100	+/-575	(X)	(X)	170,800	+/-1,621	(X)	(X)	166,700	+/-1,283	(X)	(X)
MORTGAGE STATUS												
Owner-occupied units	1,147,903	+/-6,864	1,147,903	(X)	67,730	+/-1,091	67,730	(X)	113,307	+/-1,361	113,307	(X)
Housing units with a mortgage	679,545	+/-5,311	59.2%	+/-0.3	47,946	+/-933	70.8%	+/-0.8	79,418	+/-1,214	70.1%	+/-0.7
Housing units without a mortgage	468,358	+/-4,100	40.8%	+/-0.3	19,784	+/-672	29.2%	+/-0.8	33,889	+/-923	29.9%	+/-0.7
SELECTED MONTHLY OWNER COSTS (SMOC)												
Housing units with a mortgage	679,545	+/-5,311	679,545	(X)	47,946	+/-933	47,946	(X)	79,418	+/-1,214	79,418	(X)
Less than $500	29,480	+/-960	4.3%	+/-0.1	1,232	+/-222	2.6%	+/-0.5	2,018	+/-252	2.5%	+/-0.3
$500 to $999	245,726	+/-2,891	36.2%	+/-0.3	11,759	+/-621	24.5%	+/-1.2	21,676	+/-804	27.3%	+/-0.9
$1,000 to $1,499	236,394	+/-3,213	34.8%	+/-0.3	18,575	+/-748	38.7%	+/-1.3	29,787	+/-917	37.5%	+/-1.0
$1,500 to $1,999	97,184	+/-2,044	14.3%	+/-0.3	8,636	+/-426	18.0%	+/-0.9	13,661	+/-618	17.2%	+/-0.7
$2,000 to $2,499	38,711	+/-1,101	5.7%	+/-0.2	3,805	+/-304	7.9%	+/-0.6	6,086	+/-376	7.7%	+/-0.5
$2,500 to $2,999	15,531	+/-617	2.3%	+/-0.1	1,675	+/-204	3.5%	+/-0.4	2,680	+/-253	3.4%	+/-0.3
$3,000 or more	16,519	+/-667	2.4%	+/-0.1	2,264	+/-230	4.7%	+/-0.4	3,510	+/-282	4.4%	+/-0.3
Median (dollars)	1,116	+/-4	(X)	(X)	1,275	+/-17	(X)	(X)	1,243	+/-11	(X)	(X)
Housing units without a mortgage	468,358	+/-4,100	468,358	(X)	19,784	+/-672	19,784	(X)	33,889	+/-923	33,889	(X)
Less than $250	122,219	+/-2,045	26.1%	+/-0.4	2,222	+/-232	11.2%	+/-1.1	4,395	+/-396	13.0%	+/-1.1
$250 to $399	173,255	+/-2,244	37.0%	+/-0.5	6,832	+/-434	34.5%	+/-1.8	11,830	+/-561	34.9%	+/-1.4
$400 to $599	118,830	+/-2,202	25.4%	+/-0.4	6,392	+/-417	32.3%	+/-1.9	11,047	+/-563	32.6%	+/-1.5
$600 to $799	34,652	+/-1,178	7.4%	+/-0.2	2,652	+/-262	13.4%	+/-1.3	4,044	+/-352	11.9%	+/-0.9

$800 to $999	11,746	+/-587	2.5%	+/-0.1	1,033	+/-208	5.2%	+/-1.0	1,586	+/-280	4.7%	+/-0.8
$1,000 or more	7,656	+/-457	1.6%	+/-0.1	653	+/-142	3.3%	+/-0.7	987	+/-170	2.9%	+/-0.5
Median (dollars)	343	+/-2	(X)	(X)	422	+/-10	(X)	(X)	411	+/-8	(X)	(X)
SELECTED MONTHLY OWNER COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME (SMOCAPI)												
Housing units with a mortgage (excluding units where SMOCAPI cannot be computed)	676,168	+/-5,344	676,168	(X)	47,762	+/-936	47,762	(X)	79,140	+/-1,216	79,140	(X)
Less than 20.0 percent	338,027	+/-3,776	50.0%	+/-0.4	25,487	+/-727	53.4%	+/-1.3	41,353	+/-957	52.3%	+/-1.1
20.0 to 24.9 percent	105,271	+/-2,222	15.6%	+/-0.3	7,839	+/-576	16.4%	+/-1.1	13,268	+/-740	16.8%	+/-0.9
25.0 to 29.9 percent	65,112	+/-1,758	9.6%	+/-0.2	4,694	+/-415	9.8%	+/-0.8	7,562	+/-546	9.6%	+/-0.6
30.0 to 34.9 percent	41,964	+/-1,300	6.2%	+/-0.2	2,641	+/-318	5.5%	+/-0.7	4,314	+/-382	5.5%	+/-0.5
35.0 percent or more	125,794	+/-2,317	18.6%	+/-0.3	7,101	+/-517	14.9%	+/-1.0	12,643	+/-658	16.0%	+/-0.8
Not computed	3,377	+/-428	(X)	(X)	184	+/-71	(X)	(X)	278	+/-85	(X)	(X)
Housing unit without a mortgage (excluding units where SMOCAPI cannot be computed)	461,288	+/-4,058	461,288	(X)	19,456	+/-672	19,456	(X)	33,444	+/-914	33,444	(X)
Less than 10.0 percent	221,188	+/-2,714	48.0%	+/-0.4	10,436	+/-471	53.6%	+/-2.0	17,881	+/-615	53.5%	+/-1.5
10.0 to 14.9 percent	90,306	+/-1,710	19.6%	+/-0.3	3,667	+/-337	18.8%	+/-1.6	6,332	+/-444	18.9%	+/-1.2
15.0 to 19.9 percent	50,929	+/-1,271	11.0%	+/-0.3	1,793	+/-222	9.2%	+/-1.0	3,187	+/-302	9.5%	+/-0.8
20.0 to 24.9 percent	28,385	+/-902	6.2%	+/-0.2	1,011	+/-192	5.2%	+/-1.0	1,796	+/-224	5.4%	+/-0.7
25.0 to 29.9 percent	18,599	+/-740	4.0%	+/-0.2	794	+/-166	4.1%	+/-0.8	1,224	+/-183	3.7%	+/-0.5
30.0 to 34.9 percent	11,575	+/-649	2.5%	+/-0.1	292	+/-89	1.5%	+/-0.5	605	+/-121	1.8%	+/-0.4
35.0 percent or more	40,306	+/-1,290	8.7%	+/-0.3	1,463	+/-244	7.5%	+/-1.2	2,419	+/-318	7.2%	+/-0.9
Not computed	7,070	+/-501	(X)	(X)	328	+/-96	(X)	(X)	445	+/-107	(X)	(X)
GROSS RENT												
Occupied units paying rent	515,769	+/-3,977	515,769	(X)	56,005	+/-1,075	56,005	(X)	77,336	+/-1,340	77,336	(X)
Less than $500	115,179	+/-2,272	22.3%	+/-0.4	7,368	+/-570	13.2%	+/-1.0	11,117	+/-685	14.4%	+/-0.9
$500 to $999	312,465	+/-3,235	60.6%	+/-0.5	32,813	+/-1,009	58.6%	+/-1.3	46,573	+/-1,252	60.2%	+/-1.2
$1,000 to $1,499	71,920	+/-1,819	13.9%	+/-0.3	12,238	+/-764	21.9%	+/-1.3	15,705	+/-878	20.3%	+/-1.1
$1,500 to $1,999	11,254	+/-878	2.2%	+/-0.2	2,257	+/-333	4.0%	+/-0.6	2,582	+/-352	3.3%	+/-0.5
$2,000 to $2,499	3,123	+/-374	0.6%	+/-0.1	948	+/-215	1.7%	+/-0.4	972	+/-220	1.3%	+/-0.3
$2,500 to $2,999	1,006	+/-220	0.2%	+/-0.1	143	+/-74	0.3%	+/-0.1	149	+/-74	0.2%	+/-0.1
$3,000 or more	822	+/-202	0.2%	+/-0.1	238	+/-119	0.4%	+/-0.2	238	+/-119	0.3%	+/-0.2
Median (dollars)	690	+/-3	(X)	(X)	793	+/-10	(X)	(X)	782	+/-8	(X)	(X)
No rent paid	54,545	+/-1,532	(X)	(X)	2,704	+/-377	(X)	(X)	5,312	+/-502	(X)	(X)
GROSS RENT AS A PERCENTAGE OF HOUSEHOLD INCOME (GRAPI)												
Occupied units paying rent (excluding units where GRAPI cannot be computed)	502,473	+/-4,055	502,473	(X)	54,890	+/-1,124	54,890	(X)	75,886	+/-1,328	75,886	(X)
Less than 15.0 percent	77,680	+/-2,092	15.5%	+/-0.4	7,382	+/-602	13.4%	+/-1.0	10,587	+/-685	14.0%	+/-0.9
15.0 to 19.9 percent	67,765	+/-1,939	13.5%	+/-0.4	7,286	+/-599	13.3%	+/-1.1	10,769	+/-769	14.2%	+/-1.0
20.0 to 24.9 percent	63,842	+/-1,671	12.7%	+/-0.3	7,110	+/-693	13.0%	+/-1.2	9,831	+/-794	13.0%	+/-1.0
25.0 to 29.9 percent	56,044	+/-1,977	11.2%	+/-0.4	5,974	+/-607	10.9%	+/-1.1	8,581	+/-740	11.3%	+/-0.9
30.0 to 34.9 percent	44,017	+/-1,535	8.8%	+/-0.3	4,385	+/-448	8.0%	+/-0.8	6,171	+/-531	8.1%	+/-0.7
35.0 percent or more	193,125	+/-2,718	38.4%	+/-0.5	22,753	+/-1,023	41.5%	+/-1.7	29,947	+/-1,154	39.5%	+/-1.4
Not computed	67,841	+/-1,796	(X)	(X)	3,819	+/-422	(X)	(X)	6,762	+/-529	(X)	(X)

Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates

Explanation of Symbols:
An '**' entry in the margin of error column indicates that either no sample observations or too few sample observations were available to compute a standard error and thus the margin of error. A statistical test is not appropriate.
An '-' entry in the estimate column indicates that either no sample observations or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowest interval or upper interval of an open-ended distribution.
An '-' following a median estimate means the median falls in the lowest interval of an open-ended distribution.
An '+' following a median estimate means the median falls in the upper interval of an open-ended distribution.
An '***' entry in the margin of error column indicates that the median falls in the lowest interval or upper interval of an open-ended distribution. A statistical test is not appropriate.
An '*****' entry in the margin of error column indicates that the estimate is controlled. A statistical test for sampling variability is not appropriate.
An 'N' entry in the estimate and margin of error columns indicates that data for this geographic area cannot be displayed because the number of sample cases is too small.
An '(X)' means that the estimate is not applicable or not available.


Missouri American Water Company
Joplin District Residential Sales per Customer
(Annual Average Usage Historic vs. Trend Estimated)
Residential Sales (Gallons/Customer/Day)
180.0000
170.0000
160.0000
150.0000
140.0000
130.0000
120.0000
110.0000
100.0000
90.0000
2000
2002
2004
2006
2008
2010
2012
2014
2016
Actual
Trend Line

American Water Works Company
Residential Water Usage Forecasts Based on 10 year history
Based on Weather Normalized Trends except where noted below

State	*Annual Decline (GPCY) 10-year (2008-2017)*	*Rate of Decline (%) 10-year (2008-2017)*
California*	-6,611	-6.8%
Illinois	-1,225	-2.4%
Indiana	-1,049	-2.1%
Iowa	-964	-2.1%
Kentucky	-987	-2.0%
Maryland	-794	-1.8%
Missouri	-1,383	-1.9%
New Jersey (SA1)	-1,233	-1.8%
New York*	-1,596	-1.7%
Pennsylvania	-941	-2.2%
Tennessee	-784	-1.7%
Virginia	-698	-1.3%
West Virginia	-618	-1.6%
Michigan++	-1,084	-3.5%
Weighted Average (w/o CA)	-1,114	-2.0%
Weighted Average (w/ CA)	-1,409	-2.2%

Notes:

*California used the Annual Average Method for trending using a 10 yr (2008-2017) history

**New York used Winter average usage trending with time variable

++ MI Analyses presented were performed using an annual average method for a 10 year duration only

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF:	**)**	
	)	
THE APPLICATION OF KENTUCKY-	**)**	**CASE NO. 2018-00358**
AMERICAN WATER COMPANY FOR AN	**)**	
ADJUSTMENT OF RATES	**)**	

DIRECT TESTIMONY OF KEVIN ROGERS

November 28, 2018

INTRODUCTION

Q. Please state your name and business address.

A. Kevin Rogers. My business address is 2300 Richmond Road, Lexington Kentucky 40502.

Q. By whom are you employed and in what capacity?

A. I am employed by Kentucky-American Water Company ("KAWC," "Kentucky-American" or "Company") as the Vice President of Operations.

Q. Have you previously filed testimony before this Commission?

A. Yes, I testified on behalf of Kentucky-American in the 2015 rate case (Case No. 2015-00418) and also in 2017 in the Preventative Maintenance Deviation Case (Case No. 2016-00394).

Q. Please state your educational and professional background and state whether you are a member of any professional organizations.

A. I received a Bachelor of Science degree in Accounting from Freed-Hardeman University and a Masters of Business Administration from the University of Tennessee at Chattanooga. I also have an active Certified Public Accounting license in the State of Tennessee. I began my career in 1977 as a cost accountant for Concrete Forms Corporation and was promoted into management in 1983 as the Cost Accounting Manager and then on to Chief Accountant in 1985. In 1986, I went to work for Burner Systems International as Accounting Manager and served in that capacity until late 1988 when I moved to Rubbermaid Commercial Products as Manager of Finance/MIS for the Cleveland, TN plant. In 2002, I began serving as Operations Controller for the Rubbermaid Cleaning Division overseeing the financial operations for plants in Tennessee, North Carolina and Mexico. In 2003, I was promoted into general

management as Senior Operations Manager for the plant in Cleveland, TN. In 2006, I became Vice President of Finance for Crescent, Inc. in Niota, TN and later that year responsibility for operations was added and I served as Executive Vice President of Finance and Operations. In late 2008 I began work as a financial and operations consultant for a number of regional businesses in the textile, metal/wood fabrication and defense industry. I began my career with Tennessee-American Water Company ("TAWC") in 2009 serving as the Finance Manager and in September of 2011 I took on the role as Operations Manager for TAWC. In October 2014, I was promoted to Director of Operations for TAWC, and in November 2015, I was promoted to Vice President of Operations for KAWC.

I am a member of the American Water Works Association and serve on its Kentucky Water Utility Executive Council. I am also a board member of both the Kentucky River Authority and Kentucky Water Resources Board, as well as other civic and community boards.

Q. What are your responsibilities as Vice President of Operations of KAWC?

A. I am responsible for the day-to-day development and management of the Company's operations, which includes treating and furnishing potable water; collecting, treating and discharging wastewater; and providing customer service. I oversee the safety and continuity of the Company's operations; the Company's water quality efforts; and the upkeep and maintenance of the Company's facilities. I manage a team of approximately 134 professionals that provide high quality water and wastewater service to KAWC customers.

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony is multi-fold as I will describe KAWC's operations and facilities throughout Kentucky, the Company's commitment to water quality and safety, and the Company's operating and maintenance ("O&M") expenses that support the Company's efforts to provide high quality and cost-effective service to our customers. I also specifically address the pro forma adjustments to production costs. In addition, I discuss KAWC's programs and commitment to improving water efficiency and support the Company's employee levels.

KAWC FACILITIES AND OPERATIONS

Q. Please describe KAWC's operations and the facilities and property KAWC utilizes to provide water service to customers.

A. As of August 31, 2018, KAWC provides water utility service to over 130,000 customers in all or portions of 14 Kentucky counties. Our service territory is divided into three operating districts serving the following counties: the Central District is composed of Bourbon, Clark, Fayette, Harrison, Jessamine, Nicholas, Scott and Woodford counties; the Northern District is composed of Owen, Gallatin, Grant and Franklin counties; and the Southern District is composed of Rockcastle and Jackson counties KAWC also transmits water to ten bulk water customers from various points in the distribution system.[1] KAWC's utility plant accounts include land and land rights, structures and improvements, collecting and impounding reservoirs, wells, pumping equipment and

[1] The bulk water customers are Jessamine South Elkhorn Water District, the City of Nicholasville, the Georgetown Municipal Water and Sewer Service, the City of Versailles, the City of Midway, the City of North Middletown, East Clark County Water District, the Harrison County Water Association, Nicholas County Water District and Peaks Mill Water District.

associated facilities, purification plant and equipment, sludge disposal facilities, transmission and distribution mains, collection pipes, distribution storage facilities, service lines, meters, hydrants and other facilities, including materials and supplies.

Q. Please describe KAWC's water treatment and distribution system assets.

A. KAWC currently operates three water treatment facilities which provide treated water to our retail and bulk water customers. These are the Kentucky River Station I ("KRS I"), the Kentucky River Station II ("KRS II") and the Richmond Road Station ("RRS"). The combined treatment capacity at these facilities is 85 million gallons per day ("MGD") – 40 MGD at KRS I, 25 MGD at RRS, and 20 MGD at KRS II. KAWC withdraws water from Pool 9 of the Kentucky River for KRS I and RRS. An intake pumping facility at river level withdraws water and pumps the raw water up a 380-foot bluff. The raw water is then directed to the KRS I treatment plant, and as necessary may also be directed through a pipeline to the RRS or to the Jacobson Reservoir. The RRS may utilize raw untreated water supplied directly from the Kentucky River pipeline or withdraw water from the Jacobson Reservoir, located on US 25 south of Lexington. On an emergency basis, RRS has the capability to withdraw water from Lake Ellerslie, located on Richmond Road next to the RRS. KAWC withdraws water from Pool 3 of the Kentucky River for KRS II. Similar to KRS I, river water is pumped up a steep bluff (approximately 300 feet) to the water treatment facility. Treated water is then pumped through transmission mains to the distribution system. KAWC's treatment facilities utilize a chemical-mechanical process. Both RRS and KRS II utilize a conventional coagulation and sedimentation process, followed by filtration through sand filters. RRS also employs granular activated carbon as an additional filter media. KRS I has an up-

flow solid contact process followed by filtration through mixed media high rate filters. The KRS I, KRS II and RRS facilities use chloramination to maintain residual disinfectant within the distribution system. Each facility is fully staffed by water treatment plant operators certified by the Kentucky Division of Water. KAWC's treatment facilities meet or exceed all federal and state water quality regulations. Following treatment at our water treatments plants, treated water is supplied to our customers through a system of distribution mains and other facilities. KAWC's distribution system is composed of 22 water storage tanks, 18 distribution pump stations, 8,029 public fire hydrants, 15,970 main line valves, and 2,038 miles of mains.

Q. What is the condition of KAWC's utility property?

A. KAWC maintains its water utility properties in good operating condition for the rendering of water service. The reports of inspections conducted by the Kentucky Division of Water confirm the Company's operations are in compliance with state and federal drinking water and wastewater laws and regulations. Brent O'Neill's Direct Testimony contains information regarding the Company's capital investment activities that, in addition to utility property maintenance and operation, are critical to the continued provision of safe and adequate water and wastewater utility service.

COMMITMENT TO WATER QUALITY AND SAFETY

Water Quality

Q. Please discuss KAWC's commitment to water quality.

A. KAWC has provided water service to customers for over 130 years. We are acutely aware that water is the only utility product intended for customers to ingest, and that our customers rely on KAWC to provide them with safe and reliable water service. Water

quality is of paramount importance to the health and well-being of our customers. Beyond health and safety, we know that KAWC's customers are also interested in the aesthetic qualities of the water we treat and deliver to them. We proactively look for ways to optimize treatment capabilities to continue to improve the overall quality of drinking water delivered to our customers, and do so in a way that strives to create operational efficiencies that also benefit our customers.

Q. Please discuss KAWC's efforts with respect to water quality.

A. The Company's participation in the Partnership for Safe Water Treatment Plant Optimization program (the "Partnership") is one demonstration of KAWC's commitment to the health and safety of our customers through the delivery of clean, safe, aesthetically pleasing water. The Partnership is an alliance of six organizations[2] with a mission to improve the quality of water delivered to customers by optimizing water system operations. Each year, the Partnership recognizes water treatment plants for their optimization and water quality.

Q. Has KAWC been recognized for its optimization and water quality achievements?

A. Yes. All three of KAWC's water treatment plants are participants in the Partnership's water treatment plant optimization program and KRS I and RRS treatment plants have been recognized for their optimization and water quality achievements. In fact, the KRS I and RRS water treatment plants have been recognized for maintaining the Phase III

[2] Partnership organizations include EPA, the American Water Works Association ("AWWA"), Association of State Drinking Water Administrators ("ASDWA"), Association of Metropolitan Water Agencies ("AMWA"), National Association of Water Companies ("NAWC") and the Water Research Foundation ("WRF").

Directors Award status for twenty years. In 2018, KRS II was recognized by the Partnership for achieving its first Phase III Directors award.

Q. Have any of KAWC's treatment plants received other water quality recognition?

A. Yes. The KRS II and RRS water treatment plants were both recognized in 2017 by the Kentucky Energy and Environment Cabinet for optimized drinking water treatment plant performance for turbidity. In meeting these goals, we provided customers with protection against waterborne disease extending above and beyond regulatory requirements. This achievement signifies a commitment to the standards of excellence that is at the heart of the U.S. Environmental Project Agency's ("EPA") Area-Wide Optimization Program ("AWOP"). The KRS II plant has been recognized for this achievement every year since 2010 when the plant first went into service. The RRS plant has received this recognition nearly every year since 2010. Additionally, KRS II was also recognized by the Kentucky/Tennessee Section of the AWWA as the 2017 Kentucky Large Plant of the Year.

Q. Please describe other ways the Company is demonstrating its commitment to water quality.

A. The Company has enhanced its source water protection program by taking an integrated approach to monitoring its source water quality and evaluating risks to that source using innovative technologies, which support the Company's ability to make more informed decisions regarding treatment and when responding to potential source water contamination events. The integrated approach includes source water quality monitoring panels and a map-based information gathering tool called WaterSuite.

Q. Please describe KAWC's source water quality monitoring panels.

A. The Company installed an online, multi-panel source water quality monitoring device at each of its surface water treatment plants as an effective tool for optimizing treatment decisions and aiding in the detection of potential source water contamination. The sensors in each panel monitor parameters in the source water that include UV254, turbidity, pH, oxygen reduction potential, temperature, conductivity and dissolved oxygen. This equipment will establish baseline water quality data for each parameter and alert water plant operators to certain changes in water characteristics. The Company can use this information to better understand the characteristics of its source water. In addition, a change in the baseline characteristics may indicate an issue that warrants additional investigation.

Q. You previously mentioned WaterSuite. Please describe it.

A. WaterSuite is a map-based tool that collects information about potential sources of contamination from various sources and pulls it into a database for a defined area of concern. The database is updated on a regular basis to include the latest available information and has search and reporting capabilities, which provides a significant advantage over standard static contaminant assessments. This gives the Company a dynamic tool it can continue to use over time rather than a paper-based equivalent that captures only the circumstances present at a point in time. The database provides a larger set of data that is automatically updated on a periodic basis without requiring manual work by KAWC. The Company can use the monitoring panels and WaterSuite together to better inform its response to a potential contamination event, adding a level of protection to the benefit of our customers.

Q. Have any new water quality regulations that KAWC is required to meet become effective in recent years?

A. Yes. Reporting for the Revised Total Coliform Rule became effective April 1, 2016 for all public water systems. In addition, the 1996 Safe Drinking Water Act ("SDWA") amendments require that once every five years the EPA issue a new list of no more than 30 unregulated contaminants to be monitored by public water systems. The fourth Unregulated Contaminant Monitoring Rule ("UCMR 4") was published in the Federal Register on December 20, 2016. UCMR 4 requires new testing of 10 identified cyanotoxins and 20 identified contaminants for specified periods of time within the 2018 to 2020 timeframe. KAWC is also taking action to improve its ability to handle taste and odor issues that can develop at the Jacobson Reservoir. This reservoir is an alternative source for our RRS water treatment plant. The future capital plans include moving our permanganate feed from Jacobson Reservoir to RRS and in turn moving the Poly Aluminum Chloride feed from RRS to Jacobson Reservoir. This change will allow for more effective treatment of this issue.

Safety

Q. Please describe KAWC's overall commitment to safety.

A. Ensuring the health and safety of our employees and customers is critical to our success. Our coworkers' and customers' safety is of vital importance and we focus on it every day. My commitment is to ensure that every KAWC employee chooses safety in every job, every day. Employee health and safety is the responsibility of every KAWC employee, and to that end, every employee strives for safety. A safe workplace increases employee

morale, increases our commitment to one another, and in the long run, makes for a more engaged and productive workforce.

Q. Is safety an important part of KAWC's operational performance?

A. Yes. Safety is both a value and a strategy for KAWC. We ask our employees to place safety first in everything they do. We have a strong commitment to our customers and employees safe.

Q. How do you measure safety performance?

A. The Occupational Recordable Incident Rate ("ORIR") is a key metric we can use to gauge the effectiveness of our safety program. It considers the number of recordable injuries occurring during a specified time frame (e.g., month, quarter, and year) and the total number of hours worked by all employees during that same period. American Water establishes a safety target annually to drive continuous improvement (i.e., reduced injury rates). The target is based on a variety of factors, including historical performance and rate of improvement and safety performance data for both utility and non-utility industries. The Company is placing a greater emphasis on employee engagement and providing training as well as better tools and personal protective equipment ("PPE") to employees to improve our safety performance.

Q. What safety initiatives has KAWC implemented to help improve its safety performance?

A. In 2015, the Company launched a Near Miss Reporting Program. Near Miss reporting involves employees identifying a situation that almost, or could have, resulted in an injury or accident. For example, if a piece of equipment becomes worn outside of a

regular maintenance cycle, an employee reports this as a "near miss" so KAWC can replace the worn part and avoid a potential injury from an equipment malfunction.

In addition to near miss reporting, we have begun a certification program for "Certified Safe Workers." "Certified Safe Worker" is a program where employees certify they have completed or demonstrated six safety actions in areas such as health screenings, CPR/First Aid training, other safety training, pre-job stretching, stopping an unsafe job, submitting safety improvement suggestions and/or practicing safety at home. During 2018 to date, 97% of KAWC's employees earned their designation as a Certified Safe Worker.

Q. How did KAWC perform in the Near Miss Reporting Program?

A. KAWC saw significant progress since the program's inception in 2015. In the first year our team reported 109 near misses. As the program evolved, we reported 318 in the second year, 2016, an improvement of almost 300%. The near miss reports have continued to increase over the following years. In 2017 the total increased to 426 and has continued to grow at a faster pace in 2018. Through September of 2018 we have had 397 near misses submitted and are on a pace to exceed 2017 levels for the year. As the program has evolved, the majority of near miss reports have been corrected by the individual identifying the issue, either when observed, or by working with the appropriate people to obtain resources to correct the issue where necessary. In total, 100% of all near misses are corrected or have a correction plan in place within 30 days of the report.

Q. What other initiatives has the Company taken to improve safety?

A. First, the Company has reviewed its water treatment process at each of its facilities. As mentioned previously, we currently use chloramination, which is a very effective

disinfectant process for the safe treatment of our water. The current process, however, uses chlorine gas and anhydrous ammonia as well as sodium hydroxide to balance the water's ph. An atmospheric release of the chlorine and ammonia gases could pose a risk to our employees and the public around our plant facilities. To mitigate this potential risk, we are revising our treatment process to use liquid bleach, ammonia and lime. Director of Engineering Brent O'Neill explains the project further in his testimony.

We also continue to look at other portions of our operations for safety improvements. For example, we replaced our Cox Street booster station with a safer design that eliminates the need for work at the station to be performed by a two-person crew due to its current confined space design. The new station does not have a confined space design which eliminates that risk for our employees and makes the work more efficient.

Additionally, in 2017, we instituted a limitation of 16 consecutive hours for our work crews. This new work rule was based on a US Department of Transportation study that demonstrated the unfavorable safety impact of extended long-hour shifts. Our new policy mandates that relief crews be made available within 16 hours (or sooner if requested) for any individual or work crew. The policy also requires 8 hours of rest before returning to work. We believe this policy positively impacts our employee's safety and demonstrates our commitment to safety.

Q. How has this benefited KAWC's customers?

A. A strong safety culture is a cornerstone for any high performing organization. It also improves employee morale, as our employees know that we care for them and their families. It also reduces safety-related incidents and the associated costs, which also benefits customers.

OPERATING AND MAINTENANCE EXPENSE

Q. Please discuss some of Kentucky-American's efforts to control O&M costs over the past several years.

A. Kentucky-American has successfully controlled costs over the past several years. The Company's 2017 operating and maintenance expenses were less than one percent (1%) higher than 2010 operating expenses, and we are continuing our cost mitigation efforts. At the same time, there are other cost areas that are increasing - inflation marches on despite our best efforts. Particularly, fuel, power and employee costs have increased since the end of the 2017. These increases have somewhat outstripped the continued savings we have achieved in other areas, and they too are included in our rate filing.

Q. What level of O&M expense is the Company seeking in this case?

A. KAWC is seeking recovery of approximately $38 million in O&M expense for the future test year ending June 30, 2020, which represents about a 4.7% percent annual increase from 2017 levels and about a 1.2% annual increase from 2010 levels. The requested increases in O&M expense over these periods support the Company's efforts to continue providing high quality water service in the most cost-effective way to our customers in the long-term. The direct testimonies of KAWC witnesses James Pellock and Melissa Schwarzell discuss KAWC's specific O&M pro forma adjustments in this case, and I address the adjustments to production costs.

Q. Why is the Company seeking an increase in O&M expense in this case?

A. As part of the requested revenue requirement in this case, the Company is seeking to enhance its maintenance activities. The requested increase includes additional costs associated with efforts to reduce non-revenue water and increased demands for line

locates, as well as other field activities to support the Company's efforts to continue providing more cost effective, high quality water service to our customers over the long-term.

IMPROVING WATER EFFICIENCY

Q. What is water efficiency?

A. In simple terms, water efficiency means using improved practices and technologies to deliver water service more efficiently. KAWC's efforts to improve water efficiency cover a wide range, and include supply-side practices, such as water loss reduction efforts, improved pump efficiencies, electrical cost management programs, chemical and waste disposal improvement projects, as well as demand-side strategies, such as customer efficiency and public education programs that provide incentives to improve water and energy efficiency. From an operations perspective, improving water efficiency requires achieving a cost-effective mix of prudent investments and improved operations and maintenance management capabilities targeting safety, customer satisfaction, sustainability, and system efficiency.

Q. What is the connection between improving water efficiency and energy efficiency?

A. Electricity plays a critical role in producing, treating and delivering safe, clean reliable water to our customers. A large portion of a typical water utility's total energy consumption is used to pump water. As pumps age, they wear and become less hydraulically efficient. As a result, more power is required to pump the same volume of water. Replacing aged, worn pumps with new and more efficient models improves the system's "wire-to-water" efficiency. Variable frequency drives ("VFDs") allow more precise and efficient control of flow and operations, and variable speed pumping can

reduce electrical consumption where a throttling valve would otherwise be used to control pumping rate.

Q. Has KAWC made any recent investments to improve water efficiency?

A. Yes. Our engineering team continues to work with operations in replacing pumps and motors with more efficient assets. For example, as noted above, the Company anticipates approximately $133,345 in electrical savings from the installation of high efficiency pumps and VFDs for High Service Pumps 13 & 14 at KRS I. Another significant efficiency improvement made in recent years is the use of our internal transmission and distribution crews to bolster our infrastructure replacement in a very cost effective manner. Since this program began in 2014, our internal crews have installed over 13,000 feet of small diameter mains at a cost estimated to be just over $903,000 lower than if done by external contractors. But these two items are not the only examples of our work to improve water efficiency, some of the others are: the chemical change in our disinfection treatment process to liquid bleach and anhydrous ammonia to reduce the potential safety-related risks to employees and adjacent public at our Richmond Road and KRS I treatment plants; the chemical process change at Jacobson Reservoir that will allow us to feed powder-activated carbon and improve our ability to treat taste and odor in an efficient manner; the Athens Boonesboro main extension phase II that will allow us to serve these customers from our three treatment plants and reduce the cost of purchased water; and the KRS I valve house 4 rehabilitation that installed new valves and actuators and redesigned a safer workflow that provides our workforce easier access by eliminating climbing ladders and over and under pipes to access the equipment. Company witness

Brent O'Neill describes these and other projects that demonstrate our ongoing commitment to improving both water efficiency and energy efficiency.

Q. How else is KAWC using technology to improve water efficiency?

A. KAWC is using technology to further enhance its preventative maintenance programs. Accurate electronic maps ensure that the institutional knowledge currently held by some of our employees is captured for use by current and future employees. To that end, we have loaded our facilities into a GIS so that maps of KAWC's water and wastewater systems are accessible online. GIS includes the location and a short description of the facilities, giving us an electronic spatial view of our entire system. GIS also helps us to locate customers that might be impacted by related service issues and allows us to more effectively communicate the impact directly with our customers.

In addition, KAWC has implemented MapCall, an application that provides a more intuitive spatial interface among the Company's enterprise software, GIS and its employees in the field. The MapCall system provides the flexibility to create work orders, configure workflows and report progress while in the field. For example, a supervisor can create a work order to flush a dozen hydrants in a particular area. Using MapCall, the field worker can report progress as flushing is performed and both the supervisor and others in the field can visually see the progress made toward completing the identified work in real-time, through the MapCall interface. The same can be done to schedule and monitor other routine work as well as emergency work, such main break repairs. As the MapCall system matures, field workers will be able to access pressure and flow sensor data while in the field and see the impact of their activities, if any, allowing them to address potential issues that may arise in a timelier manner and minimize the

impact on service to our customers. In addition, MapCall allows those in the field to more efficiently communicate water quality and other events (e.g., sewer overflows, etc.) through pre-loaded notifications via electronic mail to both internal and external stakeholders (including regulators), allowing them to quickly shift back to focusing on the task at hand and providing quality water and wastewater service to customers.

MapCall, along with an enhancement to our Customer Information System, provides employees in the field with the same information a customer sees on their bill or a customer service representative sees in the customer service center. This gives employees in the field access to critical information and historical data to resolve customers' inquiries. These types of improvements will continue to drive a better customer experience and level of satisfaction.

Q. How else can prudent capital expenditures improve water efficiency?

A. The Qualified Infrastructure Program ("QIP") proposed in this case is a good example. The QIP will enable us to develop and maintain a more systematic replacement program in our production plant facilities, tank and booster sites as well our distribution mains throughout our service territory. The accelerated systematic replacement cycle QIP supports will be more cost effective for customers in the long run because replacing our aging infrastructure will reduce the high cost of breaks and emergency situations that are not only costly to repair but also interrupt customer service and are prone to causing damage to KAWC property, customer property and city streets.

Employee Staffing Levels

Q. Please discuss how KAWC staffs its business operations.

A. The Company continually strives to find more efficient and cost-effective ways to operate and maintain its business. As part of that effort, we manage our cost structure as efficiently as possible, including employee costs. We recognize our duty to staff our business in a manner consistent with the provision of safe, reliable and affordable service. This requires a constant evaluation of the right mix of internal and contract labor, straight time versus overtime, training programs, and replacing labor with technology. We continue to evaluate costs and expenses going forward, always looking for the best solution for the unique and changing challenges we face. A large portion of our cost structure is for labor, and as a position becomes vacant in our organization, we look to the value of that position. We review the overall need for that position and consider, among other things, whether it should be transferred to another area, modified, or even eliminated. Cost control and improved business performance are the goals of these efforts. We continue to evaluate the new roles that will be created as new regulatory requirements are promulgated, and the appropriate positions that KAWC will need to optimize new technology and most effectively serve our customers in the long term.

Q. What is KAWC's forecasted staffing level in this case?

A. KAWC's labor force produces high quality drinking water, maintains the production facilities and distribution systems, monitors water quality, provides engineering services, and supports the efficient management of local operations. The Company's forecasted number of employees is based upon each department's and functional area's plans to continue providing safe, adequate, reliable and affordable service to our customers. We

have identified 152 full-time positions as the appropriate staffing level for the Company's operations. As of August 31, 2018, KAWC had 143 employees (including five temporary employees filling vacancies). Since then, three positions have opened and the Company has hired two of the temporary employees as permanent employees, hired three additional employees and made offers to two others with the expectation the offers will be accepted with scheduled start dates in November and December. We have four positions in the interview phase and also expect to add an employee from North Middletown Water Works when we close on that transaction in February. The Company expects to reach an employee complement of 152 by the beginning of the fully forecasted test period. The direct testimony of James Pellock explains how the Company's labor and labor-related costs were determined and the direct testimonies of Robert Mustich and Kurt Kogler support the Company's overall compensation.

Q. Please describe the types of maintenance activities performed by the Company's workforce.

A. The Company's workforce performs a variety of maintenance activities, such as locates, service orders, meter reading, fire hydrant maintenance, flushing and painting, distribution system valve inspection and operation, fire service inspections, leak detection, cross connection inspection, contractor site inspections and other water distribution related tasks.

Q. Please explain why KAWC is increasing its staffing level.

A. The Company is adding resources in an effort to establish and sustain a more cost-effective level of service to best serve the long-term interests of our customers. Service needs and related resource requirements are consistent with meeting regulatory

requirements, tariff requirements, industry standards, service requests, customer needs, and providing support to the business operations in the most cost-effective way. The additional nine (9) positions the Company is seeking, two of which are already filled, others have been extended offers and the remainder are in the interview phase, will support the Company in the following areas:

- Two will be dedicated to addressing the increased volume in line locates;
- Two will be dedicated to the Company's leak detection and water loss reduction efforts; and
- Three additional field service representatives ("FSRs") will be assigned meter trouble shooting and length of service meter changes.
- One production maintenance trainee who will better prepare us for future work force retirements.
- One construction inspector who will initially focus on the new chemical treatment processes.

Several of these additional resources will allow other FSRs, who have been assigned these responsibilities on an interim basis, to concentrate on customer service related work order types (e.g., turn on/turn offs, high reads, service inquiries). The Company also plans to hire an employee upon the completion of the North Middletown Water Works acquisition.

Q. Please discuss the increased level of field work orders since the Company's last rate case.

A. While we continue to invest in our infrastructure, the volume of our work orders for our general field service work as described above continues to increase as our assets age and

customer base grows. This increasing order trend is seen across virtually all order types as our field service completed orders rose from 73,830 in 2016 to 78,489 in 2017, a 6.3% increase. Our August 2018 YTD completed orders are already at 65,428 and are projected to grow to an annual total over 98,000, a 25% increase over work orders completed in 2017. While the Company has already completed more orders in 2018 than any year on record, the Company has not been able to keep up with the increase in overall demand for work.

Q. What else is contributing to the Company's increase in work orders?

A. Line locate requests from road and utility construction has increased from 29,267 tickets YTD August 2017 to 34,164 tickets YTD August 2018, a 16.7% increase. Not only have the number of service requests increased, but the average area covered by each request has also risen significantly. This is a result of new utility activity that started early this year and is expected to continue through the rate year.

- Lexington Fayette Urban County Government has entered into an agreement with MetroNet to install fiber optic cable throughout 100% of the county in four years. Through August of this year, MetroNet alone has entered over 8,800 locate requests, and we have had to double our locating resources through temporary job transfers from other tasks thus creating more overtime and a heavier workload on those remaining in those roles. It also means we have had to prioritize and temporarily delay certain maintenance tasks. At last report MetroNet has installed approximately 100 miles of fiber optic cable this year with another 650 miles to complete in the next three years. A normal locate request ticket typically requests our mains be located at a construction lot or intersection, however the fiber optic requests are much grander in scale. They often require us to identify the location of our mains over significantly larger distances that can include hundreds of feet on a single ticket.

- The City of Lexington and State of Kentucky also have significant work in progress for major road improvements. Earlier this year Lexington began the multi-year main replacement portion of their sewer consent decree action plan.

Line locates are considered priority work as the law generally requires they be completed within two (2) business days, and therefore, this increase in locate requests has strained the Company's resources. In some instances, we have had to shift resources from other activities to focus on locates, which then defers those other activities. To address this long term increase in work load, we have hired two additional full time field employees that will be dedicated to line locates. Once they are fully trained, the temporarily transferred employees can go back to their normal roles.

Q. Please explain the impact the increased demand from work orders has had on service orders.

A. The increased overall demand for work orders has put a strain on the Company's ability to perform all its routine maintenance activities and continue to provide high quality service to customers. While every effort is made to balance competing priorities, line locates generally must be completed within two business days. The Company's requested employee complement balances near term cost control with service levels that are intended to provide the most cost-effective way to best serve the long-term interests of our customers.

Q. How are the acquisitions included in this case impacting the requested staffing level?

A. This case includes two acquisitions, Eastern Rockcastle Water Association and the City of North Middletown Water. Two full-time employees were added during the base

period to support the Eastern Rockcastle system and one additional full-time employee will be added to support the North Middletown upon completion of the acquisition.

Reducing Water Loss

Q. Please describe the Company's program to reduce water loss.

A. Reducing water loss is a very complex issue with many contributing factors. To reduce water loss as effectively as possible, we stress the need to gather standard data from our operating centers so that we can efficiently and effectively communicate what is working, what is not and how we are progressing on mitigating unaccounted for water ("UFW") around the state. UFW can be defined in a variety of ways across the water industry.[3] Non-revenue water ("NRW"), however, is consistently calculated by subtracting the number of gallons of water sold from the number of gallons of water treated. To avoid any ambiguity, American Water, based in part on guidance from AWWA, measures its reduction in water loss in terms of NRW rather than UFW.

Q. Please describe the difference between apparent and real losses.

A. Apparent and real losses make up the two sides of the non-revenue water equation. Apparent losses represent the difference between the gallons of water delivered and the gallons of water billed to customers. This difference can result from a variety of issues, ranging from estimated bills to theft of service, but, in the case of apparent losses, the

[3] The AWWA had begun to discourage the use of the term UFW since 2012 because its definition is inconsistent from organization to organization. There are several opportunities for inconsistency. For example, some organizations may deduct the number of gallons lost during a known main break while other exclude gallons lost as a result of main breaks all together.

water loss is not caused by a leak in the system. Leaks in the system, on the other hand, are captured in real losses. Real losses reflect water treated and sent into the distribution system that is not ultimately delivered to customers.

Q. What is KAWC doing to improve apparent losses?

A. There are several ways to reduce apparent losses, including improving the Company's billing process, conducting fire service audits, evaluating large meter size and calibrating the plant meters that quantify the water we send into our distribution system. One fundamental approach to mitigate apparent losses is to reduce estimated meter reads. We have a process that helps identify estimated reads during the meter reading process. Employees read the meters by driving by and receiving the reading by a radio signal. If an employee does not receive a reading, they manually read the meter. They then enter a code into the meter reading software that automatically creates a service order. The service order is then assigned to a field service employee to investigate the issue and resolve it before the next meter reading cycle so as to avoid the need for manual reads as well as the potential for estimated bills to that customer in the future.

We monitor our fire services through their attached detector meters. This meter is read monthly and allows us to bill for any small usage on the fire service for the month. If there is consistent month-to-month usage on a detection meter we can further investigate to determine whether it was for authorized use. The Company requires a detector meter on all new fire service installations to help us identify unauthorized usage.

Additionally, we evaluate customers' needs for large meters when the Company is aware that a premise has been repurposed. A customer or premise could have had a need for a large meter in times past but as businesses or buildings are repurposed their routine usage

can diminish the need for a large meter. An oversized meter is more susceptible to missing low flows so having appropriately sized meters is important. When the Company determines, in consultation with the customer, that the meter is oversized, it replaces the meter with the appropriately sized meter for the customer's usage.

We also annually calibrate the plant meters to ensure the accuracy of our measurement of the water volume leaving our three treatment plants.

Q. What is KAWC doing to improve real losses?

A. First and foremost, the replacement of aging infrastructure helps address real losses by replacing mains that are leaking or otherwise impaired. In addition to the continued replacement of aging infrastructure – which the Company proposes to accelerate through the implementation of the proposed QIP discussed further in the testimony of Mr. O'Neill -- KAWC is also addressing real losses by enhancing its leak detection efforts throughout the state. We are using acoustic listening devices to conduct surveys of our systems to assist in determining the condition of our buried infrastructure, and to pinpoint the location of known leaks in a particular area of the distribution system. We have hired two additional employees and an external contractor to support these efforts.

We engaged the external contractor to pilot a new technology that uses satellite imaging to identify areas showing high leakage in our Central and Northern districts. The technology uses aerial imaging taken from satellite-mounted sensors to spot leakage in underground distribution pipes over a large area. The raw imagery is then overlaid on a geographic information system and is processed by unique algorithms. The algorithm detects treated water, by looking for a particular spectral "signature" typical to drinking water. A leakage graphic report overlaid on a map showing streets and potential problem

areas was provided to the Company for review. The potential benefit of this technology is that it allows us to focus our resources on the provided "targets" instead of leak sounding the entire distribution system. We are in the process of doing field verification of the identified sites to determine the effectiveness of this technology.

Q. Has KAWC implemented any other programs to help reduce water loss?

A. Yes. KAWC uses its integrated geographic information system ("GIS") mapping information as part of its comprehensive review of water main breaks to identify and better prioritize areas with an abnormally high main break frequency over a defined period. Main breaks are not only costly to repair, but may also impair water quality, interrupt service to customers and/or result in damage to KAWC property, customer property, and city streets. Being able to identify potential problem areas before main breaks occur could avoid catastrophic failures, reducing the cost of repairs, restoration, and damage to other facilities or property. Mr. O'Neill describes this further in his testimony.

In addition, our engineering team continues to work with operations in replacing pumps and motors with more efficient assets.

Production Costs

Q. Please explain which operating expenses are considered production costs.

A. Production costs are those expenses that vary depending on the amount of water produced by the Company's treatment plants. These costs include fuel and power, chemical, waste disposal, and purchased water.

Q. Please explain the system delivery impact on production costs.

A. System delivery is the amount of treated water that the Company's treatment plants produce. Water sales as well as other factors impact the amount of water produced by the plants, which in turn impacts expenses associated with treating that water. The Company has proposed pro forma sales adjustments in the direct testimonies of Company witnesses Gregory P. Roach and Melissa L. Schwarzell, respectively. Accordingly, the Company's production related expenses were adjusted to reflect the same level of water sales used in the Company's pro forma revenue adjustments. The Company's pro forma system delivery number was used in the projected expense calculation for fuel and power, chemicals and waste disposal.

Purchased Water

Q. Please explain the adjustment for purchased water.

A. The purchased water expense includes the costs for purchasing water from other utilities. The Company has water connections with eight neighboring utilities from which we can buy water: Jackson County Water Association, City of Livingston Municipal Water, City of Mt Vernon Water Works, Carroll County Water District #1, Gallatin County Water District, City of Winchester Municipal Utilities, City of Georgetown Municipal Utilities and City of Paris Water Works. In order to calculate the base period expense, the Company used actual purchased water expenses by vendor for the 6 month period ended August 2018 and included projected expense amounts for September 2018 through February 2019. The first adjustment is to forecast expenses related to the quantity of water purchases expected during the time period of July 2019 through June of 2020. The second adjustment is to eliminate the cost of water currently being purchased from

Winchester Municipal Utilities. As witness Brent O'Neill discusses in his testimony, the Athens Boonesboro Main Extension – Phase II will be placed in service by June 2019 connecting these customers to our system and allowing them to be served by KAWC's three water treatment facilities and thereby reducing our projected purchased water expenses by $68,801 for the fully forecasted test period. The fully forecasted test period purchased water expense can be found on Exhibit 37, Schedules C and D.

Purchased Power and Fuel

Q. Please describe the purchased power expense.

A. Purchased power and fuel expense is composed of the energy costs associated with treating, pumping and delivering water. Electrical costs are the driving force in this expense category as the costs for backup generator diesel fuel is negligible. In order to calculate the base period expense, the Company used actual fuel and purchased power invoices by vendor for the 6 month period ending August 2018 and included projected expense amounts for September 2018 through February 2019. The purchased power expense for the fully forecasted test period of July 2019 through June 2020 was impacted by four adjustments. The first adjustment includes the power usage of the new I-75 Booster Station going into service in late 2018. This booster station will provide increased reliability and redundancy for Toyota Manufacturing of Kentucky and allow KAWC to take the Muddy Ford tank out of service temporarily for much needed rehabilitation. It also includes any system delivery changes. The second adjustment is for the expected rate increase resulting from Kentucky Utilities pending general rate case filed in September 2018. No other electricity provider rate increases are projected, so the projected Kentucky Utility rate increase has an overall net impact of 4.8% on the forecast

period fuel and power expenses. The third adjustment is for $133,345 in anticipated savings from the installation of high efficiency pumps and variable frequency drives for High Service Pumps 13 & 14, resulting in anticipated reduction of head pressure and increased motor efficiency to 95%. The fully forecasted test period fuel and power expense can be found on Exhibit 37, Schedules C and D.

Chemicals

Q. Please describe the operating expense related to chemicals.

A. The Company uses chemicals for water treatment. The amount of chemicals utilized by the Company can vary depending on the season and other external factors. In order to calculate the base period expense the Company used chemical usage and related expense for the 6 month period ending August 2018 and included projected expense amounts for September 2018 through February 2019. In order to calculate the fully forecasted test period expense level for chemicals the Company used a three year average of the quantity for each chemical from 2015, 2016, and 2017, adjusted for any projected change in consumption, and applied to the anticipated system delivery for the fully forecasted test period of July 2019 through June 2020. The Company used current 2018 cost per chemical, adjusted for known 2019 pricing changes applied to the respective period's usage per month to calculate the total expense. The 2019 overall chemical prices have increased by 13.6% driven primarily by significant increases in poly-aluminum chloride, zinc orthophosphate and flocculation coagulants. Additionally, as described in Brent O'Neill's Direct Testimony the new chemical treatment process's elimination of gaseous chlorine, anhydrous ammonia and caustic soda will reduce the safety risks for our employees and communities surrounding our Kentucky River Station and Richmond

Road water treatment plants. This change to bulk liquid bleach, ammonia and lime while utilizing lower concentrations of chlorine will increase costs over $750,000 for the fully forecasted test period. The fully forecasted test period chemical expense can be found in Exhibit 37, Schedules C and D.

Waste Disposal

Q. Please explain the adjustment for waste disposal.

A. The Company incurs waste disposal costs as a result of the need to beneficially reuse sludge and other by-products resulting from water treatment. The Company incurs monthly charges for chemical costs used in waste removal as well as a monthly accrual for anticipated costs associated with periodic cleaning of lagoons based on cycles that range from 12 to 24 months. The cleaning schedule is based on the amount of waste and size of lagoon, consistent with EPA standards. In order to calculate the base period expense the Company used actual chemical expenses by vendor for the 6 month period ending August 2018 and included projected expense amounts for September 2018 through February 2019. The first adjustment to the base period was to normalize the annual expense accrual as there was a one-time item budgeted entirely in December 2018 that should have been profiled monthly across the budget year. The second adjustment projected the increase in system delivery over the base period. The fully forecasted test period of July 2019 through June 2020 includes accruals for the anticipated costs of cleaning the lagoons as noted above as well as monthly chemical costs related to waste removal. The fully forecasted test period waste disposal expense can be found on Exhibit 37, Schedules C & D.

Q. Does this conclude your prepared direct testimony?

A. Yes, it does.

VERIFICATION

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF FAYETTE)

SS:

The undersigned, **Kevin Rogers**, being duly sworn, deposes and says he is the Vice President of Operations for Kentucky-American Water Company, Inc., that he has personal knowledge of the matters set forth in the foregoing testimony, and the answers contained therein are true and correct to the best of his information, knowledge, and belief.

Kevin Rogers
KEVIN ROGERS

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 16th day of November, 2018.

Sharon Miller (SEAL)
Notary Public

My Commission Expires:
7/25/2020

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF:	**)**	
	)	
THE APPLICATION OF KENTUCKY-AMERICAN WATER COMPANY FOR AN ADJUSTMENT OF RATES	**)**	**CASE NO. 2018-00358**

DIRECT TESTIMONY OF NICK O. ROWE

November 28, 2018

Q. Please state your name and business address.

A. My name is Nick O. Rowe and my business address is 2300 Richmond Rd, Lexington, KY 40502.

Q. By whom are you employed and in what capacity?

A. I am employed by American Water Works Service Company, Inc., ("AWWSC" or "Service Company") as President of Kentucky-American Water Company ("Kentucky-American," "KAWC" or "Company"). I am also the Senior Vice President of American Water Works Company, Inc.'s ("American Water") Southeast Division, which consists of Kentucky and Tennessee.

Q. What is your educational background?

A. My educational background includes a B.S. in Civil Engineering from Western Kentucky University and a Master of Business Administration from Lebanon Valley College. I am also an alumnus of Thames Water's Oxford Leadership Program and the RWE International Leadership Program, Lausanne, Switzerland.

Q. Please describe your business experience.

A. I began working at American Water in 1987 as a management assistant at West Virginia-American Water Company, Inc. I was subsequently promoted into various management positions, with responsibility for the day-to-day operations of American Water facilities in various states including Kentucky, Virginia, West Virginia, Maryland, Pennsylvania, Tennessee, New York, Missouri, Illinois, Iowa, Michigan, North Carolina, Georgia, Indiana and Florida. From the fall of 2003 until the summer of 2005 I served as Vice President – Business Change and a member of American Water's executive management team. This role was designed to coordinate a set of major business initiatives that were

implemented throughout American Water to deliver strategic objectives. From July 2005 through July 2006 I served as Vice President of Service Delivery Operations for the Southeast Region of American Water. My responsibilities included overseeing engineering, network, production, maintenance, risk management, customer relations, environmental management, and contract operations that spanned thirteen states. I was President of KAWC from August 2006 until January 2011. From 2009 to 2011, I also served as Senior Vice President of the Eastern Division, which then included the nine states of Kentucky, Indiana, Michigan, Ohio, Tennessee, New York, Virginia, Maryland, and West Virginia. In 2011, as Senior Vice President I led American Water's Central Division, which then included Kentucky, Michigan, Tennessee, Indiana, Missouri, Illinois, and Iowa. On November 11, 2015, I returned as President of KAWC, while retaining a dual role as Senior Vice President of the new Southeast Division (Kentucky and Tennessee).

Q. Please describe your duties as President of KAWC.

A. As President of KAWC, I am responsible for all aspects of the Company's business including financial, operations (production, distribution, customer service, engineering and capital investment planning), employee relations, environmental, and regulatory affairs. In this role, I am ultimately responsible for assuring that the Company is delivering high-quality water and wastewater services to our customers. This responsibility includes taking care to see that all activities of the Company are carried out in compliance with local, state and federal laws and regulations, and standards of good business practice.

Q. Have you previously testified before the Kentucky Public Service Commission?

A. Yes, I have. I testified before the Kentucky Public Service Commission in Case Nos. 2010-00036, 2006-00197, and 2000-00120. In addition, I filed direct testimony in Case Nos. 2015-00418, 2008-00427, 2007-00143, and 2007-00134.

Q. Please describe the areas KAWC serves.

A. Kentucky-American supplies water and/or wastewater services, and public and private fire service to people in Lexington and portions of Bourbon, Clark, Fayette, Franklin, Gallatin, Grant, Harrison, Jackson, Jessamine, Nicholas, Owen, Rockcastle, Scott and Woodford Counties.

PURPOSE AND SUMMARY OF KAWC'S TESTIMONY

Q. Please describe the purpose of your testimony.

A. There are several reasons why I am offering testimony in this case. I will introduce the witnesses who will testify on behalf of the Company. I will also explain the primary reasons for the proposed increase; explain why the Company is seeking approval of a Qualified Infrastructure Program ("QIP") and justify recovery of variable performance-based compensation. It is important that the Commission and our stakeholders understand the Company's contributions to the Commonwealth in providing water service -- a service that is vital to our health, welfare and economic well-being -- and expanding that service to citizens who need it. Inevitably, periodic rate relief is necessary to ensure we can continue to make these contributions. My testimony will also address two intertwined concepts – the Company's ongoing efforts to improve "water efficiency," and the impact of those efforts on the value and affordability of our service. Finally, I will discuss the Company's community outreach efforts and corporate citizenship, which are emblematic of who we are as a company.

Q. Please list KAWC's witnesses in this case and a brief summary of their testimony.

A. In addition to my direct testimony, the following witnesses provide testimony in support of the Company's request:

Kevin Rogers:	will testify on KAWC's facilities and operations, commitment to water quality and safety, production costs, improving water efficiency, and staffing levels.
Brent O'Neill:	will testify on the Company's capital investment planning process, plant additions, QIP proposal, tap fees, and some of the risks and challenges for water utilities associated with increased regulation and climate variability.
Melissa Schwarzell :	will testify on the Company's revenue requirement, minimum standard filing requirements, revenues, certain operations and maintenance ("O&M") expenses, rate base, depreciation and amortization, acquired system cost recovery, and QIP rider.
Kurt Kogler:	will testify on the Company's total compensation, including performance pay and benefits
Robert V. Mustich:	will testify on the reasonableness of the Company's compensation program, and benchmarks the Company's compensation expense against national and regional peer groups, including variable compensation and benefits.
Timothy Willig:	will testify on the reasonableness of the Company's benefits package.
James Pellock:	will testify on certain O&M expenses, including labor and labor related.

Patrick L. Baryenbruch:	will testify on the reasonableness of Service Company costs.
Gregory P. Roach:	will testify on weather normalized usage per customer, including the impact of declining use per customer.
John R. Wilde:	will testify on accumulated deferred income taxes ("ADIT"), property tax, and the Company's request to record a regulatory asset or liability on its books to capture changes in property tax expense.
Scott Rungren:	will testify on the Company's capital structure.
Ann E. Bulkley:	will testify on her recommendation regarding rate of return on rate base and assessment of the reasonableness of KAWC's proposed capital structure.
Constance E. Heppenstall:	will testify on the Company's cost of service allocation and proposed rate design.

REASONS FOR RELIEF REQUESTED

Q. When were KAWC's current rates approved?

A. The Commission approved KAWC's base rates in its Order issued August 23, 2016 in Case No. Case No. 2015-00418. Those rates were effective August 28, 2016 and were based on a fully forecasted test period ended August 31, 2017. By order issued on August 30, 2018, the Commission approved a rate reduction (effective September 1, 2018) to provide KAWC's customers with immediate benefits resulting from the Tax Cuts and Jobs Act ("TCJA"). The test period in this case is the forecasted 12 months ending June 30, 2020.

Q. How has KAWC notified customers of its proposed rates?

A. KAWC mailed the required notice directly to each customer that describes the proposed rates, provides information regarding this proceeding, and contact information for KAWC. In addition, there is information available on KAWC's website, and KAWC has communicated with local media outlets regarding the proposed rates.

Q. Why is the Company filing this rate case?

A. There are several reasons. The most significant driver of this rate case is Kentucky-American's increasing infrastructure investment, which accounts for more than one-half of our total requested rate increase. It is for this reason that the Company is again seeking a QIP to provide the Company with much needed assistance to carry out its planned infrastructure replacement program that supports the continued provision of high quality and reliable service for the long-term benefit of our customers. Another significant driver of this rate case is the need to reset the TCJA interim base rate reduction. In fact, if the adjustment necessary to re-set the TCJA interim reduction were eliminated from our request, investment driven rate relief would be nearly two-thirds of our rate request. We are also seeking cost recovery of increasing O&M expenses, largely driven by an increased demand on Company resources associated with line locates and other high value work, and increases for property taxes that are driven by legislative changes. Finally, we seek recognition in rates of employee performance based compensation expense that we believe is not only competitive, but also reasonable.

Q. What is the amount of the Company's rate request, and how would it affect customer bills if approved?

A. The Company is seeking a rate increase to produce additional revenues of $19.9 million per year, or a 22.6% increase over water service revenues. For an average residential customer on Kentucky American's single tariff rate, using 3,869 gallons of water per month, the requested rate increase will increase the bill from $32.06 to $39.62. This is still about a penny per gallon of water and approximately only $1.32 per day. As I noted, however, of the $19.9 million amount we seek, $4.1 million of the increase is due solely to the temporary portion of the rate reduction ordered by the Commission in August 2018, to flow accrued TCJA benefits from January 1 through August 31, 2018 (what has been called the "stub" period) back to customers. With respect to going concern rate matters, approximately $10 million – more than one-half of the increase – is due to infrastructure investment of more than $100 million of utility plant in service ("UPIS"). The remainder of the increase is largely composed of property taxes, ($1.5 million, a 30% increase); O&M expense increases ($4.1 million); and recognition of $1.8 million of performance compensation costs that the Commission previously has not recognized in rates.

Q. Why is Kentucky-American requesting rate relief at this time?

A. KAWC has provided service to our customers for well over 125 years. Our customers rely on the Company to provide them with safe and reliable water and wastewater services. We take very seriously our obligation to meet our customers' needs and expectations, but these services are not without cost. Providing these services requires us to incur a substantial amount of O&M expense, as well as make ongoing, significant

capital investments. This filing, however, is primarily driven by the investments we are making to maintain and improve our infrastructure. We are accelerating investment in infrastructure that is nearing the end of its useful life and in need of replacement. Despite the need for additional revenue to fund this ongoing and growing investment, our revenue is lagging behind. In the area of O&M expense, the Company has been quite successful in controlling our costs in the past. In fact, our total 2017 O&M expense is relatively flat as compared to our total 2010 O&M expense. This is a remarkable achievement. While the Company has effectively controlled its O&M expenses in the past, new challenges now require increased O&M spending. Furthermore, the Company must maintain its ability to attract capital to continue its investment in infrastructure and have timely recovery of these expenditures. We continue to maintain adequate sources of supply, treatment, pumping, transmission and distribution facilities, as well as to comply with applicable laws and regulations – that is our public service obligation. But the necessary funding level to ensure the safety and integrity of the systems is not the same as the funding levels that best serve the long-term interests of our customers. From the perspective of long-term sustainable customer service and pricing, the Company's goal is to continue providing high quality water service in the most cost-effective way through the replacement, operation, maintenance, and rehabilitation of assets for present and future customers.

Q. Are you saying that this case is fundamentally about investment in infrastructure?

A. Yes, that is exactly what I'm saying. Essentially one-half of our increased revenue requirement is driven by our investments. We simply must upgrade and replace our systems and infrastructure that are at or nearing the end of their useful life - which also

requires significant capital expenditures. The Company will have invested more than $100 million in capital improvements since the last rate case without realizing any capital cost recovery or depreciation expense on that investment.

Q. Is the Company also seeking to recover its full employment costs?

A. Yes, as explained further in my testimony, there is $1.8 million of performance compensation costs that the Commission previously has not recognized in rates. The Company must pay these costs to remain competitive in the job market to attract and retain skilled employees. As the Company witnesses Mustich, Willig, and Kogler will show, Kentucky-American's total employee compensation, including benefits costs, is a reasonable, prudently incurred expense designed to keep the organization focused on delivering clean, safe, reliable and affordable water service while improving performance at all levels of the organization.

CAPITAL INVESTMENT AND THE QIP

Q. You have focused on the Company's significant capital investment. Please address how you propose the Commission address growing investment needs?

A. As explained by Mr. O'Neill, maintaining KAWC's facilities in accordance with the standards I discuss above requires substantial capital investment. Mr. O'Neill also demonstrates that KAWC's water infrastructure is deteriorating at a rate faster than our current replacement rate. This aged infrastructure must be continuously replaced, so that KAWC can continue to provide its customers safe, adequate, efficient, and reliable utility service. KAWC's investment has, in fact, shifted largely from plant needed to meet demand to non-revenue producing infrastructure replacement and compliance with new drinking water standards.

Q. How does the obligation to provide safe and reliable service affect the need to increase rates?

A. It is important to sustain an appropriate level of investment to maintain and improve our water systems. Compared with other utilities, water utilities are the most capital intensive utilities in the industry. The water industry is significantly more capital intensive than both the gas and electric industries. While revenues per customer are decreasing, the nature of water utility investment has shifted from plant needed to meet demand to non-revenue producing investments such as: improved leak detection, infrastructure replacement and repair, and environmental compliance. It is for this reason that the Company is, again, bringing the QIP to the Commission with the hope that its critical importance will be recognized and addressed.

Q. Please explain why the QIP is critically important to the Company.

A. While American Water always ensures that each of its water utilities is afforded access to capital to provide safe, adequate, and reliable service, investment funding is not limitless. American Water is competing with other companies and industries in the marketplace for capital, and American Water's subsidiaries (including Kentucky-American) are competing within the American Water system for discretionary allocations of American Water's investment and financing capacity. Discretionary allocations within American Water can be influenced by a subsidiary company's capital requirements, as well as by market conditions and available funds. Investors have choices. The choices investors make must necessarily consider the returns available on invested capital. American Water is acutely aware that utility statutes and regulatory frameworks vary from state to state; regulatory commissions have different policies, administrative procedures, and

precedents; and these differences affect American Water's investment decisions. Kentucky, like the rest of the United States is reaching a crossroads and facing difficult choices. Kentucky-American is looking to reach and maintain an optimal level of infrastructure investment, but if Kentucky's regulatory treatment does not keep up with ongoing capital expenditures and results in significant and persistent regulatory lag, it discourages expenditures in Kentucky verses alternative investments available to American Water.

Q. Is that one of the reasons KAWC is asking the Commission to approve a QIP?

A. Yes, it is. Ideally, KAWC's spending level for infrastructure replacements and rehabilitation should be adequate to keep pace with the anticipated remaining useful life of infrastructure. For example, as Mr. O'Neill points out in his testimony, at the current rate over the past few years it would take nearly 377 years to replace all of the mains in the system, which have a realistic pipe life expectancy of only 60 to 100 years, depending on the pipe type. Although the Company has managed to bring this down from the nearly 500 years to replace all of the mains in the system identified in the last rate case, this acceleration is not sustainable without more timely cost recovery. As a result, the Company is requesting approval of a QIP to provide a more current matching between making an investment and recovering the cost of that investment. As discussed in the testimony of Mr. O'Neill, KAWC's infrastructure replacement needs are significant now, and are expected to grow in the coming decades. A surcharge mechanism mitigates the significant adverse revenue impact of regulatory lag. The QIP would publicly demonstrate commitment on the part of both the Company and regulators to the successful pursuit of this infrastructure replacement. A long-term commitment is needed

to enable both Company resources and contracted resources to expand their capabilities. Without an alternative recovery mechanism such as the QIP, the ability to sustain a long-term replacement program without impacting other capital needs would be difficult. The QIP is an important component of the Company's efforts to replace its aging infrastructure in a fiscally prudent manner by supporting an accelerated rate of infrastructure replacements, while moderating future rate increases on customers. Brent O'Neill's testimony demonstrates why the QIP is needed. Melissa Schwarzell's testimony provides a thorough explanation of how the QIP will work.

Q. Please explain how the adoption of a QIP supports the Company's efforts to replace its aging infrastructure in a fiscally prudent manner while moderating future rate increases on customers.

A. From the perspective of long-term sustainable customer service and pricing, KAWC's goal is to continue providing high quality water service in the most cost-effective way through the replacement, operation, maintenance, and rehabilitation of assets for present and future customers. As Mr. O'Neill explains, ideally, KAWC's investment level for infrastructure replacements and rehabilitation should be adequate to keep pace with the anticipated remaining useful life of the infrastructure. As I noted previously, the Company, however, is currently replacing its distribution system infrastructure on an approximately 377 year cycle. The need for infrastructure renewal is expected to grow with time, so delaying investment would not only be ill advised, it would also inequitably burden the next generation of customers. Approval of the QIP rider will allow the Company to recover, on a timelier basis, the costs associated with qualified, non-revenue producing investment and provide for smaller, more gradual increases to customers' bills

as the on-going plant investment is made, rather than the larger rate increases associated with base rate cases where the Company's plant investments are recognized in a single, lump sum basis.

Q. Why is it important for the Company to receive a timely recovery of QIP investments to replace aging infrastructure?

A. While American Water always ensures that each of its water utilities is afforded access to capital to provide safe, adequate, and reliable service, investment funding is not limitless. QIP investments are directed at infrastructure replacement programs and do not apply to new main extension projects that would partially pay for themselves through revenue production from connecting new customers. As explained by Mr. O'Neill, however, KAWC is looking to reach and maintain a more optimal level of infrastructure investment. KAWC's current regulatory structure, however, does not keep up with the ongoing trajectory of its planned capital expenditures, and this discourages expenditures in Kentucky verses alternative investments available to American Water in other states. A QIP will provide more timely cost recovery of investments made in an ongoing manner, while mitigating regulatory lag by not waiting to lump together a cumulative series of investments for episodic rate case filings. In addition, as noted above, more predictable and timely recovery of costs improve the ability to attract the capital necessary to carry out an infrastructure replacement program that supports the continued provision of high quality and reliable service for the long-term benefit of our customers. Again, the best way to ensure that optimal levels of capital are available is through predictable and timely recovery of investments and the return on capital devoted to serving customers.

Q. Is the use of QIP surcharge-type mechanisms to mitigate regulatory lag for the replacement of infrastructure widely utilized?

A. Yes, for some time regulators have been aware of the aging of water utility infrastructure, the need to accelerate replacement of that aging infrastructure, and the need to adopt mechanisms to assist utilities in that process. In 2005, the National Association of Regulatory Utility Commissioners ("NARUC") passed a "Best Practices" resolution that endorsed the infrastructure rider mechanism as a regulatory tool that agencies such as the Commission should consider. The February 2005 Resolution provides, in pertinent part:

> **. . . .WHEREAS,** To meet the challenges of the water and wastewater industry which may face a combined capital investment requirement nearing one trillion dollars over a 20-year period, the following policies and mechanisms were identified to help ensure sustainable practices in promoting needed capital investment and cost-effective rates: a) the use of prospectively relevant test years; b) the distribution system improvement charge; c) construction work in progress; d) pass through adjustments; e) staff-assisted rate cases; f) consolidation to achieve economies of scale; g) acquisition adjustment policies to promote consolidation and elimination of non-viable systems; h) a streamlined rate case process; i) mediation and settlement procedures; j) defined timeframes for rate cases; k) integrated water resource management; l) a fair return on capital investment; *and* m) improved communications with ratepayers and stakeholders; *and*
>
> **WHEREAS,** Due to the massive capital investment required to meet current and future water quality and infrastructure requirements, adequately adjusting allowed equity returns to recognize industry risk in order to provide a fair return on invested capital was recognized as crucial;
>
> . . . . ***now therefore be it***
>
> **RESOLVED,** That the National Association of Regulatory Utility Commissioners (NARUC), convened in its July 2005 Summer

> Meetings in Austin, Texas, conceptually supports review and consideration of the innovative regulatory policies and practices identified herein as "best practices;" ***and be it further***
>
> **RESOLVED,** That NARUC recommends that economic regulators consider and adopt as many as appropriate of the regulatory mechanisms identified herein as best practices; ***and be it further***
>
> **RESOLVED,** That the Committee on Water stands ready to assist economic regulators with implementation of any of the best practices set forth within this Resolution. ….[1]

NARUC further reinforced its support for this kind of mechanism at its November 2013 resolution on "alternative regulation."2 In this resolution, NARUC emphasizes the "important role of innovative regulatory policies and mechanisms in facilitating the efforts of water and wastewater utilities to address their significant infrastructure investment challenges." The resolution goes on to state that "alternative regulatory mechanisms can enhance the efficiency and effectiveness of water and wastewater utility regulation by reducing regulatory costs, increasing rates for customers, when necessary, on a more gradual basis; and providing the predictability and regulatory certainty that supports the attraction of debt and equity capital at reasonable costs." Both resolutions describe many of the issues laid out above – namely, the need for infrastructure replacement, the non-revenue producing nature of the investment, and the need to assist utilities in tackling these problems while helping customers manage costs. And both

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[1] National Association of Regulatory Utility Commissioners, *Resolution Supporting Consideration of Regulatory Policies Deemed as "Best Practices,"* 2005.

[2] *Resolution Endorsing Consideration of Alternative Regulation that Supports Capital Investment in the 21st Century for Water and Wastewater Utilities***,** 2013.

NARUC resolutions expressly encourage commissions to adopt an infrastructure surcharge mechanism as a means to provide a regulatory framework that supports investment in infrastructure replacement and the Company's ability to attract the capital to fund that investment. (See Exhibit NOR-1 for the full text of the NARUC's 2013 and 2005 resolutions.)

Q. Do other American Water subsidiaries with which KAWC competes for capital have similar mechanisms?

A. Yes. American Water regulated subsidiaries in Illinois, Indiana, Iowa, Missouri, New Jersey, New York, Pennsylvania, Tennessee, Virginia and West Virginia have some mechanism to recover costs of infrastructure replacement in between general rate case proceedings. With Kentucky-American being among the last of American Water's regulated subsidiaries without a mechanism to achieve timely recovery of its investment in accelerated infrastructure replacement, it is at a significant disadvantage to attract discretionary capital allocations from American Water as compared to its affiliates.

Q. Why is the QIP beneficial to Kentucky-American, its customers, and the state of Kentucky?

A. The best way to ensure that the appropriate levels of expenditures and capital investment are consistently funded is through predictable and timely recovery of expenses and the return on the capital devoted to serving our customers' needs. The timely cost recovery of these expenditures in turn provides an incentive for continued capital infusion by the investors who are called upon to put their capital at risk for our customers. Investors' willingness to commit their capital to Kentucky-American results in stronger and more reliable water systems for both current and future customers. The QIP offers the best way

for Kentucky-American to attract capital investment to sustain the ongoing investment in its infrastructure through approval of an accelerated infrastructure replacement program. Further, the investment and commitment of the Company and its investors support the Kentucky economy as an employer, through its use of outside contractors, and as a taxpayer. Water and wastewater utilities are an integral part of our nation's infrastructure investment solutions. Jobs in water utilities are accessible to workers with a range of educational and training backgrounds, and offer opportunities for workforce development and advancement. Every million dollars of investment in water utility infrastructure generates jobs for the local economy.3 With over a third of the current workforce at water utilities eligible for retirement, there is an excellent opportunity to connect people to quality jobs.

IMPROVING WATER EFFICIENCY

Q. Please explain the concept of water efficiency.

A. Water efficiency means using improved practices and technologies to deliver water service more efficiently. Water efficiency efforts include supply-side practices, such as more accurate meter reading, leak detection, main replacement and repair programs, as well as demand-side strategies, such as public education programs to encourage the wise use of water. For example, improved metering results in more accurate usage information and increases employee efficiency, and leak detection programs can reduce the amount of

[3] See, e.g., Clean Water Council, *Sudden Impact: An Assessment of Short-Term Economic Impacts of Water and Wastewater Construction Projects in the United States*, 2009. Alexander Quinn, et al., *National Economic & Labor Impacts of the Water Utility Sector: Executive Report*, Water Research Foundation and Water Environment Research Foundation, 2014. The United States Conference of Mayors estimates that a $1 billion investment in water infrastructure creates over 26,000 jobs nationwide, 2009.

water, pressure, and energy required to deliver the same amount of water to consumers' taps. Improving water efficiency reduces operating costs (e.g., pumping and treatment) and reduces the need to spend capital developing new supplies and expanding our water infrastructure. It also reduces withdrawals from limited freshwater supplies, leaving more water for future use and improving the ambient water quality and aquatic habitat.

Q. How is water efficiency relevant to this case?

A. Water efficiency is a common thread throughout the entire fabric of this case. At its core, this case is about investments we are making to better serve our customers. Striving for increased water efficiency is evident in our infrastructure investments, such as the main and service replacements that help us provide a better, more reliable system. Our water efficiency efforts are demonstrated by investments in new technologies, and by improved business processes that help us work smarter and more efficiently and, by extension, contribute to our cost control efforts. As discussed in Mr. O'Neill's direct testimony, the investments we are making to better serve our customers are primarily in non-revenue producing investments – replacing aging infrastructure, enhancing reliability and resiliency, and water efficiency investments.

As we plan our investments, however, we know how important it is to balance the need for system improvements with what our customers pay for water service. Consequently, the Company continually strives to find more efficient and cost-effective ways to operate and maintain its business. As part of that effort, we strive to manage our cost structure as efficiently as possible. Through the size and breadth of American Water, the Company has continued to increase its purchasing power and obtain significant discounts on the necessary equipment needed to manage and maintain our system including pipes,

fittings, and water treatment chemicals that we otherwise would be unable to obtain if we were a separately owned water system.

Q. Please describe the support that KAWC receives from its affiliates to improve efficiency.

A. Our affiliation with the American Water family of companies allows us to leverage the expertise, purchasing power and financial strength of the larger organization. For example, Service Company provides a wide spectrum of cost-effective, value-added services that enable KAWC to fulfill its responsibilities in a more cost effective manner. These services include customer service, water quality testing at a state of the art laboratory, innovation and environmental stewardship, human resources, communications, information technology, finance, accounting, tax, legal, engineering, supply chain, and risk management services. AWWSC provides KAWC's customers more cost effective services and expertise than the Company can achieve on its own. Mr. Baryenbruch describes the cost effectiveness of the services that KAWC obtained from AWWSC. Also, American Water Capital Corp. ("AWCC") provides the Company with access to short-term loans, long-term borrowings, and cash management services at very competitive rates; rates that KAWC would not be able to obtain on its own due to our relatively small size Mr. Rungren explains the benefits that AWCC provides the Company.

Q. Does the Company invest in its employees, and do those investments yield efficiencies and other benefits for customers?

A. Yes. The Company recognizes that our human capital is one of our greatest assets and that it requires continued development. Investing in employees has created ascertainable

benefits for our customers. Not only do we invest in our employees in terms of providing them with competitive salaries and benefits, but we also invest in their safety and well-being, both on and off the job. This means not only providing our employees with a competitive package of wages, salaries and performance pay but also with competitive benefits that ensure their well-being. The testimony of Messrs. Kogler, Mustich and Willig establishes that Kentucky-American's pay and benefits are reasonable and designed to keep the organization focused on delivering clean, safe, reliable and affordable water service while increasing efficiency, decreasing waste, and boosting overall productivity. They are manifestly just, reasonable and prudent expenses required to operate our business. If we cannot recover the prudently incurred costs necessary to attract, and retain, a dedicated, motivated workforce, our efforts to improve water efficiency will be thwarted.

Q. What is the Company's ultimate goal?

A. Our goal is to provide quality water service as efficiently as possible, and by doing so, to increase the value of our services. I have to tell you that, as the President of Kentucky-American, I derive great satisfaction from seeing the commitment to continuous improvement across the business, and how that commitment benefits our customers and the communities that we serve.

VALUE OF WATER SERVICE AND AFFORDABILITY

Q. Do customers receive a good value for water service the Company provides?

A. Absolutely. The Company operates against the myth that water is "free" – a fundamental human need supplied by the earth itself. And, in fact, no one is charged for taking a bucket of water from a river or other natural source of supply. That water, however, is not safe to drink and it is not conveniently supplied. The vast infrastructure required to treat

and deliver that water safely where it is needed is far from free. Too many rural Kentuckians, served by unreliable, contaminated, or unpleasant well water can attest to the value of quality, reliable water service. I often see or hear from these individuals as they seek to have water mains extended to their struggling communities. Most Americans, however, are unaware of these costs – to treat and deliver clean, safe water to their homes. Americans pay less for tap water than do residents of most other developed nations. Water is also typically the utility that makes up the lowest percentage of household budgets – less than gas, oil, telephone, cable, and electricity.

When customers appreciate the true value of water, it not only helps water utilities to continue to provide customers with safe and clean water, but it also has the added benefit of encouraging more conservation and ensuring a sustainable supply for future generations. American Water has joined with other water resource companies and organizations in an industry-wide initiative to enhance customer awareness of what is involved in providing high quality, reliable water service and the relative value of the service as part of the Value of Water Coalition. The Coalition's aim is to educate the public on the importance of clean, safe, and reliable water to and from every home and community and to ensure quality water service for future generations.

Q. How does Kentucky-American maintain the affordability of its water service?

A. Our water service is critical, and we know how important it is for those services to remain affordable. As discussed above, Kentucky-American's water service is quite affordable when one considers that all of a residential customer's needs for drinking, cooking, cleaning and washing are provided for about $1.32 per day. An important way that we maintain affordability is by continuously seeking to improve our business

processes and make investments that improve efficiencies. We have managed to keep our total O&M expense relatively flat. With the monumental investment challenges we face, keeping our costs as low as practicable is paramount. With each dollar of O&M expense we can avoid, we can invest eight dollars in new or replacement plant without increasing customer rates.

Q. What else is Kentucky-American doing to maintain the affordability of its services for its customers?

A. Kentucky-American offers several targeted customer assistance programs to help our most vulnerable customers. Kentucky-American's residential customers have the option of paying bills under the Company's budget billing plan, whereby the total service for the succeeding twelve (12)-month period is estimated in advance, and bills are rendered monthly on the basis of one-twelfth (1/12) of the twelve (12)-month estimate. In addition, Kentucky-American offers its customers flexible payment arrangements through installment agreements if they are financially unable to pay a past due water service bill. A payment arrangement allows Kentucky-American customers the opportunity to pay off a past due bill balance to keep utility accounts in good standing. A past due amount is spread out over a specified period of time (monthly installments), and customers are required to pay the agreed upon monthly installment in addition to paying their current monthly utility charges in full by the bill due date. Paying both the installment and current utility charges gives customers extra time to bring their utility account up to date. The length of a payment arrangement can vary and there is no limit to the number of installment agreements available to our customers, provided that prior installment agreements terms have been fully met. We also assist customers who are experiencing

financial hardship through Kentucky-American's Help to Others ("H2O") Fund. The H2O program is an emergency bill-paying assistance program funded by KAWC's shareholders and donations from customers who want to help other customers in need. The H2O program is administered by Dollar Energy Fund, an independent, non-profit organization whose mission is to improve the quality of life for households experiencing hardships by providing utility assistance and other services that lead to self-sufficiency. Customers who qualify may receive one grant of up to $125 annually toward their Kentucky-American bill. In addition, as part of the settlement of our last case, beginning in Fiscal Year 2017, Kentucky-American increased its annual contribution from shareholders to the H2O program to a total contribution of $62,500. Kentucky-American also agreed to discuss and implement methods to improve awareness of the H2O program.

Q. Has KAWC continued to make significant charitable contributions?

A. Yes, the Company has continued to make significant charitable contributions since the last rate case. Our shareholders donate $62,500 annually to assist low-income customers with water bill payment. The Company also contributes annually to a variety of other charitable and civic causes throughout its service area in an effort to help build and maintain strong communities.

COMMUNITY OUTREACH

Q. Please describe Kentucky American's commitment to the communities it serves.

A. We enjoy a number of positive relationships in the communities we serve, including with the Lexington-Fayette Urban County Government, the city of Owenton in Owen County, and the city of Millersburg in Bourbon County, in areas such as education, economic development, environmental protection, fire safety and assistance for low-income

families. The Company takes its commitment to the communities we have the privilege to serve very seriously. As such, we are community partners for a number of local initiatives and events. For example, in 2018 KAWC hosted its eighth WaterFest community open house -- an event that is designed to provide the community with an up-close, informative and fun view of how water is withdrawn from a reservoir or river and is transformed into nationally recognized, quality drinking water. Also in 2018, KAWC continued its support for Kentucky River Sweep, an annual effort held in several communities along the Kentucky River whereby volunteers work together to help clear the river and its banks of trash and debris.

The Company also provides annual support for Reforest the Bluegrass, an annual riparian reforestation event in Fayette County during which hundreds of volunteers plant thousands of tree seedlings near an urban stream. Likewise, the Company has an ongoing partnership with the Lexington Division of Police and local Drug Enforcement Agency officials in offering two drug take-back days each year at the Company's Richmond Road location designed to assist citizens in keeping expired and no-longer-needed medications out of the wrong hands and out of waterways. The Company also sponsors or contributes to a number of initiatives that enhance our communities. For example, KAWC provides grants to local firefighting organizations to fund critical needs, such as additional hoses, communication equipment, and training. Since its inception in 2011, KAWC has contributed $65,658 to professional and volunteer fire and rescue organizations. With respect to having pride in our service area, KAWC assists with the operational expenses for the fountains at Triangle Park, which are a landmark in the City of Lexington, and also supports a number of community festivals, such as Sweet Owen Days in Owen

County, Millersburg's Chautauqua Days Festival, Founders' Day at McConnell Springs and Fayette County's Arbor Day. KAWC also provides Puddle's Hydration Station, a portable trailer equipped with six water dispensers which provides refreshing tap water at races, walks, festivals and other large outside events. Our commitment to the areas we serve is not confined to monetary shareholder contributions.

KAWC has adopted a portion of Richmond Road near its offices in Lexington as well as a portion of US 127 in Owen County near its Kentucky River Station II water treatment facility through the "Adopt-a-Highway" program sponsored by the Kentucky Transportation Cabinet. Many of our employees donate their time by performing trash pick-ups through this program to provide a clean environment and instill civic pride. Similarly, KAWC annually engages in a United Way campaign in which our employees support local charitable and non-profit organizations, and annually in September, employees participate in Americans in Action community service efforts such as volunteering time at local animal shelters and serving meals to the homeless.

KAWC also offers a total of $10,000 each year to area organizations through its Environmental Grant Program to assist with a variety of environmental initiatives. Organizations are eligible for grants up to $5,000 for community-based projects that improve, protect and restore drinking water supplies and surrounding watersheds. Since 2006, this program has provided $195,000 in such grants. On an annual basis, KAWC awards Ripple Effect Scholarships to high school seniors who demonstrate academic excellence, an ongoing commitment to environmental stewardship and interest in a related career. Since the program's inception in 2002, KAWC has awarded a total of $58,500 in Ripple Effect Scholarships to 106 students. Relatedly, KAWC continues to

sponsor local science fairs, which are important events in which our youth exhibit their inventive and creative work and apply the scientific method.

Q. What are some of the specific activities Kentucky American Water has partnered in?

A. Being a good neighbor is part of our mission at Kentucky-American. The employees of Kentucky-American play an active role in the communities we serve by getting involved in a variety of environmental and educational activities related to water, everything from watershed clean-up efforts to school programs focused on drinking water and source water protection. KAWC leadership team members give back to the community by serving on a number of boards and committees for civic and charitable causes, such as the American Red Cross, Bluegrass GreenSource, Bluegrass Tomorrow, the Explorium, Living Arts and Science Center, Shriner's Hospital, United Way, the Urban League, the YMCA of Central Kentucky and Women Leading Kentucky. We work with a number of community-based partners throughout our service areas to improve the overall quality of life where our employees and neighbors live and work.

Q. Does this complete your testimony?

A. Yes, it does.

VERIFICATION

COMMONWEALTH OF KENTUCKY)
) **SS:**
COUNTY OF FAYETTE)

The undersigned, **Nick O. Rowe**, being duly sworn, deposes and says he is the President of Kentucky-American Water Company, Inc., that he has personal knowledge of the matters set forth in the foregoing testimony, and the answers contained therein are true and correct to the best of his information, knowledge, and belief.

NICK O. ROWE

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 19th day of November, 2018.

(SEAL)
Notary Public

My Commission Expires:
7/25/2020

Resolution Supporting Consideration of Regulatory Policies Deemed as "Best Practices"

WHEREAS, A number of innovative regulatory policies and mechanisms have been implemented by public utility commissions throughout the United States which have contributed to the ability of the water industry to effectively meet water quality and infrastructure challenges; *and*

WHEREAS, The capacity of such policies and mechanism to facilitate resolution of these challenges in appropriate circumstances supports identification of such policies and mechanisms as "best practices"; *and*

WHEREAS, During a recent educational dialogue, the "2005 NAWC Water Policy Forum," held among representatives from the water industry, State economic regulators, and State and federal drinking water program administrators, participants discussed (consensus was not sought nor determined) and identified over 30 innovative policies and mechanisms that have been summarized in a report of the Forum to be available on the website of the Committee on Water at www.naruc.org; *and*

WHEREAS, As public utility commissions continue to grapple with finding solutions to meet the myriad water and wastewater industry challenges, the Committee on Water hereby acknowledges the Forum's *Summary Report* as a starting point in a commission's review of available and proven regulatory mechanisms whenever additional regulatory policies and mechanisms are being considered; *and*

WHEREAS, To meet the challenges of the water and wastewater industry which may face a combined capital investment requirement nearing one trillion dollars over a 20-year period, the following policies and mechanisms were identified to help ensure sustainable practices in promoting needed capital investment and cost-effective rates: a) the use of prospectively relevant test years; b) the distribution system improvement charge; c) construction work in progress; d) pass-through adjustments; e) staff-assisted rate cases; f) consolidation to achieve economies of scale; g) acquisition adjustment policies to promote consolidation and elimination of non-viable systems; h) a streamlined rate case process; i) mediation and settlement procedures; j) defined timeframes for rate cases; k) integrated water resource management; l) a fair return on capital investment; *and* m) improved communications with ratepayers and stakeholders; *and*

WHEREAS, Due to the massive capital investment required to meet current and future water quality and infrastructure requirements, adequately adjusting allowed equity returns to recognize industry risk in order to provide a fair return on invested capital was recognized as crucial; *and*

WHEREAS, In light of the possibility that rate increases necessary to remediate aging infrastructure to comply with increasing water quality standards could aversely affect the affordability of water service to some customers, the following were identified as best practices to address these concerns: a) rate case phase-ins; b) innovative payment arrangements; c) allowing the consolidation of rates ("Single Tariff Pricing") of a multi-divisional water utility to spread capital costs over a larger base of customers; *and* d) targeted customer assistance programs; *and*

WHEREAS, Small water company viability issues continue to be a challenge for regulators, drinking water program administrators and the water industry; best practices identified by Forum participants include: a) stakeholder collaboration; b) a memoranda of understanding among relevant

State agencies and health departments; c) condemnation and receivership authority; and d) capacity development planning; *and*

WHEREAS, The U.S. Environmental Protection Agency's "Four-Pillar Approach" was discussed as yet another best practice essential for water and wastewater systems to sustain a robust and sustainable infrastructure to comprehensively ensure safe drinking water and clean wastewater, including: a) better management at the local or facility level; b) full-cost pricing; c) water efficiency or water conservation; *and* d) adopting the watershed approach, all of which economic regulators can help promote; *and*

WHEREAS, State drinking water program administrators emphasized the following mechanisms which Forum participants identified as best practices: a) active and effective security programs; b) interagency coordination to assist with new water quality regulation development and implementation, such as a memorandum of understanding; c) expanded technical assistance for small water systems; d) data system modernization to improve data reliability; e) effective administration and oversight of the Drinking Water State Revolving Fund to maximize infrastructure remediation, along with permitting investor owned water companies access in all States; f) the move from source water assessment to actual protection; *and* g) providing State drinking water programs with adequate resources to carry out their mandates; *now therefore be it*

RESOLVED, That the National Association of Regulatory Utility Commissioners (NARUC), convened in its July 2005 Summer Meetings in Austin, Texas, conceptually supports review and consideration of the innovative regulatory policies and practices identified herein as "best practices;" *and be it further*

RESOLVED, That NARUC recommends that economic regulators consider and adopt as many as appropriate of the regulatory mechanisms identified herein as best practices; *and be it further*

RESOLVED, That the Committee on Water stands ready to assist economic regulators with implementation of any of the best practices set forth within this Resolution.

Sponsored by the Committee on Water
Adopted by the NARUC Board of Directors July 27, 2005

Resolution Addressing Gap Between Authorized Versus Actual Returns on Equity in Regulation of Water and Wastewater Utilities

WHEREAS, There is both a constitutional basis and judicial precedent allowing investor owned public water and wastewater utilities the opportunity to earn a rate of return that is reasonably sufficient to assure confidence in the financial soundness of the utility and its ability to provide quality service; *and*

WHEREAS, Through the *Resolution Supporting Consideration of Regulatory Policies Deemed as "Best Practices"* (2005), the National Association of Regulatory Utility Commissioners has previously recognized the role of innovative regulatory policies and mechanisms in the ability for public water and wastewater utilities to address significant infrastructure investment challenges facing water and wastewater system operators; *and*

WHEREAS, Public utilities carry the responsibility to invest prudently, provide safe and reliable service, and take reasonable action to take precautionary measures to address business risk and economic forces, as necessary; *and*

WHEREAS, Recent analysis shows that as compared to other regulated utility sectors, significant and widespread discrepancies continue to be observed between commission authorized returns on equity and observed actual returns on equity among regulated water and wastewater utilities; *and*

WHEREAS, The extent of such discrepancies suggests the existence of challenges unique to the regulation of water and wastewater utilities; *and*

WHEREAS, Ratemaking that has worked reasonably well in the past for water and wastewater utilities no longer addresses the challenges of today and tomorrow. Revenue, driven by declining use per customer, is flat to decreasing while the nature of investment (rate base) has shifted largely from plant needed to serve new customers to non-revenue producing infrastructure replacement; *and*

WHEREAS, Deficient returns present a clear challenge to the ability of the water and wastewater industry to attract the capital necessary to address future infrastructure investment requirements necessary to provide safe and reliable service, which could exceed one trillion dollars over a 20-year period; *and*

WHEREAS, The NARUC Committee on Water recognizes the critical role of the implementation and the effective use of sound regulatory practice and the innovative regulatory policies identified in the *Resolution Supporting Consideration of Regulatory Policies Deemed as "Best Practices"* (2005); *and*

WHEREAS, It is recognized that State legislative bodies play a significant and important role in considering and addressing the challenges present in the regulation of water and wastewater utilities; therefore, it is critical that economic regulators strive to continue to foster an environment of cooperation and open communication between themselves, legislative bodies,

and other State agencies involved in the oversight of water and wastewater utilities such that implementation and effective use of sound regulatory practice and the innovative regulatory policies identified in the *Resolution Supporting Consideration of Regulatory Policies Deemed as "Best Practices"* (2005) is both possible and effective; *and*

WHEREAS, A number of issues have been identified that if addressed may assist in lessening the discrepancy between authorized and actual returns, including: a) reducing, where appropriate, the length of time between rate cases and/or the length of time to process rate cases for regulated water and wastewater utilities; b) reducing rate case expense relative to requested revenue increases through the encouragement of mediation and settlement as appropriate; and c) examining the rate of infrastructure replacement and system improvements among regulated water and wastewater utilities; *now, therefore be it*

RESOLVED, That the Board of Directors of the National Association of Regulatory Utility Commissioners, convened at its 2013 Summer Meeting in Denver, Colorado, identifies the implementation and effective use of sound regulatory practice and the innovative regulatory policies identified in the *Resolution Supporting Consideration of Regulatory Policies Deemed as "Best Practices"* (2005) as a critical component of a water and/or wastewater utility's reasonable ability to earn its authorized return; *and be it further*

RESOLVED, That NARUC recommends that economic regulators carefully consider and implement appropriate ratemaking measures as needed so that water and wastewater utilities have a reasonable opportunity to earn their authorized returns within their jurisdictions; *and be it further*

RESOLVED, That the Committee on Water stands ready to assist economic regulators with the execution of a sound regulatory environment for regulated water utilities, and will continue to monitor progress on this issue at future national committee meetings until satisfactorily improved.

Sponsored by the Committee on Water
Adopted by the NARUC Board of Directors, July 24, 2013

Resolution Endorsing Consideration of Alternative Regulation that Supports Capital Investment in the 21st Century for Water and Wastewater Utilities

WHEREAS, Through the *Resolution Supporting Consideration of Regulatory Policies Deemed as "Best Practices"* (2005), the National Association of Regulatory Utility Commissioners (NARUC) has previously recognized the important role of innovative regulatory policies and mechanisms in facilitating the efforts of water and wastewater utilities to address their significant infrastructure investment challenges; *and*

WHEREAS, Traditional cost of service ratemaking, which has worked reasonably well in the past for water and wastewater utilities, no longer adequately addresses the challenges of today and tomorrow. Revenue, driven by declining use per customer, is flat to decreasing, while the nature of investment (rate base) has shifted largely from plant needed for serving new customers to non-revenue producing infrastructure replacement and compliance with new drinking water standards; *and*

WHEREAS, The traditional cost of service model is not well adapted to a no/low growth, high investment utility environment and is unlikely to encourage the necessary future investment in infrastructure replacement; *and*

WHEREAS, Compared to the water and wastewater industry, the electric and natural gas delivery industries have in place a larger number and a greater variety of alternative regulation policies, such as multiyear rate plans and rate stabilization programs, and those set forth in the 2005 Resolution; *and*

WHEREAS, The U.S. water industry is the most capital intensive sector of regulated utilities and faces critical investment needs that are expected to total $335 billion to $1 trillion over the next quarter century, as noted in the *American Society of Civil Engineers 2013 Report Card for America's Infrastructure*; *and*

WHEREAS, Tap water is physically ingested and the quality of the service must be maintained to protect the health and economic well-being of communities across our Nation and comply with current and future regulations covering the control of a number of contaminants from nitrosamines to chromium, at a cost estimated at $42 billion by the EPA as part of their April 2013 Report to Congress; *and*

WHEREAS, Alternative regulatory mechanisms can enhance the efficiency and effectiveness of water and wastewater utility regulation by reducing regulatory costs, increasing rates for customers, when necessary, on a more gradual basis; and providing the predictability and regulatory certainty that supports the attraction of debt and equity capital at reasonable costs and maintains that access at all times; *now, therefore be it*

RESOLVED, That the National Association of Regulatory Utility Commissioners, convened at its 125th Annual Meeting in Orlando, Florida, supports consideration of alternative regulation plans and mechanisms along with and in addition to the policies and mechanisms outlined in the

Resolution Supporting Consideration of Regulatory Policies Deemed as "Best Practices" adopted by the NARUC Board of Directors on July 27, 2005; *and be it further*

RESOLVED, That the Committee on Water stands ready to assist economic regulators with implementation of alternative regulatory approaches that support water companies' capital investment needs of the 21st century.

_____

Sponsored by the Committee on Water
Recommended by the NARUC Board of Directors November 19, 2013
Adopted by the NARUC Committee of the Whole November 20, 2013.

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF:	**)**	
	)	
THE APPLICATION OF KENTUCKY-AMERICAN WATER COMPANY FOR AN ADJUSTMENT OF RATES	**)**	**CASE NO. 2018-00358**

DIRECT TESTIMONY OF SCOTT W. RUNGREN

November 28, 2018

Q. Please state your name and business address.

A. My name is Scott W. Rungren, and my business address is 727 Craig Road, St. Louis, Missouri 63141.

Q. By whom are you employed and in what capacity?

A. I am employed by American Water Works Service Company, Inc. ("Service Company") and my title is Principal Regulatory Analyst. The Service Company is a subsidiary of American Water Works Company, Inc. ("American Water") that provides support services to Kentucky-American Water Company ("KAWC," "Kentucky-American," or "Company") and its affiliates.

Q. Have you previously filed testimony before this or any other commission?

A. Yes, I have presented testimony before the Kentucky Public Service Commission ("Commission"), and have testified before the Illinois Commerce Commission, the Iowa Utilities Board, the Missouri Public Service Commission, the Indiana Utility Regulatory Commission, and the Public Utilities Commission of Ohio.

Q. Please summarize your educational and professional qualifications.

A. In May of 1983, I received a Bachelor of Science degree in Business Administration with a major in Energy Management from Eastern Illinois University. In May of 1986, I received a Master of Business Administration degree with a specialization in Finance from Northern Illinois University. From 1986 to 1999, I was employed by the Illinois Commerce Commission ("Illinois Commission"). I held various positions while employed there. I joined the Finance Department of the Illinois Commission in 1987, and was promoted to Senior Financial Analyst in 1989. My principal responsibility in that role was to analyze the cost of capital, financial condition and corporate structure of

electric, gas, telephone, and water utilities. In 1993, I transferred to the Energy Programs Division where I performed research and analysis of the integrated resource plans filed by Illinois electric utilities. In 1995 I returned to the Finance Department in the role of Senior Financial Analyst. I remained in the Finance Department at the Illinois Commission until February of 1999. In March of 1999, I began employment with Cinergy Corp., working in the Retail Commodity Services group, focusing on their Real Time Pricing program. In 2001, I began performing long-run generation planning studies for Cinergy's Kentucky and Indiana service areas. In 2006, by which time Cinergy Corp. had merged with Duke Energy, I began working in the Rates Department as a Rates Coordinator, assisting with the development of cost of service studies for the electric and gas operations of Duke Energy Ohio and Duke Energy Kentucky. I also prepared various rate and revenue analyses in that role. In May of 2007, I joined the Service Company as a Senior Financial Analyst. In January 2017, I was promoted to my current position of Principal Regulatory Analyst.

Q. What are your current employment responsibilities?

A. My current duties as a Principal Regulatory Analyst include preparing exhibits, testimony, and responses to data requests in support of rate applications and other regulatory filings for American Water's regulated subsidiaries. I also prepare, or assist with preparing, various reports required by regulatory commissions governing jurisdictions in which American Water operates.

Q. What is the purpose of your direct testimony in this proceeding?

A. The purpose of my direct testimony is to present the recommended capital structure to use for computing Kentucky-American's weighted average cost of capital ("WACC").

The WACC is used as the authorized overall rate of return on rate base in this case. The Company's WACC reflects, among other things, the rate of return on common equity recommendation presented in the Direct Testimony of KAWC witness Ann E. Bulkley.

Q. Did you prepare, or cause to be prepared under your direction and supervision, the exhibits and schedules that you are sponsoring?

A. Yes, I did.

Q. Please identify the exhibits you are sponsoring.

A. I am sponsoring Exhibits SWR-1 and SWR-2. Exhibit SWR-1 presents the Company's proposed capital structure and WACC, and Exhibit SWR-2 shows the short-term interest rate projections used to derive the cost rate to apply to the short-term debt component of the capital structure.

Q. Please identify the schedules you are sponsoring.

A. I am sponsoring Schedules J-1 through J-5 of Exhibit 37.

Q. What were the sources of the data used to prepare Exhibits SWR-1 and SWR-2?

A. The information contained in Exhibits SWR-1 and SWR-2 is derived from the financial and operational records of the Company and interest rate projections from Bloomberg.

Q. What forecast period has the Company proposed in this case?

A. The Company's proposed fully forecasted test period is the twelve months ending June 30, 2020 ("forecasted test year").

CAPITAL STRUCTURE & OVERALL COST OF CAPITAL

Q. What is the purpose of determining the Company's capital structure?

A. As noted previously, the capital structure is used to compute the Company's WACC in this proceeding. The WACC is the overall rate of return that is applied to the Company's rate base.

Q. What capital structure did the Company use to calculate the revenue requirement in this case?

A. The Company used the capital structure for the thirteen-month average of the forecasted test-year ending June 30, 2020. The capital structure proposed by the Company is attached to this testimony as Exhibit SWR-1 and is also included in the filing documents on Schedules J-1 thru J-5 of Exhibit 37. Exhibit SWR-1 indicates the thirteen-month average capital structure and WACC on which the Company based its cost of service and revenue requirement in this case. The proposed capital structure is composed of 1.519% short-term debt, 49.324% long-term debt (50.843% total debt), 0.503% preferred stock, and 48.654% common equity.

Q. Is the capital structure proposed by the Company in line with the capital structures historically approved by the Commission for setting the Company's rates?

A. Yes, it is. Subsequent to the Commission's Order in Case No. 2006-00197, the Company has maintained its debt ratio in the 53-57% range and its common equity ratio in the 40-47% range. Although this historic equity ratio range is slightly lower than the Company's current target equity ratio of 50%, the mix of debt and equity in the Company's proposed capital structure is generally in line with rating agency expectations and in line with capital structures previously approved by the Commission. A capital

structure composed of 51.346% debt and preferred stock, and 48.654% common equity, enables the Company to attract capital at a reasonable cost and balances the interests of shareholders and customers.

Q. Is there another basis that the Commission can use to determine that the Company's proposed capital structure in this case is reasonable for ratemaking purposes?

A. Yes, there is. The Company's proposed capital structure also compares favorably to the proxy groups used by Company witness Ann E. Bulkley to derive her cost of equity estimate for KAWC in this case. As explained by Ms. Bulkley on pages 73-76 of her direct testimony, she compared KAWC's proposed equity ratio to the average equity ratios of both her water utility and combined utility proxy groups. Ms. Bulkley's finding is that KAWC's proposed capital structure, consisting of 48.654% common equity, is reasonable when compared to the mean and median equity ratios of her proxy groups. The details of her analysis and findings are discussed on page 74 of her direct testimony.

Q. In what manner does the Company currently obtain its long-term and short-term debt?

A. The Company utilizes the services of American Water Capital Corp. ("AWCC") to meet its long-term ("LT") and short-term ("ST") debt requirements. AWCC is an American Water subsidiary, and an affiliate of KAWC. AWCC was created to consolidate the financing activities of the operating subsidiaries, to effect economies of scale on debt issuance and legal costs, to obtain lower interest rates through larger debt issues in the public/private markets, and to use more cost-effective means of obtaining ST debt (used to bridge the gap between permanent financings) than the historical bank lines of credit

used previously. Participating in AWCC debt issuances has allowed the Company to obtain debt at lower interest rates and incur lower issuance and transaction costs by utilizing the combined size and resources of the larger American Water system.

Q. Has the Commission approved the Company obtaining its debt through AWCC?

A. Yes, it has. By Order entered July 21, 2000 in Case No. 2000-189, the Commission authorized the Company to enter into a Financial Services Agreement with AWCC which enables the Company to periodically issue debt securities in the form of notes or debentures for the purpose of replacing ST debt or refinancing maturities of existing long-term debt. In Case No. 2006-00418 the Commission reaffirmed the Company's authorization to use AWCC for the attainment of its debt financing. In its Orders in Case No. 2009-00156 and Case No. 2012-00393, the Commission again authorized the Company's use of AWCC as a source for its LT and ST debt funding. And most recently, in its Order in Case No. 2015-00400, the Commission reaffirmed the Company's continued participation in the AWCC borrowing program. The Company expects the benefits of using AWCC to continue.

Q. What factors require the Company to seek additional capital?

A. The Company has documented in past rate cases and in this filing that capital improvements to meet the new and changing regulations in the water industry, replace aged treatment and distribution facilities, and provide quality, reliable water service to its customers have driven, and will continue to drive, the need for new capital. The Company's business plan includes a new LT debt financing in the amount of $16 million and an equity infusion in the amount of $6 million through the forecasted test year ending June 30, 2020. It is important that the Company maintain a strong financial position to

allow it to continue to attract capital at a reasonable cost, which will assist the Company in its effort to provide service improvements at the least possible cost to its customers.

Q. Why is the level of short-term debt included in the Company's forecasted test year capital structure appropriate for setting rates in this case?

A. The Company uses ST debt to temporarily finance capital improvements. This type of financing is used to bridge the gap between the placement of permanent financings, such as LT debt and common equity. This permits the Company to time permanent financings in a cost-effective manner and to take advantage of attractive LT debt interest rate opportunities when they occur. The capital structure used to set rates in this proceeding should reflect the capital component mix that will be in place to finance the rate base upon which rates will be set, since the capital structure is used to calculate the overall rate of return that is applied to rate base. The level of ST debt in the Company's proposed capital structure in this case is the thirteen-month average balance for the forecasted test-year ending June 30, 2020. That level of ST debt is reflective of the level that will be utilized to fund the construction and other cash requirements during the forecasted test-year.

Q. Please explain the new LT debt financing included in this filing.

A. The Company's proposed capital structure includes $16 million of new LT debt to be placed in May 2019. The Company used an expected taxable interest rate of 4.55% for this financing. This rate is based on the projected rate for a 30-year U.S. Treasury bond ("Treasury") for May 2019, plus a credit spread.

Q. Please explain why you assumed a 30-year term to estimate the interest rate on the new LT debt issuance.

A. The Company's expectation is that the new LT debt will be a 30-year taxable offering by AWCC, for which KAWC will issue a note to AWCC for its share of the total debt placement. The basis for assuming a 30-year term is that it more closely matches the expected life of the utility plant assets being financed than would the use of shorter term maturities.

Q. How did you determine the interest rate for the new LT debt issuance?

A. The rate projection developed for the new LT debt issue in 2019 is based on the rate for a 30-year Treasury taken from Bloomberg's forward yield curve on October 18, 2018. The projected rate for May 2019 was 3.43%. To that rate I added 1.12% to capture the estimated spread at which AWCC will issue above the 30-year Treasury rate, which is the actual spread above the 30-year Treasury rate that AWCC's 30-year Senior Notes were issued at in August 2018. Thus, this spread is a reasonable expectation to use for AWCC's planned 2019 issuance. Using the base rate of 3.43% and a spread of 1.12% produces the overall estimated issue rate of 4.55%. Based on the assumption that the Company will issue a 30-year bond, and on the methodology used to develop the projection discussed above, the estimated interest rate of 4.55% for the new LT debt issuance is reasonable.

Q. Does KAWC intend to file an application with the Commission seeking authorization to issue new indebtedness?

A. Yes, the Company intends to file an application with the Commission in early 2019 in which it will ask approval to issue new long-term debt, including the $16 million of new long-term debt discussed above.

Q. How was the cost rate for short-term debt determined?

A. The Company compiled projections of the one-month LIBOR rate for the months of October 2018 through June 2020. As shown on Exhibit SWR-2 attached to this testimony, the projected ST debt interest rates are 2.869% for February 28, 2019 and 3.338% for June 30, 2020. Using the projections on SWR-2, I also computed the thirteen-month average ST debt cost of 3.274% for the period ending June 30, 2020. This cost rate, 3.274%, was then used to calculate the weighted cost of ST debt in the Company's proposed capital structure. The Company will continue to monitor ST debt interest rates as the case progresses and may update the ST interest rate as more up-to-date forecast information becomes available.

Q. How were the weighted costs of long-term debt and preferred stock determined?

A. The face value of each issue was reduced by the unamortized issuance cost and the result was divided by the interest or dividends to arrive at the effective interest rate that will include recovery of the amortization of the issuance costs. This result was then multiplied by the percentage of each issue to the total capital to arrive at the weighted cost for each series. The weighted cost for each series of LT Debt and Preferred Stock was totaled to arrive at the overall weighted cost of LT Debt and Preferred Stock. The overall embedded cost of LT debt for the forecasted test year is 5.90%, and the cost of

preferred stock is 8.51%. These costs are shown on Exhibit SWR-1 attached to this testimony.

Q. Has the Commission previously addressed the method by which the weighted costs of long-term debt and preferred stock are determined?

A. Yes, it has. The method used to determine the weighted costs of LT Debt and Preferred Stock was discussed in Case Number 2000-00120. The Commission's Order in that case indicated that the methodology described in the previous answer (and used historically by the Commission) for setting KAWC's rates was appropriate and was approved. The Company has continued to utilize this method in subsequent rate filings.

Q. What WACC is the Company requesting in this case?

A. The overall WACC being requested is 8.25%, as shown on Exhibit SWR-1 attached to this testimony. The Company's complete capital structure and cost of capital presentation is shown on Schedules J-1 through J-5 to Exhibit 37. The Company is requesting the return on equity ("ROE") be set at 10.80%, which is within the ROE range recommended by Company witness Ann E. Bulkley.

Q. Does this conclude your direct testimony?

A. Yes, it does.

VERIFICATION

STATE OF MISSOURI)
) **SS:**
CITY OF ST. LOUIS)

The undersigned, **Scott W. Rungren**, being duly sworn, deposes and says he is the Principal Regulatory Analyst for American Water Works Service Company, Inc., that he has personal knowledge of the matters set forth in the foregoing testimony, and the answers contained therein are true and correct to the best of his information, knowledge, and belief.

Scott W. Rungren
SCOTT W. RUNGREN

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 16th day of November, 2018.

Mary Beth Hercules (SEAL)
Notary Public

My Commission Expires:
April 26, 2020

MARY BETH HERCULES
Notary Public - Notary Seal
STATE OF MISSOURI
St. Louis County
My Commission Expires April 26, 2020
Commission # 96546828

Kentucky American Water Company
Case No. 2018-00358
Cost of Capital Summary
13-Month Average For Forecast Period Ending June 30 , 2020

Data: ___ Base Period _X_ Forecasted Period
Type of Filing: __X__ Original _____ Updated _____ Revised

Exhibit 37, Schedule J-1
Capital Structure\[KAWC 2018 Rate Case - Capital Structure.xlsx]Sch J-1
Witness Responsible: Scott Rungren
Page 1 of 1

Line No.	Class of Capital	Reference	13-Month Average Net Carrying Amount	% of Total	Add (1)	Adjusted Capital	Cost Rate	13-Month Average Weighted Cost
1								
2	Short-Term Debt	W/P - 7-3	$6,777,501	1.519%	$3,110	$6,780,612	3.274%	0.050%
3								
4	Long-Term Debt	W/P - 7-4	220,061,621	49.324%	100,990	220,162,611	5.900%	2.910%
5								
6	Preferred Stock	W/P - 7-5	2,243,433	0.503%	1,030	2,244,463	8.510%	0.040%
7								
8	Common Equity	W/P - 7-6	217,071,552	48.654%	99,618	217,171,170	10.800%	5.250%
9								
10	Total Capital		$446,154,108	100.000%	$204,748	$446,358,856		8.250%
11								
12								
13								
14								
15								
16	(1) JDITC:	W/P - 7-7	$204,748					

Kentucky-American Water Company

Short-Term Interest Rates

Date	Actual Rate	Forward Rate
August-18	2.388%	
September-18	2.352%	
October-18		2.534%
November-18		2.580%
December-18		2.752%
January-19		2.834%
February-19		**2.869%**
March-19		2.939%
April-19		2.935%
May-19		2.993%
June-19		3.116%
July-19		3.117%
August-19		3.163%
September-19		3.243%
October-19		3.247%
November-19		3.277%
December-19		3.325%
January-20		3.325%
February-20		3.339%
March-20		3.361%
April-20		3.360%
May-20		3.351%
June-20		**3.338%**
Test Year 13-Month Average		**3.274%**

Source For Projected Rates: Bloomberg

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF:	**)**	
	)	
THE APPLICATION OF KENTUCKY-	**)**	**CASE NO. 2018-00358**
AMERICAN WATER COMPANY FOR AN	**)**	
ADJUSTMENT OF RATES	**)**	

DIRECT TESTIMONY OF MELISSA L. SCHWARZELL

November 28, 2018

Q. Please state your name and business address.

A. My name is Melissa L. Schwarzell, and my business address is 1 Water Street, Camden, NJ, 08102.

Q. By whom are you employed and in what capacity?

A. I am employed by American Water Works Service Company, Inc. ("Service Company"). Service Company is a wholly owned subsidiary of American Water Works Company, Inc. ("American Water") that provides services to Kentucky-American Water Company ("KAWC", "Kentucky-American" or the "Company") and its affiliates. My current role is Senior Director of Regulatory Services. I am also serving as interim Director of Rates for Kentucky and Tennessee.

Q. Have you previously filed testimony before this or any other commission?

A. I have sponsored testimony before the Kentucky Public Service Commission in Case No. 2012-00520. I have also sponsored testimony before the utility regulatory bodies in Tennessee and Ohio.

Q. Please state your educational and professional background.

A. I have a Bachelor of Science degree from Ohio State University. I am currently enrolled in Temple University's Master of Business Administration program. I have completed NARUC Utility Rate School and the IPU Advanced Regulatory Program.

I have been employed by Service Company since 2009. Prior to my current role, I served as Director of Investor Relations from February 2016 to January 2017. In this role, I supported American Water's relationship with its shareholders, by developing public disclosures and communicating with institutional investors and equity analysts. From December 2014 to February 2016, I served as Manager of Regulatory Policy, providing

research, communications, and business support on key water service issues and policy solutions. From February 2011 to December 2014, I held increasing levels of responsibility for rates and regulatory service to American Water's subsidiaries as a Financial Analyst Rates I, Financial Analyst Rates II, and Rates and Regulatory Analyst III. Prior to this, I began my career at American Water working as Executive Assistant to the Eastern Division Vice President of Finance. In this role, I provided labor budgeting, as well as analysis of labor costs, Service Company, revenues, and the general ledger. Prior to joining American Water, I worked for the Bluegrass Area Agency on Aging, supporting social services programs for senior citizens in Central Kentucky. From 2001 to 2003, I worked as a Financial and Administrative Assistant, supporting bookkeeping, website, and database development. In 2004 I was promoted to Program Specialist.

Q. What are your duties as Senior Director of Regulatory Services?

A. My duties in this position consist of reviewing, preparing and assisting in regulatory filings and related activities for the regulated subsidiaries of American Water. My responsibilities and my team's responsibilities include the preparation of written testimony, exhibits and work papers in support of rate applications and other regulatory filings as well as responses to data requests for Kentucky-American and its regulated utility affiliates.

Q. What is the purpose of your direct testimony in this proceeding?

A. The scope of my testimony will include the following topics:

- Development of the Forecasted Test Year
- Minimum Standard Filing Requirements
- Revenue Requirement, Revenue Deficiency, and Average Bill

- Present Rate Revenue and Proposed Rate Revenue
- Tariff Changes
- Select Expenses (Pension and Other Post-Employment Benefits or "OPEB", Support Services, Insurance Other than Group ("IOTG"))
- Rate Base
- Depreciation, and Amortization
- Acquired System Cost Recovery and Tariffed Rates
- Qualified Infrastructure Program

DEVELOPMENT OF THE FORECASTED TEST YEAR

Q. What is the base period in this case?

A. The Company has used a base period of the twelve months ending February 28, 2019. This base period data reflects six months of actual data (March – August 2018) and six months of forecasted data (September 2018 – February 2019).

Q. Please explain the development of the Company's fully forecasted test period.

A. The fully forecasted test period in this case is the twelve months following the suspension period ("forecasted test year"). For revenues and expenses, this is July 2019 to June 2020. For thirteen month average rate base and capitalization, the period is from June 2019 to June 2020.

The development of the forecasted test year is completed using the same assumptions and methodologies as used in the forecast developed by management. To the extent there are differences, they relate to timing differences, availability of more recent information, and other stretch management goals. The Company has made pro forma adjustment to the

base period for any known or projected increases or decreases to arrive at the forecasted test year expenses, investments, financings, and revenues on which KAWC proposes to base its rates.

Q. Did the Company include the revenues and costs of any acquired systems in its rate case forecast?

A. Yes. Since the 2015 Rate Case, KAWC has acquired a 600 customer water system in Eastern Rockcastle County (the former Eastern Rockcastle Water Association) and has signed an Asset Purchase Agreement to acquire a 400 customer water system in North Middletown, Kentucky. The North Middletown acquisition is expected to be completed in February 2019.

The present rate revenues, operating expenses, taxes, and investments associated with these two systems have been included in the rate case forecast.

MINIMUM STANDARD FILING REQUIREMENTS

Q. Please describe the Company's Minimum Standard Filing Requirements

A. Consistent with Kentucky law for forecasted test year rate cases, the Company has provided Exhibits 1 through 37 to the Application. Please see Exhibit MLS-1, attached to this testimony, for a list of these exhibits and their sponsors.

REVENUE REQUIREMENT, REVENUE DEFICIENCY, AND AVERAGE BILL

Q. Please describe Kentucky-American's revenue requirement.

A. The Company's revenue requirement is equal to the cost of providing water service to more than 130,000 customers throughout fourteen Kentucky counties (including Bourbon, Clark, Fayette, Franklin, Gallatin, Grant, Harrison, Jackson, Jessamine, Nicholas, Owen, Rockcastle, Scott, and Woodford Counties.) Providing water service is

a sprawling endeavor that starts with sourcing more than 14 billion gallons of surface water from Kentucky lakes and rivers, then treating it to meet or exceed drinking water standards, and finally pumping and distributing it through more than 2,000 miles of main to reach all homes, businesses, schools, and industries throughout KAWC's service territory. Along the way, the Company must ensure adequate capacity and storage to accommodate peak usage and to protect our communities during fire events. The Company also provides constant care to customers through two customer service centers, monthly billing, 24-hour emergency call handling, and a self-service website. The Company monitors water quality for a host of contaminants, and maintains the distribution system by exercising valves, flushing hydrants, and repairing main breaks at all hours and in all weather conditions. All of these efforts ensure that our customers can count on safe, clean, reliable drinking water, sanitation, and fire protection service year round.

To accomplish all of this, the Company incurs costs for which it seeks recovery through the ratemaking process. The Company's costs include a variety of operating expenses, depreciation and amortization, and various local, state, and federal taxes. The Company also must provide a return, at least equal to the cost of capital, on over $440 million in water infrastructure rate base that supports the Company's provision of service to customers.

Q. What is Kentucky-American's revenue requirement for the forecasted test year in this proceeding?

A. The Company's forecasted revenue requirement in this proceeding, equal to the cost of providing service, is approximately $108.4 million for the 12 months ending June 30,

2020. The Company's forecasted revenue requirement is found on Exhibit 37, Schedule A.

Q. Please describe how the Company's revenue deficiency is derived.

A. The Company's revenue deficiency, found on Exhibit 37 Schedule A, is measured as the difference between the forecasted revenue requirement and the Company's forecasted revenues at present rates. The Company's revenue deficiency in this proceeding is calculated to be $19.9 million, which is an approximate 22% deficiency. This is a larger deficiency than the Company has presented in recent cases, primarily due to a temporary reduction in rates ordered in Case No. 2018-00042, described further below.

Q. When were Kentucky-American's present water rates established?

A. Kentucky-American's present water rates were most recently established through Case No. 2018-00042 (the Tax Cuts and Jobs Act case) ("TCJA Case"). The rates were ordered on August 30, 2018 with an effective date of September 1, 2018.

Q. What was the impact of the rate authorization in the TCJA Case?

A. The impact was to reduce the Company's volumetric water rates and fire rates, to provide the benefits of the Tax Cuts and Jobs Act of 2017 ("TCJA" or "Tax Cuts and Jobs Act") to Kentucky-American's customers. There were two components to this rate reduction, which combined to lower customer rates by approximately 10%.

The first component of the rate reduction is approximately $5.4 million or 5.7% compared to the rates established in the Company's last rate case, Case No. 2015-00418 ("2015 Rate Case"). This savings arises from a lower corporate income tax rate (21% instead of 35%), which reduces income tax expense on an ongoing basis for the Company.

The second component of the rate reduction was a temporary rate reduction of approximately $3.4 million. This reduction returns to customers the corporate income tax savings experienced during a finite period of time, namely January 1, 2018 to August 31, 2018 (before lower rates were established in the TCJA Case). While the reduction is designed to return this sum over ten months (September 2018 to June 2019), the annualized effect is a $4.1 million rate reduction ($3.4 million / 10 months x 12 months), or an additional 4.3% reduction to the rates authorized in the 2015 Rate Case. There is no alternate rate set to go into effect in July 2019 when this temporary reduction should expire. As a result, part of the purpose of this rate case is to restore rates following the expiration of this temporary reduction.

Q. What is the effect of the temporary rate reduction on the Company's revenue deficiency in this case?

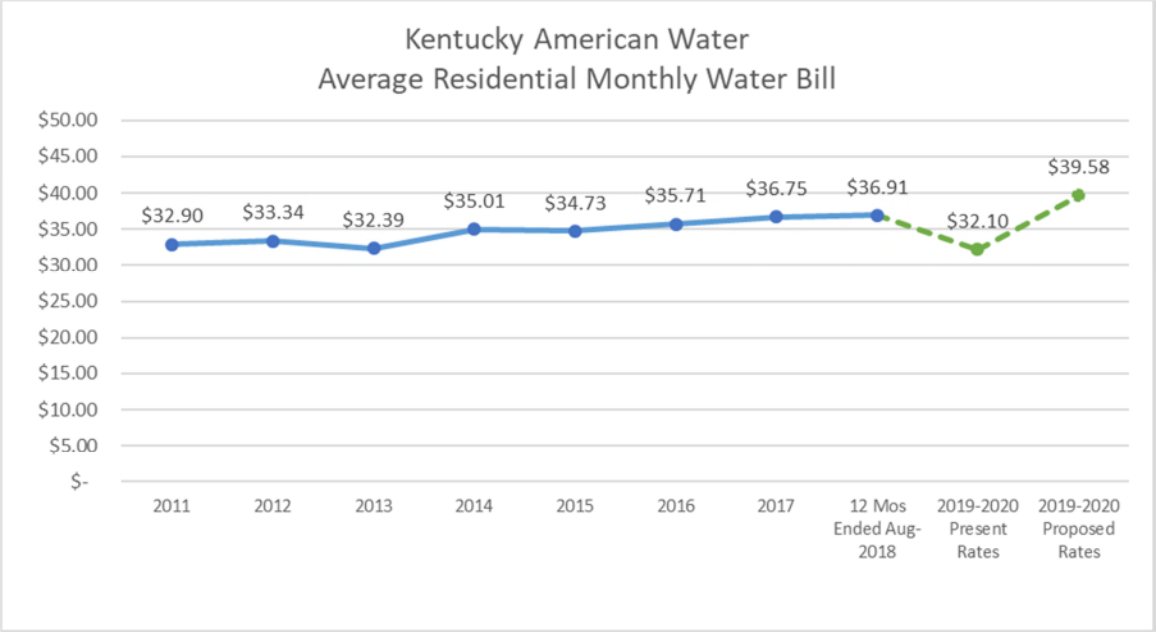
A. The temporary rate reduction ($4.1 million on an annual basis) provides a benefit to customers currently, but unfortunately makes the revenue deficiency in this case seem much larger, both on a dollar basis and a percentage basis, than it would have been without this reduction. It also makes the rate increase request seem larger than other requests in recent history. The Company requests that parties to the case consider the importance of allowing the Company to restore this previously authorized revenue that results simply from efforts by stakeholders to provide timely benefits to customers from the TCJA.

Q. What does this rate request mean for the average residential customer?

A. While the revenue deficiency (both on a dollar basis and percentage basis) seems significant, the average residential bill as we head into 2020 is still proposed to be under

$40 per month.[1] For comparison, in 2011, the average residential bill was just under $33. So the Company's request is to have customers paying about $7 more per month than they were paying nearly a decade before. To make this easier to see, please see Table 1 for Kentucky-American's actual average residential bills since 2011, and its bills at present and proposed rates for 2019 -2020.

Table 1



Q. Aside from the temporary TCJA rate reduction, what are the other drivers of revenue deficiency in this case?

A. In addition to restoring rates following the temporary tax reduction, this case is also fundamentally driven by over $100 million in infrastructure investment since the 2015

[1] As shown on Exhibit 37, Schedule N.

Rate Case, increases in certain operations and maintenance ("O&M") expenses and increases in property taxes charged to the Company by state and local governments.

PRESENT RATE REVENUE AND PROPOSED RATE REVENUE

Q. Please explain the source of Kentucky-American's revenue.

A. Kentucky-American provides high quality drinking water and fire protection service to customers throughout its service territory. Water Revenue and Other Revenue is generated to cover the cost of providing service. The Company generates Water Revenue through both fixed charges (typically based on meter size, fire service size or number of hydrants) and variable charges based on water sales. Both fixed and variable charges can vary by customer class.[2] The Company also generates Other Revenue, through various discreet fees such as late payment fees, service initiation fees, and reconnection fees.

Q. Please describe the overall change in present rate revenue from the base period to the forecasted test year.

A. Without a rate increase, there would be a significant reduction in revenue between the base year and forecasted test year. This is driven by the temporary TCJA rate reduction (an approximate $4.1 million drop), partially offset by a net increase in billing determinants in most customer classes due to organic growth and acquisitions.

[2] One exception is the present rates and charges for a recent acquisition, Eastern Rockcastle, which do not vary by class.

Q. Please describe the process for calculating present rate revenue for the Residential and Commercial customer classes.

A. Residential and Commercial classes present rate revenue was forecasted by establishing the relevant billing determinants during the forecasted test period and multiplying these by the present tariffed rates. Billing determinants were forecasted as follows:

- Volumetric usage per customer: Volumetric consumption per customer for the residential and commercial classes was forecasted using a statistical weather normalization model based on actual, historical meteorological data and other predictor variables to establish forecasted sales. Please refer to the testimony of Greg Roach for further information.
- Number of customers:
  - For residential customers, the Company started with customers as of August 2018. Then average organic growth in 2017 and 2018 (both actual through August, and projected through the end of the year) was used to project 1008 customer additions per year through the forecasted test year.
  - For commercial customers, the Company has not projected organic growth. This is because the Company has experienced a loss of customers in 2018 despite recent increases in 2016 and 2017. Given the variability of the recent results, the Company proposes holding the non-acquisition related customer base flat for the commercial class.
- Number of meter billings: The Company used an actual bill analysis for the six months ended September 2018, plus forecasted meter billings through February 2019 to establish meter billings for the base period. New customers resulting

from both acquisitions and organic growth were then added, resulting in increased meter billing determinants for both classes in the forecasted test year.

Q. Please describe the process for calculating revenues for the remaining customer classes.

A. The process for calculating revenue for the remaining customer classes is described below:

- Industrial, Other Public Authority, and Sale for Resale: For these classes, the Company analyzed the actual historical usage of each customer, reviewing 2016, 2017, and 218 data in order to forecast projected usage. Current meter counts as of August 2018 were used to forecast future meter billings.

  There were two exceptions to this process. The first exception is for Toyota, the Company's largest industrial customer. The Company used Toyota's own projection for its future water consumption, after validating it against recent actual usage to confirm reasonableness for use in the forecast. The second exception is Trane. The Company removed usage and meter billings for Trane in the forecast, given the October 4, 2018 announcement that the Lexington Trane plant would be closing before the close of 2019.

- Private Fire and Public Fire: For these classes, the number of active fire hydrants and fire services was taken as of August 2018 and used for forecasting revenue.

- Miscellaneous: For miscellaneous sales, the billing determinants from the 12 months ended August 2018 were used to project forecasted revenue.

Q. Please also describe the methodology for developing "Other Revenues".

A. Other Revenues for the forecasted test year were projected as being equal to the Other Revenues recorded during the 12 months ended August 2018. One exception is Late Payment Fees, which are tariffed based on 5% of past due water billings. Given the relationship between Late Payment Fees and billed revenue, and the recent reduction in rates on September 1, 2018, a ratio of Late Payment Fees to billed revenue was established for the 12 months ended August 31, 2018. This ratio, 0.92%, was multiplied by forecasted present rate Water Revenue to derive the forecasted Late Payment Fees.

Q. What method was used for calculating the present rate revenue from customers acquired from Eastern Rockcastle and North Middletown?

A. Present rate revenue for Eastern Rockcastle customers is based on the Company's current tariff sheet for them (which is different than the tariff for Kentucky American's general service territory) and the available billing data. Approximately 6 months' worth of billing data was available and was annualized for use in the forecast.

For North Middletown, the entity's current tariffs were used for all customers except public fire, for which Kentucky American's tariffs were presumed. Additionally, North Middletown was removed as a Sale for Resale customer from the billing determinants of the Company.

Q. Can you please explain the proposed rate revenue?

A. Proposed rate revenue is the result of the forecasted test year billing determinants multiplied by the prices developed by cost of service witness Connie Heppenstall of Gannett Fleming. When applied to the forecasted billing determinants, these prices yield

proposed rate revenue equal to Kentucky-American's cost of providing water service, as documented in this proceeding.

Q. Are present and proposed rate revenues summarized on an exhibit or schedule?

A. Yes, both present and proposed rates are summarized on Exhibit 37 M and Exhibit 37 N.

- Schedule M summarizes billing determinants (such as meter billings and volumes of water at various block rates) and prices to calculate both present and proposed rate revenue. The schedule is shown for the total water operation and also by class. Schedule M is further broken down in three sections in this case, one for Eastern Rockcastle, one for North Middletown, and one for Kentucky-American's current single tariff customer base. While all are proposed to join the same rate schedule, this breakout helps to shed light on present rate revenue.
- Schedule N provides a present and proposed rate bill comparison at various water consumption levels by class. Schedule N also shows the average bill, based on average water consumption for each class and the most common meter size for the class. Like Schedule M, Schedule N is broken out for Eastern Rockcastle, North Middletown, and Kentucky-American's current single tariff customers.

TARIFF CHANGES

Q. Has the Company proposed changes to its tariff in this proceeding?

A. Yes. Exhibit 37 L provides a narrative explanation of these changes. The changes can also be seen on Exhibit 3, which compares the current and proposed tariffs.

SELECT EXPENSES

Q. Please describe the adjustment to operating expenses related to pension expense.

A. Generally, union employees hired before January 1, 2001 and non-union employees hired before January 1, 2006 are eligible for pension benefits.

Pension expense is recorded according to Financial Accounting Standards Board ("FASB") Accounting Standards Codification Topic 715 or "ASC 715" (formerly Statement of Financial Accounting Standards 87). ASC 715 cost is forecasted by the Company's professional third party actuary, Willis Towers Watson. As of late September 2018, the annual service cost for American Water is $32.8 million. Kentucky-American's current share of American Water's pension cost is 1.69%. Once this factor is applied to the American Water total amounts, it yields a Kentucky-American service cost of $554,118 for calendar year 2018. The Company's pro forma service cost for the twelve months ending June 30, 2020 was calculated by using the 2018 value. The Company expects to have an update for the 2019 actual pension expense in January 2019. The percent chargeable to expense, based on pro forma labor costs, is 72.1%, for a net expense of $399,519.

Q. Please describe the adjustment to operating expenses related to OPEB expense.

A. Other Post-Employment Benefits, such as retiree medical benefits, are also offered to some Kentucky-American employees. Generally, this includes union employees hired before January 1, 2006 and non-union employees hired before January 1, 2002. OPEB expense is recorded according to ASC 715 (formerly Statement of Financial Accounting Standards 106). The OPEB cost is forecasted by the Company's professional third party actuary, Willis Towers Watson. As of late September 2018, the annual service cost for

American Water is expected to be $3.9 million. Kentucky-American's current share of American Water's OPEB cost is 2.62%. Once this factor is applied to the American Water total amounts, it yields a Kentucky-American service cost of $102,681. The Company's pro forma service cost for the twelve months ending June 30, 2020 was calculated by using the current 2018 value. The Company expects to have an update for the 2019 actual OPEB expense in January 2019. The percent chargeable to expense, based on pro forma labor costs, is 72.1%, for a net expense of $74,033.

Q. What services does KAWC obtain from the Service Company?

A. The services provided by the Service Company include customer service, water quality testing, innovation and environmental stewardship, human resources, communications, information technology, finance, accounting, payroll, tax, legal, engineering, accounts payable, supply chain, and risk management services. The Service Company operates customer service centers in Alton, Illinois and Pensacola, Florida that handle customer calls, billing, and collection activities for KAWC and its public utility affiliates. The customer service centers handle customer inquiries and correspondence, and process service order requests. In addition, the Service Company operates two Field Resource Coordination Centers responsible for tracking and dispatching service orders for our field representatives and distribution crews. The Service Company also operates the Central Laboratory, located in Belleville, Illinois.

Q. What level of Support Services expense is KAWC seeking in this case?

A. For the future test year ending June 30, 2020, the Company is seeking recovery of $9.7 million in support services expenses. The direct testimony of KAWC witness Patrick

Baryenbruch will discuss the reasonableness of Service Company costs charged to Kentucky–American.

Q. How was the pro forma adjustment for the Support Services expense calculated?

A. The expenses are categorized into labor & related, and other costs. The base period expenses have been adjusted to annualize a salary increase effective March 12, 2018. A three-year average merit increase of 2.69% for non-union, and actual contract rate increases for union employees is then applied to derive the 2019 labor expense levels. Similarly, an average merit increase of 2.69% for non-union, and actual contract rate increases for union employees is then applied to 2019 to derive the 2020 expense. Certain other costs pertaining to lobbying, advertising, community relations, and charitable contributions have been removed from the base period expenses, and therefore are not included in the pro forma expense. The expenses pertaining to severance have also been removed from the base period expenses. Additional adjustments were made for pension and OPEB expense, increased customer service employees, acquisitions, the expansion of annual performance plan eligibility to union employees, depreciation, capital lease interest, security, and office leasing expense. Finally, a 0.11% allocation of sewer costs were removed from the end of the forecasted test year.

Q. Please explain the adjustment for IOTG.

A. Kentucky-American incurs costs related to several types of IOTG insurance, including general liability, worker's compensation, auto liability and property. The Company's property insurance premiums are based on the total insured value of KAWC's assets. The Company's auto liability insurance premiums are based on a combination of loss experience (50%) and exposure (50% based on number of vehicles). The Company's

general liability and worker's compensation premiums are based upon a combination of loss experience (50%) and exposure (50% estimated annual payroll). The loss experience is generally based upon a five year average of historical loss experience. This five year average is used to normalize losses in the event Kentucky-American suffers an anomalous year of claims experience. This is consistent with the commercial insurance market underwriting practice.

Q. Please describe the IOTG pro forma adjustments to operating expenses.

A. The majority of the Company's IOTG premiums renew on January 1 of each year, (Directors & Officers Liability, Crime, Employment Practices, Fiduciary, Lawyers and Travel insurances renew in April of each year). Development of the pro forma expense begins with the annual premiums as of 2018 with an estimated update for January 2019 premiums for auto liability, general liability, worker's compensation, and excess liability. Next, the pro forma capitalized labor percentage was multiplied by the worker's compensation premium, to reduce the expense. An adjustment was made to increase IOTG due to an acquisition, based on per customer cost.

RATE BASE

Q. What is Rate Base?

A. Rate Base measures the Company's net investment in the provision of water service. This investment includes the facilities and property for sourcing, treating, pumping, and distributing potable water for consumption, sanitation, and fire protections, as well as assets to support customer accounting, customer service and basic business operations. The additions to rate base include items such as:

- Utility Plant in Service ("UPIS") and Construction Work in Progress ("CWIP")

- Working Capital, Deferred Maintenance, and Deferred Debits
- Utility Plant Acquisition Adjustments ("UPAA")

Deductions from rate base include:

- Accumulated Depreciation
- Contributions in Aid of Construction ("CIAC") and Customer Advances
- Accumulated Deferred Income Taxes ("ADIT") and Unamortized Investment Tax Credits ("ITC")
- Other Rate Base Elements

Each of these Rate Base components is described in my testimony below, and ADIT is described in greater detail in the testimony of Company witness John Wilde.

Q. Has the Company changed the methodology for calculating rate base from the approach advocated in its last case?

A. No. The Company utilized a thirteen month average rate base calculation for the forecasted test year, as shown on Schedule B-1. Most of the rate base elements shown on this schedule were forecasted from actual per books data as of August 31, 2018, adjusted for changes expected through June 30, 2020. Total rate base for the base year is $422,336,312, as shown on Schedule B-1, page 1 of 2. Total average rate base for the forecasted test year is $441,122,362, as shown on Schedule B-1, page 2 of 2. Please describe each of the components of rate base.

Each component of rate base is described below:

UPIS

UPIS includes the original cost of all land, land rights, easements, structures, improvements, and other equipment that is used for the provision of water utility service.

The rate case forecast begins with the UPIS balance per books as of August 31, 2018. The forecasted monthly UPIS balances were then calculated through June 30, 2020, by adding forecasted plant additions as they are placed into service and deducting forecasted plant retirements. Plant additions are addressed in greater detail in Mr. Brent O'Neill's testimony. The 13 month average of UPIS balances from June 1, 2019 through June 30, 2020 was then calculated, to arrive at the average value for the forecasted test year. The thirteen month average UPIS in the forecasted test year is $790,806,081. Supporting schedules and analysis can be found on Schedule B-1 and B-2.

CWIP

CWIP is the value of utility plant that is under construction but which has not yet been placed into service. The forecast for CWIP begins with the actual balance as of August 31, 2018. This balance is then forecasted monthly through June 2020 by adding estimated construction expenditures and deducting estimated transfers to UPIS. The 13-month average CWIP is determined by totaling the monthly balances for June 1, 2019 to June 30, 2020 and dividing by 13 months. The 13 month average CWIP balance in the forecasted test year as reflected on Schedule B-1, page 2 of 2, is $7,859,210. Further support can also be found on Schedule B-4.

WORKING CAPITAL AND OTHER WORKING CAPITAL

Working Capital and Other Working Capital are included in a utility's rate base to recognize the cost of funding the lag between the time utility service is rendered to the customer and the time it takes to collect revenues from the customer to pay for that service. In other words, investors had to provide "upfront" capital to fund the daily operations of the business before customers pay their bills. The Working Capital

calculations can also properly reflect the impact of any difference in time between when expenses are accrued and the associated cash is disbursed. Working Capital is calculated through two separate processes. The first process measures average Materials and Supplies balances, the result of which is shown as "Other Working Capital" on the Exhibit 37, Schedule B-1. The second process is a Lead / Lag Study, the result of which is shown as "Working Capital" on the Exhibit 37, Schedule B-1.

Materials and Supplies are calculated for the forecasted test year by averaging 24 months of recent actual balances in the Materials and Supplies account. The average in this case is $807,789 and this is used to estimate the thirteen month average for the forecasted test year. This is shown as "Other Working Capital" on the Exhibit 37, Schedule B-1 and as "Materials and Supplies" on Exhibit 37, Schedule B-5.

The second process, the Lead/Lag Study, was performed based on historical data for the twelve months ended August 31, 2018 and used the same methodology as in the prior case.

The determination of the amount of Lead/Lag working cash for a specific item is a complex calculation. The daily Lead/Lag Factor is calculated by starting with Revenue Lag Days, subtracting Expense Lag Days and Check Clear Time Days for each expense category to arrive at the Net Interval. This Net Interval is then multiplied by the daily amount of forecasted operating funds. The total Lead Lag Working Capital was calculated to be $3,754,000 and is shown as "Working Capital" on Exhibit 37, Schedule B-1. More detailed information is also shown on Exhibit 37, Schedule B-5.

DEFERRED MAINTENANCE

This item is calculated as an average of the thirteen month balance of deferred maintenance projects based upon both actual and forecasted projects. These projects include the repainting and repairs of system water storage tanks, and other major repairs as shown in the workpapers that support Schedule B. New deferred maintenance items include seven new tank paintings while four items are completing amortizations. These types of deferred maintenance expenses have been afforded rate base treatment by the Commission in past proceedings. Because it has been almost 34 months since the last rate filing, there are significant additions to the deferred maintenance for scheduled tank maintenance. Based upon these actual expenditures and the forecasted expenditures for 2019 through June 2020, as adjusted for amortizations, the Company has developed a 13-month average of these deferred maintenance items totaling $9,539,974. Amortization of the balances are set at 15 years. The amortization is discussed in the testimony of Company Witness James Pellock. The values may be seen on Exhibit 37, Schedules B-1.

DEFERRED DEBITS

The Company is requesting a rate base addition of $1,198,681 for Deferred Debits. This is for Source of Supply cost and was approved for rate base treatment and a 40 year amortization in Case No. 2000-00120. The unamortized balance is included in rate base and is offset by applicable deferred taxes. The Deferred Debit balance is shown on Exhibit 37, Schedule B-1.

UPAA

The Company is proposing UPAA associated with its upcoming North Middletown acquisition. It is expected that the acquisition would generate UPAA of approximately $245,668 at the time of closing. With a proposed ten year amortization of this value, the

thirteen month average for the forecasted test year is $225,195, as shown on Exhibit 37, Schedule B-1. I'll discuss this in more detail in my testimony below on Acquired System Cost Recovery and Rates.

ACCUMULATED DEPRECIATION

The accumulated depreciation component of rate base includes both accumulated life depreciation and accumulated cost of removal. The accumulated depreciation forecast begins with the actual balances as of August 31, 2018, less the accumulated depreciation of the allowance for funds used during construction ("AFUDC") regulatory asset. Accumulated depreciation and accumulated cost of removal balances were then calculated by month through the end of the forecasted test period utilizing current depreciation rates from the 2015 Depreciation Study, as adopted in the settlement in Case No. 2015-00418.

Additional monthly adjustments were made to the accumulated depreciation to account for plant retirements, salvage credits and the cost of removals. Under utility plant accounting, when an asset is retired, the UPIS is reduced by the original cost of the asset and the accumulated depreciation account is reduced by an equal amount. When scrap value is obtained from retired plant, the salvage amount is added to the depreciation liability. The cost of removal is based on an average of the past two years and these expenditures reduce the liability.

The forecasted test year accumulated depreciation was then calculated by averaging the month end balances from June 30, 2019 to June 30, 2020. The thirteen month average forecast for Accumulated Depreciation is calculated at ($197,770,449), as shown on Schedule B-1. More detail can be found on Exhibit 37, Schedule B-3.

CIAC

CIAC reflects non-refundable money or physical property that is received from third parties, and thus is not considered to be investor supplied capital. An example would be a portion of main that was relocated to accommodate road alignment changes and the relocation was funded by the Kentucky Transportation Cabinet or a local municipality. Tap fees paid by new Kentucky-American customers are another example.

Following the enactment of the Tax Cuts and Jobs Act in 2017, all contributions have become taxable. Consequently, all new CIAC receipts are forecasted to be grossed up for income tax, which offsets the cost of the corresponding tax assets to the general customer base. This is consistent with proposed tariff changes, as seen on Exhibit 37, Schedule L.

CIAC balances are calculated monthly by increasing the actual August 31, 2018 balance for forecasted grossed-up contribution, less amortization of the contributed funds. The thirteen month-end balances for the forecasted test year ending June 30, 2020 are averaged to arrive at the forecasted test year amount of $73,319,577. CIAC is shown on Exhibit 37, Schedules B-1 and B-6.

CUSTOMER ADVANCES

Customer advances are a reduction to rate base to recognize money collected, typically from developers, for the installation of new mains. The funds are held in an account and refunded to the contributor / developer as new customers tap onto the extended main. By having a developer pay for the initial main extension investment, KAWC avoids the cost of financing speculative developments until new customers materialize. Like other rate base components, the forecasted test year customer advances amount is developed

starting with the August 31, 2018 balance, then forecasted monthly by adding forecasted receipts from developers, and deducting forecasted refunds.

Like CIAC, Customer Advances are also taxable now due to the Tax Cuts and Jobs Act. KAWC has begun collecting additional funds from developers to recognize the taxability of funds received. The forecast is consistent with this practice and includes gross-up on all expected Customer Advances. This offsets the cost of the corresponding tax assets to the general customer base.

The thirteen-month end balances from June 2019 through June 2020 are then averaged, yielding a value of $13,508,680. Customer advances are shown on Exhibit 37, Schedules B-1 and B-6.

ADIT

The Company deducted $90,721,671of accumulated deferred income taxes in arriving at its rate base requested in this case. This includes both the forecasted ADIT balance, as well as the forecasted balance of excess ADIT, which is a regulatory liability associated with changes in tax rates. The largest portion of this excess ADIT is associated with the TCJA. It is not yet forecasted with any amortization, so the full amount of the liability is deducted from rate base in the Company's revenue requirement. However, as indicated in the TCJA Case, the Company will provide an amortization value for the TCJA related excess ADIT if it is able to do so in this proceeding. Please see the testimony of Mr. John Wilde for more information. To see the value of ADIT (including excess ADIT) in the Company's forecasted rate base, please refer to Exhibit 37, Schedules B-1, and B-6.

UNAMORTIZED ITC

This item is calculated as an average of the thirteen month end balance of unamortized 3% investment tax credits ("ITCs") for the forecasted test year June 30, 2020. The Company also has 4% and 10% investment tax credits on its books, and these are reflected in the Company's capital structure, as discussed in the testimony of Company witness Scott Rungren. This rate base treatment of 3% ITC is consistent with previous rate cases. The thirteen month average amount in the forecasted test year of 3% ITC is $10,001. The values may be seen on Exhibit 37, Schedules B-1 and B-6.

OTHER RATE BASE ELEMENTS

In Case No. 2010-00036, the Commission adjusted rate base for Contract Retentions, Unclaimed Extension Deposit Refunds, Retirement Work in Progress, and Accrued Pension. The Company has included the Contract Retentions and Unclaimed Checks as "Other Rate Base" deductions in this proceeding. Contract retentions had a $0 balance for each of the 24 months between September 2016 and August 2018, and has a $0 value in the forecasted test year. The Company took a 24 month average of Unclaimed Checks from September 2016 to August 2018, and has forecasted that the ($14,660) average is appropriate for the forecasted test year. The total Other Rate Base deduction in this proceeding is thus ($14,660). This may be seen on Exhibit 37, Schedules B-1.

DEPRECIATION AND AMORTIZATION

Q. Could you please describe the depreciation expense requested for recovery in this case?

A. Depreciation expense was calculated for the forecasted test year by multiplying the forecasted UPIS balances for each plant account by the life depreciation rates and cost of

removal accrual rates found reasonable for those accounts in the 2015 Rate Case. This is offset by CIAC amortization, which is similarly calculated by multiplying gross CIAC balances by their amortization rates. The CIAC amortization essentially offsets the depreciation expense resulting from assets funded by CIAC. For the acquired North Middletown plant, the Company's current composite depreciation rate was applied to the UPIS balance and the Company's current composite CIAC amortization rate was applied to the gross CIAC amount. The Company has also included an adjustment to depreciation expense that was recommended as a result of the depreciation study submitted with the 2015 Rate Case. This adjustment was proposed to be completed over five years, beginning in 2016, with an annual expense credit of $221,989. In order to realign the amortization with other proposed short term amortizations in this case, the Company proposes amortizing the remaining balance over three years, with an annual expense credit of $160,325. Depreciations expense is shown on Exhibit 37, Schedules C and D.

Q. Could you please describe the amortization expense requested for recovery in this case?

A. Amortization expense is adjusted from the base year to remove disallowed items (some previous UPAA amortization and a regulatory asset amortization), and to make slight adjustments to align the forecast for amortized property losses and AFUDC. Additionally, an increase to amortization is made for the North Middletown UPAA requested to amortize over 10 years at $24,567 per year, which is discussed further in the Acquired System Cost Recovery section below. Amortization expenses are shown on Exhibit 37, Schedules C and D.

ACQUIRED SYSTEM COST RECOVERY AND TARIFFED RATES

Q. Why is water system consolidation in the public interest?

A. The water industry in the United States is a remarkably fragmented network of more than 50,000 community water systems.[3] Each of these separate systems must provide the most critical of services to its community. These services include drinking water, fire protection, and sanitation, as well as water for other domestic, commercial and industrial purposes. Without safe, clean, reliable, affordable water service, the public and economic health of our communities can be compromised.

There is inherent inefficiency in serving the public through such fragmented efforts. Small systems often suffer from resource deficiency, as they cannot always afford full time professional engineering, water quality, research, and operations professionals. Small, fragmented utilities likewise suffer inherent cost and operational inefficiency, as they can't leverage the buying power and capital market access that larger utilities can provide.

Finding ways to consolidate and regionalize the management of water systems in Kentucky can improve the efficiency, reliability, and safety of water service in the Commonwealth and is in the public interest.

Q. Has Kentucky American acquired water systems in the last five years?

A. Yes. These are summarized below:

1) In 2015, the Company acquired the water and wastewater assets of the City of Millersburg, in Bourbon County, adding approximately 500 water customers and

[3] U.S. EPA 3rd Quarter 2018 water system inventory.

300 sewer customers to the Company's service territory. The Millersburg water operation was considered in the 2015 Rate Case and the water customers were brought onto the Company's single tariff.

2) In 2016, the Company acquired the Ridgewood Sewer utility in Franklin County. As a sewer operation only, it is not included in this rate case.

3) In February 2018, the Company acquired the water assets of the Eastern Rockcastle Water District, adding more than 600 customers in Rockcastle and Jackson counties. The customers continue to pay the rates authorized by the PSC for the water district. All revenues and costs for the system are included in the forecasted test year.

4) The Company has an agreement with the town of North Middletown to purchase their water and sewer assets. The acquisition is expected to close in February 2019. It is proposed that the customers will continue to pay their current rates while the current rate case is pending. All revenues and costs for North Middletown are included in the forecasted test year.

Q. What is the Company proposing in terms of the tariffed rates for the Eastern Rockcastle and North Middletown customers?

A. The Company proposes moving these customers to the single tariff rate structure provided to all other customers in the Company's service territory. This proposal is consistent with the Commission's Final Order in the Company's 2007 rate case (Case No. 2007-00143). This would result in a rate reduction for most of the customers in North Middletown and Eastern Rockcastle, as shown on Exhibit 37, Schedule N.

Q. What is the Company proposing in this proceeding related to the cost recovery for North Middletown?

A. The Company is proposing in this proceeding that the purchase price of the North Middletown acquisition be recognized in rate base. Because the purchase price exceeds the net book value of North Middletown's system based on North Middletown's records, the Company expects to record UPAA associated with that acquisition.

Q. Does the UPAA associated with the North Middletown acquisition meet the criteria established in Case No. 9059, the 1985 Delta Natural Gas Company case ("Delta Case")?

A. Yes. The purchase price is the result of arms-length negotiations; the initial investment plus the cost of restoring any inadequate facilities to required standards will not have an adverse impact on customers; operational economies will be achieved; the purchase price of utility and non-utility property can be clearly identified; and overall benefits will occur.

Q. While the Company does meet its criteria, does the Delta Case policy for UPAA recognition adequately support consolidation of the fragmented water sector in Kentucky?

A. Not necessarily. Because the ratemaking treatment of UPAA resulting from a transaction cannot be known by the parties to the transaction until the subsequent rate case, there is uncertainty about how UPAA will be treated which can impact the parties ability to complete transactions. Instead, the Company asks the Commission to consider application of a much simpler method for handling UPAA. That method should allow the fair market value of the assets being acquired to be included in the acquiring utility's

rate base. Such an approach would facilitate and encourage transactions thereby paving the way for greater regionalization and consolidation. For North Middletown, the purchase price does, in fact, represent fair market value because it is what a willing buyer agreed to pay to a willing seller as a result of arms-length negotiations.

Q. What finding should be made regarding acquisition cost recovery in this proceeding?

A. The purchase price for the North Middletown assets should be recognized as the ratemaking rate base at the time of acquisition, for this proceeding. The thirteen month average of the North Middletown system will of course vary from this, as additional depreciation is accrued, but the basis should be the purchase price. The Commission can reach that conclusion either through the application of the Delta factors or a fair market value approach. However, use of a fair market value approach would be an excellent way to encourage future consolidation and regionalization via transactions. Such encouragement would be consistent with: (1) the Kentucky Legislature's stated policy that regionalization and consolidation of water and wastewater systems should be encouraged;[4] and (2) the Commission's recent implementation of that policy when it approved the Company's acquisition of Eastern Rockcastle's customers.[5]

[4] See KRS 224A.300(1).

[5] See the Commission's January 19, 2018, Order in Case No. 2017-00383 (p. 12) in which the Commission stated that the Company's acquisition of Eastern Rockcastle is consistent with the General Assembly's policy of regionalization and consolidation of water and wastewater systems.

QUALIFIED INFRASTRUCTURE PROGRAM ("QIP")

Q. Please discuss how the proposed QIP will work.

A. The QIP rider is a regulatory tool to provide for the recovery of the costs of capital, depreciation, and taxes associated with qualified infrastructure investment between base rate case filings. Some key mechanics are described below and also shown in the Exhibit 2 proposed tariff. These include:

1) Qualified Investments: The QIP rider will apply only to qualified, non-revenue producing plant investment that is incremental to recovery in the most recent base water rate proceeding. The types of qualified investment include distribution and water treatment infrastructure, as described in Brent O'Neill's testimony and the proposed QIP tariff sheet on Exhibit 2.

2) QIP Test Periods and Annual QIP filings: The QIP surcharge would be established on an annual prospective basis through an annual QIP filing ("Annual Filing"), with the first QIP test period ("QIP Period") being the twelve months following the forecasted test year in this case, which would be July 2020 – June 2021. The Company proposes to make its first Annual Filing at least 90 days prior to the commencement of this first QIP Period (by April 2, 2020). Subsequent Annual Filings would follow a similar schedule, with the Annual Filing being made at least 90 days prior to the commencement of the next annual QIP Period.

3) Calculation of the QIP Rider: The Annual Filing would include a detailed listing of each qualifying QIP project for the Commission's review of eligibility and prudence of the projects. Components of the revenue requirement calculation would include:

Pre-Tax Return: The qualified additions and removal expenditures, less the QIP related accumulated depreciation and QIP related accumulated deferred income taxes, would be multiplied by the rate of return on capital authorized in the most recent base water rate case, grossed up for federal and state taxes.

Depreciation and Property Tax Expense: The qualified plant additions would be reduced by the retirements associated with the QIP eligible additions, in the calculation of applicable depreciation and property tax expense.

The depreciation rates last approved by the Commission, for the respective plant accounts in which the specific items of QIP-eligible plant are recorded, would be used to determine the depreciation expense.

The property tax rate per dollar of net plant used to calculate property tax as approved in the most recent rate case will be the property tax rate for QIP net plant.

Total Revenue Requirement: The total QIP revenue requirement would equal the pre-tax return plus the depreciation and property tax.

QIP Percentage: The QIP percentage to charge would be calculated by dividing the QIP revenue requirement by the total authorized Water Revenues for the classes listed on the QIP tariff sheet. Authorized Water Revenues include meter fees, volumetric water sales, fire service fees, and public and private hydrant fees from the Company's most recent base rate case.

The QIP would be cumulative and remain in place until reset at zero on the effective date of new base rates in the Company's next general rate case proceeding.

4) Balancing Adjustment Filings and Timing: The Company's proposed QIP mechanism would also include an annual Balancing Adjustment Filing. This filing would be made within 90 days after the conclusion of each QIP Period (e.g., for the first QIP Period, ending June 30, 2021, the filing would be due by September 28, 2021), with the intention of establishing a Balancing Adjustment within 180 days after the conclusion of each QIP Period. That filing would include a detailed listing of each qualifying QIP project completed and placed in service during the immediately preceding QIP period, including any project modifications resulting from changing priorities.

The actual QIP revenues billed under the rider for the immediately preceding QIP period will be subtracted from the actual revenue requirement, as updated in the Balancing Adjustment Filing. This will yield the Balancing Adjustment credit or surcharge, which measures any over or under recovery of actual QIP revenue requirement. A balancing adjustment percentage will be calculated by dividing the balancing adjustment credit or surcharge by the authorized Water Revenues from the most recent rate case, then multiplying by the number of effective days remaining before the next QIP period begins, divided by 365. The balancing adjustment percentage will be added to or deducted from the current QIP rate, and the balanced QIP rate will go into place approximately 180 days after the end of the prior QIP period. This percentage calculation will yield a rate that is

designed to credit to or recover from customers the Balancing Adjustment Credit or Surcharge before the next QIP period begins.

Q. What will happen to the QIP Rider upon approval of new rates in a rate case proceeding?

A. The QIP Rider will be reset to zero as of the effective date of the new base rates. At that time, the base rates would be providing recovery of the annual costs that had previously been recovered through the QIP. Any over or under recovery, after the rate is reset to zero, would be filed for in the balancing adjustment after rate is reset.

Q. How will the QIP be billed to customers?

A. The QIP would be expressed as a percent of water and fire service charges for each customer class included in the QIP tariff. It would be applied to all Water Revenue (meter fees, fire service fees, public or private hydrant fees, and volumetric water sales), but prior to the inclusion of any other surcharge or tax (such as franchise fees or KRA fees). The QIP would be reflected as a line item on each customer's bill.

Q. Does this conclude your direct testimony?

A. Yes.

VERIFICATION

STATE OF NEW JERSEY)
) **SS:**
COUNTY OF CAMDEN)

The undersigned, **Melissa L. Schwarzell**, being duly sworn, deposes and says she is the Senior Director of Regulatory Services for American Water Works Service Company, Inc., that she has personal knowledge of the matters set forth in the foregoing testimony, and the answers contained therein are true and correct to the best of her information, knowledge, and belief.

MELISSA L. SCHWARZELL

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 20th day of November, 2018.

(SEAL)
Notary Public

My Commission Expires:

ANN G. ALFANO
NOTARY PUBLIC OF NEW JERSEY
ID # 50014130
My Commission Expires 4/15/2020

KENTUCKY-AMERICAN WATER COMPANY
CASE NO. 2018-00358
RATE CASE EXHIBITS AND SPONSORS

Exhibit	Sponsor
Exhibit 1 Present tariffs - Kentucky American Water	M. Schwarzell
Exhibit 2 Proposed tariffs - Kentucky American Water	M. Schwarzell
Exhibit 3 Comparative sheets of Tariffs	M. Schwarzell
Exhibit 4 Certified copy of Articles of Incorporation and Amendments	M. Schwarzell
Exhibit 5 Certificate of Good Standing	M. Schwarzell
Exhibit 6 Certified copy of a Certificate of Assumed Name	M. Schwarzell
Exhibit 7 Customer Notices	M. Schwarzell
Exhibit 8 PSC Notice	M. Schwarzell
Exhibit 9 Rate base/capital reconciliation	M. Schwarzell
Exhibit 10 Testimonies (Cover Sheet)	M. Schwarzell
Exhibit 11 Capital construction budget with 3-year forecast	B. O'Neill
Exhibit 12 Description of forecast factors (Cover Sheet)	M. Schwarzell
Exhibit 13 Annual and monthly budget for the 12 months preceding the filing date, the base period and the forecasted period	M. Schwarzell and B. O'Neill
Exhibit 14 Statement of Attestation	N. Rowe
Exhibit 15 Information about major construction projects > 5% of total	B. O'Neill
Exhibit 16 Information about other construction projects < 5% of total	B. O'Neill
Exhibit 17 Financial Forecast – operating income	M. Schwarzell
Exhibit 18 Financial forecast - balance sheet	M. Schwarzell
Exhibit 19 Financial forecast - cash flow	M. Schwarzell
Exhibit 20 Financial forecast - revenue requirement	M. Schwarzell
Exhibit 21 Financial forecast - employee level	J. Pellock
Exhibit 22 Financial forecast - labor cost changes	J. Pellock
Exhibit 23 Financial forecast - capital structure requirements	S. Rungren
Exhibit 24 Financial forecast - rate base	M. Schwarzell
Exhibit 25 Financial forecast - water sales (gallon)	M. Schwarzell and G. Roach
Exhibit 26 Financial forecast - customer forecast	M. Schwarzell
Exhibit 27 Most recent stock or bond prospectus (Most recent)	S. Rungren
Exhibit 28 Annual reports to shareholders	M. Schwarzell
Exhibit 29 Current chart of accounts	M. Schwarzell
Exhibit 30 Last 12 monthly managerial reports	M. Schwarzell
Exhibit 31 Monthly budget variance reports for 12 months pre-base period and as available, for base period and subsequent months M&D	M. Schwarzell
Exhibit 32 Independents auditor's annual opinion report and any written findings of material weaknesses in internal controls	M. Schwarzell

Exhibit 33 Summary of last depreciation study	M. Schwarzell
Exhibit 34 List of software, program and models used	M. Schwarzell
Exhibit 35 Affiliate, general or home office allocations	M. Schwarzell
Exhibit 36 Cost of service study	C. Heppenstall
Exhibit 37 Schedule A (A) Jurisdictional financial summary for the base and forecast period	M. Schwarzell
Exhibit 37 Schedule B Rate Base	M. Schwarzell
Exhibit 37 Schedule C Operating Income	M. Schwarzell
Exhibit 37 Schedule D Summary of Adjustments to Operating Income	M. Schwarzell
Exhibit 37 Schedule E Income Tax Expense	J. Wilde
Exhibit 37 Schedule F Social and service club dues, charitable contributions, initiation fees / country club expenses, employee party, outing & gift expense; customer service, sales promotion & misc, advertising, professional services, rate case expense, civic, political, and related expenses.	J. Pellock
Exhibit 37 Schedule G Payroll costs, analysis, and executive compensation	J. Pellock
Exhibit 37 Schedule H Gross revenue conversion factor	M. Schwarzell
Exhibit 37 Schedule I Comparative Income Statement and revenue statistics	M. Schwarzell
Exhibit 37 Schedule J Cost of capital	S. Rungren
Exhibit 37 Schedule K Comparative financial data and earnings measures	M. Schwarzell and S. Rungren
Exhibit 37 Schedule L Narrative description and explanation of all proposed tariff changes	M. Schwarzell
Exhibit 37 Schedule M Revenue summary and billing analysis	M. Schwarzell
Exhibit 37 Schedule N Typical bill comparison under present and proposed rates	M. Schwarzell

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF:	**)**	
	)	
THE APPLICATION OF KENTUCKY-	**)**	**CASE NO. 2018-00358**
AMERICAN WATER COMPANY FOR AN	**)**	
ADJUSTMENT OF RATES	**)**	

DIRECT TESTIMONY OF JOHN R. WILDE

November 28, 2018

Q. Please state your name and business address.

A. My name is John Wilde, and my business address is 1 Water Street, Camden, NJ 08102.

Q. By whom are you employed and in what capacity?

A. I am employed by American Water Works Service Company, Inc. (the "Service Company") as Vice President - Tax. The Service Company is a subsidiary of American Water Works Company, Inc. ("American Water") that provides services to American Water's subsidiaries, including Kentucky-American Water Company, Inc. ("Kentucky-American," "KAWC," or the "Company.")

Q. Have you previously filed testimony before this or any other commission?

A. Yes. I have testified before the California Public Utilities Commission, Federal Energy Regulatory Commission, the Illinois Commerce Commission, the Indiana Utility Regulatory Commission, the Kentucky Public Service Commission, the Michigan Public Service Commission, the Minnesota Public Utilities Commission, the Missouri Public Service Commission, the Pennsylvania Public Utility Commission, Tennessee Public Service Commission, the Virginia State Corporation Commission, the West Virginia Public Service Commission, and the Public Service Commission of Wisconsin.

Q. Please state your educational and professional background.

A. I graduated from Saint Norbert College, De Pere, Wisconsin in 1984 with a Bachelor of Business Administration Degree in Accounting. I have a graduate certificate in state and local taxation, as well as a Master of Science Degree in Taxation from the University of Wisconsin-Milwaukee. I have over 30 years of experience as a tax and accounting professional serving utilities with regulated operations in multiple states. I have been the head of tax for American Water since April of 2016. Before coming to American Water,

I spent fifteen years as the head of tax for a corporate group (WEC Energy Group, Inc., formerly Integrys Energy Group, Inc.) that had six utilities with operations in four states.

Q. What are your duties as Vice President - Tax?

A. My duties include management and oversight of the corporate tax function for American Water and its subsidiaries, including KAWC.

Q. What is the purpose of your testimony?

A. My testimony describes the general impact of the Tax Cuts and Jobs Act of 2017 (the "TCJA" or the "Act"). It then discusses the Company's forecasted levels of federal and state income tax expense and accumulated deferred income taxes ("ADIT"). It also describes adjustments to the Company's General Tax expense, including adjustments to the Company's property tax expense.

My testimony then addresses the timing and method of returning Kentucky-American's net excess ADIT resulting from the TCJA's reduction in the federal corporate income tax rate, and the Company's plan for flowing back excess ADIT to customers. My testimony discusses the difficulties in re-measuring Kentucky-American's ADIT at this time and explains why the excess ADIT cannot be normalized or amortized at this time. It then recommends that the disposition of those balances, when known, be considered as part of this general rate case or, if the re-measurement process is not completed in time, that the Commission use its pending TCJA investigation proceeding1 to consider the excess ADIT issue and the return of excess ADIT to customers.

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[1] *In re: Investigation of the Tax Cuts and Jobs Act on the Rates of Kentucky-American Water Company*, Case No. 2018-00042.

Q. Please generally describe the impact of the Tax Cuts and Jobs Act.

A. The TCJA, which became law on December 22, 2017, contains many provisions that substantially modify the Internal Revenue Code, and full quantification of its impacts will take some time. The most obvious impact of the TCJA is the reduction in Kentucky-American's annual federal tax expense beginning in 2018, resulting from the federal corporate tax rate cut from 35 percent to 21 percent.

A related major impact is on the Company's ADIT. For over thirty years, Kentucky-American's ADIT has been calculated based on the 35 percent federal tax rate. With the TCJA's reduction of that rate to 21 percent, Kentucky-American's estimated ADIT balance as of the enactment date of the legislation is in a net excess position, meaning that the Company's balance overstates the taxes that will be payable in the future related to prior operations of the Company. As I explain below, the excess ADIT must be re-measured and returned to customers in a manner that comports with Internal Revenue Service requirements.

Other significant impacts of the Act relate to bonus depreciation, contributions in aid of construction ("CIAC") and customer advances for construction ("CAC"), and employee fringe benefits. Utilities will not be able to claim bonus depreciation on property placed in service after January 1, 2018 unless construction had begun before September 27, 2017, or the property was acquired pursuant to a contract in place prior to that date; however, if construction began prior to September 27, 2017 or the property was acquired subject to a binding written contract entered into prior to that date, Kentucky-American might be eligible for 50% bonus depreciation on those property additions. CIAC and

CAC are now generally 100% taxable to the Company for contributions to construct utility plant received from outside parties.

Finally, the TCJA's changes will likely result in the loss of deduction for some employee fringe benefits incurred in the context of Kentucky-American regulated operations, such as some meals provided to employees that was previously not taxed.

Q. Please explain the Company's forecasted level of income tax expense.

A. The Company's filing is based on a calculation of current federal and state income taxes at the statutory income tax rates of 21% and 5%, respectively. The 21% federal and 5% state income tax rates were both effective January 1, 2018. The Company has forecasted a level of income taxes for the forecasted test period in the amount of $2,644,124 at current rates. The current provision for federal and state income taxes of $3,532,885 and $738,871 is shown on Schedules E-1.3 and E-1.4, respectively, to Exhibit 37. Deferred federal and state income tax benefits of $1,392,470 and $235,162 are also shown on Schedules E-1.3 and E-1.4, respectively, of Exhibit 37. To arrive at the total current provision, forecasted expenses were deducted from operating revenues to arrive at income before income taxes. This was done for both the federal and state tax calculations. From this number statutory add backs and deductions were made to arrive at the taxable income. These statutory adjustments are shown on Schedules E-1.3 and E-1.4 of Exhibit 37 and are labeled as reconciling items.

Q. How did the Company adjust the per books deferred tax expense to determine the forecasted test-year expense?

A. Beginning with the deferred tax expense at August 2018, adjustments were made to reflect calculations of deferred taxes associated with UPIS through the end of the

forecasted test period. This was done for both book and tax basis accounts and incorporated all temporary timing differences through the forecasted test-year. The statutory tax rates were applied to these changes between book and tax basis property to calculate each individual month's deferred tax expense or benefit.

Q. Was the same method used to calculate deferred income taxes as was used in the Company's last rate case?

A. Yes. The Company has continued to use ASC 740 in recording deferred income taxes, a method which has been recognized for rate recovery in prior Company rate cases.

Q. How did the Company calculate the deferred tax liability shown on Exhibit 37, Schedule B-6, page 2 of 2, which is a reduction to Rate Base?

A. The deferred tax liabilities for Deferred Debits and Deferred Maintenance are calculated by applying the statutory federal and state income tax rates to the 13-month average balance included in rate base. This represents the proper method of calculating the deferred tax liability using ASC 740. The amount shown on Exhibit 37, Schedule B-6, page 2 of 2 for Deferred Taxes related to Utility Plant in Service entails analyzing and determining the net change in a number of balance sheet accounts both for book and tax basis. This analysis includes UPIS, accumulated depreciation reserve, regulatory assets and regulatory liabilities, and Customer Advances and CIAC. ASC 740 is a balance sheet approach to deferred income taxes that requires the deferred income tax provision be shown in total, but also recognizes the regulatory assets and liabilities that will be recovered in rates in future years.

Q. Can you identify what is included in General Tax?

A. Yes. General Tax includes expenses incurred for property tax, payroll taxes, other taxes and licenses, and regulatory assessment fees. I will discuss the adjustments to property tax, other taxes and licenses, and regulatory assessment fees. Please refer to Mr. Pellock's testimony for a discussion of payroll taxes. Overall, General Tax in the forecasted test year is $7,814,766, which is increase from the base period tax of $452,339.

Q. What adjustments have been made to the property tax expense?

A. Property taxes for the base year were $6,602,753. To calculate property tax expense for the forecast year, a baseline tax rate was established and then applied to the forecast year property. To establish the baseline tax rate, information from tax year 2018 (for property in the year ending December 31, 2017) was used. First, net 2017 net utility plant in service ("UPIS") was determined by taking the December 31, 2017 UPIS balance and subtracting the corresponding life depreciation and contributions in aid of construction ("CIAC") balances. This was compared to KAWC's estimated property taxes for the 2018 tax year of $6,725,609. (The Company's state property taxes for tax year 2018 have been established, but the city and county taxes are not final. Total property taxes for the 2018 tax year were estimated based on actual state property taxes and the fact that historically they have comprised 20% of the total of state, city and county property taxes.) Dividing tax year 2018 property taxes by net UPIS at December 31, 2017 yields a baseline tax rate of 1.23%. This baseline tax rate is then applied to the forecasted 2018 and 2019 net UPIS balances ($561,912,762 and $585,892,717, respectively) to determine monthly property tax accruals for the six-month periods of July through December of

2019 and January through June of 2020. The sum of these accruals yields the forecasted test period property tax expense of $7,032,232, which reflects an increase of $429,479 over the base period amount.

Q. What is the utility regulatory assessment fee in this case?

A. This component of General Taxes is the PSC Fee, which is also referred to the Utility Regulatory Assessment tax. The Company has forecasted its PSC Fee for the forecasted test period by arriving at an average PSC fee rate of 0.20%. By applying this PSC Fee rate to the total forecasted revenues, less AFUDC, the Company's forecasted level of PSC Fee is $175,930 at forecasted rates.

Q. Are there any other adjustments to General Tax?

A. Yes. There is an additional adjustment to payroll tax as discussed in Mr. Pellock's testimony, and an adjustment of $6,331 for Other Taxes and Licenses.

Q. Please describe the effect of the TCJA on Kentucky-American's ADIT balances.

A. Upon the passage of the TCJA, the deferred tax assets and liabilities on the Company's books, which were established at a federal tax rate of 35%, had to be re-measured using a federal tax rate of 21%. At the end of 2017, Kentucky-American had a significant net deferred tax liability, booked at the 35% federal corporate tax rate, and driven significantly by accelerated and bonus depreciation of fixed assets for tax purposes. The estimated re-measurement of that liability using a 21% federal corporate tax rate for financial accounting purposes at the end of 2017 demonstrates there is a net balance of "excess" ADIT that will have to be amortized in future customer rates.

Excess ADIT balances falls into two categories: "protected" balances (i.e., those balances restricted by Internal Revenue Service ("IRS") normalization rules), which are generally

associated with utility plant, and "unprotected" balances (i.e., those balances not restricted by the IRS normalization rules).

Kentucky-American's initial estimate of the net excess ADIT balance (protected/plant-related and unprotected/non-plant-related) as of December 31, 2017, is $31,547,839. This amount comprises an estimated regulatory liability of $30,163,661 of "protected" excess related to plant assets and an estimated regulatory liability of $1,384,178 of "unprotected" excess related to non-plant assets. (See Attachment JRW-1.) However, these estimates are still uncertain and subject to revision.

Q. Please describe the effect of the recent state rate change on Kentucky American Water's state ADIT balance.

A. Due to the law change, the deferred state tax assets and liabilities on the Company's books, which were established at a state tax rate of 6%, had to be re-measured using a state tax rate of 5%. Kentucky's initial estimate of the net state excess ADIT balance as of December 31, 2017 is about $1.07m. Though the state excess ADIT is not considered protected as described above, the Company proposes to treat the state excess ADIT the same as the federal excess ADIT.

Q. Why are the Company's initial excess ADIT balance estimates uncertain and subject to revision?

A. As utilities and accounting professionals work through the impact of TCJA, some tax changes may not be fully recognized for months or even years. The reason is that accounting and tax guidance is still being developed that will clarify how various provisions of the new law should be treated, and the December 31, 2017 estimates are being modified as the Company prepares and files its 2017 tax returns. More

specifically, as I explain below, calculating the TCJA's effect on ADIT balances that need to be normalized into future rates and implementing a method to normalize the resulting excess is a complex and involved process. The Company's current estimated net excess ADIT balances are not suitable for ratemaking purposes, and they should not be incorporated into rates until the balances and the applicable amortization periods have been determined with more assurance and precision.

Q. Please explain the methods available to amortize the excess ADIT created by the TCJA.

A. With respect to "protected" excess ADIT balances, the TCJA as a general rule does not dictate a specific method, but sets a limit on how fast the amounts can be refunded. Specifically, the amounts cannot be refunded any faster than the pattern created by using ARAM. That said, the TCJA recognizes that utilities that compute depreciation using composite methods may not have the records necessary to compute ARAM. If qualified, those utilities may refund the excess ADIT using an alternate method commonly referred to as Reverse South Georgia Method ("RSGM"). In order to use this method, the TCJA states that the utility taxpayer must meet two conditions:

> "A) the taxpayer was required by a regulatory agency to compute depreciation for public utility property on the basis of an average life or composite rate method, and
>
> "(B) the taxpayer's books and underlying records did not contain the vintage account data necessary to apply the average rate assumption method."

In general, this is an acknowledgement that utilities that compute depreciation using composite methods might not have records needed to compute ARAM. Notwithstanding that, utilities that have developed the records needed to compute ARAM and/or put

systems in place that can compute ARAM, or have the ability to do so, must use ARAM; the use of RSGM is allowed only if the utility does not have the records or the systems necessary to compute ARAM.

Q. Does Kentucky-American propose to use ARAM to re-measure and amortize its protected excess ADIT balance?

A. Yes. Since the Company has the system and has the base of records necessary to populate or build the database structure necessary to compute ARAM, the Company believes it must use ARAM to determine the proper rate to flow back excess protected ADIT to customers to comply with the normalization requirements specified in the Tax Act of 1986, the TCJA, and the IRS's rules. Kentucky-American also proposes to amortize excess ADIT balances related to claiming tax repairs in excess of book repairs through the applications of ARAM, consistent with the consent agreement that requires Kentucky-American to use a normalized method of accounting consistent to those outlined in the tax code?

Q. Why does Kentucky-American treat excess ADIT related to its repairs deduction as subject to the tax normalization rules?

A. Kentucky-American's parent company, American Water Works Company, Inc. ("American Water") qualified for the repairs deduction through a Form 3115 Application for Change in Accounting Methods, which was filed for the taxable year ended December 31, 2008. That application resulted in a Consent Agreement with the Internal Revenue Service that was signed by the IRS on July 30, 2010 and by American Water on September 10, 2010. A copy of the Consent Agreement is Attachment JRW-2. That Consent Agreement is what directs Kentucky-American to use a normalized method of

accounting as outlined in the internal revenue code. Absent clear direction or guidance from the IRS to the contrary, Kentucky-American believes it is required to comply with the IRS consent decree, or else risk the loss of all or part of the benefits it has achieved on behalf of customers in accelerating tax deductions by applying its tax repairs method of accounting.

Q. What does the Consent Agreement provide with respect to the repairs deduction?

A. The Consent Agreement approves the application for the change in accounting methods so as to implement the repairs deduction, but it does so conditionally. Paragraph 9 at page 6 is the condition which controls here:

> 9) If any item of property subject to the taxpayer's Form 3115 is public utility property within the meaning of §168(i)(10) or former §167(I)(3)(A):
>
> (A) A normalization method of accounting (within the meaning of § 168(i)(9), former § 168(e)(3)(B), or former §167(I)(3)(G), as applicable) must be used for such public utility property.

Q. What does this condition mean with respect to the time period over which the excess ADIT associated with the repairs deduction must be returned?

A. Given that the repairs deduction that is the subject of the Consent Agreement relates to public utility property, we must utilize a normalization method of accounting within the meaning of the Internal Revenue Code. The TCJA provides that a normalization method is not being used if the taxpayer, in computing its cost of service for ratemaking purposes must reduce its excess tax reserve more rapidly or to a greater extent than such reserve would be reduced under ARAM. So if Kentucky-American's cost of service for ratemaking purposes is computed by reducing excess ADIT associated with the repairs

deduction more rapidly than ARAM, then it would not be a normalization method and we would be in violation of the condition in the Consent Agreement. Excess ADIT associated with the repairs deduction is thus "protected" by the Consent Agreement in the same manner as excess ADIT related to utility property is protected by the Internal Revenue Code.

Q. Can Kentucky-American or any other utility in the consolidated group of American Water companies compute ARAM today?

A. No. This is not due to lack of records, but to the fact that the Company has not built those records out into an ARAM data set or set up systems to process ADIT balances pursuant to ARAM. Prior to the enactment of the TCJA, the Company was not required to utilize ARAM as a method for any regulatory, financial, or tax accounting reasons. In 1986, the last time the federal tax rate decreased, the company did not have the systems or the records compilations that it has today, so it was allowed to use an alternative method – RSGM. Like most other regulated utilities, the Company uses PowerTax, and it will make the necessary changes to its data bases and settings to execute ARAM as part of an enterprise-wide project by American Water to upgrade and re-implement its PowerPlant and PowerTax systems, a project that was started just prior to enactment of the TCJA, as discussed above. The Company is working expeditiously to implement the necessary computer software changes to compute ARAM, but doing so with the required due diligence takes time and is subject to other dependencies involved in the implementation of core systems like PowerPlant and PowerTax. These changes include formatting and aligning required vintage records into a data structure which American Water's tax accounting software (PowerTax) can utilize to compute ADIT balances and

normalize amortization pursuant to ARAM. It will also result in separating out balances between what is to be treated as subject to ARAM (protected and repairs), and what will follow an alternative method if so ordered by the Commission. This is a complicated and laborious process, which we estimate will not be completed until the end of the first quarter of 2019.

Q. Should the Company start amortizing excess ADIT before it has determined its ADIT balances and amortization periods pursuant to ARAM?

A. No. The Company should not pass any excess ADIT to customers before it has determined its protected and unprotected excess ADIT balances and the appropriate amortization periods pursuant to ARAM. Returning any portion of the Company's excess ADIT before determining what is protected and what is unprotected would risk a normalization violation and loss of accelerated depreciation or tax repair deductions to the detriment of both the Company and its customers. Customers benefit from the Company's use of accelerated tax depreciation because the resulting ADIT provides a zero-cost source of funds for infrastructure investment. If Kentucky-American returns excess ADIT to customers for protected assets more rapidly than ARAM would permit, the Company could lose its ability to utilize accelerated tax depreciation, and per the TCJA, be subject to additions to its tax liability for the amount of taxes returned in excess of what was allowed.

Q. What is your recommendation with respect to the treatment of excess ADIT at this time?

A. The Commission should allow sufficient time for Kentucky-American to complete its ARAM calculation by addressing amortization of net excess ADIT balances in this rate

case and incorporating such amortization in the Company's new rates. The Company is working diligently towards providing exact excess ADIT amounts at the earliest possible moment so that the issue can be addressed as the rate case progresses, although, as noted above, the process may not be completed until the end of the first quarter of 2019. It is my understanding that the Company will file its base period update in mid-April 2019. Assuming the ARAM calculation is completed in time, Kentucky-American will include the precise excess ADIT balances and amortization in its base period update so they may be considered by the parties and the Commission and incorporated into rates as part of the disposition of this case. However, if such exact amounts cannot be determined in time to be properly considered as part of this rate case, then the Commission can use its pending tax investigation proceeding[2] to consider the excess ADIT issue and resulting return to customers.

Q. How will customers' interests be protected if Kentucky-American does not begin amortization of net excess ADIT until new rates are implemented pursuant to a final order in this case?

A. ADIT is a deduction from rate base, and thus serves to reduce Kentucky-American's return; as excess ADIT is returned to customers in rates, rate base (and Company return) increases. Therefore, deferring the return of net excess ADIT until after entry of a final order in this case will not harm customers' interests because they will continue to pay rates based on the lower rate base. In fact, deferring amortization of excess ADIT until

[2] *In re: Investigation of the Tax Cuts and Jobs Act on the Rates of Kentucky-American Water Company*, Case No. 2018-00042.

the Company can ensure compliance with IRS normalization rules is in customers' best interests because the penalty for a violation – loss of accelerated depreciation – would result in increased costs and thus higher rates.

Q. Does this conclude your direct testimony?

A. Yes.

VERIFICATION

STATE OF MISSOURI)
) **SS:**
COUNTY OF COLE)

The undersigned, **John R. Wilde**, being duly sworn, deposes and says he is the Vice President, Tax Strategy and Compliance for American Water Works Service Company, Inc., that he has personal knowledge of the matters set forth in the foregoing testimony, and the answers contained therein are true and correct to the best of his information, knowledge, and belief.

John R. Wilde

JOHN R. WILDE

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 20TH day of November, 2018.

Dean L. Cooper (SEAL)

Notary Public

My Commission Expires:

_____

DEAN L. COOPER
Notary Public - Notary Seal
STATE OF MISSOURI
Cole County
Commission # 15433496
My Commission Expires: 3/26/2019

American Water Works Company, Inc.

Deferred Balances Report - Pre-Tax (Reporting)

2017 Combined December YE Final 10K, 1012 Kentucky American

Code	Name	Ending Balance
A1	Advances & contributions	59,550,701
A3	Other postretirement benefits (OPEBS)	1,281,689
A4	Tax Losses and Credits	5,982,974
A5	Pension Benefits	(2,065,392)
A7	Other	1,840,974
L1	Utility plant, primarily depreciation	(293,494,672)
L12	Other postretirement benefits (OPEBS)	0
L13	Pension Benefits	0
L5	OTHER	35,336,030
Unassigned	Unassigned	354,390
Total		**(191,213,306)**

	Before	After	Change
Federal Rate	35.00%	21.00%	
State Rate	6.00%	6.00%	
Blended Rate	38.90%	25.74%	-13.16%

Gross Temporary Difference on Plant only	(233,943,971)
Change in blended tax rate	-13.16%
DTL remeasurement related to Plant	30,787,027
Gross Temporary Difference on Tax Losses and Credits	5,982,974
Change in federal tax rate	-14.00%
DTL remeasurement related to Fed NOL	(837,616)
State only plant temporary items	(3,212,456)
Change in federal rate	-14.00%
DTL remeasurement on federal benefit of state items	449,744
Total	30,399,154
Items not recoverable	(235,493)
Total estimated Plant excess ADIT	**30,163,661**
Gross Temporary Differences not Plant related	36,747,691
Minus Current Reg Liability	(44,003,167)
	(7,255,476)
Change in blended tax rate	-13.16%
DTL remeasurement related to non-Plant	954,821
State only temporary items	(377,945)
Change in federal rate	-14.00%
DTL remeasurement on federal benefit of state items	52,912
Total	1,007,733
Items not recoverable	376,445
Total estimated Non-Plant excess ADIT	**1,384,178**
Total estimated excess ADIT	**31,547,839**

AMERICAN WATER

September 10, 2010

Courier's Desk
Internal Revenue Service
Attn: CC:ITA:B01- Innessa Glazman
1111 Constitution Avenue, N.W., Room 5336
Washington, DC 20224

RE: American Water Works Company, Inc. & Subs.
EIN: 51-0063696
CAM-108421-09
CONSENT AGREEMENT

Dear Ms. Glazman:

This letter relates to a Form 3115, Application for Change in Accounting Method, filed by the above-mentioned Taxpayer on behalf of itself and various subsidiaries, requesting permission to change their method of accounting for (1) costs to repair and maintain tangible property, and (2) dispositions of certain tangible depreciable property, for the taxable year that ended December 31, 2008.

Please find enclosed a Consent Agreement dated July 30, 2010, and signed by the Taxpayer on September 10, 2010. However, we note that the EINs for two of the entities subject to the Form 3115 and enclosed Consent Agreement, American Water Engineering, Inc., and United Water Virginia, Inc., were incorrectly reflected in Appendix A to the Consent Agreement. In its information response to the IRS, by letter dated July 1, 2009, the Taxpayer provided the correct EINs of the two entities, American Water Engineering, Inc. (EIN: 76-0654501), and United Water Virginia, Inc. (EIN: 54-1016694). The Taxpayer will be effecting the change permitted in the Consent Agreement.

If you have any questions, please call the Taxpayer's authorized representative, Robert Weiss, at 202-414-1421.

Sincerely,

Mark Chesla
Vice President and Controller

Enclosures
Executed Consent Agreement

CONSENT AGREEMENT

Internal Revenue Service

Department of the Treasury
Washington, DC 20224

American Water Works Company, Inc.
and Subs.
P.O. Box 5600
Cherry Hill, NJ 08003

Attn: Mark N. Chesla
VP and Controller

Person to Contact:
Innessa Glazman
Telephone Number:
(202) 622-7327
Refer Reply to:
CC:ITA:B01 CAM-108421-09
Employee Identification Number:
52-08393

EIN: 51-0063696

JUL 30 2010

In re: Application for Change of Accounting Method
Form 3115 - See Appendix A

Dear Mr. Chesla:

This letter refers to a Form 3115, Application for Change in Accounting Method, filed by American Water Works Company, Inc. & Subs., EIN:51-0063696, on behalf of thirty applicants (see Appendix A) (collectively "the taxpayer"), requesting permission to change the taxpayer's method of accounting for: (1) costs to repair and maintain tangible property, and (2) dispositions of certain tangible depreciable property. The change is requested for the taxable period beginning January 1, 2008 and ending December 31, 2008 ("year of change").

The Department of the Treasury has published proposed regulations that clarify the application of §§ 162 and 263 of the Internal Revenue Code to expenditures paid or incurred to repair, improve, or rehabilitate tangible property. See Guidance Regarding Deduction and Capitalization of Expenditures Related to Tangible Property, 73 FR 12838-01 (March 10, 2008), 2008-1 C.B. 871. A threshold issue in applying the rules under §§ 162 and 263 is determining the appropriate unit of property to which the rules should be applied. The proposed regulations reserve the rules for determining the appropriate unit of property for network assets, which are defined as railroad track, oil and gas pipelines, water and sewage pipelines, power transmission and distribution lines, and telephone and cable lines. See § 1.263(a)-3(d)(2)(iii)(C)(2) of the proposed regulations, 73 FR 12857. The preamble to the proposed regulations states that the unit of property for network assets should be addressed on an industry-by-industry basis in future Internal Revenue Bulletin guidance. See preamble discussion at 73 FR 12843.

Section 6.09 of Rev. Proc. 2010-1, 2010-1 I.R.B. 1, 16, provides that the Internal Revenue Service generally will not issue a letter ruling if the request presents an issue that cannot be readily resolved before a regulation or any other published guidance is issued. A letter ruling includes an Associate Office's response granting or denying a

request for a change in a taxpayer's accounting method. Section 2.01 of Rev. Proc. 2010-1. The unit of property determination for network assets is an issue that cannot be readily resolved before a regulation or other published guidance is issued. Further, because the taxpayer's proposed method of accounting is based on the unit of property determination, the propriety of the taxpayer's proposed method of accounting is also an issue that cannot be readily resolved. Thus, the Service declines to rule on whether the taxpayer's unit of property determination for its network asset is correct, and accordingly, whether its proposed method of accounting is a proper method of accounting.

Further, pursuant to section 4.02(1) of Rev. Proc. 2010-3, 2010-1 I.R.B. 110, 118, the Service will not ordinarily issue a letter ruling or determination letter on any matter in which the determination requested is primarily one of fact. The determination of the unit of property for dispositions of tangible depreciable property is a factual one. Thus, the Service declines to rule on whether the taxpayer is using the appropriate unit of property for determining dispositions of tangible depreciable property subject to its Form 3115 and, accordingly, whether its proposed method of accounting for determining dispositions of such property is a proper method of accounting.

FACTS

The taxpayer is a corporation that is in the business of operating as public water and wastewater utility company that pumps, treats, and distributes water to and from residential, commercial, and industrial customers in the United States. The taxpayer uses an overall accrual method of accounting. Its principal business activity code is 221300. The taxpayer is requesting permission to: (1) change its method of accounting for costs associated with the routine repair and maintenance of all of the taxpayer's network assets; and (2) change its units of property for determining dispositions of certain tangible depreciable property.

Routine repair and maintenance costs

The costs included in this request consist of costs associated with the routine repair and maintenance of taxpayer's tangible property. The taxpayer represents that these costs are incurred to keep the taxpayer's property in ordinarily efficient operating condition, and that they do not materially increase the value or substantially prolong the useful life of any unit of property compared to the value or useful life of the property before the general decline or event that led to the repairs or maintenance. The taxpayer represents that the repair and maintenance costs do not adapt any unit of property to a new or different use. The taxpayer represents that the repair and maintenance costs do not include costs to replace any unit of property or any major components or substantial

structural parts of any unit of property. The taxpayer represents that the repair and maintenance costs are not incurred as part of a plan of rehabilitation, modernization, or improvement to any unit of property. The taxpayer represents that the repair and maintenance costs do not result from any prior owner's use of any unit of property.

Section 162 allows a deduction for all the ordinary and necessary expenses paid during the taxable year in carrying on any trade or business.

Section 1.162-4 of the Income Tax Regulations allows a deduction for the cost of incidental repairs that neither materially add to the value of property nor appreciably prolong its useful life, but keep it in an ordinarily efficient operating condition.

Under the taxpayer's present method of accounting for repair and maintenance costs, the taxpayer capitalizes the repair and maintenance costs described above and recovers these costs using the appropriate method over the applicable recovery period and the applicable convention as prescribed by §168(a).

Under the taxpayer's proposed method of accounting for repair and maintenance costs, the taxpayer will treat the repair and maintenance costs as ordinary and necessary business expenses pursuant to §§ 162 and 1.162-4.

Disposition of certain tangible depreciable property

The items of tangible depreciable property subject to the taxpayer's request to change its units of property for determining dispositions are described as network assets. Such property is depreciated by the taxpayer under § 168.

The taxpayer represents that:

1. None of the assets that are the subject of the taxpayer's Form 3115 are leasehold improvements.

2. None of the assets subject to the taxpayer's Form 3115 is subject to a general asset account election under § 168(i)(4) and the regulations thereunder.

3. None of the assets subject to the taxpayer's Form 3115 is subject to a mass asset account election under former § 168(d)(2)(A).

4. Depreciation for all of the assets subject to the taxpayer's Form 3115 is not determined in accordance with § 1.167(a)-11 (regarding the Class Life Asset Depreciation Range System (ADR)).

5. None of the assets subject to the taxpayer's Form 3115 is subject to the repair allowance under § 1.167(a)-11(d)(2) (including expenditures incurred after December 31, 1980, that were for the repair, maintenance, rehabilitation, or improvement of property placed in service by the taxpayer before January 1, 1981).

6. None of the assets subject to the taxpayer's Form 3115 were disposed of in a transaction to which a nonrecognition section of the Code applies (for example, § 1031, transactions subject to § 168(i)(7)).

7. There is no building (and its structural components) that is the subject of the taxpayer's Form 3115.

Under the taxpayer's present method of accounting, the taxpayer uses a method other than the functional interdependence test to identify the unit of property for purposes of determining when a depreciable network asset is disposed of.

Under the taxpayer's proposed method of accounting, the taxpayer will use the functional interdependence test to identify the unit of property for purposes of determining when a depreciable network asset is disposed of. The taxpayer will use the same unit of property for purposes of determining when a depreciable network asset is placed in service (and when depreciation begins) and when the depreciable network asset is disposed of (and when depreciation ends).

The taxpayer has represented that, on the date the Form 3115 was filed, it was not under examination and it was not before an appeals office or a federal court with respect to any income tax issue. See sections 3.07, 3.08(2) and 3.08(3) of Rev. Proc. 97-27, 1997-1 C.B. 680, as modified by Rev. Proc. 2002-19, 2002-1 C.B. 696.

SECTION 481(a) ADJUSTMENT

The information provided indicates that, as of the beginning of the year of change, the required aggregate adjustment under § 481(a) (the § 481(a) adjustment) for the year of change is ($461,238,422). This amount represents a netting of the net negative § 481(a) adjustment for maintenance and repairs with the net positive § 481(a) adjustment for dispositions. The netting represents a one-time exception allowed the taxpayer for the year of change based on its particular situation. As a rule, the netting of the § 481(a) adjustment for maintenance and repairs with the § 481(a) adjustment for dispositions is not allowed under the provisions of Rev. Proc. 97-27. The § 481(a) adjustment for each applicant is shown in Appendix A. The net amount represents a decrease in computing taxable income.

American Water Works Company, Inc. & Subsidiaries
CAM-108421-09

CONSENT/TERMS AND CONDITIONS OF CONSENT

Based solely on the facts presented and representations made, permission is hereby granted the taxpayer to change its method of accounting from the present method to the proposed method, beginning with the year of change, provided that:

(1) The taxpayer takes the entire net § 481(a) adjustment into account in computing taxable income in the year of change. See section 2.02(1) of Rev. Proc. 2002-19, 2002-1 C.B. 696, as amplified and clarified by Rev. Proc. 2002-54, 2002-2 C.B. 432.

(2) The taxpayer keeps its books and records for the year of change and for subsequent taxable years (provided they are not closed on the date it receives this letter) on the method of accounting granted in this letter. This condition is considered satisfied if the taxpayer reconciles the results obtained under the method used in keeping its books and records and the method used for federal income tax purposes and maintains sufficient records to support such reconciliation; and

(3) No portion of any net operating loss that is attributable to a negative § 481(a) adjustment may be carried back to a taxable year prior to the year of change that is the subject of any pending or future criminal investigation or proceeding concerning (a) directly or indirectly, any issue relating to the taxpayer's federal tax liability, or (b) the possibility of false or fraudulent statements made by the taxpayer with respect to any issue relating to its federal tax liability. See section 5.02(4) of Rev. Proc. 97-27.

(4) None of the items of property subject to the taxpayer's Form 3115 is subject to a general asset account election under § 168(i)(4) and the regulations thereunder;

(5) None of the items of property subject to the taxpayer's Form 3115 is subject to a mass asset account election under former § 168(d)(2)(A);

(6) The taxpayer does not determine depreciation for any of the items of property subject to the taxpayer's Form 3115 in accordance with § 1.167(a)-11 (regarding the Class Life Asset Depreciation Range System (ADR));

(7) None of the items of property subject to the taxpayer's Form 3115 is subject to the repair allowance under § 1.167(a)-11(d)(2) (including expenditures incurred after December 31, 1980, for the repair, maintenance, rehabilitation, or improvement of property placed in service before January 1, 1981);

8) None of the cost (or a portion thereof) of the assets subject to the taxpayer's Form 3115 is expensed or amortized under any provision of the Code, regulations, or other published guidance in the Internal Revenue Bulletin (for example, § 179D, § 1400I); and,

9) If any item of property subject to the taxpayer's Form 3115 is public utility property within the meaning of § 168(i)(10) or former § 167(l)(3)(A):

(A) A normalization method of accounting (within the meaning of § 168(i)(9), former § 168(e)(3)(B), or former § 167(l)(3)(G), as applicable) must be used for such public utility property;

B) As of the beginning of the year of change, the taxpayer must adjust its deferred tax reserve account or similar reserve account in the taxpayer's regulatory books of account by the amount of the deferral of federal income tax liability associated with the § 481(a) adjustment applicable to such public utility property; and

C) Within 30 calendar days of filing the federal income tax return for the year of change or of receiving this letter ruling, whichever is later, the taxpayer must provide a copy of its Form 3115 (and any additional information submitted to the Service in connection with such Form 3115) to any regulatory body having jurisdiction over such public utility property.

EFFECT OF THIS ACCOUNTING METHOD CHANGE

The accounting method change granted in this letter is a letter ruling pursuant to § 601.204(c) of the Statement of Procedural Rules. See also section 2.01 of Rev. Proc. 2010-1, 2010-1 I.R.B. at 6 (or any successor). The taxpayer ordinarily may rely on this letter ruling subject to the conditions and limitations described in Rev. Proc. 97-27.

However, the consent granted under this letter ruling for the taxpayer's requested change is not a determination by the Commissioner that the taxpayer is using the appropriate unit of property for determining dispositions of tangible depreciable property and does not create any presumption that the proposed unit of property is permissible

for such purposes. The director will ascertain whether the taxpayer's determination of its unit of property for dispositions of tangible depreciable property is correct.

Further, the taxpayer should not infer approval of any tax treatment not specifically stated in this letter ruling. For example, this letter does not address the application of § 263A, which generally requires taxpayers to capitalize certain direct and indirect costs of property produced or acquired for resale, or the propriety of the taxpayer's classification of property under § 168(e) or Rev. Proc. 87-56, 1987-2 C.B. 678. Further, this letter ruling does not imply approval of any tax treatment (including amounts that are part of the § 481(a) adjustment) when the Code, the regulations, or other published guidance provides specific limitations and/or prohibitions. The Service expresses no opinion on the propriety of the unit(s) of property the taxpayer proposes to use in determining the deductibility of repair and maintenance costs. The unit of property determination is a factual one within the jurisdiction of the director.

The director must apply the ruling in determining the taxpayer's liability unless the director recommends that the ruling should be modified or revoked. The director will ascertain whether (1) the representations upon which this ruling was based reflect an accurate statement of the material facts, (2) the change in method of accounting was implemented as proposed in accordance with the terms and conditions of the Consent Agreement and Rev. Proc. 97-27, (3) there has been any change in the material facts upon which the ruling was based during the period the method of accounting was used, (4) there has been any change in the applicable law during the period the method of accounting was used, (5) the amount of the § 481(a) adjustment was properly determined, and (6) the taxpayer's determination of its unit of property is correct. In the case of (1), (2), (3), or (4) above, if the director recommends that the ruling should be modified or revoked, the director will forward the matter to the national office for consideration before any further action is taken. Such a referral to the national office will be treated as a request for technical advice, and the provisions of Rev. Proc. 2010-2, 2010-1 I.R.B. 90 (or any successor) will be followed. See section 11.01 of Rev. Proc. 97-27.

As noted above, the Department of the Treasury has published proposed regulations that clarify the application of §§ 162 and 263 to expenditures paid or incurred to repair, improve, or rehabilitate tangible property. See Guidance Regarding Deduction and Capitalization of Expenditures Related to Tangible Property, 73 FR 12838-01 (March 10, 2008), 2008-1 C.B. 871. If final or temporary regulations are adopted with positions that are inconsistent with the method of accounting that the taxpayer implements in accordance with this letter ruling, the taxpayer will be required to follow any instructions in those final or temporary regulations concerning methods of accounting for the repair, improvement, or rehabilitation of tangible property for future taxable years.

American Water Works Company, Inc. & Subsidiaries
CAM-108421-09

AUDIT PROTECTION

An examining agent may not propose that the taxpayer change the same method of accounting as the method changed by the taxpayer under this ruling for a year prior to the year of change provided the taxpayer implements the change as proposed, in accordance with the terms and conditions of this ruling and Rev. Proc. 97-27, and the ruling is not modified or revoked retroactively because there has been a misstatement or an omission of material facts. See sections 9.01 and 9.02(1) of Rev. Proc. 97-27.

However, the Service may change the taxpayer's method of accounting for the same item for taxable years prior to the requested year of change if there is any pending or future criminal investigation or proceeding concerning (a) directly or indirectly, any issue relating to the taxpayer's federal tax liability for any taxable year prior to the year of change, or (b) the possibility of false or fraudulent statements made by the taxpayer with respect to any issue relating to its federal tax liability for any taxable year prior to the year of change. See section 9.02(4) of Rev. Proc. 97-27.

CONSENT AGREEMENT

If the taxpayer agrees to the terms and conditions set forth above, an individual with the authority to bind the taxpayer in such matters must sign and date the attached copy and return it within 45 days from the date of this letter to:

Internal Revenue Service
Attention: Innessa Glazman, CC:ITA:B01
P.O. Box 14095
Benjamin Franklin Station
Washington, D.C. 20044

The signed copy constitutes an agreement regarding the terms and conditions under which the change is to be effected ("Consent Agreement") within the meaning of § 481(c) and as required by § 1.481-4(b). The Consent Agreement shall be binding on both parties except that it will not be binding upon a showing of fraud, malfeasance, or misrepresentation of a material fact. In addition, a copy of the executed Consent Agreement must be attached to the taxpayer's federal income tax return for the year of change. For further instructions, see section 8.11 of Rev. Proc. 97-27. Alternatively, a taxpayer that files its returns electronically may satisfy this requirement by attaching a statement to its return that provides the date and control number of this letter ruling.

The rulings contained in this letter are based upon information and representations submitted by the taxpayer and accompanied by a penalty of perjury statement executed by an appropriate party. While this office has not verified any of the material submitted in support of the request for rulings, it is subject to verification on examination.

The accounting method change granted in this letter is directed only to the taxpayer and may not be used or cited as precedent. See section 11.02 of Rev. Proc. 2010-1, 2010-1 I.R.B. at 49. Final or temporary regulations under § 167 or § 168 pertaining to one or more of the issues addressed in this letter ruling have not yet been adopted. Therefore, if final or temporary regulations under § 167 or § 168 should be adopted with positions that are inconsistent with the conclusions reached in this letter ruling, the method of accounting utilized as a result of the letter ruling will no longer be regarded as a proper method of accounting and would be subject to change within the framework of §§ 446 and 481.

American Water Works Company, Inc. & Subsidiaries
CAM-108421-09

In accordance with the provisions of a power of attorney currently on file, we are sending a copy of the ruling letter to your authorized representatives.

Sincerely yours,

JOHN P. MORIARTY
Chief, Branch 1
Office of the Associate Chief Counsel
(Income Tax and Accounting)

cc: Internal Revenue Service
Industry Director, LM:NRC
Natural Resources and Construction
1919 Smith Street, Stop 1000HOU
Houston, TX 77083

Robert Weiss
PricewaterhouseCoopers LLP
1301 K Street, NW, Ste 800W
Washington, DC 20005

Gwynneth H. Stott, CPA
PricewaterhouseCoopers LLP
2001 Market Street, Ste 1700
Philadelphia, PA 19103

Signed this 10th day
of September, 2010
American Water Works Inc & Subs,
(taxpayer)
By _____, Vice President and Controller
(Name and corporate title of parent officer)

BEFORE THE KENTUCKY
PUBLIC SERVICE COMMISSION

Case No. 2018-00358

KENTUCKY-AMERICAN WATER COMPANY

DIRECT TESTIMONY OF
TIMOTHY WILLIG

I. Introduction

Q. Please provide your name, position and business address.

A. My name is Timothy Willig. I am a Senior Director and Actuary in the Health and Benefits practice of Willis Towers Watson. Willis Towers Watson is a leading global professional services company employing 42,000 associates throughout the world, and offers solutions in the areas of corporate risk and broking, human capital and benefits, health care marketplace solutions, investment, risk and reinsurance. My business address is 8 Campus Drive, Parsippany, NJ 07054.

Q. Please explain Willis Towers Watson's experience in providing compensation and benefits consulting services to organizations like Kentucky American Water Company (KYAWC, Kentucky American Water, or the Company).

A. Willis Towers Watson has extensive experience serving clients in the utility industry, having served approximately 100 utilities in the U.S. within the last year. Because we invest so heavily in our utility industry capabilities, we have rich industry compensation and benefits information that enables us to benchmark Kentucky American Water against similar companies in the U.S. Given Willis Towers Watson's breadth and depth of resources, we are frequently engaged by companies to evaluate the competitiveness and reasonableness of their benefit levels and to perform other consulting services. Willis Towers Watson has conducted similar benefits studies for other utility clients.

Q. Please state your educational and professional background and experience.

A. I graduated from New York University in 1979 with a B.A. majoring in mathematics. I successfully completed a series of exams to become an Associate in the Society of Actuaries in 1984. I worked for major insurance companies for 10 years in individual and group insurance areas. I have worked for Willis Towers Watson and its predecessor firms for 28 continuous years, all in the Health and Benefits area.

II. Purpose of Testimony

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to describe the study of KYAWC's employee cost sharing structure and compare the calculated KYAWC employee cost share percentage results by benefit program against those of peer companies, both inside and outside KYAWC's industry.

Q. Please describe the benefits considered in your study.

A. Our study encompasses several types of employee benefits sponsored by KYAWC, including: medical and prescription drug, vision, dental, long-term disability, sick leave/short-term disability, life insurance/accidental death & dismemberment, vacation/holiday/leave and retirement income.

III. Summary of Willis Towers Watson's Benefits Study

Q. Please describe how the study was conducted.

A. Willis Towers Watson utilized its BENVAL system to assess the cost sharing structure of Kentucky American Water's benefit program. BENVAL is a method for determining the value of benefits provided by participating companies by applying a standard set of actuarial methods and assumptions to a common employee population. BENVAL results provide a quantitative evaluation of each company's benefit provisions and overall benefit program, and facilitate a comparison of these benefit values against peer companies. The BENVAL system warehouses benefit plan data from over 850 U.S.-based employers across a wide spectrum of industries. KYAWC's benefit program parameters were updated in the system in 2018. We calculated the value of KYAWC's benefit plans (separately for "all benefits", "medical/prescription drug", "dental" and "retirement") as a percentage of base pay, and compared to said percentage of two separate benchmark groups: 1) entire BENVAL database and 2) energy industry subset of BENVAL database. Separate percentages were calculated for the employer and employee portions of the total cost of benefits (employee portion reflects the amount paid by employees via payroll contributions).

Q. How did you define "base pay" for the purposes of your study?

A. Base pay is defined as the average base salary of a representative sample of large U.S. companies. The average base salary utilized in our study is $77,500 per year. It is intended as a means of normalization; i.e. to develop a simple metric enabling fair and straightforward comparison between KYAWC and the benchmark groups.

Q. What were the results of the study?

A. The table below summarizes our findings[1].

Summary of Kentucky American Water (KYAWC) Benefit Cost Share as a Percentage of Base Pay			
	Kentucky American Water	**Median, full BENVAL database**	**Median, energy industry subset of BENVAL database**
Full benefit program	24% employee / 76% KYAWC	22% employee / 78% employer	23% employee / 77% employer
Medical/prescription drug benefits	20% employee / 80% KYAWC	21% employee / 79% employer	14% employee / 86% employer
Dental benefits	15% employee / 85% KYAWC	35% employee / 65% employer	26% employee / 74% employer
Retirement income program (defined contribution + stock purchase)	49% employee / 51% KYAWC	51% employee / 49% employer	50% employee / 50% employer

[1] Only the most prevalent/pertinent programs are shown; table is not a comprehensive representation of all benefits.

IV. Conclusions

Q. What are the conclusions of your study?

A. Overall, KYAWC's employee cost share is comparable to the medians of both the full BENVAL database and the energy industry subset of the database. In some cases (i.e. active medical/prescription drug benefits), KYAWC employees are actually subject to a cost share higher than benchmark. Employee cost share of the dental benefit is considerably below benchmark, but dental benefits comprise only a very small portion of total benefit program value. It is important to note that the result of the

comparison between KYAWC and the benchmarks varies by benefit type. Moreover, the table shown above is not additive as it shows only selected benefits and not all benefits considered in our analysis; therefore, the "full benefit program" results shown cannot be deduced from the subsequent rows.

Q. Does this conclude your testimony?

A. Yes, it does.

VERIFICATION

STATE OF VIRGINIA)
) **SS:**
ARLINGTON COUNTY)

The undersigned, **Timothy J. Willig**, being duly sworn, deposes and says he is Senior Director with Willis Towers Watson, that he has personal knowledge of the matters set forth in the foregoing testimony, and the answers contained therein are true and correct to the best of his information, knowledge, and belief.

TIMOTHY J. WILLIG

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 15 day of November, 2018.

_____(SEAL)
Notary Public

My Commission Expires:
12/24/18

JACQUELYN DEANGELIS
Notary Public
State of New Jersey
My Commission Expires Dec 24, 2018

THE REFERENCED WILLIS TOWERS WATSON STUDY IS EXHIBIT RVM-1 TO KAW_DT_RVM_112818

(FILED UNDER SEAL PURSUANT TO THE PETITION FOR CONFIDENTIAL TREATMENT FILED ON NOVEMBER 28, 2018)