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. 2015-00418**

DIRECT TESTIMONY OF LINDA C. BRIDWELL, P.E.

January 29, 2016

Q. Please state your name and business address.

A. My name is Linda C. Bridwell 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 Central Division of American Water Works Company ("AWW") as Manager of Rates and Regulation for Kentucky and Tennessee.

Q. Have you previously filed testimony before this or any other commission?

A. Yes. I have provided both written and oral testimony in at least fifteen different proceedings before the Kentucky Public Service Commission including rate cases, special investigations, and applications for a Certificate of Public Convenience and Necessity. I have also provided both written and oral testimony before the Tennessee Regulatory Authority.

Q. Please state your educational and professional background.

A. I received a B.S. degree in Civil Engineering from the University of Kentucky in 1988 and I received a M.S. degree in Civil Engineering from the University of Kentucky in 1992 with an emphasis in water resources. I completed a Masters of Business Administration from Xavier University in Cincinnati, Ohio in 2000. I am a registered Professional Engineer in the Commonwealth of Kentucky.

I have been employed by AWW since 1989. I began as a distribution supervisor for Kentucky-American Water Company ("KAWC" or "Company") until 1990 when I was promoted to Planning Engineer, then Engineering Manager, and later Director of Engineering in 1998. In July 2004, I accepted the position of Project Delivery and Developer Services Manager for the Southeast Region of AWW, responsible for

Kentucky, Tennessee, and West Virginia. In 2008, I became the KAWC Project Delivery Manager for the construction of a new water treatment plant, booster station, and transmission main in Kentucky. This project was the largest project completed by American Water, in any of its regulated businesses, at $164 million. Upon completion of the project in October 2010, I became the Director of Environmental Compliance and Water Quality for KAWC and in February of 2012 I accepted my current position. I am an active member of the American Water Works Association ("AWWA"), served as president of the local chapter and state section of the American Society of Civil Engineering ("ASCE"), and served as an officer in the local chapter of the National Society of Professional Engineers ("NSPE") and as a State officer. I have served periodically as an Adjunct Professor at the University of Kentucky in the Civil Engineering Department, teaching "Water Quality and Pollution Control" and "Introduction to Environmental Engineering." I served as a member of the Civil Engineering Industrial Advisory Committee at the University of Kentucky from 2005 until 2012. I served as a Commissioner on the Kentucky Water Resources Development Commission established by Governor Patton. I currently serve as Vice Chairman of the Board of Directors for the Kentucky Infrastructure Authority, and I am on the Kentucky Board of Licensure for Professional Engineers and Land Surveyors.

Q. What are your duties as Manager of Rates and Regulation?

A. My primary responsibilities encompass the coordination of regulatory issues in Kentucky and Tennessee. This includes coordinating all reports and filings, working with our regulatory staff to make sure that all information produced addresses the requirements or requests, and overseeing the preparation and filing of rate cases and tariff changes. I work with the senior management in both states on planning matters. I am also responsible for keeping abreast of changes and trends in regulation across the United States that may impact our local operations. I report to the Presidents of KAWC and Tennessee American Water Company ("TAWC"). I am located in Kentucky, but work closely with the staff in Tennessee as well.

Q. What topics will your testimony address?

A. My testimony will 1) review in general the exhibits and schedules that are required as part of KAWC's Application, which support the proposed revenue increase of $13,453,664; 2) address the Company's forecasted test year level of Revenues, Operating Expenses, and Rate Base; 3) review KAWC's proposed Qualified Infrastructure Program ("QIP"); and 4) review the proposed changes to the tariffs.

Q. Were the Company's financial exhibits prepared by you or under your supervision?

A. Yes.

Q. What is the source of information used in the Company's financial exhibits?

A. The information contained in the Exhibits and Schedules filed with KAWC's Application was obtained from KAWC's financial and operational records.

Q. What is the increase in the annual revenue requirement the Company is seeking?

A. The Company is seeking rates that would produce additional annual revenues of $13,453,664, which is an overall increase of 15.23%.

Q. When did the Company last increase rates?

A. The Company last filed for a rate increase on December 28, 2012. By Commission Order dated October 25, 2013, the Commission approved rates effective July 26, 2013.

Q. What is the test period reflected in this case?

A. The Company has used a base period of the twelve months ending April 30, 2016 to reflect recent actual expenses and revenues. This base period data reflects six months of actual data and six months of estimated data. 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 August 31, 2017.

Q. Please describe the guidelines the Company followed in adjusting the base period data.

A. The guidelines that the Company followed in adjusting the base period data were designed to ensure that its forecast contains the same assumptions and methodologies as used in the forecast prepared for use by management. These guidelines are designed to reflect, as accurately as possible, the Company's requirements to operate and maintain its assets, provide quality service to its customers, and provide a reasonable return to its stockholders.

Q. Please summarize the Company's rate filing.

A. As noted earlier, the Company is filing this Application for an increase in rates based upon a fully forecasted test period of 12 months ending August 31, 2017, as currently allowed by 807 KAR 5:001 Section 16(1)(b). The Commission has outlined various filing requirements concerning a forecasted test period. The Company's filing is supported by a series of 37 exhibits. We have allocated direct and indirect costs between the water and sewer operations, similar to previous rate cases.

Q. Do you wish to comment on any specific exhibit?

Yes. I would like to briefly discuss Exhibit 37. Exhibit 37 presents the standard schedules required by the Commission when a utility files for a general adjustment in rates supported by a forecasted test period. This exhibit contains 14 schedules identified as Schedules A through N. I would like to identify each schedule. Please note that the requirements for the filing are for jurisdictional information. 100% of KAWC's operations are jurisdictional, so the schedules reflect the full 100% jurisdictional information. Some schedules do not have a specific calculation for jurisdictional percentage on each schedule as in previous rate case filings.

Within the jurisdiction of the PSC, KAWC operates a water operation and a sewer operation. As this case is strictly for the water division, sewer division costs have not been included in the schedules. Direct charges for sewer expenses and direct revenues from sewer operations have been omitted. In Case No. 2014-00390, which was a rate case for KAWC's sewer operations, the PSC directed KAWC to make additional allocations from its water division to its sewer division for some corporate costs. As appropriate, those allocations are reflected and noted on the schedules.

Schedule A is a jurisdictional financial summary for both the base period and the forecasted period, which details how the utility derived the amount of the requested revenue increase.

Schedule B is a jurisdictional rate base summary for the base period and the forecasted period with the supporting schedules, which include detailed analyses of each component of rate base.

Schedule C is a jurisdictional operating income summary for the base period and the forecasted period with supporting schedules that are broken down by major account group and by individual account.

Schedule D is a summary of jurisdictional adjustments to operating income by major account with supporting schedules for individual adjustments and jurisdictional factors.

Schedule E is the jurisdictional federal and state income tax summary for the base period and the forecasted period with supporting schedules of the various components of jurisdictional income taxes.

Schedule F contains summary schedules for the base period and the forecasted period of organization membership dues, initiation fees, charitable contributions, marketing, sales, and advertising expenditures, professional service expenses, civic and political expenses, expenditures for employee awards functions and outings, employee gift expenses, and rate case expenses.

Schedule G is an analysis of payroll costs including schedules for wages and salaries, employee benefits, payroll taxes, straight time and overtime hours, and executive compensation.

Schedule H is a computation of the gross revenue conversion factor for the forecasted period.

Schedule I provides comparative income statements, revenue statistics and sales statistics for the five most recent calendar years from the application filing date, the base period, the forecasted period, and two calendar years beyond the forecast period.

Schedule J provides a cost of capital summary for both the base period and forecasted period and supporting schedules providing detail on each component of the capital structure.

Schedule K provides comparative financial data and earnings measures with the 10 most recent calendar years, the base period and the forecasted period.

Schedule L provides a narrative explanation of all proposed tariff changes.

Schedule M provides a revenue summary for both the base period and forecasted period with supporting schedules, which provide detailed billing analyses for all customer classes.

Schedule N provides a typical bill comparison of the present and proposed rates for all customer classes.

Q. How did the Company determine the operating revenues shown in its exhibits?

A. The Company's operating revenues are obtained from (i) metered sales, (ii) private fire service, and (iii) miscellaneous revenues, service revenues, rents from property, and other water revenues. The Company uses a bill analysis reflecting the actual billing determinants for the base year, the twelve months ended April 30, 2016. Exhibit 37, Schedule M-3 sets forth the individual bill analysis by customer class. The base year billing determinants are then adjusted to: (i) include customer growth through the forecasted test year, and (ii) adjust residential and commercial classes for weather normalization as forecasted by Dr. Edward Spitznagel. Dr. Spitznagel has provided testimony in this proceeding to support his customer usage forecasts. The schedules then multiply forecasted test year billing determinants by present and proposed rates.

Q. How were the operating expense adjustments in the summary expenses exhibit calculated?

A. The adjustments reflect an ongoing level of operating expenses consistent with the base year matching principles. Known and measurable price adjustments have been reflected to restate the consistent test year expense levels to forecasted rate year levels.

Q. Are there changes to the presentation of financial information that you would like to discuss?

A. Yes. In addition to the schedule changes that I have just discussed, American Water revised its Financial Statements with the conversion to the new financial software in 2012. Certain lines of expense including General Office, Miscellaneous, and Customer Accounting have been separated into more detail to more robustly reflect our business. These new details appear on the Income Statement and include: Other Benefits; Contract Services; Building Maintenance and Services; Telecommunications; Postage, Printing and Stationary; Other Supplies and Services; Employee Related Expense; Transportation; and Uncollectible Accounts. This was first presented in Case No. 2012-00520.

Q. Are the factors driving your requested rate increase the result of issues unique to the water industry?

A. Yes, many are. The water industry is extremely capital intensive, much more so than electric, gas or any other utility industry regulated by the Commission. A December 2014 report issued by AUS Consultants (an entity that provides financial, engineering, and other consulting services to the utility industry) indicated that the ratio of dollars invested in utility plant per dollar of revenue for the water industry is approximately 150% higher than the comparable ratio for the electric utility industry, and approximately 240% higher than the comparable ratio for the natural gas distribution utility industry.[1] This fact often goes unacknowledged because much of the water industry infrastructure is out of public view. Because of the large amount of capital required to develop water infrastructure and the need to replace existing infrastructure, issues related to capital utilization and financing are more significant for water utilities than other utilities.

The problem of aging water and wastewater infrastructure is not widely understood but is becoming better known. It is clear that the general public does not understand the immediacy of the problem or the substantial cost to fix the problem. Much of this country's investment in water and wastewater systems was made in the early part of the twentieth century and is in need of systematic replacement. This is coming at a time when there are significant competing demands for capital for other infrastructure. Along with the need to replace existing infrastructure, the water industry faces increasing maintenance costs not covered by rates due to regulatory lag. Main breaks from aging infrastructure can cause fish kills from discharge into ponds and streams resulting in fines. Moreover, greater capital expenditures result in higher business risk associated with contractors and vendors.

At the same time the industry is facing higher capital needs, the industry is facing declining customer usage similar to what is being experienced across the utility industry. Reduced sales have been caused by a number of key factors, including but not limited to: increasing prevalence of low flow (water efficient) plumbing fixtures and appliances

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[1] AUS Utility Report, *AUS Monthly Utility Report*, December 2014; Published by AUS Utility Reports, 155 Gaither Drive, Suite A, Mount Laurel, NJ.

within residential households,[2] customers' conservation efforts, and conservation programs implemented by the federal government, state government, and other entities.[3] Moreover, weather impacts water consumption not only as a result of cooling degree day variations, but also because of ground moisture, rain and even the threat of rain.

Other Operations

Q. Has KAWC excluded from this case the revenues and expenses related to any of its operations?

A. Yes. The case presented is limited only to KAWC's regulated water service operations. KAWC does not currently operate any other system under a contractual arrangement. As discussed previously, the Company examined its expenses in the base and forecast years and removed all sewer operation expenses. KAWC continues to directly charge appropriate expenses to sewer operations, and utilizes the same assumptions and methodologies in the forecast prepared for use by management. Where additional allocations were directed by the PSC in Case No. 2014–00390, the allocations are reflected on the financial schedules.

Revenues

[2] Plumbing fixtures such as toilets, showerheads, and faucets available to consumers today are more water efficient than they were in the past. Similarly, appliances such as dishwashers and washing machines are also more water efficient.

[3] The Energy Policy and Conservation Act of 1992 and 2005 ("EPAct92" and "EPAct05" respectively) mandated the manufacture of water efficient toilets, showerheads and faucet fixtures. The Energy Independence & Security Act of 2007 (Public Law 110–140) ("EISA") will further reduce indoor water consumption. EISA established stringent efficiency standards for dishwashers and clothes washers. Programs 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 programs that seek 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. EnergyStar is another USEPA voluntary partnership that helps businesses and individuals save money and protect our climate through superior energy efficiency.

Q. Please describe the revenues the Company is proposing in this case.

A. Certainly. Exhibit 37, Schedule M-1 summarizes the adjustments to operating revenue by customer class and other operating revenue type. The subsequent revenue exhibits and supporting schedules further detail the operating revenue adjustments made to the Forecast Year at Present Rates and the Forecast Year at Proposed Rates. Exhibit 37, Schedule M-2 presents a summary and detail by district of the Company's revenues by customer class. The revenues are classified in four different categories: base period at present rates, base period at proposed rates, forecast year at present rates and forecast year at proposed rates. The proposed rates are primarily based on a cost of service study and other rate design adjustments that are addressed in Mr. Paul Herbert's testimony.

Q. How are the revenues calculated?

The revenues are simply a sum of the projected revenues by customer classification, added to projected revenues from other tariffs and fees. For Residential and Commercial classes, KAWC uses the projected customer usage based on the weather normalization model from Dr. Edward Spitznagel.

For industrial, Other Public Authority ("OPA"), and sale for resale customer classifications, KAWC developed a forecast based on its best judgment from the historical usage. For industrial and sale for resale customers, each individual customer's historical usage was reviewed and projection made. For OPA customers, the average customer usage from the previous two years was projected forward.

Other revenues were based on historical averages depending on the tariff or fee, and adjusted as appropriate for projected changes. The other revenues are discussed in more detail later in my testimony.

Q. Why did KAWC use the weather normalization customer usage forecasts from Dr. Spitznagel rather than the declining usage model presented in the last case?

A. Although KAWC presented a declining usage model in its last case, the PSC indicated it was "of the opinion that Kentucky-American's methodology does not adequately consider the effect of weather and that, especially as it relates to commercial customer usage, is not based upon a sufficient period of time to establish reliable usage trends."[4] During cross-examination at the evidentiary hearing, questions were raised about KAWC's move away from the Dr. Spitznagel's weather normalization model that had been evaluated and accepted by the PSC in prior cases. Based on the questions posed by the parties and the Commission's Final Order, KAWC has utilized Dr. Spitznagel's weather normalization model to neutralize the effect of weather in analyzing customer usage trends for developing its usage forecasts in this case. The result of this model is to provide a projection that statistically accounts for recent demand-side water efficiency usage trends, while neutralizing any impact from weather.

Q. Are there adjustments to the base period level of revenues?

A. Yes. The adjustments to the base period level of revenues can be characterized as follows:

1) Adjust for the change in billing determinants at present rates for the forecast year
2) Eliminate unbilled revenue
3) Adjust for private fire usage charges

[4] Final Order in Case No. 2012-00520 dated October 25, 2013 at Page 24.

Q. What is the change in billing determinants at present rates for the forecast year?

A. The base period was adjusted to reflect a forecasted number of increased customers based on historic growth trends in order to produce a representative level of revenues for KAWC for the forecasted period. The change in billing determinates represents the projected level of sales and customer growth reflected in the forecast year.

Q. Did the Company make any changes to the forecasted test year revenues?

A. Yes. The Company adjusted the level of miscellaneous sales based on data reflected in the actual six months of the base period. The Company used a six month average of usage to adjust the forecast year. The change to miscellaneous sales is related to Company usage, which is non-revenue, and therefore has no effect on revenue.

Q. Would you please explain the adjustment to unbilled revenue?

A. The bill analysis, which summarizes the actual customer billings for the twelve months of the forecast year, was utilized to develop the billing determinants. A full twelve months of revenue is reflected for the customers at August 2017, and the inclusion of unbilled revenue at the end of the forecast year is inappropriate. If unbilled revenues were not eliminated, forecast year revenues at present rates would have been overstated. This approach is consistent with the Company's methodology in recent cases.

Q. Why did the Company make an adjustment for private fire usage charges?

A. KAWC does not charge for fire-related usage for private fire service. However, in November 2012, the Company implemented its previously approved tariff to permit the installation of meters and usage charges on all non-fire prevention and testing-related flows when a reasonable belief exists that water is being used for non-fire protection purposes. The Company performed an analysis of non-fire related flows for the period of

November 2011 – October 2012. In Case No. 2012-00520, KAWC adjusted revenues to include sales on fire service lines. Since that time, the usage on private service lines has dropped significantly, with only $12,413 of billed revenues in the base period. KAWC believes this program has helped reduce unaccounted-for water from unauthorized usage on private fire lines, and has adjusted the revenues to reflect no sales in the forecasted period.

Q. What is the Company's proposed Allowance for Funds Used During Construction ("AFUDC")?

A. The Company's proposed amount for AFUDC for present rate revenues is $665,027 and is based upon the capital spending levels and projects included in the forecasted test year.

Expense Adjustments

Q. Please describe the methodology used to determine the expense adjustments.

A. The preparation for this case began by taking the 2016 annual business plan, and making adjustments for known changes since the annual business plan was developed in June 2015. This shows that the Company's forecast in this case utilizes the same assumptions and methodologies used by management. KAWC generally prepares a detailed annual business plan for the immediate year, and a strategic business plan for the subsequent years. Because the forecasted period extends to August 2017, KAWC utilized the 2016 annual business plan and the 2017 strategic business plan information.

Q. What is included in the Purchased Water expense?

A. The Purchased Water expense includes the costs for purchasing water from other utilities in the forecasted test period. KAWC has portions of its system in both the Central Division and the Northern Division that are served through the purchase of treated water from other utilities. The amount that the Company anticipates for Purchased Water through the forecast period of August 31, 2017 is $230,255. This is less than the base year amount of $271,476, because of plans to reduce the amount of water purchased from the City of Paris. This results in an adjustment of ($41,221).

Q. Please describe the fuel and power adjustments proposed in this case.

A. These expenses are directly related to how much water is forecast to be treated and delivered (i.e., system delivery). The Company's filing includes a forecast of customer usage by customer class. From that forecasted usage, a forecasted system delivery of water is calculated by applying a projected level of non-revenue water in addition to the projected water sales. The historical level of fuel and power expense by unit of water treated is calculated for the various locations, and increased for any anticipated fuel or power rate increases. The projected per unit cost is then multiplied to projected system delivery by month to create the projected monthly power costs.

Q. What is included in the fuel and power expenses?

A. KAWC has assumed an expense of $4,011,587 in the forecasted period through August 31, 2017 for fuel and power, which is an increase of $122,463 over the base year amount of $3,889,124.

Q. Please explain the chemical expense adjustments.

A. The chemical expense includes the adjustments for costs the Company incurs in purchasing the chemicals it needs to provide safe water that is compliant with all state and federal water quality standards. Similar to the fuel and power adjustment, the chemical expense varies based on water usage, and our original business plan forecast was reviewed and adjustments were made to reflect known changes in the projected chemical expense including the differences in system delivery. The chemical expense adjustment from the base year to the forecasted year results in an adjustment of $148,890. The chemical expenses proposed in the forecasted period ending August 31, 2017 are $1,768,379.

Q. What are the waste disposal expenses projected in the forecasted period?

A. The Company incurs waste disposal costs as a result of the need to properly dispose of sludge and other by-products of the water treatment process. The proposed expenses are $377,380, which is an adjustment of $102,011 from the base year. This increase is because of a need to begin removing waste from the KRS II intake structure beginning in 2016 and continuing annually.

Q. Please explain the items in contract services.

A. Items in this category include other contract services such as snow removal, mowing, and landscaping. Also included are expenditures for lab testing, accounting, audit and legal fees. The contract services expense included in the forecast is $758,671, which is a reduction of $265,801 from the base period expenses of $1,024,472.

Q. What is included in the building maintenance and services category?

A. Items included in this category are building costs that are incurred throughout the year that are part of maintaining office facilities. Included in this category are costs for electricity, grounds keeping, heating, janitorial, security services, trash removal, water, and waste water. The Company's forecast for building maintenance and service category is $595,702, which is an increase of $66,158 over the base period due to expected increases in security costs, trash removal, janitorial expenses and grounds keeping.

Q. What is included in the category of telecommunication expense?

A. Telecommunication expense items include office telephone and cell phone charges. The forecasted expense is $250,548, which is a projected increase of $11,490 from the base period.

Q. What is the level of postage, printing and stationary expense?

A. Postage, printing and stationary expense are costs for mailings and printings not related to customer billing. The forecasted expense is $22,530.

Q. What are other supplies and services?

A. Included in this category are credit line fees, office and administrative supplies, software licenses, and uniforms. The Company's forecast for other supplies and services is $283,442, which is an increase of $42,359 from the base year period.

Q. Are there any items included in the advertising and marketing category?

A. No, there are not. Kentucky American is not seeking recovery of any advertising and marketing, therefore there are no items included in the advertising and marketing category. Thus, the Company's forecasted expense is $0.00.

Q. What items are included in the miscellaneous expenses?

A. Included in this category are various expense items that are incurred throughout the year that are part of carrying out normal business functions. Miscellaneous expenses include customer education items, community relations, company dues and memberships, directors' fees, hiring costs, injuries and damages, lab supplies, and operating expenses. The miscellaneous expense included in the forecast is $934,027, which is a reduction of $385,214 from the base period forecast of $1,319,241.

Q. What is the adjustment to rent expense proposed by KAWC?

A. Base year rent expense was $20,528. This includes rent expense for copiers, postage machines, and various real estate rental payments. This is a reduction from the previous case due to an initiative to streamline and minimize copiers and printers.

Q. What items are included in transportation expense?

A. Items included are transportation operation and maintenance and fuel costs. KAWC has undertaken an effort to eliminate vehicles with higher maintenance and operating costs, as well as eliminating less frequently driven vehicles. Beginning in 2016, American Water is undertaking an initiative to eliminate all administrative and pool vehicles, while reimbursing employee mileage at IRS authorized mileage rates. Because of KAWC's previous efforts in streamlining its vehicle fleet, we do not anticipate any additional savings to the transportation costs. KAWC's forecast for transportation expense is $428,841, which is a slight increase of $23,821 from the base period of $405,020.

Q. How was the uncollectible percentage calculated?

A. In previous cases, the uncollectible percentage was calculated by applying the 3 year average of net-charge offs to billed revenue for twelve months. However, following the conversion to the new billing software system in 2012 and the increase in the shut-off threshold from $25 to $75, KAWC experienced an increase in uncollectible percentage. KAWC has been working to reduce the uncollectible percentage, and has used a forecast percentage at a lower rate comparable to the percentage experienced in 2012.

Q. Please discuss KAWC's forecasted level of customer accounting expense.

A. KAWC's customer accounting expense includes costs for such items as postage, telephone, forms utilized for customer service and billings, uncollectible accounts and collection agencies. This is not a complete listing but it does represent most of the larger dollar items in this expense. The base year expense is $1,110,639. The forecast reflects an expense of $1,461,560 or an increase of $350,921 for customer accounting costs. This is primarily due to the inclusion of fees for credit card payments in the forecasted test year. KAWC is seeing an improved efficiency from greater e-billing and e-payment options. So while this is an increase from the base period, this forecast represents a decrease from the previous case due to initiatives for efficiencies including a reduction in bank service fees and a reduction in postage as customers are moving toward e-billing.

Q. Can you please describe the regulatory expense request in this case?

A. Yes. The Company is seeking recovery of $290,523 of regulatory expenses in this case. Regulatory expenses are estimated costs incurred for the presentation of this case, including studies and investigations. We are requesting a three-year amortization of rate case expense and cost of service study expense.

Q. Please describe the proposed expenses for Insurance Other than Group.

A. Certainly. The expense category Insurance Other than Group includes costs for general liability, workers compensation, and property insurance. In addition to expected increases between the base year and the forecasted period, the category has been adjusted to allocate some costs to sewer operations per the PSC in Case No. 2014-00390. The base year is $798,704, with an adjustment to the forecast period including the sewer allocation of $2,801 that includes an allocation of both the general liability and workers' compensation, for a forecast amount of $805,579. Insurance Other than Group is projected to be steady, with some variance due to retrospective insurance adjustments.

Q. Please explain the maintenance, supplies and services expense proposed.

A. The Company incurs maintenance costs for the general operation of the business. The proposed maintenance expense is $2,215,590, which is $53,599 more than the base year amount.

Q. What is depreciation expense?

A. Every physical asset, when it is purchased or constructed, is assigned to a utility plant account. Depreciation is the recovery, over time, of these capital expenditures. Utility Plant In Service ("UPIS") depreciation expense is driven by two factors: the remaining original cost of UPIS for each plant account, and the depreciation rates assigned to those account. Each month, depreciation is recognized for 1/12th of each account's annual depreciation rate, multiplied by each account's prior month UPIS balance.

Depreciation expense is also influenced by the amortization of Contributions in Aid of Construction ("CIAC"). These amortizations offset depreciation expense, and thus reduce both recognition and recovery of UPIS. Like depreciation, amortization of CIAC is based on two factors: the original value of CIAC for each CIAC account, and the amortization rate for those accounts.

Q. What is cost of removal ("COR") expense?

A. COR is the recognition over time, of the costs required to retire in place or remove certain UPIS infrastructure. Like depreciation expense, it is driven by two factors: the original cost of UPIS for each plant account, and the COR rates assigned to each account. COR is also calculated for CIAC assets. Because CIAC is a reduction of rate base, COR for CIAC is a reduction in the COR expense. The forecasted test year COR expense is equal to the net of $2,835,988 in COR accruals and ($419,775) in CIAC COR. The net forecasted test year amount is $2,416,213.

Q. Can you describe the forecasted test year amounts and adjustments for depreciation expense?

A. Yes. The forecasted test year depreciation expense is equal to the net of $13,912,201 in depreciation accruals and ($1,380,319) in CIAC amortization. The net forecasted test year amount is $12,531,882. As shown on KAWC's forecasted income statement, on Exhibit 37, Schedule C.1, the combined Depreciation and COR expense is $14,948,095.

Q. Were there any adjustments to depreciation expense for the forecasted test year?

A. Yes. The base year depreciation expenses are adjusted for changes associated with the Company's UPIS investments and CIAC balances, and also to reflect the new depreciation rates requested by the Company based on the new depreciation study. Mr. John Spanos has prepared the Depreciation Study for KAWC and has provided it in this filing, along with his testimony.

Q. Why did the Company do a depreciation study?

A. KAWC last did a full depreciation study in 2010. Given the significant additions to rate base and PSC direction that a depreciation study should be completed every five years, KAWC retained Gannett Fleming to complete a comprehensive depreciation study. Additionally, in 2014 KAWC undertook a comprehensive effort to verify that all assets on the books are actually in-service, used and useful. KAWC determined that a number of recorded assets which had exceeded their service lives had actually been removed from service but not appropriately retired from the books. In late 2014, these assets were fully retired from the books, which resulted in both a reduction of depreciation expense and rate base. This adjustment was then fully captured in the depreciation study and the rate base and depreciation expense throughout both the base period and the forecasted period.

Q. Please discuss the Company's amortization expense adjustment.

A. Amortization expense is the recovery of expenses over a set period of time. Forecasted test year amortization expense is $227,127.

Q. Please explain the Company's forecasted level of income taxes.

A. The Company's filing is based on a calculation of current federal and state income taxes at the statutory income tax rates of 35% and 6%, respectively. The 6% state income tax rate was effective January 1, 2007. The Company has forecasted a level of income taxes for the forecasted test year in the amount of $7,647,970 at current rates. The current provision for federal and state income taxes of $6,483,459 and $1,164,511 is shown on Schedules E-1.3 and E-1.4, respectively, to Exhibit 37. Deferred federal and state income taxes of $1,504,246 and $23,717 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. 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 and that method 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. 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 October 2015, 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. 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. Petry's testimony for a discussion of payroll taxes. Overall, General Tax in the forecasted test year is $6,219,184, which is a reduction from the base year tax of $290,978.

Q. What adjustments have been made to the property tax expense?

A. Property taxes for the base year were $5,267,665. 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, 2014 tax year information was used. These are bills paid in 2015 for the tax year of 2014. First, measured 2014 property was established by totaling the 12/31/2014 balances for the following: UPIS of $634,757,122, Construction Work in Progress ("CWIP") of $9,512,998, and Materials & Supplies ("M&S") of $949,561. This yields total property of $645,219,681. This was compared to the 2015 year property tax amounts. All counties and the State of Kentucky have established their 2015 assessments. 2015 property tax is calculated to be $5,213,123. When compared against the 12/31/2014 property, a baseline tax rate of 0.8080% is indicated. This baseline tax rate is then applied to the 2015 and 2016 forecasted UPIS, CWIP and M&S balance. Property tax accruals by month are applicable to the four month period of September 2016 – December 2016 for the UPIS, CWIP, and

M&S as of 12/31/2015, which totals $666,414,463. The 2016 rate is applied to that balance and spread evenly over the eight month period. Property tax accruals by month are applicable to the eight month period of January 2017 – August 2017 for the UPIS, CWIP, and M&S of as of 12/31/2016 of $687,080,553. The sum of each property tax accrual is added together to the forecasted test period property tax expense of $5,440,027. This is an increase of $226,904 over the base period.

Q. What is the regulatory assessment fee in this case?

A. This component of General Taxes is the PSC Fee, which is also referred to the Gross Receipts Tax. The Company has forecasted its PSC Fee for the forecasted test period by arriving at an average PSC fee rate of .1901%. By applying this PSC Fee rate to the total forecasted revenues, less AFUDC, the Company's forecasted level of PSC Fee is $167,669 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. Petry's testimony, and an adjustment of $9,691 for Taxes and Licenses. Finally, there is an adjustment in Other Taxes to remove a sales tax payment from 2009-2012 sales tax audit.

<u>Rate Base</u>

Q. What is Rate Base?

A. Rate Base is the net value of all of the used and useful facilities and property of KAWC. In large part, this represents the costs that KAWC has had to incur to provide facilities to withdraw, treat, and deliver potable water. It is funded partially through investment by shareholders and partially from borrowing money. The cost of all construction is assigned to an account of UPIS, which is the fundamental basis of Rate Base. Additions and deductions from that account occur regularly. Additions include construction costs ongoing at the time of the rate case, materials and supplies, deferred maintenance, deferred debits and working capital. Deductions include accumulated depreciation, deferred taxes, customers' advances, facilities paid for by others, and other rate base elements. The details of these are described below. Establishing the level of Rate Base is important because this measurement determines the amount of investment on which the company may earn a return.

Q. Has the Company changed the methodology in calculating the requested Rate Base from the approach advocated in its last case?

A. No. The Company utilized a thirteen month average rate base calculation for most of the items shown on Schedule B-1. Many of the rate base elements shown on this schedule, including UPIS, accumulated depreciation, customer advances, etc. were analyzed from actual per books data as of October 31, 2015. Using data and projections for each of the rate base elements, the Company developed a 13-month average for the forecasted test period ending August 31, 2017. Shown on Schedule B-1, page 1 of 2 is the rate base for the base year totaling $399,653,506. On Schedule B-1, page 2 of 2, the Company has further reflected its requested rate base for the forecasted year of $403,866,142.

Q. Please describe the UPIS component that is included in the Rate Base.

A. UPIS includes the original cost of all land, land rights, easements, structures and improvements, together with equipment in service at October 31, 2015. The Utility Plant balance was calculated through August 31, 2017, by adding net additions and retirements through the end of the forecasted test period. The 13 month average of the Utility Plant balances from July 1, 2016 through August 31, 2017 was calculated to arrive at the utility plant balance for the forecasted test period. The monthly in-service additions and monthly retirements which support these balances have been calculated by project and/or account. The total UPIS in the forecasted year is $679,624,591. These additions and retirements are addressed in greater detail in Mr. Brent O'Neill's testimony.

Q. Please describe the CWIP included in Rate Base.

A. Certainly. This amount, shown in Schedule B-4, is the April 2016 balance adjusted for construction expenditures and transfers to utility plant that occur through the forecasted test year. This is calculated by taking the actual balance as of October 2015 and adjusting through the end of the base period for construction expenditures and transfers to utility plant. The 13-month average CWIP is determined by totaling the monthly balances for July 1, 2016 to August 31, 2017 and dividing by 13 months. The CWIP balance in the forecasted test year as reflected on Schedule B-1, page 2 of 2, is $9,193,558.

Q. What is working capital as a Rate Base adjustment?

A. Working capital is 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 calculation can also properly reflect the impact of the delay in receiving revenues from customers and the disbursement of cash for expenses.

Q. What level of working capital did the company include in its requested Rate Base?

A. The Company is requesting working capital of $5,208,000. This amount was determined in a manner consistent with working capital in the previous case, and is reflected on Schedule B-5. The change is based on the increase in Total Operating Funds and an increase in the net interval between Date Service Furnished and the Date Expenses are incurred from the Lead/Lag Study. Materials and Supplies are calculated based on an average of the thirteen month ending balance for the forecasted test year ending August 31, 2017 at $813,037.

Q. Is KAWC utilizing a Lead/Lag Study in this case?

A. Yes. The Company is utilizing a Lead/Lag Study that was performed based on historical data for the twelve months ending April 30, 2015. The Lead/Lag Study will be discussed below.

Q. How was the level of Lead/Lag working cash requirement determined?

A. 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 Lag Days. These Net Lag Days are divided by 365 (number of days per year) to arrive at the Lead/Lag Factor. This Lead/Lag Factor is then multiplied by the annual amount of forecasted test year expenses per expense category.

Q. Has KAWC changed its methodology on calculating its Lead/Lag working case requirement in this case?

A. No. This Lead/Lag Study used the same methodology as approved in the prior case.

Q. What is the level of accumulated depreciation in this case?

A. The accumulated depreciation balance begins with the actual balance as of October 31, 2015. This base year balance excludes the accumulated depreciation of the AFUDC regulatory asset, and is reduced by the accumulated cost of removal. Accumulated depreciation and accumulated cost of removal was then calculated through the end of the forecasted test period utilizing current depreciation rates from the 2015 Depreciation Study submitted in this case.

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 by month.

The forecasted test year accumulated depreciation was then calculated by averaging the month end accumulated depreciation balances from July 31, 2016 to August 31, 2017. Depreciation is calculated at $152,076,279.

Q. Were there any depreciation rates that varied from the 2010 Depreciation Study?

A. Yes. As reflected in Mr. Spanos' study attached to his testimony, many of the depreciation rates have changed as proposed in this case.

Q. What level of accumulated deferred income tax did the Company deduct from rate base?

A. The Company deducted $78,268,967 of accumulated deferred income taxes in arriving at its rate base requested in this case. The calculation of the Deferred Income Tax is discussed above.

Q. What are the other components of Rate Base?

A. <u>Customer Advances</u>

Customer Advances are a reduction to rate base to recognize money collected for new mains that are held in an account and refunded to the original customer as new customers tap onto a main. This allows KAWC to avoid the risk of investing in speculative developments by having a developer pay the initial investment upfront. But then it recognizes the benefit of the investment based on a new customer by refunding a portion of the amount by contract for each bona fide new customer KAWC receives. The forecasted test year customer advances balance is based on an average of the thirteen-month end balances from July 2016, through August 2017. The balance is $14,060,794.

Contribution in Aid of Construction

This item is a reduction in rate base that recognizes the value of mains, meters, services or hydrants that are paid for by a third party and thus are not an investment by KAWC, but fully owned and maintained by the Company. An example would be a portion of main paid for by a developer that is not eligible for refunds under the contract, or 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.

The Company's forecasted CIAC balance includes the impact of the Company's proposed revision to the tap fee tariff. The revised tap fee tariff is found under Exhibit 2 of the Company's filing. The revised tap fee tariff indicates the Company will collect from homebuilders or developers $1,280 for residential service with a 5/8" meter, $2,201 for 1" service, and $4,238 for 2" service. The tap fee for services over 2" is based on the actual cost of installation. The calculation of the proposed revision to the tap fee tariff is discussed in Mr. O'Neill's testimony.

CIAC balances are calculated by adjusting the prior months' account balances for activity related to contributions received, and CIAC amortizations. The forecasted test year CIAC balance is then is calculated as an average of the thirteen month end balance for the forecasted test year ending August 31, 2017. The balance is $58,556,435.

Unamortized Investment Tax Credit

This item is calculated as an average of the thirteen month end balance of unamortized investment tax credit at the end of the forecasted test year August 31, 2017. This calculation is similar to previous rate cases. The amount in the forecasted test year is $31,363.

Deferred Maintenance

This item is calculated as an average of the thirteen month balance of deferred maintenance projects based upon both actual projects deferred and projects forecasted to be deferred. 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 six new tank paintings while other items have completed amortizations. These types of deferred maintenance expenses have been afforded rate base treatment by the Commission in past proceedings. Because it has been almost 37 months since the last rate filing, there are significant additions to the deferred maintenance for necessary and scheduled tank maintenance. Based upon these actual expenditures and the forecasted expenditures for 2016 through August 2017, as adjusted for amortizations, the Company has developed a 13-month average of these deferred maintenance items totaling $9,539,974.

Deferred Debits

The Company is requesting a rate base addition of $1,360,408 for deferred debit items. These amounts are offset by their applicable deferred taxes. The Company developed its 13-month average addition to rate base for items deferred and recognized in prior cases decided by the Commission.

Other Rate Base Elements

In Case No. 2004-00103, the Commission reduced rate base for Contract Retentions, Unclaimed Extension Deposit Refunds, Retirement Work in Progress, Deferred Compensation and Accrued Pension. The Company has calculated a rate base increase of $1,120,412 for these items consistent with the Commission's Order in Case No. 2004-00103.

DEMAND-SIDE WATER EFFICIENCY TRENDS

Q. Has KAWC moved away from the declining usage analysis that was utilized in the previous rate case?

A. Yes. As I discussed previously in my testimony, based on the Final Order in Case No. 2012-00520, KAWC has returned to the weather normalized projections by Dr. Edward Spitznagel that had been reviewed and accepted in prior rate cases. A significant and continuing trend of demand-side water efficiency by customers has been experienced by KAWC, and this is reflected in the weather normalization analysis.

Q. What are the causes of the demand-side water efficiency trend?

A. The pattern of demand-side water efficiency is attributed to several key factors, including but not limited to: increasing prevalence of low flow (water efficient) plumbing fixtures within residential households and commercial establishments, conservation ethic of the customers, conservation programs implemented by the Company and other entities, and price elasticity. The phenomenon of demand-side water efficiency has been a part of KAWC's demand model for years and was specifically a part of the demand modeling that was the basis for the projections that proved the necessity of KAWC's Kentucky River Station II project that was approved by the Commission in Case No. 2007-00134.

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, with newer and more efficient models coming out continuously. Similarly, appliances such as dishwashers and washing machines are also more water efficient, as well as energy efficient. Very simply, when a customer replaces an older toilet, washing machine, or dishwasher, the new unit will use less water than the one it replaced. New homes will have water efficient fixtures. Similarly, if a customer remodels an older kitchen, bathroom or laundry room, he or she will use less water in the future.

Q. Would you please elaborate on other factors driving demand-side water efficiency in residential, commercial and Other Public Authority water consumption?

A. Certainly. Customer awareness and interest in the benefits of conserving water and energy continue to increase. As awareness of water and energy efficiency increases, customers may decide to replace a fixture or appliance even before it has broken. Or when an appliance is being replaced, customers may opt for appliances that are even more efficient but higher priced. Also, customers may further reduce consumption by changing their household water use habits in other various ways. In addition, there is some elasticity to price that is contributing to demand-side water efficiency as water or sewer rates increase.

Q. Is this trend happening across the industry beyond KAWC?

A. Yes. According to the 2010 Water Research Foundation ("WRF") report, "many water utilities across the United States and elsewhere are experiencing declining water sales among households."[5] (WRF Report, p. 1) The report further states: "A pervasive decline in household consumption has been determined at the national and regional levels." (WRF Report, p. xxviii).

Q. Do you expect the demand-side water efficiency trend to continue in the future?

A. Yes. It is clear that water efficient fixtures and conservation actions by utilities and customers will continue to drive further efficiency into usage per customer. In fact, the trend could accelerate. According to the 2010 American Housing Survey, 75% of homes in the Lexington-Fayette urban county area were built prior to 1994.[6] These homes were constructed with toilets, washing machines, and dishwashers that are more water-intensive than newer fixtures and appliances now on the market. As discussed, a new toilet will use 1.6 (or 1.28) gallons per flush, compared to 3.5 to 7.0 gallons per flush for a pre-1994 toilet. As turnover of household fixtures and appliances continues to occur over time, residential, commercial and OPA usage per customer will continue to decline accordingly.

The regulations mandating washing machines and dishwashers that are more energy and water efficient are relatively new. Given the life expectancy of appliances, it is likely that the replacement of existing appliances, and the corresponding reduction in water used, will continue to occur over time for the next fifteen years or more.

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[5] Coomes, Paul et al., North America Residential Water Usage trends since 1992 – Project # 4031. (Water Research Foundation, 2010). (Hereinafter referred to as the "WRF Report").

[6] U.S. Census Bureau, 2010 American Community Survey 5-Year Estimates, http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_10_5YR_DP04&prodType=table

Q. Are there benefits from demand-side water efficiency by residential, commercial and OPA customers?

A. Yes. There are environmental and operational benefits from demand-side water efficiency by residential, commercial and OPA customers. Reduced usage helps maintain source water supplies or may prolong the periods between the needs for capacity and source water expansions due to growth. Reductions in the growth of power consumption, chemical usage, and waste disposal not only reduce water utility operating costs but also provide environmental benefits such as overall reduced carbon footprint and waste streams. Furthermore, demand-side water efficiency also reduces energy consumption within the customer's property, for instance, through lower hot water heating needs.

Q. What is the importance of understanding the impact of demand-side water efficiency trends along with weather impacts in utility forecasting?

A. There are two main reasons that understanding these trends is critical. First, it is important that KAWC find the right balance of rate design that encourages responsible demand-side water efficiency yet still provides financial stability for the Company to make the necessary infrastructure investments. The second reason is that understanding those water usage trends is a critical component of infrastructure planning, not just for treatment capacity but also in the distribution system.

Q. Has KAWC factored this ongoing demand-side water efficiency into its demand modeling and water supply and treatment plant capacity planning?

A. Yes. As mentioned above, the phenomenon of demand-side water efficiency has been a part of KAWC's demand model for over 20 years and the model specifically incorporates the effects of demand-side water efficiency and price elasticity. In Case No. 93-434, the Commission found that "Kentucky-American has used reputable sources for data and nationally accepted methodologies in developing its demand projections. Over the years, KAWC has made numerous revisions to its methodology for projecting water demand resulting in a state of the art, dynamic process."[7] The output of the demand model has formed the basis for KAWC's source of supply and capacity planning for years, and is consistent with the water efficiency trend I have described here. It is important to recognize that capacity planning also considers peak day capacity, and supply constraints such as safe yield in a drought and passing flow requirements. Further, capacity planning is based on 20-30 year forecasts and construction plans, not short-term windows of demand that may be significantly yet temporarily impacted by weather or economic factors.

Q. Do the demand-side water efficiency trends you have described have any effect on the need for KRS II?

A. Absolutely not. As discussed above, the phenomenon of demand-side water efficiency was a part of the demand modeling and was fully considered in the calculations that proved the necessity of KRS II. That modeling included all of the factors that are related to demand-side water efficiency, including price elasticity, in its demand forecast model. As demonstrated as recently as the summer of 2012 when KAWC utilized 72.8% of its water treatment capacity, including KRS II, the plant was and is necessary for KAWC to meet the reasonable demands of its customers. In short, during the five years that the KRS II plant has been in service, Central Kentucky has experienced fairly normal or cool,

[7] PSC Order, Case No. 93-434, March 14, 1995, pp.4-5.

wet weather patterns. Coupled with the demand-side water efficiency trends that KAWC had factored into its demand forecasting, the critical need for that facility has not diminished.

QIP

Q. Please explain why KAWC is proposing the adoption of a QIP, which is a tariff rate adjustment mechanism for the replacement of aging infrastructure.

A. As is true with many water service providers in Kentucky and nationwide, KAWC has infrastructure nearing the end of its useful life expectancy that must be replaced. The Company recognizes that, given the current age and condition of its distribution infrastructure and current performance related factors, the historical annual improvement rate of 0.2% would only result in a higher level of service failures and magnifies the future costs to remediate the distribution system. This is addressed in the direct testimonies of Mr. O'Neill and Mr. Rogers. Ideally, KAWC's spending level for infrastructure replacements and rehabilitation should be adequate to keep pace with the anticipated remaining useful life of the distribution system infrastructure.

The cost of infrastructure replacement, however, is substantial. If KAWC must not only advance the cost of the investment, which has increased significantly over the years, but also has to bear the burden of the associated carrying costs of depreciation and interest while awaiting base rate case increases to recover these necessary costs, it simply will not have the opportunity to achieve the rate of return set by the PSC in base rate cases. This need for increased capital spending without earning a return on that investment between rate cases places at risk our ability to adequately and efficiently attract capital necessary to support more consistent planning and efficient deployment of resources. The extent to which KAWC can reduce regulatory lag for infrastructure replacement costs by recovering those costs outside a general rate case will help to defer the need for a new rate filing. In such cases, KAWC can stretch its investment on behalf of the ratepayer with the same impact on rates and all stakeholders benefit.

KAWC is proposing the QIP to enable KAWC to implement a more systematic main replacement program for pipe in the distribution system that has proven to be most susceptible to breaks and leaks. As Mr. Rogers explains in his testimony, the accelerated systematic replacement cycle QIP supports will be more cost effective for customers because replacing these mains will reduce the high cost of unscheduled 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. The best way to ensure that the appropriate levels of expenditures and capital investment are consistently funded is through predictable and timely rate recovery. The timely cost recovery of these expenditures in turn allows for increased and continued levels of capital infusion. This results in a stronger and more reliable water system for both current and future customers. In addition, the QIP mechanism will ensure smaller, more gradual increases to customers' bills as the on-going plant investment costs are incurred gradually as the investment is made, rather than the larger rate increases associated with base rate cases where the Company's plant investments are recognized in a in single, lump sum basis.

Q. Did KAWC file for a similar mechanism in Case No. 2012-00520, its most recent rate case?

A. Yes, KAWC requested approval of a Distribution System Improvement Charge, or "DSIC," in Case No. 2012-00520. The PSC denied the DSIC in its Final Order in Case No. 2012-00520.

Q. What has changed since KAWC requested the DSIC in Case No. 2012-00520?

A. Mr. O'Neill describes in his testimony that KAWC recently completed a multiple method comprehensive assessment of its water distribution system. He shows that KAWC has a multi-decade-long ongoing need to replace its aging infrastructure, and the rate at which existing infrastructure is reaching its useful life continues to increase at a quicker pace than the work to replace the outdated mains occurs. Expecting the distribution system infrastructure to continue to provide service long beyond its anticipated useful life generally results in higher levels of service failures and disruptions to customers. KAWC has developed a detailed main replacement program that prioritizes distribution system improvement projects as part of the Company's overall capital program. This program is based on past performance and a qualitative assessment of the value of the improvements in terms of water quality, flow capacity, and service reliability with consideration given to the potential for coordination with street paving work. Consequently, KAWC believes that the case for an infrastructure surcharge program such as a DSIC or a QIP is even more compelling than it was in the last case.

Q. Can you point to additional evidence about how other public utility commissions view infrastructure replacement surcharge mechanisms?

A. Yes, I can. At its November 2013 annual meeting, the National Association of Regulatory Utility Commissioners ("NARUC") adopted a resolution that supports infrastructure replacement surcharge mechanisms for water and wastewater utilities. The NARUC resolution states, in part:

> **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,** 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, … 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[8]

NARUC's 2013 and 2005 resolutions (*see* Exhibit LCB-1 for the full text of the 2013 resolution) consider an infrastructure surcharge mechanism such as the QIP a "best practice" for water and wastewater utilities "to help ensure sustainable practices in promoting needed capital investment and cost-effective rates."[9] Both NARUC resolutions expressly encourage commissions to adopt an infrastructure surcharge mechanism as a means to provide regulatory incentives to needed capital investment in infrastructure replacement.

Q. You indicated that infrastructure replacement surcharge mechanisms are being used in more states. What other states have adopted tariff riders similar to KAWC's proposed QIP?

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[8] *Resolution Endorsing Consideration of Alternative Regulation that Supports Capital Investment in the 21st Century for Water and Wastewater Utilities* **-** Sponsored by the Committee on Water, Adopted by the NARUC Committee of the Whole November 20, 2013 *and Resolution Supporting Consideration of Regulatory Policies Deemed as "Best Practices"***-** Sponsored by the Committee on Water, Adopted by the NARUC Board of Directors July 27, 2005.

[9] *Id.*

A. Pennsylvania, Indiana, Illinois, Missouri, Ohio, Delaware, Connecticut, New Jersey, Tennessee, New Hampshire, Maine, North Carolina, Nevada, Arizona, and Texas have adopted similar programs. Although the mechanisms employed in these other states may go by a different name, (e.g. the Illinois rider is referred to as Qualified Infrastructure Plant ("QIP"), the Indiana rider is referred to as Distribution System Improvement Charge ("DSIC"), and the Missouri rider is referred to as Infrastructure System Replacement Surcharge ("ISRS")), they are similarly defined and share the same objectives.

Q. How can KAWC's proposed QIP benefit customers?

A. Infrastructure replacement cost recovery mechanisms have become prevalent in the water utility industry around the United States. These programs provide a mechanism to a utility to accelerate investment in its infrastructure replacement program by providing for cost recovery for replacement of system components between general rate filings. The value of accelerated infrastructure replacement is substantial, benefiting customers today and well into the future with improved water quality, increased water pressure, and fewer main breaks and service interruptions. Mr. O'Neill explains that the Company is currently replacing its distribution system infrastructure on an approximately 500 year cycle. This replacement rate is not optimal when the useful lives of the equipment are a fraction of that, and our goal is to reduce that rate of replacement to a more cost effective rate of replacement over time. The Commission's approval of the infrastructure cost recovery mechanism proposed by KAWC in this case will provide the Company with the resources to accelerate its replacement of infrastructure to a more cost effective rate.

Q. What are some of the other benefits of KAWC's proposed QIP?

A. In addition to less loss of a precious resource - water - from a reduction in water leakage attributable to deteriorating and failing infrastructure, there is a cost savings from lower power and chemical costs related to the treatment and delivery of less water. Because water and electricity production are so related and dependent upon one another, less water leakage means less energy production needed, and, as such, less of a carbon footprint on the United States and the world. Furthermore, over time, we would expect to see lower O&M expense related to main break repairs as aging lines are replaced on a systematic basis. And finally, increased spend in needed infrastructure investments results in economic development results for the Lexington area and for the Commonwealth of Kentucky as well. I will discuss each of these items further below.

Q. You mentioned above there are cost savings resulting from an accelerated infrastructure replacement program. Can you elaborate on this?

A. Yes, I can. There are cost savings resulting from a reduction in water leakage attributable to deteriorating and failing infrastructure from treatment costs and power costs, in addition to less of a loss of a precious resource - water. In addition, replacing aged infrastructure on an accelerated, and proactive rather than reactive, basis will achieve direct customer benefits in the form of improved and sustained water quality, increased pressure, improved fire protection, fewer service disruptions and lower operating and maintenance costs over time. Capital cost savings may also be achieved through increased coordination and sharing of paving costs with the Kentucky Transportation Cabinet ("KTC"), local government, and other utilities. The Lexington-Fayette Urban County Government ("LFUCG") is in the midst of a widespread sewer and storm water infrastructure upgrade program that will likely continue for years, and will involve replacing or installing mains in areas that KAWC may also have aging infrastructure. There is further opportunity for cost efficiencies through becoming a partner with the LFUCG on projects; however, KAWC recognizes that the LFUCG program cannot be delayed or hindered in any way due to the LFUCG regulatory deadlines. Permitting the Company to coordinate replacements with the LFUCG and recovering the attendant costs through a QIP will pay dividends in the future through realizing a more modern system at a lower cost than if the Company pursued a main replacement project on its own.

Q. You also contended that because water and electricity production are so related and dependent upon one another, less water leakage means less energy production needed, and, as such, less of a carbon footprint on the united states and the world. Can you elaborate on this?

A. Yes, I can. Energy consumption by public drinking water represents a substantial cost for both public and private water systems. In this filing, purchased power costs at present rates for KAWC represent 11.7% of total O&M costs. Aging and leaking infrastructure results in energy waste. Although KAWC's non-revenue water rate is not excessively high as in some other communities and is thus not a driver of the program, reducing the costs of leakage is still a reduction of energy waste. It is estimated that every two minutes a significant water line ruptures somewhere in the United States, leading to trillions of gallons of water wasted annually. This indirectly translates to energy waste from additional required treatment and pumping. The situation can be addressed through advanced leak monitoring, advanced pressure management, and accelerated replacement of buried infrastructure. Thus, less leakage relates to energy savings and less of a carbon footprint on the United States and the world.

Q. In Case No. 2012-00520, the PSC expressed concern that the estimated impact of the accelerated replacement of the mains was overstated because KAWC had been filing for general rate increases every two years. Please address that issue.

A. As I mentioned above, I am confident that, all thing remaining equal, a QIP would increase the time between general rate case filings. One recent example is in Tennessee. New legislation in 2013 clarified existing powers of the Tennessee Regulatory Commission ("TRA") by setting forth various investment and expense riders available to utilities. One of the purposes of this legislation was to allow the implementation of various alternative regulatory methods to allow for public utility rate reviews and cost recovery in lieu of a general rate case proceeding before the authority, thus saving consumers utilities, and regulators time and money.

TAWC received its last general rate case order from the Tennessee Regulatory Authority in October 2012. Prior to that time, TAWC was filing for general rate increases, on average, every 18 months to two years. TAWC filed its first alternative regulatory method filing in October of 2013 which was approved in April of 2014. Since the alternative regulatory riders have been put in place in Tennessee, TAWC has not filed for a general rate increase, which has reduced regulatory expense to its customers.

Q. What is your conclusion as to whether or not a QIP in Kentucky would increase the time between rate case filings in Kentucky?

A. Again, as I said, all things being equal, I am confident that the QIP would allow KAWC to increase the time between general rate case filings. Obviously, there would be required infrastructure improvements that would not be covered under the QIP, and the magnitude and/or timing of those improvements and expenses will affect the amount of time between general rate case filings. However, a QIP would increase the time between general rate case filings for KAWC. An increase in time between general rate case filings results in less regulatory expense and time for all parties involved – regulators, intervenors, as well as KAWC and its customers. This would definitely be a win-win for all parties concerned.

Q. Would KAWC's proposed QIP support economic development for the Lexington area and for the commonwealth of Kentucky?

A. Yes, it would. There are many studies that show that increased spending on infrastructure investments produces positive economic development results. In a study released in 2012 on the economic impact of under-investing in our water and wastewater infrastructure, the American Society of Civil Engineers estimated that remaining on the current track will cost American businesses $734 billion in sales between now and 2020, and cumulative loss to our gross domestic product ("GDP") will be $416 billion, directly due to deteriorating water infrastructure. A modest increase in investment would prevent 700,000 job losses and avoid personal income losses of $541 billion.[10] Additionally, according to the U.S. Conference of Mayors, every dollar invested in water infrastructure adds $6.35 to the national economy.[11]

Additional studies show further economic benefit in infrastructure investment. According to a 2008 study undertaken by the Clean Water Council, between 16 and 27

[10] American Society of Civil Engineers, *"Failure to Act – The Impact of Current Infrastructure Investment on America's Economic Future"*, accessed November 2015, https://www.asce.org/uploadedFiles/Issues_and_Advocacy/Our_Initiatives/Infrastructure/Content_Pieces/failure-to-act-economic-impact-summary-report.pdf

[11] 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

jobs are created for every $1 million spent on water and wastewater infrastructure.[12] The jobs created are not just in the construction industry, but also jobs in supporting fields such as architecture, engineering, industrial machinery, and truck transport. Recent United States Environmental Protection Agency surveys tallied a 20-year need of over $650 billion for needed water and sewer infrastructure improvement projects. 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.[13]

All of the above cited statistics would hold true for infrastructure investment in the Lexington area and the Commonwealth of Kentucky. KAWC has an obligation to provide safe, adequate and reliable service, and the quality of the service it provides is dependent, in part, upon the ongoing replacement of this aging infrastructure. Not only would the increase in needed infrastructure investment in KAWC infrastructure maintain and improve service reliability, it would benefit the local economy as well. An effective QIP would benefit the Commonwealth of Kentucky, the City of Lexington, and the surrounding communities through an increase in jobs brought about by the increased investment in infrastructure provided for by a 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. 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.

[12] Clean Water Council, "*Sudden Impact: An Assessment of Short Term Economic Impacts of Water and Wastewater Construction Projects in the United States*," 2008.

[13] U.S. Department of Education, National Center for Education Statistics. Accessed November 2015, http://nces.ed.gov/fastfacts/display.asp?id=372

Q. Please describe the categories of utility plant that would qualify for inclusion in the Company's proposed QIP.

A. The specific utility plant categories proposed for inclusion in the QIP are: (1) Account 331, Transmission and Distribution Mains, including valves; (2) Account 333, Services; (3) Account 334, Meters and Meter Installations; (4) Account 335, Hydrants; and (5) Account 311, Pumping Equipment. There may be other appropriate utility plants related to qualified infrastructure replacement that could be considered for inclusion in the future; however, these are the primary accounts at this time. 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. Please discuss the general operation of the proposed QIP mechanism.

A. The QIP mechanism is a regulatory tool to provide for the recovery of the costs of capital, depreciation, and property tax (return on and return of) associated with qualified infrastructure investment between base rate case filings. The QIP will apply only to qualified, non-revenue producing plant investment that has not been included in rate base in a prior base rate case proceeding. The QIP would be established on an annual prospective basis utilizing 13 month average end-of-month balances and would reflect only those qualified plant additions installed after the conclusion of the initial rate year after the PSC's final order in this case. The qualified plant additions would be reduced by the projected retirements associated with the QIP additions in the calculation of applicable depreciation and property tax expense.

The Company would make its annual QIP filing establishing the applicable QIP not later than 90 days prior to the effective date of each QIP implementation.[14] The Company's proposed QIP also includes an annual Reconciliation filing made not later 60 days after the conclusion of each QIP year. That filing would include a detailed listing of each qualifying QIP project completed and placed in service to the Company's customers during the immediately preceding QIP year. The Company would then calculate the applicable QIP revenue requirement based on the QIP formula utilizing the actual completed qualifying QIP projects. The Commission would review all aspects of the Reconciliation filing including verification that the included projects are QIP qualifying and the prudence of the projects. Based on its review, the Commission would make any necessary adjustments to the Company calculated revenue requirement.

The final revenue requirement as determined by the Commission will be compared to the actual QIP revenues collected under the QIP rider in effect for the preceding QIP year. Any over or under recovery of QIP revenue represents the "R" factor in the QIP formula and is included in the calculation of the next adjustment to the QIP. Ultimately therefore, the QIP reflects only actual projects completed and placed in service. The QIP would be cumulative and remain in place until reset at zero at the conclusion of the Company's next Base Rate case filing, at which point the capital costs, property tax, and depreciation previously recovered through the QIP are then subsumed within Base Rates.

Q. Please explain specifically how the QIP will function.

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[14] For illustrative purposes, assuming the Commission were to issue its Order in this Base Rate case proceeding with Base Rates effective 11/15/2016, with such rates inclusive of utility plant additions based on 13 month average month-end balances for the forecasted test period 9/1/2016 to 8/31/2017, then the first prospective QIP year would be 9/1/2017 – 8/31/2018, with the QIP filing not later than 6/1/2017 for rates implementation on 9/1/2017.

A. KAWC will utilize an annual prospective approach to the utility plant additions that would be included for recovery through the QIP. The QIP will provide for the recovery of revenue sufficient to cover the capital cost related to: the average forecasted investment in qualified utility plant for the QIP year, net of the associated accumulated depreciation, including related retirements, ("NetQIP"); and associated depreciation and property tax expense. The average forecasted investment in QIP plant for the period, net of depreciation, would be computed by using an average of 13 end-of-month balances. The current PSC-approved pre-tax rate of return ("PTROR") would then be applied to this net amount to determine the revenue requirement of the rate base portion to which the related depreciation expense ("NetDep"), utilizing the current PSC-approved depreciation rates by account, would be added. Next, incremental new property taxes ("PT") would be added. Then, any over or under QIP collection of prior periods would be added or subtracted as applicable ("R").

The sum of these components would be grossed-up to include the recovery of the associated additional revenue taxes (the PSC Assessment) and Uncollectible expense ("RT") to derive the final revenue requirement. This total would then be divided by the projected annual level of general metered service and private fire service customer revenues subject to the QIP, i.e. not including any other revenues, ("PAR") to render the new QIP percentage. Prior to the implementation of the next year's QIP, a similar analysis and approval process will occur and the QIP will be adjusted accordingly on a cumulative basis until Base Rates are established in a Base Rate case and the QIP is reset to zero.

Q. **Can the above described QIP mechanism be shown as a formula?**

A. Yes, the calculation of the QIP would be as follows:

$$\text{QIP \%} = \frac{[\{(\text{NetQIP x PTROR}) + \text{NetDep} + \text{PT} + \text{R}\} / 1 - \text{RT}]}{\text{PAR}}$$

where:

(i) NetQIP: average forecasted cost of the investment in QIP plant (QIP additions net of associated QIP retirements) for the QIP year less forecasted accumulated depreciation on the QIP plant for the QIP year. The average forecasted cost of QIP plant, net of depreciation, shall be computed by using an average of 13 end-of-month balances of QIP plant and accumulated depreciation for the annual prospective QIP year.

(ii) PTROR: current PSC-approved pre-tax rate of return from most recent Base Rate case Order.

(iii) NetDep: net annual depreciation expense related to the average forecasted QIP additions, net of retirements, per application of current PSC-approved depreciation rates by account.

(iv) PT: property taxes

(v) R: reconciliation component related to over/under recovery of QIP costs during the prior QIP year.

(vi) RT: sum of revenue taxes % (PSC Assessment) and uncollectible expense %, expressed as a decimal.

(vii) PAR: projected annual base revenue subject to QIP.

Q. How will the QIP revenue be recovered?

A. The QIP would be expressed as a percentage and would be applied to the total amount billed to each customer under the otherwise applicable rates and charges for basic service, metered usage charges, and private fire charges, and would be applied prior to the inclusion of any other surcharge. The QIP would be reflected as a line item on the bill of each customer.

Q. What will happen to the QIP upon approval of new rates in a rate case proceeding?

A. The QIP will be reset to zero as of the effective date of the new base rates, which base rates then provide for the recovery of the annual costs that had theretofore been recovered through the QIP. Thereafter, only the new QIP qualified plant additions not previously included in rate base and base rates will be reflected in the future QIP filings.

Q. What cost of capital will be utilized in the QIP formula?

A. The cost of capital will be the approved overall rate of return (on a pre-tax basis) established by the PSC in the Company's most recent rate case.

Q. What depreciation rates will be used to determine the depreciation expense to be recovered by the QIP?

A. The depreciation rates last approved by the PSC, for the respective plant accounts in which the specific items of qualified QIP plant are recorded, would be used to determine the depreciation expense.

Q. Could the amount of QIP revenue collected from KAWC's customers vary from the actual amount of revenue needed to cover a return of and a return on the Company's QIP infrastructure investment and taxes?

A. Yes. This could occur as a result of a difference between the actual and the allowed water operating revenues upon which the QIP is based.

Q. Does the QIP include a reconciliation mechanism for the protection of the Company's customers in the event that the level of revenue varies from the actual costs?

A. Yes. As discussed earlier, the QIP will be subject to an annual reconciliation whereby the revenue received under the QIP for the reconciliation period will be compared to the revenue necessary for the Company to recover its return of and return on investment plus taxes, for that QIP year. Any over or under recovery will be included in the calculation of the next adjustment to the QIP.

Q. Has KAWC proposed a specific forecasted QIP amount for approval in this case?

A. No, we have not. The amount of the QIP, which would be applied at the end of the forecasted test year, would be approved in a separate filing prior to the initiation of the QIP, and adjusted annually. All parties would have the opportunity to review and ask questions regarding the capital expenditures at that time. KAWC would then anticipate a reconciliation of actual capital expenditures to the forecasted capital expenditures occur in a separate filing after the completion of the QIP review period.

Q. Has KAWC filed a tariff rider addressing the proposed QIP as a part of this proceeding?

A. Yes. A QIP tariff rider has been included in the tariffs filed.

Tariffs

Q. Other than the changes to metered tariffs, what new tariffs or adjustments to existing tariffs is the Company proposing?

A. As I mentioned previously, KAWC is proposing a revision to its tap fee as supported in Mr. O'Neill's testimony. KAWC is proposing a QIP surcharge tariff as discussed above. KAWC is proposing minor changes to the index sheets as appropriate. The proposed tariffs are included in Exhibit 2 of the filing. Additionally, KAWC is proposing to eliminate two tariff pages that reflect charges for former Tri-Village and Elk Lake customers. At the time KAWC acquired these systems, KAWC adopted their rates. However, with the move to single tariff pricing, KAWC applies all of its rates to all of its customers for water. These distinct schedules of fees are no longer utilized and should be eliminated.

Q. Does this conclude your direct testimony?

A. Yes.

VERIFICATION

COMMONWEALTH OF KENTUCKY)
) **SS:**
COUNTY OF FAYETTE)

The undersigned, **Linda C. Bridwell**, being duly sworn, deposes and says she is the Manager of Rates and Regulation for Kentucky-American Water Company, 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.

Linda C. Bridwell
LINDA C. BRIDWELL

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 14th day of January, 2016.

Peggy A. Stone (SEAL)
Notary Public

My Commission Expires:
10/3/2016

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.

<u>KENTUCKY-AMERICAN WATER COMPANY</u>
<u>CASE NO. 2015-00418</u>

DIRECT TESTIMONY OF
PAUL R. HERBERT

CONCERNING
COST OF SERVICE ALLOCATION
AND
CUSTOMER RATE DESIGN

BEFORE THE

KENTUCKY PUBLIC SERVICE COMMISSION

January 29, 2016

BEFORE THE KENTUCKY PUBLIC SERVICE COMMISSION

RE: KENTUCKY-AMERICAN WATER COMPANY
CASE NO. 2015-00418

DIRECT TESTIMONY OF PAUL R. HERBERT

Line
No.

QUALIFICATIONS

1. Q. Please state your name and address.

A. My name is Paul R. Herbert. My business address is 207 Senate Avenue, Camp Hill, 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. I am President. 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 Pennsylvania Public Utility Commission, the New Jersey Board of Public Utilities, the Public Utilities Commission of Ohio, the Public Service Commission of West Virginia, the Kentucky Public Service Commission, the Iowa State Utilities Board, the Virginia State Corporation Commission, the Illinois Commerce Commission, the Tennessee Regulatory Authority, the California Public Utilities Commission, New Mexico Public Regulation Commission, the Delaware Public Service Commission, the Arizona Corporate Commission, the Connecticut Department of Public Utility Control, the Idaho Public Utilities Commission, the Hawaii Public Utilities Commission, and the Missouri Public Service 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 Science Degree in Finance from the Pennsylvania State University, University Park, Pennsylvania.

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

A. I am a member of the American Water Works Association and serve as a member of the Management Committee for the Pennsylvania Section. I am also a member of the Pennsylvania Municipal Authorities Association. In 1998, I became a member of the National Association of Water Companies as well as a member of its Rates and Revenue Committee.

7. Q. Briefly describe your work experience.

A. I joined the Valuation Division of Gannett Fleming Corddry and Carpenter, Inc., predecessor to Gannett Fleming Valuation and Rate Consultants, Inc., in September 1977, as a Junior Rate Analyst. Since then, I advanced through several positions and was assigned the position of Manager of Rate Studies on July 1, 1990. On June 1, 1994, I was promoted to Vice President and on November 1, 2003, I was promoted to Senior Vice President. On July 1, 2007, I was promoted to my current position as President.

While attending Penn State, I was employed during the summers of 1972, 1973 and 1974 by the United Telephone System - Eastern Group in its accounting department. Upon graduation from college in 1975, I was employed by Herbert Associates, Inc., Consulting Engineers (now Herbert Rowland and Grubic, Inc.), as a field office manager until September 1977.

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 2012 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 15 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 16 through 19, 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 20 through 23, of Exhibit No. 36.

Factor 4 was modified to exclude the allocation of distribution mains to the sales for resale classification. This recognizes that sales for resale 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. The demand for private fire units are increased by a factor of 1.5 over the public fire units to recognize the greater flow rate required for a fire at a private service than for a public hydrant.

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 24 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 32 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 34 through 36 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.

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 August 31, 2017, 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 page 42 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 existing rate structure applicable to all divisions that includes a service charge by meter size 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, (3) increase public fire service class as indicated by the cost of service, and (4) adjust revenues among the remaining classes in conformity with or toward the indicated cost of service.

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 41 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.

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. 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, and meter reading 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 $14.85 and the monthly rate is proposed at $14.85 per month 5/8-inch service charge. The rates for the larger-sized meters are determined by multiplying the meter capacity ratios times the $14.85 rate for the 5/8-inch meter, as shown at the bottom on the schedule. Meter capacity ratios also 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, **Paul R. Herbert**, being duly sworn, deposes and says he is the President of Gannett Fleming Valuation and Rate Consultants, 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.

Paul R Herbert
PAUL R. HERBERT

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 13th day of January, 2016.

_______________ (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

PAUL R. HERBERT – LIST OF CASES TESTIFIED

	Year	Jurisdiction	Docket No.	Client/Utility	Subject
1.	1983	Pa. PUC	R-832399	T. W. Phillips Gas and Oil Co.	Pro Forma Revenues
2.	1989	Pa. PUC	R-891208	Pennsylvania-American Water Company	Bill Analysis and Rate Application
3.	1991	WV PSC	91-106-W-MA	Clarksburg Water Board	Revenue Requirements (Rule 42)
4.	1992	Pa. PUC	R-922276	North Penn Gas Company	Cash Working Capital
5.	1992	NJ BPU	WR92050532J	The Atlantic City Sewerage Company	Cost Allocation and Rate Design
6.	1994	Pa. PUC	R-943053	The York Water Company	Cost Allocation and Rate Design
7.	1994	Pa. PUC	R-943124	City of Bethlehem	Revenue Requirements, Cost Allocation, Rate Design and Cash Working Capital
8.	1994	Pa. PUC	R-943177	Roaring Creek Water Company	Cash Working Capital
9.	1994	Pa. PUC	R-943245	North Penn Gas Company	Cash Working Capital
10.	1994	NJ BPU	WR94070325	The Atlantic City Sewerage Company	Cost Allocation and Rate Design
11.	1995	Pa. PUC	R-953300	Citizens Utilities Water Company of Pennsylvania	Cost Allocation and Rate Design
12.	1995	Pa. PUC	R-953378	Apollo Gas Company	Rev. Requirements and Rate Design
13.	1995	Pa. PUC	R-953379	Carnegie Natural Gas Company	Rev. Requirements and Rate Design
14.	1996	Pa. PUC	R-963619	The York Water Company	Cost Allocation and Rate Design
15.	1997	Pa. PUC	R-973972	Consumers Pennsylvania Water Company Shenango Valley Division	Cash Working Capital
16.	1998	Ohio PUC	98-178-WS-AIR	Citizens Utilities Company of Ohio	Water and Wastewater Cost Allocation and Rate Design
17.	1998	Pa. PUC	R-984375	City of Bethlehem - Bureau of Water	Revenue Requirement, Cost Allocation and Rate Design
18.	1999	Pa. PUC	R-994605	The York Water Company	Cost Allocation and Rate Design
19.	1999	Pa. PUC	R-994868	Philadelphia Suburban Water Company	Cost Allocation and Rate Design
20.	1999	WV PSC	99-1570-W-MA	Clarksburg Water Board	Revenue Requirements (Rule 42), Cost Allocation and Rate Design
21.	2000	Ky. PSC	2000-120	Kentucky-American Water Company	Cost Allocation and Rate Design
22.	2000	Pa. PUC	R-00005277	PPL Gas Utilities	Cash Working Capital
23.	2000	NJ BPU	WR00080575	Atlantic City Sewerage Company	Cost Allocation and Rate Design
24.	2001	Ia. St Util Bd	RPU-01-4	Iowa-American Water Company	Cost Allocation and Rate Design
25.	2001	Va. St. CC	PUE010312	Virginia-American Water Company	Cost Allocation and Rate Design
26.	2001	WV PSC	01-0326-W-42T	West-Virginia American Water Company	Cost Allocation And Rate Design
27.	2001	Pa. PUC	R-016114	City of Lancaster	Tapping Fee Study
28.	2001	Pa. PUC	R-016236	The York Water Company	Cost Allocation and Rate Design
29.	2001	Pa. PUC	R-016339	Pennsylvania-American Water Company	Cost Allocation and Rate Design
30.	2001	Pa. PUC	R-016750	Philadelphia Suburban Water Company	Cost Allocation and Rate Design
31.	2002	Va.St.CC	PUE-2002-0375	Virginia-American Water Company	Cost Allocation and Rate Design
32.	2003	Pa. PUC	R-027975	The York Water Company	Cost Allocation and Rate Design
33.	2003	Tn Reg Auth	03-	Tennessee-American Water Company	Cost Allocation and Rate Design
34.	2003	Pa. PUC	R-038304	Pennsylvania-American Water Company	Cost Allocation and Rate Design
35.	2003	NJ BPU	WR03070511	New Jersey-American Water Company	Cost Allocation and Rate Design
36.	2003	Mo. PSC	WR-2003-0500	Missouri-American Water Company	Cost Allocation and Rate Design
37.	2004	Va.St.CC	PUE-200 -	Virginia-American Water Company	Cost Allocation and Rate Design
38.	2004	Pa. PUC	R-038805	Pennsylvania Suburban Water Company	Cost Allocation and Rate Design
39.	2004	Pa. PUC	R-049165	The York Water Company	Cost Allocation and Rate Design
40.	2004	NJ BPU	WRO4091064	The Atlantic City Sewerage Company	Cost Allocation and Rate Design
41.	2005	WV PSC	04-1024-S-MA	Morgantown Utility Board	Cost Allocation and Rate Design
42.	2005	WV PSC	04-1025-W-MA	Morgantown Utility Board	Cost Allocation and Rate Design
43.	2005	Pa. PUC	R-051030	Aqua Pennsylvania, Inc.	Cost Allocation and Rate Design
44.	2006	Pa. PUC	R-051178	T. W. Phillips Gas and Oil Co.	Cost Allocation and Rate Design
45.	2006	Pa. PUC	R-061322	The York Water Company	Cost Allocation and Rate Design
46.	2006	NJ BPU	WR-06030257	New Jersey American Water Company	Cost Allocation and Rate Design
47.	2006	Pa. PUC	R-061398	PPL Gas Utilities, Inc.	Cost Allocation and Rate Design
48.	2006	NM PRC	06-00208-UT	New Mexico American Water Company	Cost Allocation and Rate Design
49.	2006	Tn Reg Auth	06-00290	Tennessee American Water Company	Cost Allocation and Rate Design
50.	2007	Ca. PUC	U-339-W	Suburban Water Systems	Water Conservation Rate Design
51.	2007	Ca. PUC	U-168-W	San Jose Water Company	Water Conservation Rate Design
52.	2007	Pa. PUC	R-00072229	Pennsylvania American Water Company	Cost Allocation and Rate Design
53.	2007	Ky. PSC	2007-00143	Kentucky American Water Company	Cost Allocation and Rate Design
54.	2007	Mo. PSC	WR-2007-0216	Missouri American Water Company	Cost Allocation and Rate Design
55.	2007	Oh. PUC	07-1112-WS-IR	Ohio American Water Company	Cost Allocation and Rate Design

PAUL R. HERBERT – LIST OF CASES TESTIFIED

	Year	Jurisdiction	Docket No.	Client/Utility	Subject
56.	2007	Il. CC	07-0507	Illinois American Water Company	Customer Class Demand Study
57.	2007	Pa. PUC	R-00072711	Aqua Pennsylvania, Inc.	Cost Allocation and Rate Design
58.	2007	NJ BPU	WR07110866	The Atlantic City Sewerage Company	Cost Allocation and Rate Design
59.	2007	Pa. PUC	R-00072492	City of Bethlehem – Bureau of Water	Revenue Reqmts, Cost Alloc.
60.	2007	WV PSC	07-0541-W-MA	Clarksburg Water Board	Cost Allocation and Rate Design
61.	2007	WV PSC	07-0998-W-42T	West Virginia American Water Company	Cost Allocation and Rate Design
62.	2008	NJ BPU	WR08010020	New Jersey American Water Company	Cost Allocation and Rate Design
63.	2008	Va St CC	PUE-2008-0009	Virginia American Water Company	Cost Allocation and Rate Design
64.	2008	Tn.Reg.Auth.	08-00039	Tennessee American Water Company	Cost Allocation and Rate Design
65.	2008	Mo PSC	WR-2008-0311	Missouri American Water Company	Cost Allocation and Rate Design
66.	2008	De PSC	08-96	Artesian Water Company, Inc.	Cost Allocation and Rate Design
67.	2008	Pa PUC	R-2008-2032689	Penna. American Water Co. – Coatesville Wastewater	Cost Allocation and Rate Design
68.	2008	AZ CC.	W-01303A-08-0227 SW-01303A-08-0227	Arizona American Water Co. - Water - Wastewater	Cost Allocation and Rate Design
69.	2008	Pa PUC	R-2008-2023067	The York Water Company	Cost Allocation and Rate Design
70.	2008	WV PSC	08-0900-W-42T	West Virginia American Water Company	Cost Allocation and Rate Design
71.	2008	Ky PSC	2008-00250	Frankfort Electric and Water Plant Board	Cost Allocation and Rate Design
72.	2008	Ky PSC	2008-00427	Kentucky American Water Company	Cost Allocation and Rate Design
73.	2009	Pa PUC	2008-2079660	UGI – Penn Natural Gas	Cost of Service Allocation
74.	2009	Pa PUC	2008-2079675	UGI – Central Penn Gas	Cost of Service Allocation
75.	2009	Pa PUC	2009-2097323	Pennsylvania American Water Co.	Cost Allocation and Rate Design
76.	2009	Ia St Util Bd	RPU-09-	Iowa-American Water Company	Cost Allocation and Rate Design
77.	2009	Il CC	09-0319	Illinois-American Water Company	Cost Allocation and Rate Design
78.	2009	Oh PUC	09-391-WS-AIR	Ohio-American Water Company	Cost Allocation and Rate Design
79.	2009	Pa PUC	R-2009-2132019	Aqua Pennsylvania, Inc.	Cost Allocation and Rate Design
80.	2009	Va St CC	PUE-2009-0059	Aqua Virginia, Inc.	Cost Allocation (only)
81.	2009	Mo PSC	WR-2010-0131	Missouri American Water Company	Cost Allocation and Rate Design
82.	2010	VaSt CorpCom	PUE-2010-00001	Virginia American Water Company	Cost Allocation and Rate Design
83.	2010	Ky PSC	2010-00036	Kentucky American Water Company	Cost Allocation and Rate Design
84.	2010	NJ BPU	WR10040260	New Jersey American Water Company	Cost Allocation and Rate Design
85.	2010	Pa PUC	2010-2167797	T.W. Phillips Gas and Oil Co.	Cost Allocation and Rate Design
86.	2010	Pa PUC	2010-2166212	Pennsylvania American Water Co. - Wastewater	Cost Allocation and Rate Design
87.	2010	Pa PUC	R-2010-2157140	The York Water Company	Cost Allocation and Rate Design
88.	2010	Ky PSC	2010-00094	Northern Kentucky Water District	Cost Allocation and Rate Design
89.	2010	WV PSC	10-0920-W-42T	West Virginia American Water Co.	Cost Allocation and Rate Design
90.	2010	Tn Reg Auth	10-00189	Tennessee American Water Company	Cost Allocation and Rate Design
91.	2010	Ct PU RgAth	10-09-08	United Water Connecticut	Cost Allocation and Rate Design
92.	2010	Pa PUC	R-2010-2179103	City of Lancaster-Bureau of Water	Rev Rqmts, Cst Alloc/Rate Design
93.	2011	Pa PUC	R-2010-2214415	UGI Central Penn Gas, Inc.	Cost Allocation
94.	2011	Pa PUC	R-2011-2232359	The Newtown Artesian Water Co.	Revenue Requirement
95.	2011	Pa PUC	R-2011-2232243	Pennsylvania-American Water Co.	Cost Allocation and Rate Design
96.	2011	Pa PUC	R-2011-2232985	United Water Pennsylvania Inc.	Demand Study, COS/Rate Design
97.	2011	Pa PUC	R-2011-2244756	City of Bethlehem-Bureau of Water	Rev. Rqmts/COS/Rate Design
98.	2011	Mo PSC	WR-2011-0337-338	Missouri American Water Company	Cost Allocation and Rate Design
99.	2011	Oh PUC	11-4161-WS-AIR	Ohio American Water Company	Cost Allocation and Rate Design
100.	2011	NJ BPU	WR11070460	New Jersey American Water Company	Cost Allocation and Rate Design
101.	2011	Id PUC	UWI-W-11-02	United Water Idaho Inc.	Cost Allocation and Rate Design
102	2011	Il CC	11-0767	Illinois-American Water Company	Cost Allocation and Rate Design
103.	2011	Pa PUC	R-2011-2267958	Aqua Pennsylvania, Inc.	Cost Allocation and Rate Design
104.	2011	VaStCom	2011-00099	Aqua Virginia, Inc.	Cost Allocation
105.	2011	VaStCom	2011-00127	Virginia American Water Company	Cost Allocation and Rate Design
106.	2012	TnRegAuth	12-00049	Tennessee American Water Company	Cost Allocation and Rate Design
107.	2012	Ky PSC	2012-00072	Northern Kentucky Water District	Cost Allocation and Rate Design
108.	2012	Pa PUC	R-2012-2310366	Lancaster, City of – Sewer Fund	Cost Allocation and Rate Design
109.	2012	Ky PSC	2012-00520	Kentucky American Water Co.	Cost Allocation and Rate Design
110.	2013	WV PSC	12-1649-W-42T	West Virginia American Water Co.	Cost Allocation and Rate Design
111.	2013	Ia St Util Bd	RPU-2013-000_	Iowa American Water Company	Cost Allocation and Rate Design
112.	2013	Pa PUC	R-2013-2355276	Pennsylvania American Water Co.	Cost Allocation and Rate Design
113.	2013	Pa PUC	R-2012-2336379	The York Water Company	Cost Allocation and Rate Design
114.	2013	Pa PUC	R-2013-2350509	City of DuBois – Bureau of Water	Cost Allocation and Rate Design

	Year	Jurisdiction	Docket No.	Client/Utility	Subject
115.	2013	Pa PUC	R-2013-2390244	City of Bethlehem – Bureau of Water	Cost Allocation and Rate Design
116.	2014	Pa PUC	R-2014-2418872	City of Lancaster – Bureau of Water	Cost Allocation and Rate Design
117.	2014	Pa PUC	R-2014-2428304	Borough of Hanover	Cost Allocation and Rate Design
118.	2014	VAStCom	2014-00045	Aqua Virginia, Inc.	Cost Allocation
119.	2015	NJ BPU	WR15010035	New Jersey American Water Company	Cost Allocation and Rate Design
120.	2015	Pa PUC	R-2015-2462723	United Water PA	Cost Allocation and Rate Design
121.	2015	WV PSC		West Virginia American Water Company	Cost Allocation and Rate Design
122.	2015	Id PUC	UWI-W-15-01	United Water Idaho Inc.	Pro Forma Revenues

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BEFORE THE KENTUCKY PUBLIC SERVICE COMMISSION
Case No. 2015-00418

TESTIMONY OF ROBERT V. MUSTICH

BEFORE THE KENTUCKY PUBLIC SERVICE COMMISSION

TESTIMONY OF ROBERT V. MUSTICH

I. INTRODUCTION

Q1. Please provide your name, position and business address.

A1. My name is Robert V. Mustich. I am Managing Director and the U.S. East Division Practice Leader, Executive Compensation for Willis Towers Watson. Willis Towers Watson is a leading global professional services company, which has 39,000 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 901 North Glebe Road, Arlington, VA 22203.

Q2. Please explain Willis Towers Watson's experience in providing compensation and benefits consulting services to organizations like Kentucky-American Water Company (KAWC or the Company).

A2. 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 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.

Q3. Please state your educational and professional background and experience.

A3. 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 18 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 currently serve as U.S. East Division Executive Compensation Practice Leader in addition to being 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. <u>PURPOSE OF TESTIMONY</u>

Q4. Please define Target Total Cash Compensation.

A4. Target Total Cash Compensation represents the sum of base salary plus target short-term variable compensation.

Q5. Please define Target Total Direct Compensation.

A5. Target Total Direct Compensation represents the sum of base salary, plus target short-term variable compensation, plus long-term variable compensation.

Q6. What is the purpose of your testimony?

A6. The purpose of my testimony is to demonstrate that the target total direct compensation provided to Kentucky American Water short-term variable compensation eligible employees, when viewed against the markets for talent for employees in similar positions, is below the competitive range of the 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 direct compensation (base salary plus short-term variable compensation plus long-term variable compensation)
- Design of short-term variable compensation program; and
- Design of long-term variable compensation program.

III. <u>OVERVIEW OF TOTAL COMPENSATION PHILOSOPHY</u>

Q7. Does Kentucky American Water have a defined compensation philosophy?

A7. Yes, American Water Works Company, Inc. (American Water), KAWC's parent, has a defined compensation philosophy that is utilized by Kentucky American Water.

Q8. How would you define the parent company's compensation philosophy?

A8. American Water's compensation philosophy is to generally pay salaries that are 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 (50^{th} percentile) of the market with greater earning opportunity for exceptional performance for fully qualified individuals.

Q9. How does this compensation philosophy compare with other utilities?

A9. It is comparable. Willis Towers Watson examined the proxy statements for two peer groups: (1) Large Utility Peer Group, 16 publicly-traded utilities comparable in size to American Water (revenues range from ½ to 2.5 times American Water's 2014 revenues of $3.0 billion), as disclosed in the parent company's March 26, 2015 proxy statement, and

(2) Small Utility Peer Group, 13 publicly-traded utilities comparable in size to Kentucky American Water (revenues range from $46-$780M, compared to Kentucky American Water's forecasted 2015 revenue of $91M). 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 (15 of 16, 94%) and Small Utility Peer Group companies (7 of 13, 54%) target the market median (50^{th} percentile) for some or all pay elements. Our consulting experience also suggests that American Water's median (50^{th} percentile) pay philosophy is comparable to typical market practice found in general industry.

IV. SUMMARY OF WILLIS TOWERS WATSON'S TOTAL COMPENSATION STUDY

Q10. Did you conduct a compensation study of Kentucky American Water's compensation program?

A10. Yes, and a copy of the Study is included as **Attachment 1** to my testimony (filed under confidential protection).

Q11. Please describe how the study was conducted.

A11. Willis Towers Watson utilized three data sources to assess Kentucky American Water's compensation 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 (1) Large Utility Peer Group and (2) Small Utility Peer Group, and (3) competitive market positioning of Kentucky American Water's target total direct compensation levels was compared to Willis Towers Watson published compensation surveys.

Q12. How did you define "competitive" for the purposes of your study?

A12. Willis Towers Watson and typical market practice define an element of compensation as being competitive if it falls in a range that extends between 10% below to 10% above the market median level of compensation.

Q13. Please describe how you assessed the competitiveness of Kentucky American Water's target total direct compensation levels.

A13. Willis Towers Watson assessed the competitiveness of target total direct compensation provided by Kentucky American Water to its short-term variable compensation 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 surveys in our Compensation Databank (CDB). These surveys are comprised of compensation data from over 400 U.S. based companies, and Willis Towers Watson has been conducting these surveys for over 20 years.

Kentucky American Water's current compensation levels were compared to the market 50^{th} percentile (market median) for two different market perspectives to determine the competitiveness of pay and to validate the alignment with American Water's current compensation philosophy (targeting compensation at the 50^{th} percentile of market).

To derive 50^{th} 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 66% of the population of Kentucky American Water employees as of December 17, 2015, who are eligible for at-risk compensation. Specific details regarding our study, which includes a detailed description of the study methodology, are included in **Attachment 1**.

Q14. Please describe how you determined the competitiveness of Kentucky American Water's target total direct compensation.

A14. Two different market perspectives were examined to validate the competitiveness of Kentucky American Water's target total direct compensation.

A national market perspective was examined which consisted of the entire population of survey participants in Willis Towers Watson's Energy Services Industry and General Industry databases. This perspective represents a U.S. national compensation perspective and is aligned with American Water's compensation philosophy.

A Midwest regional perspective including Arkansas, Illinois, Indiana, Iowa, Kansas, Kentucky, Missouri, Nebraska, Ohio, Oklahoma, Tennessee, Wisconsin, and West Virginia labor markets was examined for non-executive positions, 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 that work in the thirteen states listed above for companies headquartered anywhere in the United States.

Q15. What were the results from the national perspective?

A15. Kentucky American Water's target total direct compensation as reported in Exhibit 1 (below) is slightly below the range of competitive market median by being 11% (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 Direct Compensation vs. Market Median (National Market Perspective)		
Base Pay	**Target Total Cash Compensation**	**Target Total Direct Compensation**
-16%	-14%	-11%

Q16. What were the results from the Midwest Regional perspective?

A16. Kentucky American Water's target total direct compensation is below the range of competitive market median as reported in Exhibit 2, because it falls 16% (represents a weighted average of all positions reviewed) below the market median.

Exhibit 2

Summary of Kentucky American Water Target Total Direct Compensation vs. Market Median (Midwest Regional Market Perspective)		
Base Pay	**Target Total Cash Compensation**	**Target Total Direct Compensation**
-15%	-15%	-16%

Q17. What would be the impact on the competitiveness of Kentucky American Water's compensation program if short-term and long-term variable compensation were not part of that compensation program?

A17. If we compare Kentucky American Water's compensation program excluding variable compensation (that is, base salary alone) to market pay levels that include variable compensation, as reported in Exhibits 3 and 4, Kentucky American Water's compensation would not be competitive because it would fall 31% below median from a national perspective and 26% below median from a Midwest Regional perspective.

Exhibit 3

Summary of Kentucky American Water Base Salary vs. Market Median (National Market Perspective)		
Base Pay	**Target Total Cash Compensation**	**Target Total Direct Compensation**
-16%	-26%	-31%

Exhibit 4

Summary of Kentucky American Water Base Salary vs. Market Median (Midwest Regional Market Perspective)		
Base Pay	**Target Total Cash Compensation**	**Target Total Direct Compensation**
-15%	-24%	-26%

Q18. In your opinion and based on the results of the study, are Kentucky American Water employees overcompensated?

A18. No. For both market perspectives, Kentucky American Water employees are below the range of market median for each element of compensation.

V. <u>SUMMARY OF WILLIS TOWERS WATSON'S SHORT-TERM VARIABLE COMPENSATION PROGRAM ASSESSMENT</u>

Q19. Did you conduct an assessment of American Water's short-term variable compensation program?

A19. Yes.

Q20. What was the purpose of this assessment?

A20. This assessment was completed to compare the design of American Water's short-term variable compensation program and its various elements to market practice.

Q21. What were the findings of the assessment?

A21. 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 the Small Utility Peer Group referenced earlier. Like American Water, practically every company in each peer group 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, customer, safety, technology and operational efficiency to determine a corporate funding pool. American Water's program requires the achievement of at least 90% of target EPS performance to ensure the financial viability of the plan before any short-term variable compensation payment can be made to any participant.

American Water's short-term program design is within the range of market practice for utilities. Specific details regarding our assessment are included in **Attachment 1**.

VI. SUMMARY OF WILLIS TOWERS WATSON'S LONG-TERM VARIABLE COMPENSATION PROGRAM ASSESSMENT

Q22. Did you conduct an assessment of American Water's long-term variable compensation program?

A22. Yes.

Q23. What was the purpose of this assessment?

A23. This assessment was completed to compare the design of American Water's long-term variable compensation program and its various elements to market practice.

Q24. What were the findings of the assessment?

A24. 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 the Small Utility Peer Group referenced earlier. Like American Water, every company in the Large Utility Peer Group and every company but two in the 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 Attachment 1.

VII. <u>OVERALL FINDINGS</u>

Q25. What are the conclusions of your analysis?

A25. Overall, our analysis indicates that Kentucky American Water's total direct compensation program objective and design are comparable to and competitive with market practices of other similarly-sized utilities and are therefore reasonable. Kentucky American Water, like the companies it competes with for talent, has to provide a competitive total direct compensation opportunity delivered via programs that benefit employees, customers and shareholders. Kentucky American Water attempts to achieve this goal with balanced and competitive base salary and short-term and long-term variable compensation programs. My experience working with both utilities and general industry companies and the results of the study included as **<u>Attachment 1</u>** indicate the programs at Kentucky American Water fall within a broad range of market norms and are not excessive in design or level of pay.

Q26. Does this conclude your testimony?

A26. Yes.

VERIFICATION

STATE OF MARYLAND)
) **SS:**
COUNTY OF MONTGOMERY)

The undersigned, **Robert V. Mustich**, being duly sworn, deposes and says he is the Managing Director and the U.S. East Division Practice Leader, Executive Compensation 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 14 day of January, 2016.

_______(SEAL)

Notary Public

RAQUEL E. UMANA
NOTARY PUBLIC
PRINCE GEORGE'S COUNTY
MARYLAND
MY COMMISSION EXPIRES JUNE 5, 2017

My Commission Expires:
June 05th, 2017

ATTACHMENT 1 TO TESTIMONY OF ROBERT V. MUSTICH FILED UNDER SEAL PURSUANT TO PETITION FOR CONFIDENTIAL TREATMENT FILED ON JANUARY 29, 2016

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF:	)	
	)	
THE APPLICATION OF KENTUCKY-AMERICAN	)	
WATER COMPANY FOR AN ADJUSTMENT	)	**CASE NO. 2015-00418**
OF RATES	)	
	)	

DIRECT TESTIMONY OF BRENT E. O'NEILL, P.E.

JANUARY 29, 2016

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 ("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 provided written testimony in Case No. 2014-00258, the Application of Kentucky-American Water Company for Certificate of Convenience and Necessity Authorizing the Construction of Richmond Road Station Filter Improvements.

Q. Have you filed or presented testimony before any other commissions or regulatory authorities?

A Yes. I have provided written testimony to the Illinois Commerce Commission and presented testimony to the Tennessee Regulatory Authority.

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. ("American Water") or one of its subsidiaries since 1996. I began as a Staff Engineer for Northern Illinois Water Company ("NIWC") 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 American Water 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. I am an active member of the American Water Works Association ("AWWA").

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 main extensions, replacement mains, water treatment plant upgrades, new construction and network facilities improvements. I coordinate technical assistance with 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 describe the calculation of tap fees as submitted in the case, the preparation of the investment plan, the need for the construction projects, and the need for an alternative investment replacement rider.

CAPITAL INVESTMENT PLAN

Q. Please describe the Company's capital investment plan.

A. The Company's capital investment plan can be divided into two distinct areas: 1) Recurring Projects ("RP") and 2) Major Projects identified as investment projects ("IP"). Typically, Major Projects are those having a significant investment to the Company or projects that are addressing complex issues.

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 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 costs are trended from historical and forecasted data. Estimates are prepared for the installation of new mains, service lines, meter settings, and the purchase of new meters based on preliminary plats from the appropriate governmental planning agencies. KAWC also conducts consultations with developers, homebuilders, and engineering firms.

The purchase of tools, furniture, equipment, and vehicles are based on needs. KAWC reviews each item independently and prepares a list of expected expenditures for each budget line. Estimates are made based on historical spending and current year pricing.

These improvements will enable KAWC to continue providing safe, adequate and reliable service to its customers to meet their domestic, commercial and industrial needs, as well as flows adequate for fire protection and to satisfy all regulatory requirements. The criteria for evaluating the need for 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 Commission regulations and to provide adequate fire flow identified by the Insurance Service Organization (ISO) Fire Suppression Rating Schedule 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 that have a substantial cost or complexity which the Company describes as Major Projects. These projects typically represent investments that are needed to meet environmental or water quality regulations, infrastructure capacity expansion, infrastructure rehabilitation, or general needs of the business such as structures and technology investments.

Including an IP within the investment plan starts with the development of the anticipated demand projections of the system, identification of improvements needed to meet those demands and adoption of strategies designed to bring about the correct prioritization and distribution of capital spending for the various needs of the business.

Specific capital planning needs are addressed in both the short term (one year) and longer term (five years). Projects are prioritized within service districts using objective criteria that validate the need for a project and assess the risk of not doing the project. A key component of this planning technique is that it is flexible and can be adjusted as needed to address new needs, 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 of the reasonableness of the projects proposed and their forecasted costs. Although the Service Company may make suggestions with respect to that budget, KAWC ultimately determines the budget. This process is the basis for the capital expenditures reflected in the Company's Investment Plan.

Q. Does KAWC focus on cost control of capital expenditures in its normal day-to-day activities?

A. Yes. All significant construction work done 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 American Water Works Service Company ("AWWSC") procurement group annually takes competitive bids for material and supplies that are either manufactured or distributed regionally and nationally. We have the advantage of being able to purchase these materials and supplies on an as-needed basis at favorable prices. The AWWSC also has undertaken a number of procurement initiatives for services and materials to reduce costs through either streamlined selection or utilization of large volume purchasing power. Some of these 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 plan?

A. Since 2003, all American Water affiliates have used a process for the development and review of capital expenditures that has incorporated industry best practices. KAWC, like its sister companies, has benefitted from that process. The process includes a regional Capital Investment Management Committee ("CIMC") to ensure capital expenditure plans meet the strategic intent of the business, which includes introduction of new technologies that result in efficiencies. In turn, this ensures that capital expenditure plans are integrated with operating expense plans, and provide more effective controls on budgets and individual capital projects.

The CIMC includes the KAWC President, KAWC Vice President of Operations, KAWC Director of Engineering and KAWC Financial Lead. The CIMC receives capital expenditure plans from project managers and reviews them as required by the process. Once budgets are approved, the CIMC meets monthly to review capital expenditures compared to budgeted levels. 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 personnel handle all of the stages, with oversight by the CIMC. All projects, including normal recurring items, have an identified project manager responsible for processing each stage. The focus of the CIMC, along with the monthly meetings, has allowed KAWC to be more flexible with changes that inevitably occur during the course of implementation of large construction projects. KAWC made tremendous progress in its delivery of capital expenditures over the last ten years in regard to schedules, budgets, and quality of delivery.

As an added level of coordination an Infrastructure meeting is held monthly to discuss ongoing projects and discuss emerging trends. This meeting includes the KAWC Vice President of Operations, the KAWC Director of Engineering and the appropriate Distribution and Operations supervisors, water quality managers and project managers. The purpose of the meeting is to review projects that are moving forward in the next step of approval, or that require a change. This allows the project manager and operational area supervisors to communicate about the project on a monthly basis and help coordinate projects from initial development through in-service. Through the direction and actions of both the CIMC and the Infrastructure meetings allows the Company to deliver its capital plan on schedule and within budget.

Q. Please describe the Company's recent performance its capital investment plan.

A. KAWC has been able to make appropriate adjustments in the capital investment plan to account for unexpected changes in projects and to address important emerging items. KAWC has delivered its capital investment plan within 1% of the budget cumulatively over the past three years.

CAPITAL PROJECTS

Q. Please explain the major projects proposed during 2016 and 2017.

A. The major capital projects that are designated as Investments Projects (IP) that are planned to be undertaken during 2016 and 2017 are as follows:

I12-020021 Power Reliability at Remote Sites ($1,200,000) – This project includes the review of remote pumping sites and the installation of electrical power redundancy to improve reliability of critical remote pumping sites. It is expected the project will be placed in service by December 2017.

I12-020032 Richmond Road Station Filter Building Replacement ($15,600,000) – This project consists of the construction of a new filter building with eight dual-media filters, a chlorine contact basin, and a backwash tank at its Richmond Road Station WTP to replace the existing filter building that was originally constructed in 1924. The project will retain the existing plant capacity of 25 million gallons per day (MGD) the construction of the eight filters that have a filtration rate of 3.6 MGD. The Commission granted a certificate of public convenience and necessity for the project in Case No. 2014-00258 on December 23, 2014. The project is expected to be in service by May 30, 2016.

I12-020037 Chemical Storage and Feed Improvements ($3,500,000) - This project incorporates several components of chemical storage and delivery and total organic carbon (TOC) removal and will be designed to enhance the robustness and reliability of KRS I operations, and minimizing the risk of plant shutdown due to insufficient chemical storage and feed. The project is expected to enter design during 2016 and be placed in service by December 2018.

I12-020039 Georgetown Bypass and US 25 Area ($2,250,000) - This project will provide a second major supply line to Georgetown and Scott County. This project will increase the reliability of the system to these communities and allow KAWC to redirect service when the existing supply main is compromised in the future. The project also allows Georgetown and Scott County level of service to be maintained while required maintenance is performed on the Muddy Ford Tank, which is not possible with the current distribution system. The project will allow for enhanced reliability to the customers in the area including the industrial customer Toyota Manufacturing Facility. The project is expected to enter design during late 2016 and begin construction during 2017. The project is expected to be placed in service by July 30, 2018.

I12-020040 Kentucky River Station I Valve House Rehabilitation – Phase 2 ($1,100,000) - This project is the second phase of the renovation and rehabilitation of the Kentucky River Station Valve Houses. This project will make improvements to Valve Houses 3 and 4 that includes new valves and actuators; corrective measures to mitigate flooding; improved access for piping and valves; relocation of electrical panels, boxes and SCADA. The project is expected to be in service by December 31, 2016.

I12-020043 Athens Boonesboro Main Extension ($1,451,100) - This project is the replacement of several sections of main along Athens Boonesboro Road and the installation of a portion of main to complete a gap in the existing distribution system. The project will allow for more reliable service in the area and start the process that will permit KAWC to connect a portion of its service area that is currently served through a purchase water agreement with Winchester Municipal Utilities to the Company's distribution system. The project is expected to be in service by December 31, 2016.

I12-020049 Kentucky River Station I Raw Water Access ($2,000,000) – This project will install a new access to the Kentucky River Station I intake station that will replace the existing reliance on the tramway constructed in 1957. Concerns with future repair costs, ongoing maintenance cost and overall safety requires the review of the existing access and to determine additional options for gaining access for materials and personnel to the intake station. This project is expected to enter the research and design phase during late 2017 and be placed in service during 2018.

I12-020051 Kentucky River Station I High Service Pumps Replacement ($2,680,000) – The project will install replacement high service pumps at the Kentucky River Station I. The Company conducted a pumping efficiency study based on four perspectives – 1) operational perspective, 2) energy optimization, 3) energy efficiency and 4) energy demand. The analysis indicated there is room for improvement both operationally and from an energy perspective that will be addressed with the installation of the new high service pumps. The expected in service date is September 30, 2017.

I12-020052 Millersburg Tank Replacement ($450,000) – The recently acquired Millersburg system is experiencing disinfectant byproducts formation within the system due to recent changes in the operation of the system. KAWC has been able to address the disinfectant byproducts formation on a temporary basis through expanded system flushing and operational changes with the existing water storage tank. However, these temporary changes are not a viable long term solution and at times impact the overall operation of the system. The recommended project is to enhance the ability of the system to utilize the water storage in the community and reduce the impact of water age in the system. The project will relocate the water storage in the community to a more advantageous location to enhance the ability of the system to use the storage in a more efficient manner. It has been determined that the relocation of an existing tank in the Northern System that is not required for that system to Millersburg is more cost effective than moving the existing Millersburg tank. Through the repurposing of the existing glass lined Northern System tank, the company is able to utilize a tank that has reduced maintenance cost and eliminate the Millersburg tank that will require future investment in maintaining its viability. The expected in service date is June 30, 2016.

I12-020055 New Circle Road Main Relocation ($775,000) - The Kentucky Transportation Cabinet District 7 will be performing a highway expansion/relocation on New Circle Road. The project will begin at the intersection of New Circle/Georgetown Road and will end at New Circle/Boardwalk. The project will require relocation of the 720' of 20" main and 1,135' of 12" main. The initial design of the project is complete and the Company is awaiting authorization from Kentucky Department of Transportation (KDOT) to commence construction. It is expected that the project will be placed in service by August 31, 2016 depending on the construction activities of KDOT.

Q. Please explain the type of projects included in the capital plan that are considered a recurring project.

A. A brief description of the projects listed in Exhibit 13 of the Application in this case follows.

Item DV (Projects Funded by Others) - This investment plan item is for the installation of new mains, valves and hydrants 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 made through deposit agreements and as non-refundable contributions. The projected expenditure amount is developed through discussions with homebuilders and developers, as well as a review of plats. This item also includes fire services that are paid by the requesting new customer, at the cost of installation.

Item A - This investment plan item is for new water mains, valves, and other appurtenances that are necessary to perform the work that is 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 that are necessary to perform the work.

Item C - This investment plan item is for the unscheduled replacement or restoration of existing water mains, including valves and other appurtenances that are necessary to perform the work. 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 that are necessary to perform the work, 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.

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 O - 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. If no project is developed as a result of the study, the expenditures are then transferred from CWIP.

QUALIFIED INFRASTRUCTURE PROGRAM

Q. Are there any important issues facing KAWC that the current capital expenditure plan does not fully address?

A. Yes. Utilities, customers, and regulators across the country are facing the reality of infrastructure nearing the end of its useful life, especially with respect to buried pipes. In recent years the AWWA and the Water Research Foundation ("WRF") have published reports highlighting the challenge for utilities, customers, and regulators. The preeminent reports are, “Dawn of the Replacement Era”, and “Buried No Longer: Confronting America’s Infrastructure Challenge”, published by AWWA, and accessible through the AWWA website.

Q. What has AWWA indicated are issues facing water utilities?

A. In the 2014 State of the Water Industry Report, AWWA indicated that their top five water industry issues were state of infrastructure, long-term supply availability, financial stability and financing of capital improvements, public understanding of the value of water, and public understanding of the value of the water systems and services. A majority of these issues are utility specific and addressed through local initiatives. However, the state of infrastructure is a global issue for every utility, and was indicated as the overall important issue facing utilities within the 2014 State of the Water Industry Report.

Q. What has AWWA used to confirm the importance of the state of 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 part 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.

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 a follow-up study "Buried No Longer" (2013), 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 weigh 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 6 important findings regarding the water infrastructure. The findings are:

1. <u>The Needs Are Large</u> – Investment needs for buried drinking water infrastructure total more than $1 trillion over the next 25 years,
2. <u>Household Water Bills Will Go Up</u> – 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.
3. <u>There Are Important Regional Differences</u> – The needs of infrastructure replacement affects 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.

4. <u>There Are Important Differences Based on System Size</u> – Small systems face different variables than larger systems but the overall impact to both is considerable.
5. <u>The Costs Keep Coming</u> – Based on the Nessie Curves, it should be expected that buried infrastructure replacement needs will continue for the coming decades.
6. <u>Postponing The Problem Only Makes It Worse</u> – Not making the investment now only steepens the slope of investment required later as more distribution lines exceed their life expectancy, increase leaks and breaks eventually reducing the level of service to customers.

Q. Why does AWWA consider infrastructure replacement an important issue?

A. In summary of the "Buried No Longer" study, AWWA indicates that "the United States is reaching a crossroads and face 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."

Q. What information has KAWC used to determine there is an issue with its current rate of infrastructure replacement?

A. The Company recently completed a multiple method review of its asset replacement needs for over 1,293 miles of pipe. 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 Company further enhanced the review by the AWWA model 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 BEO-1.

Q. What were the key findings about KAWC's current rate of pipe replacement?

A. The "Buried No Longer Pipe Replacement Modeling Tool" projects that the KAWC pipe replacement rate that more closely matches the estimated useful life of the respective assets is an average of 15 miles of pipe per year. This translates to a projected annual replacement rate of 1.2%. The model identifies that cast iron main is the material that will need to be replaced initially followed by asbestos cement pipe. During the 40-year period that the model uses to build its recommended replacement effort, 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 for a total spend of $240 million on cast iron main replacement.

At the same time, the model estimates the costs of asbestos cement main replacement of $3 to $7 million annually during the 40-year period. Since 2009 the Company has replaced 18.3 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

2.6 miles per year during the 7-year period including the accelerated rate of 3.9 miles per year over the past 2 years from 2014 and 2015. This translates to a current average pipeline replacement rate of cast iron main of only 0.2% compared to the recommended 1.2% replacement rate. At the average rate of pipe replacement over the past several years, it would take approximately 60.6 years to replace all of the cast iron mains. If this same average rate of 0.2% is used to address all of the mains in the distribution system it would take nearly 500 years to replace all of the mains in the system.

Q. What are the current assets that make up the KAWC Distribution System?

A. The KAWC distribution system contains 1,975 miles of pipeline mains of various materials ranging in sizes from 2 to 42 inches. The distribution system also contains 29 water storage tanks, 26,972 valves, and 8,412 hydrants.

Q. What is the age of the distribution system?

A. The Company's system was installed in three major groupings using three distinct pipe materials. The first period was the establishment of the system between 1885 and 1940. During this period cast iron main was the predominate material. Even though effort has been made to replace this nearly 100 year old pipe, approximately 4% of the distribution system remains this vintage pipe.

The second period was following World War II at time that the area moved away from agriculture and was affected by the baby boom. This period was during the 1950's and 60's and the material used was both cast iron and asbestos cement pipe. The pipe installed during this period represents 23% of the current distribution system. The cast iron installed during this period is reaching an average age of 80 years which is close to the life expectancy of this type of material of 100 years. The asbestos cement pipe installed during this period is reaching an average life of 80 years which is at its life expectancy.

The final major period was the growth of the system was during the period of 1970 to the early 2000s that covered the housing boom for the community. The main installed during this period represents 70% of the current distribution system. Asbestos cement pipe was used during the early part of the period but the predominate material used during this expansion of the system was ductile iron main. The asbestos cement pipe installed during this period is reaching an average life of 70 years while the ductile iron has an average age of about 30 years.

Q. **Please elaborate on the gap between the Company's current pipe replacement rate and the projected replacement rate?**

A. KAWC is replacing pipe at an average rate of 0.2 percent per year, which translates to a life expectancy of about 500 years for the mains within the system. This is not the optimal level of infrastructure investment because our pipes won't last 500 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 need to accelerate the rate of investment to replace our water infrastructure. The significant gap between the Company's current replacement rate of 0.2% and the optimal projected annual pipe replacement rate of 1.2% would require an increase in the Company's pipe replacement rate by an additional 12 miles of main per year. KAWC believes that it would be appropriate to accelerate its level of infrastructure investment over time from its current 0.2% replacement rate per year (500-year replacement cycle), to a 1% replacement rate per year (a 100-year replacement cycle).

Q. What challenges exist for closing this gap?

A. One challenge for delivering the necessary pipe replacement rate is the challenge of effectively educating all stakeholders about buried pipe infrastructure and its connection to reliable water service. Another challenge is educating stakeholders about the cost of replacing old pipes and its link to the cost of providing water service. A higher investment level is essential to keep pace with the anticipated remaining useful life of water system infrastructure. Another challenge for achieving and sustaining an optimal pipe replacement rate is educating stakeholders about the consequences of delaying replacement of old pipes. The Company is continuing its responsible planning in this regard and has identified an increasing percentage of its capital plan in future years for replacement of aging buried pipes.

Q. What consequences may result from maintaining KAWC's current rate of pipe replacement?

A. Buried pipes are a critical part of the infrastructure necessary for a utility 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's water system contains 2,011 miles of main. KAWC will always make the needed investments to maintain or replace infrastructure. In other words, we continue to all make necessary investments for 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 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 needs are deferred into the future, service quality will suffer from increasing number of pipe breaks, service disruptions, health risks from potential drinking water contamination exposure during pipe breaks, property damages, and related community opportunity costs related to community health and economic development. If we do not close the gap, we will increasingly be replacing pipes that have experienced multiple breaks; and the cost per foot to fix these individual main breaks will continue to increase. 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 expenses and disruptions that could be avoided by a systematic, accelerated pipe replacement program.

Q. Please discuss some of the customer benefits from 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 as compared with deferring needed replacements. Planned pipe replacements are much less costly on a unit cost basis than the costs of increasing pipe breaks, service disruptions, health risks from potential drinking water contamination exposure during pipe breaks, property damages, related community opportunity costs related to community health and economic development, and the steep increase in future pipe replacements resulting from prior deferrals of the replacements. The need to rebuild the distribution infrastructure is essential to maintain infrastructure that meets the ongoing needs of the community and customers.

Q. What additional review of the pipe infrastructure was conducted?

A. In addition to the "Buried No Longer Pipe Replacement Modeling Tool" modeling, KAWC performed a review of the water distribution system and developed a report. The report memorializes 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. Based on the information reviewed by the Company and the data developed for the report, we determined that the mains that are most susceptible to breaks are cast iron and galvanized steel. These material types (the majority of which are cast iron) represent 240 miles of the distribution system and KAWC believes that the best course at this time is to target this type of pipe material for replacement over the next 25 years. 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. In addition, by addressing the cast iron and galvanized steel main during this 25 year period will allow the Company to then concentrate on replacing asbestos cement pipe that represents 18% of the current distribution system as it begins to exceed its useful life.

Q. What was a key finding of the Company report?

A. One of the criteria used in the Company report was a review of the main break history from January 2012 to August 2015. During this period the Company experienced 581 main breaks during this period, averaging about 175 breaks per year. Review of the reported breaks from January 2012 to August 2015 indicated that main breaks on cast iron main represented 60% of all of the breaks. Because cast iron main lined and unlined material only represents 13% of the total inventory of mains in the ground, the break rate on this type of material, with only one exception, is significantly higher than the other material in the system. Cast iron mains had a break rate of 1.49 breaks per mile. Ductile iron mains had a break rate of only 0.04 breaks per mile. The worst performing material is galvanized steel, which had a break rate of 3.33 breaks per mile of main.

Q. What is proposed to address the aging pipe infrastructure concerns?

A. The Company 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 13% of the distribution system but account for approximately 62% of all main breaks in a given year. The Company recommends targeting accelerated replacement of this type of pipe material over the next 25 years. Through a 25-year replacement period, the Company recommends that the 240 miles of cast iron and galvanized steel mains be replaced at a rate of 9.6 miles per year at an expected cost of $6.59 million per year. The replacement of these material types will allow the Company to address underperforming mains and reduce the impact of main breaks in the areas served by them.

Q. Were other replacement periods reviewed?

A. Yes, we considered replacements rates of 15, 20, 25 and 30 years. The fastest replacement rate for cast iron main and galvanized steel was 15 years that would have replaced on average 16 miles of main a year and had an associated investment of $10.9 million a year. It was determined that based on available in-house resources and contractor resources that a replacement rate of 16 miles per year could be unstainable for 15 years. In addition, there was concern that customer and community support for disturbing 16 miles of main in mostly downtown Lexington would be difficult to maintain during the expected 15-year length of the accelerated period. The Company believes that the 25 year replacement period appropriately balances the need to maintain the program and reduce the impact on the community while still addressing a critical need to replace a portion of the distribution system that is at the end of its useful life and is beginning to impact the ability to provide reliable service.

Q. How does KAWC propose to implement the Accelerated Pipe Replacement Program?

A. KAWC is proposing to set up a separate Qualified Infrastructure Program ("QIP") to ensure long term commitment to the success of the main replacement program. A long term commitment is needed to be able to allow both Company resources and contracted resources to expand their capabilities to meet the increased demand caused by the increase in pipe being replaced.

Q. Do you believe that KAWC needs a QIP?

A. Yes, an alternative rate mechanism such as the QIP would assist the Company in performing the proposed Accelerated Pipe Replacement Program.

Q. Why is a QIP needed to perform the Accelerated Pipe Replacement Program?

A. To support the Accelerated Pipe Replacement Program, the Company is anticipating to spend an additional $4 to $6.6 million in capital over the 25-year period of the program to replace cast iron main and galvanized steel in the distribution system. Without an alternative method such as QIP, the ability to sustain a program for that duration without affecting other capital needs will be difficult. Through the use of QIP the Company can make the necessary commitment toward the replacement program and can leverage that commitment to ensure that expansion of Company and contractor resources are utilized consistently for the replacement program.

Q. How will work be carried out on the Accelerated Pipe Replacement Program?

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. How will the projects be prioritized during the 25-year replacement program?

A. KAWC has developed a Main Replacement Model (it is part of the attached Exhibit BEO-1) that will be used to prioritize the cast iron main and galvanized steel 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; and 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 were the primary criteria that would be used to determine main replacement. These criteria allowed the model to ensure that mains that were not meeting the needs of the community and customers were 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 reactive replacement program that is in concert with the community and allows for efficient use of available resources.

Q. Will alternative solutions to replacement of main be considered during the Accelerated Pipe Replacement Program?

A. Yes, KAWC will continue to look at different techniques or processes that will allow 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 that 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 expectancy of the main is increased and its ability to provide service to the community is maintained or improved.

Q. For significant replacement projects, will the Company continue to request a certificate of public convenience and necessity?

A. Yes, for significant replacement projects that would require a certificate of public convenience and necessity under Commission precedent, KAWC would seek such a certificate pursuant to KRS 278.020 and applicable regulations and request that the costs of such a project should be recovered through the QIP.

TAP FEES

Q. Does KAWC propose to increase its tap fees?

A. Yes. KAWC has experienced increases in the cost of the installation of new services compared to the tap fees approved in Case No. 2012-00520. The Company has also seen an increase in material costs.

The proposed tap fees are:

¾" x $^5/_8$" meter	$1,280 (increased from $1,078)
1" meter	$2,201 (increased from $1,576)
2" meter	$4,238 (increased from $3,563)

Q. How were the proposed tap fees determined?

A. KAWC requested an increase in the tap fees in Case No. 2012-00520. The tap fees were approved for all customers in that proceeding. Historically the 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 KAWC's 2004, 2007 and 2008 rate cases. For KAWC's 2010 and 2012 rate cases, a five-year average cost of installation was proposed and accepted due to the unusual economic situation that was occurring during that period. Based on the improvement to the economic situation, KAWC proposes to return to the three-year average cost to be consistent with previous requests and to ensure that the tap fees reflects the recent cost of installation that the Company is experiencing.

Q. Has the method used to calculate tap fees changed in any way in this case?

A. No. The methodology used is the same as approved in the previous five rate cases. The costs reflect the installation cost of the contractor that is used to install the services, KAWC oversight, and material pricing.

Q. How is the contractor selected for the installation of the new services?

A. The contractor is selected through a competitive bid process for an annual contract to perform the installation of new services.

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 14th day of January, 2016.

(SEAL)
Notary Public

My Commission Expires:
10/3/2016

Exhibit BEO-1

KENTUCKY AMERICAN WATER

AGING INFRASTRUCTURE

A REVIEW OF THE WATER DISTRIBUTION SYSTEM

2015

Kentucky-American Water Company

Contents

Introduction

Similar to other water utilities, the water distribution system of Kentucky American Water is beginning to reach its expected life expectancy. Even though the company has made investments in the replacement of the aging infrastructure, the rate at which existing infrastructure is reaching its useful life continues to increase at a quicker pace than the work to replace the outdated mains occurs.

One of the major challenges that water utilities face is that the distribution systems were installed to support the growth of communities 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 where pipes that were installed at different times in the past reach their useful life at the same time as other types of pipe material, increasing the amount of mains that need to be replaced throughout the system in a compressed timeframe.

As the American Water Works Association indicated in their May 2001 publication, “Reinvesting in Drinking Water Infrastructure,” a new era was emerging regarding the operation of our water infrastructure—the replacement era—where water providers would need to replace the water infrastructure that was built for us by earlier generations.

Although Kentucky American has made investments in the replacement of 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.

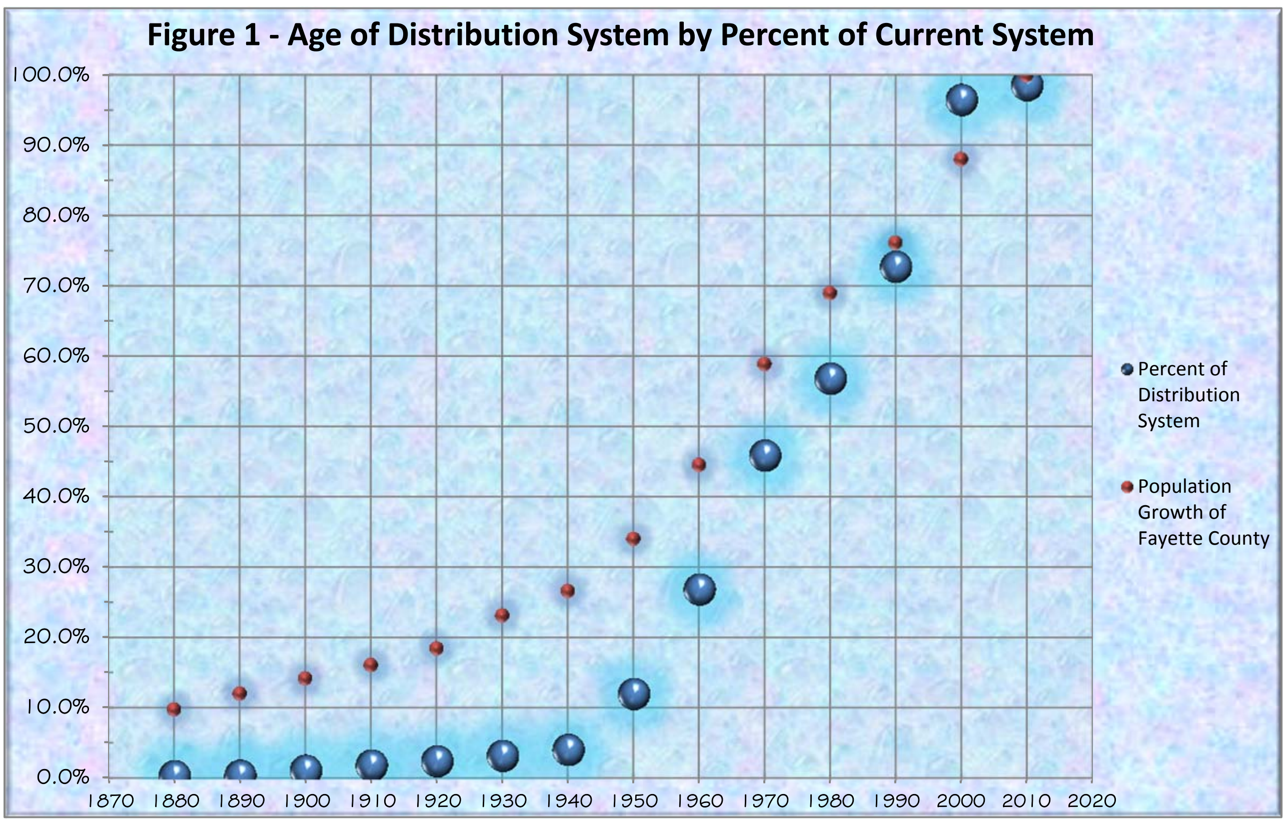
System Background

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 124,000 customers within 11 counties, including Fayette County. With that growth the distribution system has expanded to include approximately 1,975 miles of water mains of a variety of 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 1940's the area was predominately an agricultural based economy and growth was steady. Main installed during that period was unlined cast iron main and represents approximately 4% of the current distribution system (75 miles of main). This amount used to be a greater amount of the distribution system, however during the 1980s and 1990s 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 1950's and 60's, the distribution system also grew substantially to keep up with the expansion of Lexington. 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 23% of the current distribution system (425 miles of main).

The Lexington system experienced its greatest growth during the 1970s through the housing boom of the first part of 2000. During this period Lexington experienced a growth due to industry and service companies locating and growing in Fayette County. In addition, 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 September 2010, which was during the end of this time frame. Main installed during this period represents 66% of the current distribution system (1,293 miles of main). Asbestos Cement pipe was the predominate material installed during the start of this period with Ductile Iron pipe and PVC becoming the predominate material during the 1980's.

From 2010 to present, the distribution system has seen a much slower growth rate and represents a little more than 2% of the current distribution system (39 miles). Currently, the predominate material installed is 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	808.5	43.3
PVC	418.0	22.4
Asbestos Cement	342.7	18.4
Cast Iron Unlined	170.7	9.1
Cast Iron Lined	65.9	4.1
Galvanized	6.0	0.2
Prestressed Concrete	15.8	1.0

Distribution of Pipe Material by Decade

When the material type is compared to the timeline of growth of the distribution system, certain periods of time were dominated by particular pipe materials. During the first part of the system development from 1885 to 1950, cast iron unlined and lined was the predominant material. During 1950 to 1980, asbestos cement pipe was used along with cast iron pipe and the introduction of ductile iron into the system. After 1980, ductile iron pipe dominated the material type being 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, 90s and 2000s with the acquisition of systems, PVC was introduced into the Kentucky American distribution system. 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	5.5						
1891 - 1900	1.6						
1901 - 1910	15.3	0.2					
1911 - 1920	11.7	0.7				0.1	
1921 - 1930	8.6	2.2					
1931 - 1940	7.6	6.7	0.1				
1941 - 1950	3.3	5.7	12.2				
1951 - 1960	21.2	55.1	71.8	0.5	0.2	1.2	8.5
1961 - 1970	49.5	5.1	96.5	65.0	50.5	1.2	12.8
1971 - 1980	46.4		122.8	138.4	15.4	0.1	22.2
1981 - 1990			13.8	35.9	163.9		
1991 - 2000			0.3	27.0	282.7	0.1	
2001 - 2010				145.6	265.5		
2011 -					30.4		

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 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 with typical pipe conditions based on pipe material and varying conditions of age and size.

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 of reality since the life of the pipe is also impacted by the pipe material, soil properties, installation practices and climate conditions. Kentucky American has experienced that pipe life depends on many variables, such as soil conditions and installation practices, rather than just the age of the pipe itself. The company has had many pipes last longer than the typical service life indicated, but has had other pipes fail sooner than expected. For the purpose of this report and due to 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 networks 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 the water distribution system begins to reach 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, 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 and 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 impacted the ability of the local residents to continue with their regular routine.

This break follows a 48-inch water main break during April 24, 2014 near the intersection of Eastern Parkway and Baxter Avenue that 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 concerns for participates of athletic camps that were on the fields at the time of the break.

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 3 and half hours that it required to turn off the main. The water flooded into the university and entered numerous buildings and structures causing significant damage. Firefighters saved up to five people that were stuck in underground parking structures and trapped more than 730 cars with half of the vehicles being entirely submerged.

Kentucky American Water has not seen these dramatic of main breaks over the past few years, but it has seen several main breaks that have not only caused impact to the adjacent area that is surrounding the break but has 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," released in 2012 on the economic impact of under-investing in our water and wastewater infrastructure, the authors estimated that remaining on the current track will cost American businesses and households $216 billion in increased costs between now and 2020, and the cumulative loss to our gross domestic product (GDP) will be $400 billion, directly due to deteriorating water infrastructure. Without additional investment in the infrastructure, almost 700,000 jobs will be threatened due to unreliable water delivery and wastewater treatment services.

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 the loss of the service to the entire community. The loss of water through leaking pipe as the infrastructure ages is an impact that 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 the ability to manage non-revenue water would be impacted without a systematic approach for replacing aging infrastructure.

Other than the impact of pipe failure, the aging infrastructure also impacts the ability 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 its ability to provide adequate water flow for customer uses and fire service.

By 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 and reduces the number service disruptions.

The investment in replacing the infrastructure allows for a more robust system that enhance the ability of the community to compete for new business and industries, which 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 on 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.

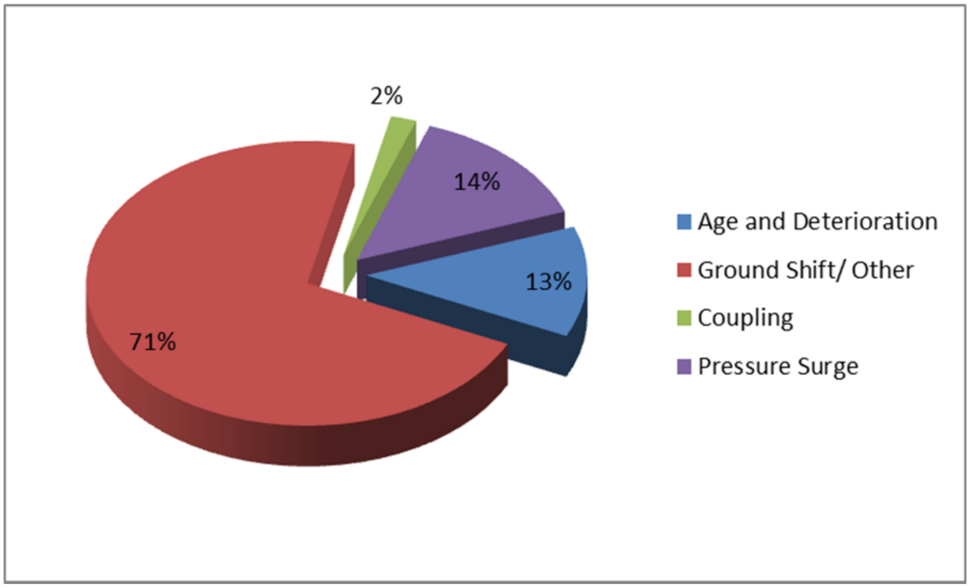
The main breaks that were reportedly caused by Age and Deterioration or Ground Shift/Other occurred on unlined cast iron main 53% of the time and, in particular, a significantly high percentage of reported breaks associated with age and deterioration occurred on unlined cast iron mains 37% of the time. 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.

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 August 2015 indicated that there has been 581 breaks during this period, averaging about 175 per year. Similar to the finding of the 2009 Gannett Fleming report, the current break history indicates that 71% of the main breaks are caused by ground shift. This percentage decreased from 82%, while the age and deterioration breaks increased to 14% compared to 10% during the past review. Although a small 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.

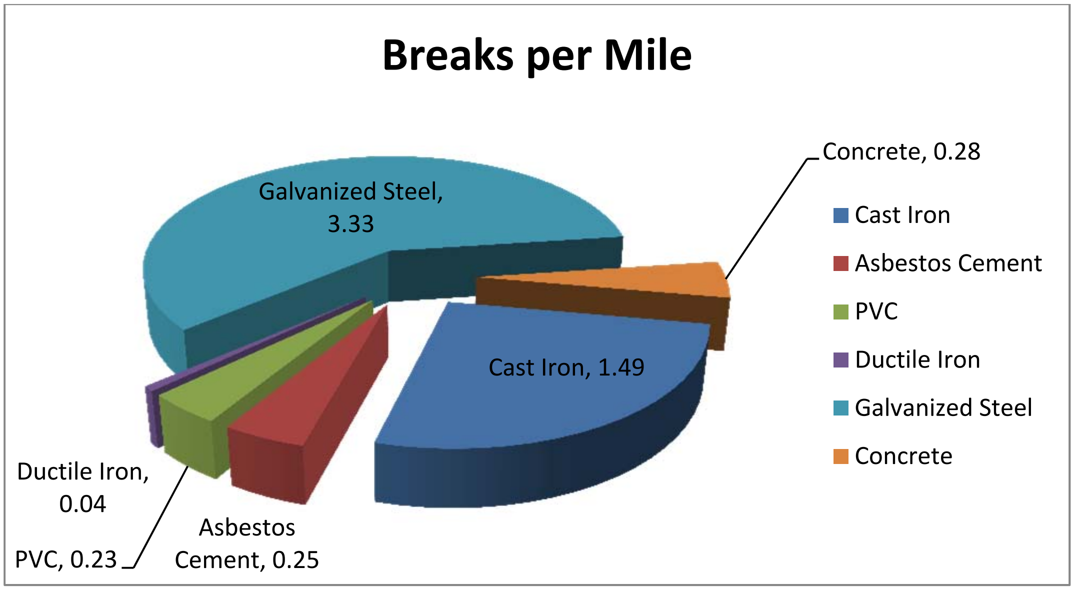


The average number of breaks per year has decreased from 222 per year for the period of January 2000 to October 2008 to 175 per year for January 2012 to August 2015. This reduction is indicative of the main replacement work conducted following 2008 that specifically targeted mains with high break incidents.

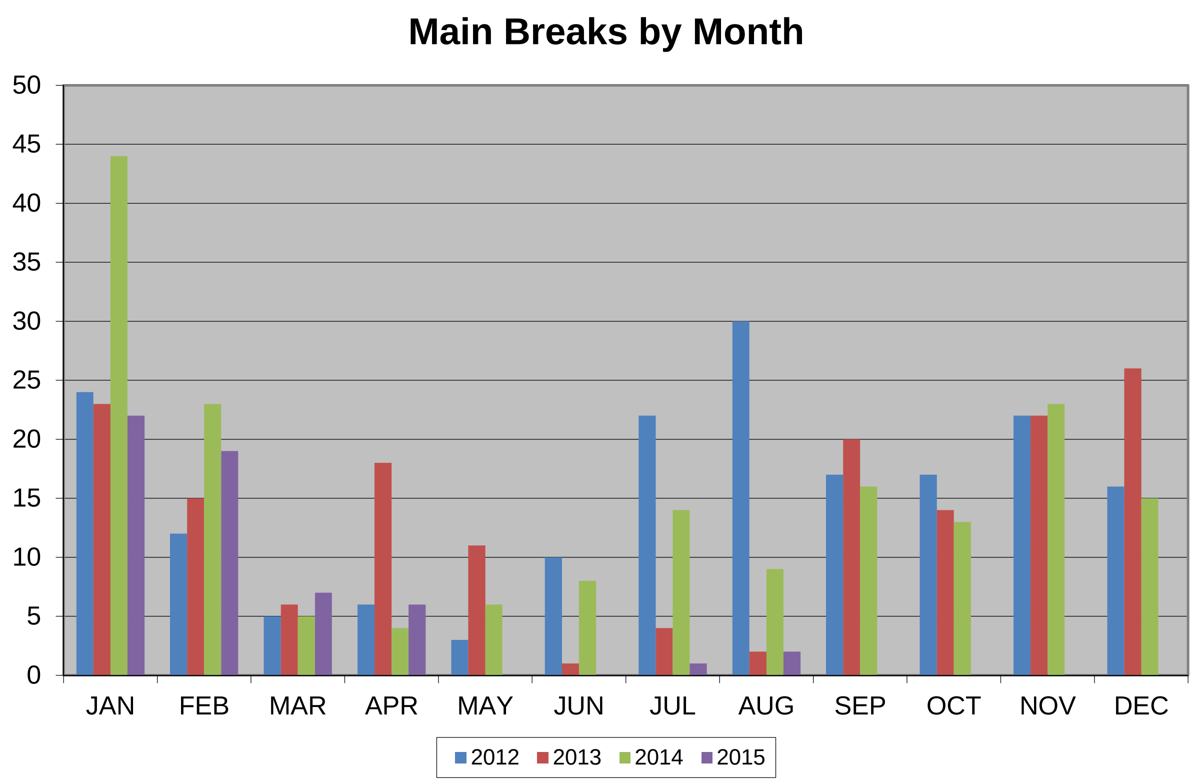
Review of the reported breaks from January 2012 to August 2015 indicated that main breaks on cast iron main represented 60% of all of the breaks. Since cast iron main lined and unlined material only represents 13% of the total inventory of mains in the ground, the break rate on this type of material 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
60.4%	14.9%	16.6%	5.3%	1.9%	0.9%

The break rate per mile of main shows that cast iron main had a break rate of 1.49 breaks per mile of main compared to ductile iron which saw a break rate of 0.04 breaks per mile of main from January 2012 to August 2015. The worst performing material was galvanized steel which had a break rate of 3.33 breaks per mile of main.



Another area reviewed in the main break data from January 2012 to August 2015 indicated that 52% 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 71% 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 resilient to tension and bending forces that result in ground shifting and contributes to the higher break per mile numbers that the system has experiencing. In addition, both of these materials

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 standardizing on ductile iron and PVC and moving away from cast iron and galvanized steel.

Current Replacement Effort

Following the Gannett Fleming report in 2009, the replacement effort was predominantly driven by mains that exhibit high break frequency 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 $1.06 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 10.5 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 August 2015 the average spend on main replacement projects was $4.2 million per year. Based on this current effort the amount of cast iron main replaced in the system from January 2014 through August 2015 was 7.8 miles with an average of 3.9 miles.

Since 2009 the main replacement work has replaced 18.3 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 2.6 miles per year during the 7 year period including the accelerated rate of 3.9 miles per year over the past 2 years from 2014 and 2015. While this is making significant progress, it is still not enough to address the rapidity aging distribution system. At the current rate over the past few years it would take approximately 60.6 years to replace all of the cast iron main in the distribution system. At the end of the 60 year period the possible age of a cast iron main could be 200 years old or 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 was determined to be too limited in determining 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 developmental 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 standards 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 2015 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.

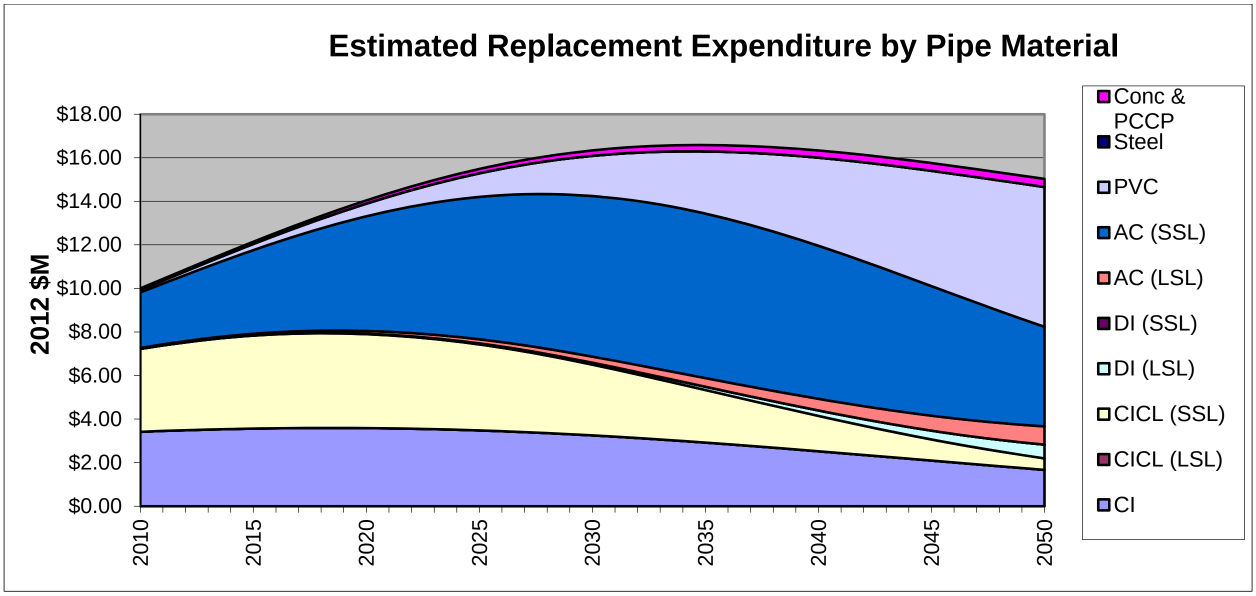
Nessie Model

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. 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.

Kentucky American Water utilized the Nessie Model to provide 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.

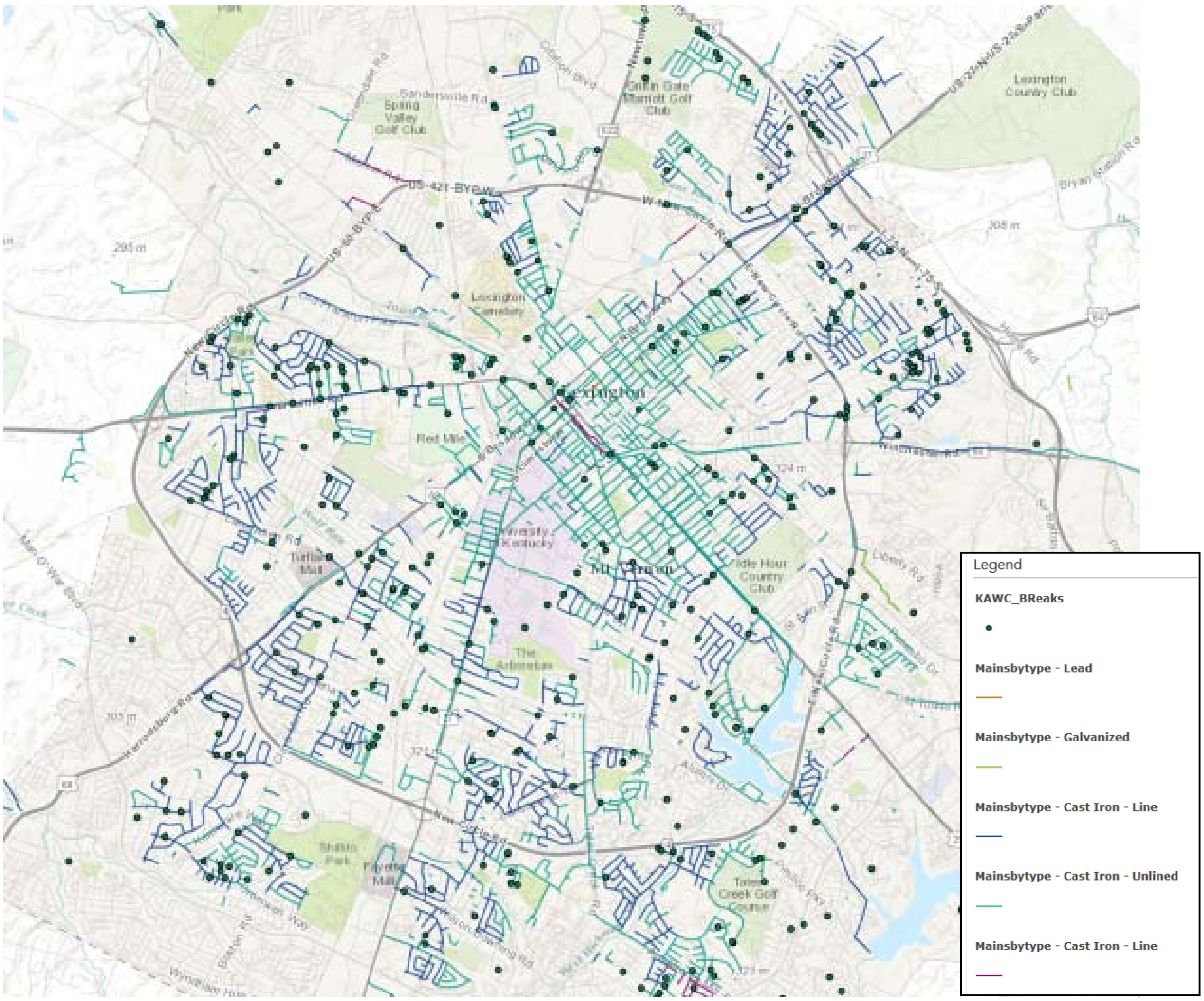
The curve reflects an "echo" of the original trends that shaped the development of the system starting in 1885. The identified capital needs is a reflection of the main installed nearly a century ago that have created a future obligation to replace the mains as they reach their useful life that is now 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 is cast iron main and galvanized steel. These two materials represent approximately 13% of the distribution system but account for approximately 62% 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 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 $11 million annually and a 30 year period would cost $5.5 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	16.0	12.0	9.6	8.0
Cost per year	$ 10,978,583	$ 8,233,938	$ 6,587,150	$ 5,489,292

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 main was removed from the system 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, with 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 mile 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 resource to complete the construction each year. The 15 year replacement rate is a fourfold increase in the amount of main replaced during the 2013 and 2014. 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 240 miles of cast iron main will be replaced at a rate of 9.6 miles per year at an expected cost of $6.59 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 342 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.

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 main are reaching 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 address 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 with the replacement of cast iron and galvanized steel main through a 25 year replacement period is important to ensure the company can responsibly enter into the period of water infrastructure renewal. Through careful prioritization and looking at emerging technology the cost of replacing main just prior to failure will be of significant benefit to the community. Through the reduction of the number of failures the system experience we can reduce the negative of property damage, disruption of businesses and the community, and waste our water resources and ensure our future generations continue to benefit from access to reliable clean water that will support the economic growth of the community.

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APPENDIX –

Five Year Projected 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

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

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 HUNTER CIRCLE HEATHER CT 300 BLOCK BELVOIR DR	1,556	$233,400
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 1300 BLOCK HOT SPRINGS CT 1300 BLOCK KEENELAND CT	1,682	$252,300
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 SHEFFIELD CT	942	$141,300
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 JADE CIRCLE KIMBERLITE CT GRANITE CIRCLE	1,438	$215,700
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 SHILOH CT	676	$101,400
29	KELSEY CT KELSEY PL YARMOUTH CT 1100 BLOCK KILRUSH DR	1,694	$254,100
30	CRICKLEWOOD CT	340	$51,000
31	1100 BLOCK APPIAN CROSSING WAY	978	$146,700
32	600 BLOCK CARDIGAN CT 3500 BLOCK BERWIN CT 3400 BL0CK IPSWICH CT	1,416	$212,400
33	3400 BLOCK FLINTRIDGE CIRCLE	426	$63,900
34	500 BLOCK FOLKSTONE DR	302	$45,300
35	1100 BLOCK GREENTREE CT GREENTREE PL GREENTREE CIRCLE	1,252	$187,800

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

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 3100 BLOCK CLAIR RD MONTAVESTA CT	1,916	$287,400
2	2000 BLOCK CUMMINS CT 2000 BLOCK DANIEL CT	758	$113,700
3	400 BLOCK CURRY AVE	468	$70,200
4	4000 BLOCK LILYDALE CT 4000 BLOCK WHITEMARK CT	1,634	$245,100
5	3500 BLOCK ORMOND CIR	636	$95,400
6	1900 BLOCK RITTENHOUSE CT	328	$49,200
7	2400 BLOCK PLUMTREE CT 2400 BLOCK THORNBERRY CT	1,236	$185,400
8	1200 BLOCK MAYWOOD PARK 1200 BLOCK OAKLAWN PARK 1200 BLOCK TANFORAN DR 1200 BLOCK NARRAGANSETT PARK LATONIA PARK 3200 BLOCK WATERFORD PARK	2,744	$411,600
9	200 BLOCK KELLY CT	1,352	$202,800
10	600 BLOCK FOGO CT 600 BLOCK CREWE CT 3400 BLOCK FRASERDALE CT 3400 BLOCK BIRKENHEAD CIR	2,020	$303,000
11	LOOKOUT CIR 2900 BLOCK MONTAVESTA RD	866	$129,900
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 MONA CT	912	$136,800
20	MARGO CT KAREN CT	1,846	$276,900
21	VERSIE CT JANNELLE CT	1,270	$190,500
22	200 BLOCK HEDGEWOOD CT	512	$76,800
23	TAMMY CT LAVERNE CT GREVEY CT HARRIS CT	2,726	$408,900
24	GRANT CT HOLLOW CREEK CT GRANT PL	1,034	$155,100
25	GRAIG CT	626	$93,900
26	LYNNWOOD CT WOODSTON CT CLEARWOOD CT	1,746	$261,900
27	3600 BLOCK CAYMAN LN JAMAICA CT	1,574	$236,100

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

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 1100 BLOCK MARTIN AVE 300 BLOCK FERGUSON ST 300 BLOCK ANDERSON ST 300 BLOCK ROBERTSON ST	3,476	$521,400
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 ELDERBERRY CT	858	$128,700
17	HEATON CT 2400 BLOCK MIRAHILL DR 2400 BLOCK WINDWOOD CT	1,042	$156,300
18	1400 BLOCK ELIZABETH ST 100 BLOCK FOREST PARK RD	2,352	$352,800
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 600 BLOCK ROSEMILL DR	2,604	$390,600
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 900 BLOCK NATIONAL AVE	1,242	$186,300
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. 2015-00418**
	)
	)

DIRECT TESTIMONY OF DONALD J. PETRY

January 29, 2016

Q. Please state your name and business address.

A. My name is Donald J. Petry and my business address is 727 Craig Road, Saint 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" or "AWWSC") as the Manager of Rates & Regulatory Support. The Service Company is a subsidiary of American Water Works Company, Inc. ("American Water") that provides support services to American Water's subsidiaries, including Kentucky American Water Company ("KAWC" or "Company").

Q. What are your responsibilities in this position?

A. My responsibilities include managing the preparation and presentation of work papers, exhibits, testimony and interrogatory responses in support of rate applications and other regulatory filings for all of American Water's regulated utility affiliates.

Q. Please describe your educational background.

A. In 1981, I graduated from Manchester College with a Bachelor of Science Degree in Accounting. In 1995, I earned my Master of Business Administration degree from Tiffin University. I have attended the Utility Rate School sponsored by the Committee on Water of the National Association of Regulatory Utility Commissioners ("NARUC").

Q. What has been your business experience?

A. I began my professional career in 1981 as an internal auditor for the Service Company. My responsibilities included conducting financial and procedural audits of American Water's operating companies. In 1983, I was promoted to Business Manager of Ohio American Water Company – Tiffin. I was responsible for the preparation and management of the budget, cash forecasting, and customer service. In 1994, I was promoted to Customer Service Superintendent for Ohio American Water Company state-wide operations. My duties included customer billing and collections, call center management, meter reading, and field services. In 2001, I was promoted to Manager of Operations and Performance for the American Water National Customer Service Center ("CSC"). My responsibilities included preparation and presentation of the CSC budget, analysis and reporting of CSC performance, scheduling of the workforce, and operation of the facility. In 2002, I was promoted to CSC Manager of Billing and Collections where I was responsible for all billing and collections activities. In 2004, I transferred back to CSC Manager of Operations and Performance. In 2005, I transferred to Senior Financial Analyst for the Service Company rates department where I prepared and presented rate applications and supporting documents and executed the implementation of rate orders. In June of 2011, I was promoted to Manager of Rates Support for the Service Company's Eastern Division where I was responsible for rate case preparation and rate order implementation. In November of 2011, as a result of American Water restructuring its divisions, I was named Manager of Rates Support for the resulting Central

Division, where I was responsible for rate case preparation, regulatory filings, and rate implementation for the seven regulated subsidiaries that comprise the Central Division of American Water. In 2014, I became Manager of Rates and Regulatory Support and provide regulatory support for all of American Water's regulated states.

Q. Have you previously participated in regulatory matters?

A. Yes. I have assisted in the preparation of rate cases and presented testimony to the Public Utilities Commission of Ohio, the Iowa Utilities Board, the Missouri Public Service Commission, and the Tennessee Regulatory Authority. I have also prepared infrastructure filings in Missouri and Indiana.

Q. What topics will your testimony address?

A. My testimony will address the Company's forecasted test year level of 1) labor and related expenses, including labor expense, payroll taxes, group insurance expense, 401(k) and defined pension contribution expense, pension expense, and other post-employment benefit ("OPEB") expense; and 2) Service Company's Support Services costs.

Q. Have you prepared, or caused to be prepared, financial exhibits in support of the Company's application to increase rates?

A. Yes.

Q. Are the exhibits as currently filed correct to the best of your knowledge and belief?

A. Yes.

Q. **What is the source of these exhibits?**

A. The data used to prepare these exhibits was acquired from the financial and operational records of KAWC.

<u>SCHEDULE G – LABOR AND LABOR RELATED EXPENSE</u>
<u>SALARIES AND WAGES</u>

Q. **Please begin by describing the total adjustment to Salaries and Wages for the forecast year in this case.**

A. For the base year (six months of actual data and six months of estimated data for the 12 months ending April 30, 2016), Salaries and Wages expense is $7,103,811. The forecast test year Salaries and Wages expense is $7,352,130 for the twelve months ended August 31, 2017. The forecast adjustment therefore increases the expense by $248,319.

Q. **Before you discuss the calculation of forecasted Salaries and Wages, is there any significant change in the Company's filing for labor and labor related expense since the Company's most recent rate case filing?**

A. Yes. In the Company's 2012 rate case filing, Annual Performance Plan ("APP") and Long Term Performance Plan ("LTPP") expense were not included in the Company's proposed Salaries and Wages revenue requirement. APP and LTPP expense have been included in the Company's proposed Salaries and Wages revenue requirement in this case. Please see the testimony of Robert Mustich from Willis Towers Watson and Kevin Rogers for further explanation of the Company's APP and LTPP and its reasonableness.

Q. Please discuss the primary foundations for the calculation of the Company's forecasted Salaries and Wages expense?

A. The forecast year pro forma Salaries & Wages expense was calculated on a position-by-position basis. The forecast year at August 31, 2017 is based on 138 full-time positions compared to 131 in the last rate case. The headcount included in the current case has 6 vacancies: 2 union positions, 3 non-union hourly positions, and 1 non-union salary position. The positions are a Maintenance Technician, Backhoe Operator, Automation & Controls Tech, Production Trainee, Technician Production, and Manager Operations. All of these positions are planned to be filled during the course of these proceedings.

Q. Please explain the various components of Salaries and Wages expense and how they were calculated in gross.

A. The first component of Salaries & Wages is base pay expense. To calculate the gross regular-time cost, wages were applied to annual working hours and totaled for the forecast year. Wages for union positions are calculated based on the negotiated union contract, which is in effect through October 31, 2017. Test year wages for non-union positions include prorated increases of 2.75% estimated for April 2016 and 3% estimated for April 2017. Gross base pay expense for the forecast test year equals $8,162,908.

The next component of Salaries & Wages is overtime expense. Overtime hours are based on budgeted overtime hours for each position. The overtime multiplier is based upon the recent average. Each associate's overtime gross expense is calculated by multiplying the associate's hourly wage by the overtime multiplier by the overtime hours. Gross overtime expense for the forecast year equals $679,464.

The next component of Salaries & Wages expense is shift premiums. These are differentials in hourly rates paid to employees for working the 2^{nd} or 3^{rd} shift, per the negotiated union contract. A three-year average annual gross shift premium amount of an additional $6,283 was spread by position according to payroll history.

The last component of Salaries & Wages is performance pay, which is based on each position's target percent for both APP and LTPP. The target percent was multiplied by the pro forma base salary to determine gross APP of $346,581 and LTPP of $14,535. As mentioned above, please see the testimony of Robert Mustich and Kevin Rogers for further detail on the performance plans included in this proceeding. All of these elements in sum equal a gross expense of $9,209,772.

Q. Once the gross costs are calculated, how are the forecast year 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". (Scheduled overtime is only multiplied by the "Water percentage," as these are production O&M hours.) The "Water percentage" is assessed by position and is based on a three-year average of payroll charges to water operations. Applying this percent has the effect of stripping out projected labor utilized in support of the sewer operations. The "O&M

percentage" is based on each position's budgeted percent of charges to O&M expense versus time charged to capital projects. This eliminates the labor expense that is projected to be included in capital projects. 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 of $9,209,772 are netted for Water percentage, O&M percentage, and the management allocation percentage, the resulting total is $7,352,130.

Q. Please summarize the Salaries and Wages expense adjustments.

A. To summarize, total forecast year regular, overtime, shift premium and performance pay expense equals $7,352,130. This is a $248,319 increase for the forecast year compared to the base year of $7,103,811.

<u>GROUP INSURANCE INCLUDING OPEB'S</u>

Q. What is the adjustment to operating expenses for group insurance expense, including other post-employment benefits ("OPEBs")?

A. The adjustment to group insurance expense is comprised of two components: other post-employment benefits ("OPEB"s), and non-OPEB group insurances.

Q. What are the Non-OPEB group insurances?

A. Non-OPEB group insurances include the basic life, short and long term disability, accidental death and disability ("AD&D"), and health, dental and vision coverages that KAWC provides for its associates.

Q. What was the base year expense for Non-OPEB group insurance?

A. The base year expense level for these costs was $1,151,971.

Q. Please describe the forecast year calculation for Non-OPEB insurances.

A. There are several types of insurance calculations that apply to these three categories: 1) Basic Life, Short and Long term disability, and AD&D; and; 2) Health, Dental and Vision insurance. Each is described below.

The first category (Basic Life, Short and Long term disability, and AD&D) was calculated based on the 2016 plan rates, with a 4% expected increase projected for January 2017. The rates are used to calculate costs for each associate, according to the insurance stipulations and with any differences for union and non-union associates applied appropriately. The gross forecast year cost for these types of insurance is $37,533.

The second category - Health, Dental, and Vision insurance – involves a gross Company cost net of an employee contribution. The costs and contributions vary by plan type (e.g. family, employee, employee + children or employee + spouse). Costs and contributions are calculated on a position by position basis, according to actual employee plan selections. Plan costs and employee contributions for the forecast year were calculated based on the 2016 rates, with an expected increase of 4% as of January 2017.

When each associate's health, dental, and vision plan costs are totaled, the gross Company cost is $1,986,275. When employee contributions are totaled, they equal $337,459. The net Company expense is thus $1,648,816 for the forecast year.

Finally, Water O&M totals for non-OPEB group insurances are calculated by totaling the two categories of insurance expense for each associate, then multiplying the total by each associate's Water O&M percentage. This net O&M expense is $1,342,269. This constitutes an increase of $190,298 from the base year.

Q. Please describe the OPEB component of group insurance expense.

A. The second component of group insurance expense relates to the accrual cost of OPEBs under the FASB Accounting Standards Codification Topic 715 (formerly Statement of Financial Accounting Standards 106). Depending on their start date, some KAWC associates are eligible for OPEBs upon their retirement. Non-union associates hired before January 1, 2006 and union associates hired before January 1, 2001 is eligible for OPEBs. For those associates who are eligible, the Company offers various levels of coverage for medical, dental, and prescription drug benefits, depending upon retirement date and age.

Q. What is the base year amount?

A. Base year OPEB expense is $505,481.

Q. How was the forecast year OPEB expense calculated?

A. Pro forma forecast year OPEB costs are calculated based on the latest estimates for 2016 and 2017 post-retirement welfare costs. The annual estimates for American Water as a whole are $30.1 million and $27.9 million respectively. Amounts for each forecast month are calculated by dividing the appropriate annual amount by twelve, then multiplying by 2.49%, which is KAWC's 2015 OPEB allocation. This calculation yields a gross expense of $713,966.

To calculate the Water O&M portion of OPEB expense, an overall Water O&M percentage was applied. When this percentage is multiplied by gross OPEB expense, a forecast year Water O&M expense level of $581,184 is derived. This constitutes an adjustment of $75,703 from the base year.

Q. What is the resulting grand total group insurance expense for both components?

A. Total O&M health, disability, and life-related insurance expense is $1,342,269. Total O&M OPEB expense is $581,184. When these two components of group insurance expense are added together, the total forecast year sum is $1,923,453.

OTHER BENEFITS

Q. Please describe the adjustment to "Other Benefits".

A. The "Other Benefits" line of the income statement contains a variety of labor-related expenses. Two of these expenses, 401(k) and Defined Contribution Program (DCP"), are calculated on a position-by-position basis. Other expenses in this category are reflected per the Company's forecasted operational costs.

Q. Please discuss the 401(k) expense found in "Other Benefits."

A. KAWC incurs 401(k) expense when it matches employee contributions to 401(k) retirement accounts. The match amounts are determined by each employee's benefit group or hire date. For employees whose benefit group falls into an "Original" category, the Company matches 50% of the first 5% of the employee's contribution (for a maximum of 2.5%). For employees whose benefit group falls into an "Enhanced" category, the Company matches 100% of the first 3% and 50% of the next 2% of the employee's contributions (for a maximum of 4%). The base year 401(k) expense amount for these matching contributions was $153,570.

Q. How was 401(k) expense calculated for the forecast year?

A. Forecast year gross 401(k) costs were calculated for each associate based on his or her forecast year wages, his or her 2015 employee contribution levels, and the corresponding match for his or her benefit group. Each associate's Water % and O&M % were then applied to the Company's 401(k) match cost, to derive a total net Water O&M cost. These calculations yield a forecast year gross cost of $221,912 and a net Water O&M cost of $172,352. This O&M costs constitutes an $18,782 adjustment from the base year.

Q. What is the Defined Contribution Plan ("DCP") expense found in "Other Benefits"?

A. DCP is a retirement savings program for employees not eligible for the defined benefit pension program based on their hire date. The DCP program entails KAWC contributing an amount equal to 5.25% of an employee's base pay into a retirement account. KAWC associates hired after January 1, 2006 are eligible for DCP. The base year expense for DCP was $161,331.

Q. How was DCP expense calculated for the forecast year?

A. Forecast year DCP was calculated by multiplying the pro forma regular time pay of each eligible associate by 5.25%. Each associate's Water % and O&M % were then applied to their gross DCP costs. These calculations yield gross forecast year DCP costs of $253,124 and a net Water O&M DCP expense of $201,208. This constitutes a $39,877 increase or adjustment from the base year.

It is noteworthy that DCP and 401(k) expenses trend upward more quickly than other labor expenses due to natural workforce transition. This is because new employees are all eligible for DCP and higher 401(k) matches, while longer-term employees are not because they are covered by more traditional pension plans. As a consequence, the number of DCP and Enhanced 401(k) eligible employees increases over time as new employees join the Company and longer-term employees leave the Company.

Q. Please discuss the Retiree Medical expense found in "Other Benefits"?

A. Retiree Medical expense (also known as VEBA) is a trust designed to help finance post-employment benefits for some non-pension-eligible employees. It has a gross cost of $500 per eligible employee. Generally, this includes union employees hired between January 1, 2006 and December 31, 2010. Each associate's Water % and O&M % were then applied to their gross Retiree Medical costs. The gross forecast year costs were $20,000 with a net Water O&M expense of $16,668. The base year Retiree Medical expense was $11,087. This constitutes a $5,581 increase or adjustment from the base year.

Q. Please discuss the employee stock purchase plan expense found in "Other Benefits."

A. The Employee Stock Purchase Plan ("ESPP") relates to the Company-funded 10% discount on American Water stock purchases made through payroll deductions by enrolled employees. The gross cost is determined by multiplying the employees' current deduction percentage by their base wages, then applying the discount. Each associate's Water percentage was then applied to their gross ESPP costs. The gross forecast year costs were $8,168 with a net Water O&M expense of $7,799. The base year ESPP expense was $10,652. This constitutes a $2,853 decrease or adjustment from the base year.

Q. What other expenses are included in "Other Benefits"?

A. Various other expenses reflected here include tuition assistance, training, drug screenings, health incentives, and safety incentives. These are reflected based on the Company's forecast for these expenses.

Q. What is the grand total adjustment to "Other Benefits"?

A. Total "Other Benefits" expense is $430,089 for the base year and $492,281 for the forecast year, resulting in a total adjustment of $62,732.

PENSION EXPENSE

Q. Please discuss the adjustment to pension expense.

A. KAWC records pension expense according to FASB Accounting Standards Codification Topic 715 or "ASC 715", (formerly Statement of Financial Accounting Standards 87). The base year O&M defined benefit pension expense totaled $630,347. Forecast year pension expense is $602,070, which is a decrease of $28,277.

Q. How was forecast year defined benefit pension expense calculated?

A. The forecast year calculation of defined benefit pension expense is based on the latest estimates for American Water's 2016 & 2017 ASC 715 defined benefit pension expense. Total American Water accruals are expected to be $46,120,000 and $39,620,000 respectively. Amounts for each forecast year month are calculated by multiplying the appropriate annual amount by 1.77%, which is KAWC's 2015 pension expense allocation. This yields a gross expense of $739,624. The forecast year grand total Water O&M % of 81.40% is then applied to arrive at a net expense of $602,070.

PAYROLL TAX

Q. Please discuss the adjustment to general tax expense for payroll taxes.

A. Certainly. 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").

Q. What are the base year and forecast year amounts for payroll tax?

A. Base year O&M payroll taxes equaled $535,550. Forecast year O&M payroll taxes were calculated on a position-by-position basis, using current 2015 tax rates and pro forma wages. Resulting forecast year gross payroll taxes total $727,410. Each associate's gross payroll taxes are multiplied by the associate's Water % and O&M %, to arrive at Water O&M payroll tax expense for each associate. When totaled, these O&M Water payroll taxes equal $576,225. This represents a forecast year adjustment of $40,675.

SUPPORT SERVICES

Q. Please describe the Company's forecast of American Water Works Service Company ("AWWSC") costs.

A. As I will show below, the level of AWWSC costs has declined since KAWC's last base rate filing. In this case, KAWC's filing includes $8.604 million for AWWSC Support Services costs. This is an increase from the base year expenses of $8.166 million. The Company increased the base year expense level based on projected expenses through August 2017, the end of the forecasted test year. Charitable contributions and advertising were removed, in addition to the .029% allocation of costs to the sewer division cost center based on Case No. 2014-00390, which was the Company's recent rate case for its sewer operations. This resulted in the $8.604 million of AWWSC costs included in the Company's filing.

Q. What are the major drivers of the increase in AWWSC costs from the base year through the forecasted test year ending August 31, 2017?

A. There are two major changes in the Support Services fees between the base year and the forecasted test year. Labor and Labor Related Costs were $5,114,776 in the base year and increased $728,453 to $5,843,229 in the forecasted test year. Increased projected labor costs were partially offset by a $287,897 projected decrease in Other Costs from $3,047,663 in the base year to $2,759,766 in the forecasted test year.

Q. Are there functions (and costs) that have specifically shifted from KAWC to AWWSC since the last case through the forecasted test year?

A. No, there have not been significant shifts of functions or costs between KAWC and Service Company since the Company's last rate case.

Q. How do the Support Services costs requested in this case compare to the level authorized in the company's previous rate case?

A. It is less. KAWC's authorized level of Support Services costs authorized in Case No. 2012-00520 (which did not include performance compensation costs), was $9.324 million.. The test year level of Support Services costs in this case is $8.601 million, which represents a decrease in requested Support Services expenses of $.723 million from the last case.

Q. Please summarize the Support Services that KAWC's affiliates provide to KAWC.

A. The Support Services provided to the Company include customer service, water quality testing, innovation and environmental stewardship, human resources, communications, information technology, finance, accounting, tax, legal, engineering, supply chain, and risk management services. AWWSC 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, AWWSC operates two Field Resource Coordination Centers responsible for tracking and dispatching service orders for our field representatives and distribution crews. Service Company employees have expertise in water quality, testing, compliance and treatment. AWWSC facilitates compliance with environmental laws and regulations, and effective use of natural resources. AWWSC's Information Technology Services provides effective information technology support and solutions to meet KAWC's business needs through standardized technology and processes. AWWSC also provides a variety of financial and accounting services for the Company, including payroll, human resources data management, utility plant accounting, cash management, general accounting and reporting, accounts payable, tax, and risk management services.

Q. How do KAWC's affiliates provide value to KAWC's customers?

A. AWWSC provides a wide spectrum of cost-effective, value-added services that enable KAWC to fulfill its public utility responsibilities in a more cost effective manner. In addition to the reasonably priced services discussed above, there are several other benefits Service Company provides. One notable example discussed in the testimony of Brent O'Neill is KAWC's ability to procure services and materials and reduce costs through either streamlined selection or utilization of AWWSC's large volume purchasing power.

As discussed in the testimony of Mr. Rungren, American Water Capital Corp. ("AWCC") provides the Company with short-term loans, long-term borrowings, and cash management services. The Company and its customers have benefited from interest savings resulting from pooling the capital requirements of the American

Water subsidiaries through AWCC, through long-term debt issues from AWCC that have been less costly than those available on the private placement market, and through daily cash management capabilities. In addition, the pooling and bidding of the credit lines has lowered the cost for short-term debt, and AWCC's access to commercial paper market has generated additional savings.

Q. Does this conclude your direct testimony?

A. Yes.

VERIFICATION

STATE OF MISSOURI	)	
	)	**SS:**
CITY OF ST. LOUIS	)	

The undersigned, **Donald Petry**, being duly sworn, deposes and says he is the Manager of Rates and Regulatory Support for American Water Works Service 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.

Donald Petry

DONALD PETRY

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 12th day of January, 2016.

MOLLIE L. OGDEN
Notary Public, Notary Seal
State of Missouri
St. Louis County
Commission # 12166844
My Commission Expires August 02, 2016

Mollie L. Ogden (SEAL)

Notary Public

My Commission Expires:

8/2/2016

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. 2015-00418**
	)	
	)	
	)	

DIRECT TESTIMONY OF KEVIN ROGERS

January 29, 2016

I. 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, Inc. ("KAWC" or "Company") as the Vice President of Operations.

Q. Have you previously filed testimony before this Commission?

A. No, but I testified before the Tennessee Regulatory Authority on behalf of Tennessee American Water Company ("TAWC") in 2012.

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 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 was promoted to Vice President of Operations for KAWC.

I am a member of the Kentucky River Authority and the American Water Works Association and have served as treasurer of the Tennessee Valley Water Alliance, as well as the Southeast Chapter of the National Association of Water Companies.

During my professional history, I have attended a number of independent and Company-sponsored training and professional development programs including the National Association of Regulatory Utility Commissioners Western Utility Rate School.

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 include the treating and furnishing of potable water; collection, treating and discharging of waste water; the provision of customer service; the safety and continuity of the Company's operations; and the upkeep and maintenance of the Company's facilities. I am responsible for the personnel employed within the Operations function as well as the development and maintenance of productive personnel relations within Operations and between Operations and the other functions with which it interacts.

I am responsible for maintaining contact with local government officials regarding operational issues, business representatives, and civic organizations. I also supervise the annual budgets covering capital investments and operation and maintenance expenditures and the construction of facilities occurring under the management of Operations employees. Finally, it is my responsibility to supervise water quality, production, distribution, and customer service activities, and procedures and to ensure their effectiveness.

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

A. The purpose of my testimony is to: describe KAWC's operations; describe the Company's efforts and investments to improve efficiency; describe certain of KAWC's expenses; summarize the Company's performance measurements; and explain the importance of variable performance compensation.

II. DESCRIPTION OF KAWC OPERATIONS

Q. Please describe KAWC's plant and property as of December 31, 2015.

A. KAWC's utility plant accounts include land and land rights, structures and improvements, collecting and impounding reservoirs, wells, pumping equipment and 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 facilities.

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 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. Operations of the KAWC treatment facilities meet or exceed all federal and state water quality regulations.

Q. **Please describe the customers served by KAWC.**

A. In total, KAWC provides water utility service to approximately 128,500 customers and also transmits water to ten bulk water customers from various points in the distribution system. Those 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.

Q. What is the condition of KAWC's utility property?

A. KAWC maintains its water utility properties in a 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 provision of safe and adequate water and wastewater utility service.

III. WATER EFFICIENCY AND REGULATIONS

Q. Are you familiar with the term "water efficiency?"

A. Yes, it is a term we are quite familiar with at KAWC.

Q. Please explain the concept of water efficiency.

A. In simple terms, improving water efficiency means KAWC's use of improved practices and technologies to deliver water service more efficiently. 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. Can prudent capital spending enhance operational sustainability as well as reduce operating expenses in the short run and long run?

A. Yes, it can, and the Qualified Infrastructure Program ("QIP") proposed in this case is a good example. A QIP program will enable us to develop and maintain a more systematic main replacement program (primarily of our cast iron mains) that have proven to be most susceptible to breaks and leaks. The accelerated systematic replacement cycle QIP supports will be more cost effective for customers because replacing these mains will reduce the high cost of unscheduled 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.

Q. Please provide other examples of improved operational efficiencies since KAWC's last rate case.

A. KAWC is a learning organization that is committed to having a continuous improvement mindset. This entails reviewing our processes and practices for areas we can improve and reduce costs for our customers. KAWC has a team dedicated to implementing operational efficiencies that have totaled over $1,600,000 of savings. These concerted efforts to be more effective and efficient with our resources and processes have allowed KAWC to achieve a major cost control milestone. We have more than offset the overall impact of inflation and consistently operated every year since 2012 without increasing our operations and maintenance ("O&M") spending. We have further demonstrated our continued focus on cost control in this filing as our O&M budget of $34.38 million through the forecasted period of August 2017 is virtually flat from our 2012 amount of $34.1 million. Below are some of the key projects that allowed us to achieve this milestone and keep our costs low for our customers:

- KAWC continues to actively monitor and manage water loss. KAWC personnel conducted more than 24,000 manual soundings on services, hydrants, mains and valves during the past two years. KAWC routinely inspects pipelines that cross streams and those in right of ways. KAWC inspected 102 stream crossings each of the last two years, and also inspected 160 right of way locations for non-surfacing leaks. Through KAWC's water loss activities, more than 60 non-surfacing leaks were identified and repaired since 2013, saving 3 million gallons a day had the leaks continued undetected. As infrastructure ages, new leaks will continue to develop even as discovered leaks are repaired. Leaks and main breaks are considerations in evaluating among alternative potential main replacement projects. In addition to managing the "leak" aspect of water loss, KAWC continues to manage other aspects of water loss, such as vacant accounts that show usage, or accounts with zero consumption registered on the meter that may indicate a stopped meter. Managing these areas helps ensure revenue is billed for water passing through meters, which otherwise would be unseen water loss. KAWC's 2014 water loss percentage was 14.8%. Without active management of water loss activities and routine replacements of aging mains, KAWC's water loss would likely increase.

- We reviewed our distribution construction process and determined it was cost effective to add an internal construction crew to install small diameter new mains and valves. That team will begin year round construction work in February 2016 and will save a projected $525,000 in construction costs in 2016.

- In reviewing our purchased water invoices we discovered a billing error, which resulted in a refund of over $136,000 from a purchased water provider.

- Other efficiencies include reviewing our depreciation schedules and finding assets that needed to be retired. The retirements resulted in reducing our depreciation expense by over $600,000.

- The team reviewed our payroll time entry process and transitioned away from paper to electronic logs and timesheets resulting in an operational efficiency gain of almost $85,000.

- We assessed our vehicle fleet utilization and were able to eliminate four vehicles; reducing our capital and expense costs approximately $136,000.

- The team reviewed our waste disposal process to optimize our chemical usage. The team was able to change the chemical feed and reduce our costs over $100,000.

- Finally, reviewing and revising our generator preventative maintenance program resulted in a savings of over $25,000 per year for our customers.

Q. Water quality continues to be a topic of emphasis as regulations evolve. Has KAWC been recognized for its water quality efforts?

A. Yes, KAWC continues to be recognized for its Partnership for Safe Water performance. The Partnership was created by the United States Environmental Protection Agency, the American Water Works Association, the National Council of Water Companies, the Association of Safe Drinking Water Administrators, the American Water Works Research Foundation and the Association of Metropolitan Water Agencies. The purpose of the Partnership is to encourage participants to identify processes that will enhance the quality of potable water and to voluntarily implement those processes with minimum capital investment. As an example, KAWC set as one of its goals filtered water turbidity less than the current regulatory requirement. Through a process of extensive treatment optimization, we have met that target, which we believe increases the microbial safety of our water for all of our customers.

In 2013, KAWC was awarded the Partnership for Safe Water Fifteen-Year Directors Award for its commitment to superior water quality at Kentucky River Station I and Richmond Road Station plants. KAWC continues to meet Partnership Goals and remains in good standing at both KRS I and RRS. Since coming online in October of 2010, KRS II has been performing like a fully optimized Phase III Partnership for Safe Water treatment plant, a significant accomplishment for a new facility. KAWC currently is in the process of enrolling KRS II in the Partnership program.

In 2014, KAWC's RRS water treatment plant was recognized by Kentucky's Energy and Environment Cabinet as part of the U.S. Environmental Protection Agency's

Area-Wide Optimization Program ("AWOP") as the AWOP Turbidity Champion for 2013. Similar to the Partnership for Safe Water, this voluntary program challenges treatment plants to reduce turbidity levels below those required by state and federal regulations and is designed as a mechanism to enhance public health protection of drinking water. Only half of Kentucky's public surface water plants met this criterion, and of the 46 plants servings populations of greater than 10,000 people, RRS was determined to be the best. In addition, KAWC's KRS II water treatment plant was notified that it performed as the second best plant in the AWOP program for 2014.

Q. Have any new water quality regulations that KAWC is required to meet become effective in recent years?

A. Yes. Reporting for the Stage 2 Disinfection Byproduct Rule ("Stage 2 DBPs") became effective in April 2012 for KAWC's Central Division. In addition, the Unregulated Contaminant Monitoring Rule 3 ("UCMR 3") became effective January 2013 and Long Term 2 ("LT2") Enhanced Surface Water Rule went into effect in April 2015. These new regulations require additional water sampling, analysis and reporting, and can present greater operational challenges.

KAWC has found that operational changes alone are not sufficient to consistently meet the Stage 2 DBP requirements, particularly during periods following high rain events when the Kentucky River source water contains elevated turbidity and organic material. Consequently, facility modifications at KRS I will be required. A recently completed engineering study recommends several changes which KAWC is currently evaluating to determine the best path forward to ensure water quality compliance for its customers. The initial step requires approximately $350,000-$500,000 of investment and will be taken in 2016 to add a permanent permanganate feed at the rapid mix. This will start removing organics earlier in our treatment process; thereby reducing the time the organics can react with the chlorine during the treatment process. Long term solutions will be finalized in 2016 to add permanent chlorination points after the filter process to achieve effective contact time and allow the reduction of the chlorine being added at the rapid mix. These actions will further reduce the reaction time of the chlorine and organics that form the disinfection byproducts during the treatment process.

KAWC has also begun monitoring its source waters for Cryptosporidium to meet regulatory requirements outlined in the LT2 Enhanced Surface Water Treatment Rule. Depending on results seen through continued source water monitoring, KAWC may find that future modifications at its water plants may be necessary to meet rule requirements.

IV. VARIOUS OPERATIONAL EXPENSES

Q. Please explain how your fuel and power and chemical expenses are determined for the forecasted test year.

A. These expenses are directly related to how much water is forecast to be treated and delivered (*i.e.*, system delivery). The volume of water sales is based on projections determined from the bill analysis for the forecasted test year as adjusted for weather normalization and other factors. System delivery volume is projected directly from this base of forecasted sales volume, adjusted for historical percentages of non-revenue water. This forecasted system delivery is then used as the basis to calculate fuel and power and chemical expense for the forecasted test year. This method matches the system delivery to the water sales developed for the forecasted test year. Total system delivery for the forecast period is 13.417 billion gallons.

Once the production volume is established, an assessment is made to project how much volume will be produced at each treatment plant over the course of the year. Anticipated fuel and power costs at each location are then calculated based on the projected power usage to meet the production volume and electric provider tariff pricing for that location. The total fuel and power expense for the forecast period is approximately $4.012 million.

Chemical expenses are similarly projected for each plant based on expected treatment volume. Contract pricing in place was adjusted (up or down) based on guidance from American Water's supply chain function, which helps procure KAWC's chemicals through a national competitive bidding process. The chemical expense for the forecast period is approximately $1.768 million.

Q. Does the water treatment process generate waste material?

A. Yes. Source water always contains some amount of solid matter in very small suspended particles that must be removed during the treatment process. The process to remove that suspended matter varies across KAWC treatment plants. For example, the RRS and KRS II processes use a coagulation and flocculation process, which helps the solid matter form particles large enough, and heavy enough, to settle out of the water. A chemical coagulant is rapidly mixed into the water to help bind the solid matter together. The water continues through chambers at slowing mix speeds into sedimentation processes that allow these larger particles to fall to the bottom of the chambers. A mechanical piping device is slowly dragged along the bottom of the chambers to extract this solid waste material. The waste is pumped to a separate holding tank where further settling occurs, and the wet sludge that results is run through a filter belt press to squeeze the water from the sludge, resulting in a dryer sludge material. At KRS I, the up-flow clarifiers serve a similar function, but the final waste product is dewatered in a series of dewatering lagoons as opposed to the use of the filter belt presses used at RRS and KRS II. KAWC incurs costs in disposing of this residual material.

Q. Please explain how KAWC's waste disposal expense is determined for the forecasted test year.

A. Waste disposal costs are projected based on anticipated routine expenses to operate the waste treatment processes, typical source water conditions and periodic expenses related to sludge removal. KAWC has mitigated typical disposal costs with its beneficial use permit-by-rule from the Division of Waste Management that allows the beneficial reuse of residuals on site at KRS I, KRS II and RRS. Waste disposal expenses are projected to be $0.377 million.

Q. How has the process of beneficial reuse of residuals on site benefited KAWC?

A. Many water facilities around the country experience significant costs associated with transporting residuals and paying to dispose of the material in a permitted landfill. KAWC has avoided the costs associated with trucking and landfilling by beneficially reusing these residuals on its property.

Q. Please explain how maintenance expenses are determined for the forecasted test year.

A. Maintenance expense is projected based on historic trends and anticipated activity. These programs include items such as valve operation, hydrant inspections, hydrant flow testing, flushing dead end mains, maintenance of equipment at treatment plants, and maintenance of building and grounds. KAWC projects maintenance related expenses to be approximately $2.216 million for the forecast period.

In addition to our maintenance programs, KAWC forecasts unscheduled maintenance based on historical levels. KAWC repairs approximately 200 main breaks and slightly fewer service line leaks each year. There is no question that replacing distribution infrastructure that is beyond its expected useful life helps to maintain or even reduce water loss and positively impact maintenance expenses.

Q. How has technology been utilized by KAWC to control costs of operations?

A. Technology often plays a role in enabling work to be completed in a more efficient fashion. In previous testimony, we indicated that Automatic Meter Reading ("AMR") meters were installed at approximately 82% of metering locations at that time. KAWC has subsequently completed the change-over and is now 100% AMR meter reads.

Two pilots referenced in prior testimony have since been incorporated into operating practice. KAWC has saved the cost previously incurred when granular activated carbon ("GAC") in the Richmond Road Treatment Plant filters was replaced every three years. Instead, a much smaller volume of GAC is added to restore that component of the filter media to the desired state. KAWC has also continued using a blend of orthophosphate and polyphosphate as a corrosion inhibiter. Expectations are that the continued use will offer long-term benefits in reduced hardness buildup on equipment, less tuberculation inside of distribution mains, and the potential to lower chlorine demand.

KAWC has participated in Kentucky Utilities Company's energy load shedding program, and when requested, limits the use of certain motors, pumps and other equipment to reduce electric demand from Kentucky Utilities Company. The incentives earned are passed back to customers in the form of a credit against fuel and power. To date more than $75,450 of credits have been received. KAWC is in discussion with Owen Electric regarding their upcoming load shedding program and expects to participate when the program becomes available.

KAWC continually looks to competitively source services to achieve the best value for our customers. Recent examples include a new janitorial contract at the Richmond Road office complex, and a new lawn mowing / snow plowing contract for the Richmond Road campus, reservoir and tank sites. The new contracts provided expense reductions over prior bids. KAWC also recently completed an assessment of internal crews versus contractors for certain main replacement projects, and determined that internal crews offered a lower cost option in certain circumstances. Consequently, KAWC has adapted the workforce to enable the undertaking those types of main replacement projects.

As these examples indicate, KAWC employees are actively engaged in looking for opportunities to improve the efficiency of operations to better serve customers and manage expenses.

V. PERFORMANCE MEASUREMENTS

Q. How does KAWC measure its efforts to improve its performance?

A. KAWC continually strives to deliver steady or improved levels of water service to its customers while mitigating cost increases. The Company monitors a variety of metrics to measure its performance including customer satisfaction, water quality complaints, customer complaints, O&M costs, O&M efficiency ratio, and non-revenue water.

Q. What are the benefits of performance measurements and operating metrics?

A. Performance measurements and operating metrics are a valuable tool to monitor and manage performance over time within a company. Tracking performance measurements can provide KAWC's management with critical feedback over time on whether the Company's practices and investments are positively or negatively affecting the desired outcomes. By objectively measuring data, KAWC can develop a framework for making rational business decisions to improve performance and eliminate waste.

Q. What do KAWC's performance measurements reveal?

A. From 2012 through 2015, KAWC performance measurements indicate that our customers are using water wisely and are increasingly satisfied with the water service that we provide them, and that KAWC is operating more efficiently while providing high levels of service quality.

Customer satisfaction climbed from 88% to 92% from 2011 to 2012, but decreased to 85% in 2013 as expected due to Business Transformation system implementation. However, our 2014 and 2015 results show our customer satisfaction has returned to above 90%.

Customer complaints have declined every year from 112 in 2012 to 52 in 2015. Water quality complaints have also declined each year from 238 in 2012 to 52 in 2015.

As mentioned earlier, very significant productivity gains have been accomplished through several means such as: process improvements, attrition, reorganization, and technology utilization and deployment. As a result, KAWC's annual O&M expenses have remained virtually flat: from $34.1M in 2012 to $34.38M through the forecasted period of August 2017. In contrast, simply increasing our O&M expenses at the rate of inflation per the Consumer Price Index from 2012 through November, 2015 would have resulted in $1.62M of additional O&M expense. These results demonstrate a solid and sustained improvement in water efficiency and is a testament to the discipline and cost controls in place at KAWC.

VI. STAFFING LEVELS AND COMPENSATION

Q. Has KAWC effectively managed its staffing levels?

A. Yes. KAWC has worked diligently to review staffing opportunities resulting from attrition and to continually evaluate the needs and priorities of the business. In this current rate application, we have 138 positions identified as the appropriate staffing level.

Q. Does the Company invest in its employees, and does that investment lead to efficiencies and other customer benefits?

A. Yes. The Company continues to provide development and continuous learning opportunities for employees. We have trained 39 employees on the principles of LEAN and Six Sigma, and they have earned their yellow belts. We have found that the results of applying Six Sigma principles -- added value, efficiency, elimination of errors and waste -- have led to many examples of reduced expense, capital avoidance, improved process efficiency, and error reduction in the Company's operations. These improvements can be expected to help control costs both now and in the future. The Six Sigma management system drives clarity around the business strategy and the metrics that most reflect success with that strategy. It provides the framework to prioritize resources for projects that will improve the metrics, and it leverages leaders who will manage the efforts for sustainable and improved business results. Our employees continue to be trained on the latest technologies which drive efficiencies and aid in retention of highly skilled employees.

Q. Please describe the Company's efforts in regards to safety.

A. Safety is a core value for KAWC and is a high priority for our Company. We have a robust safety program which employs a combination of on-the job training, classroom instruction, site observations and audits. Employees are provided the personal protective equipment and tools needed to perform work safely and are held to high standards to ensure the safety of themselves as well as the general public. KAWC has Operational Risk Management professionals on site solely dedicated to providing support, training and counseling. As incidents occur, investigations are completed to identify causes and corrective actions to minimize the likelihood of repeat occurrences. Recently, we have enhanced our near miss reporting program which provides opportunities to prevent injury. By reporting and investigating situations that could have resulted in injury but didn't, we work to identify causes and implement corrective actions to prevent injuries.

Q. How does the Company attract and retain high quality employees?

A. One of the critical tools in attracting and retaining talented employees is the ability to provide a competitive compensation and benefits package. American Water uses a combination of compensation and benefits to attract and retain employees and to improve performance and efficiency. KAWC provides base salary and overtime pay for hourly employees and fixed and variable (or “at risk”) compensation for management employees. Variable or at risk compensation is made available through American Water’s Annual Performance Plan and Long-Term Performance Plan. The Company’s objective is to pay compensation that, when variable pay is included, is, on average, comparable to the mid-point of compensation paid by enterprises with whom we compete for employee talent.

Q. Is there an objective measurement of the reasonableness of that overall expense?

A. Yes, I believe there is. The reasonableness of that overall expense is supported by the review and analysis of KAWC's compensation program conducted by Willis Towers Watson (see the Direct Testimony of Robert Mustich). When determining the reasonableness of compensation, the focus should be the reasonableness of the Company's overall compensation. When the compensation levels for many of its employees are near or below the mid-point of the compensation range for similar positions in the area, there is no evidence that the Company's employees are overpaid, even when variable payments are included. If overall compensation levels are reasonable, regardless of the combination of fixed and variable payments that the employees earn, then the Company's overall compensation expense is reasonable.

Q. Why does KAWC pay a combination of fixed and variable payments to its management employees?

A. KAWC's compensation program is designed to recognize the opportunity and accountability employees share as a team and individually for achieving Company goals and providing measurable customer satisfaction levels. The variable compensation plans (including the Annual Performance Plan and the Long-Term Performance Plan) directly tie employee performance to specific operational metrics. Variable, "at risk" compensation is an important part of KAWC's total compensation package for full-time management, professional, and technical employees who are exempt from overtime.

Q. Why is the variable compensation necessary to attract and retain talented employees?

A. Competition among companies to attract and retain the best and highest performing employees is keen. In recruiting new employees or retaining existing employees, KAWC and American Water compete with general industry in Kentucky, the surrounding regions, and nationally. For KAWC, the region includes companies in the manufacturing and service industries in addition to other utilities and energy companies.

KAWC's compensation plan is designed to provide employees with a total compensation package on par with those offered by companies with whom 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. Employees who excel at their performance can earn higher compensation than the norm, while employees who do not excel at their performance may earn less than the norm.

KAWC would be at a competitive disadvantage in the marketplace if variable or "at risk" compensation was subtracted from its overall compensation package. In that situation, KAWC would lose the ability to attract and retain the talented people it needs. Prospective employees expect to see a compensation package that is comparable to what is otherwise available in the marketplace. As demonstrated in the direct testimony of Mr. Mustich, if variable compensation were not part of KAWC's compensation program, our compensation simply would not be competitive.

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

A. Yes. The plan is designed to provide compensation for performance and to focus plan participants on delivering clean, safe, reliable and affordable water service.

The compensation plan includes components of operational, financial and individual measures. The operational components measure performance that can most directly influence customer satisfaction, health and safety, environmental performance, and operational efficiency. Customers derive a direct benefit from our focus on these key measures in the plan. 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. Our O&M expense forecast of $34.38M for the 12 months ending August 2017, is virtually the same as our 2012 $34.1M O&M costs. This improved O&M efficiency is the result of having a workforce that is incented to find smarter more efficient ways to deliver water services.

In Kentucky, employers compete for the best-qualified employee candidates at all levels. The competition for qualified employees is especially felt in technical and professional areas where pools of potential employees are small and competition is keener. In addition, with an aging workforce, we will need to attract employees to the utility business, which may or may not have appeal to a younger workforce as they plan their future careers. A competitive compensation program will help the Company fill those positions that directly affect the customer and the public at large.

Finally, a financially healthy utility focused on efficiency and customer service 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 our customers as it helps ensure the ability to provide safe and reliable service at the lowest reasonable cost. Compensation paid under our performance plans is not an addition to reasonable compensation. It is a critical component of making our entire compensation plan reasonable.

Q. Does this conclude your testimony?

A. Yes.

VERIFICATION

COMMONWEALTH OF KENTUCKY)
) **SS:**
COUNTY OF FAYETTE)

The undersigned, **Kevin Rogers**, being duly sworn, deposes and says he is the Vice President of Operations 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.

Kevin N Rogers
KEVIN ROGERS

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 14th day of January, 2016.

Peggy A. Stone (SEAL)
Notary Public

My Commission Expires:
10/3/2016

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. 2015-00418**

DIRECT TESTIMONY OF NICK O. ROWE

January 29, 2016

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 Kentucky-American Water Company ("KAWC" or "Company") as President. I am also the Senior Vice President of American Water's Central Division, which consists of Kentucky, Indiana, Tennessee, and Michigan.

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. 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 Central Division (Kentucky, Indiana, Michigan, 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. 2008-00427, 2007-00143, and 2007-00134.

Q. Please describe the areas KAWC serves.

A. KAWC supplies water and/or wastewater services, and public and private fire service, to people in Lexington and portions of Bourbon, Clark, Fayette, Gallatin, Grant, Harrison, Jessamine, Nicholas, Owen, 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 discuss the organizational structure of KAWC and the services provided by its affiliates, explain the primary reasons for the proposed increase; describe KAWC's operational efficiencies since the last case; explain why the Company is seeking approval of a Qualified Infrastructure Program ("QIP") and recovery of variable performance-based compensation; and summarize KAWC's commitment to the communities we serve.

Q. Please list KAWC's witnesses in this case and a brief summary of their testimony.

A. In addition to me, the following persons are testifying on behalf of KAWC:

- **Linda Bridwell** (Manger of Rates and Regulation for KAWC) will support several of KAWC's adjustments; present the Company's forecasted test year revenues, operating expenses, and rate base; review KAWC's proposed QIP; and discuss proposed tariff changes.
- **Paul Herbert** will present his cost of service study.

- **Robert V. Mustich** assesses KAWC's compensation program, and benchmarks KAWC's compensation expense, including variable compensation.
- **Brent O'Neill** (Director of Engineering at KAWC) will discuss KAWC's recent capital expenditures, explain the calculation of the proposed tap fees, describe the preparation of KAWC's investment plan and the need for construction projects, and discuss the need for the QIP.
- **Donald Petry** (Manager of Rates and Regulatory Support for American Water Works Service Company) will testify on Service Company fees and labor and labor-related costs.
- **Kevin Rogers** (Vice President of Operations at KAWC) will discuss KAWC's efforts and investments to improve water efficiency, summarize the Company's performance measurements, and support KAWC's recovery of variable or "at-risk" compensation expense.
- **Scott Rungren** (Rates and Regulatory Analyst III for American Water Works Service Company) will testify on the recommended capital structure, overall cost of capital, and business and financial risk; as well as why KAWC is seeking relief from the Commission condition regarding KAWC's equity-to-capital ratio.
- **John Spanos** will present his depreciation study.
- **Edward Spitznagel** will discuss the Company's weather normalization adjustment.
- **Dr. James Vander Weide** will provide his recommendations regarding the reasonableness of KAWC's capital structure and the appropriate return on equity for the Company.

KAWC ORGANIZATIONAL STRUCTURE AND AFFILIATED COMPANIES

Q. Please explain how KAWC staffs its business operations.

A. We recognize our obligation to staff our business in a manner consistent with the provision of safe and adequate utility service. This requires a constant evaluation of the right mix of internal and contract labor, straight time versus overtime, training programs and investment in technology. In this vein, 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 costs is labor. As such, we seek to use our labor in the most effective way by evaluating our employees and determining whether positions should be modified or eliminated. Cost control and improved business performance are the goals of these efforts.

Q. Please explain any significant changes since the Company's last rate case in its management.

A. The attached organization chart, Exhibit NOR-1, shows the current management structure.

In November 2015, there was a reorganization within the Central Division. As part of the reorganization, I returned as President of KAWC, while retaining my duties as Senior Vice President of the Central Division. Cheryl Norton, who had served as President of KAWC since 2011, left the position to become President of Missouri American Water Company. In addition, Kevin Rogers was named KAWC's Vice President of Operations. Mr. Rogers most recently served as Director of Operations for Tennessee American Water Company.

Q. Please describe the support that KAWC receives from its affiliates.

A. American Water Works Service Company ("AWWSC") 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 access to nationwide services and expertise that would be more costly if acquired separately. Mr. Rungren explains the benefits that American Water Capital Corp. provides the Company with short-term loans, long-term borrowings, and cash management services.

PROPOSED RATE INCREASE

Q. When were KAWC's current rates approved?

A. The Commission approved KAWC's current base rates in its Order issued October 25, 2013 in Case No. 2012-00520.[1] The rates were based on a forecasted test period ending July 31, 2014. In contrast, the test year in this case is the forecasted 12 months ending August 31, 2017--over three years later than the test year used to set the current rates.

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. Please describe the relief KAWC is requesting in this case.

[1] As amended by the December 6, 2013 Order correcting computational errors.

A. KAWC is seeking a rate increase that will produce additional annual revenues of $13,453,664, which is an increase of 15.23%. For an average residential customer using 4,130 gallons of water per month, the requested rate increase will increase the bill from $34.38 to $40.38. This is still less than a penny per gallon of water and approximately only $1.35 per day.

Q. Please explain why KAWC is seeking a rate increase 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 operational and maintenance ("O&M") expense, as well as make ongoing, significant capital investments.

This filing is primarily driven by the investment we must make to maintain and improve our infrastructure. Because we are working smarter and more efficiently, using technology and investments in our people to control costs, this filing is not driven by increases in O&M expenses. In fact, , our forecasted O&M expense is virtually flat from the previous rate case despite an environment where costs seem to rise annually. In other words, the men and women who work for KAWC are "doing more with less," achieving significant productivity and efficiencies. Instead, this filing is driven by two factors: the need to make significant investments in our infrastructure and the trend in declining use per customer that erodes revenue base. For example, one of the principal drivers of this case is the capital expenditures associated with the ongoing construction of the Richmond Road Station filter building, for which the Commission granted a Certificate of Public

Convenience and Necessity on December 23, 2014 in Case No. 2014-00258. At the same time, we are also making ongoing necessary investments in underground pipe infrastructure that is aging and in need of replacement on a more aggressive basis than in the past. Despite the need for additional revenue to fund this ongoing investment, our revenue is lagging behind.

Consequently, despite the significant achievement in cost cutting and cost containment, our need to provide significant investments to serve our customers and a steady erosion in revenue due to conservation and efficiency trends has deprived us of a reasonable opportunity to earn a reasonable rate of return without adequate rate relief. It is important for a regulated utility to file for rate relief when its ability to earn a fair rate of return is compromised. If the Company's ability to earn a fair return is compromised, then its ability to invest in maintaining and improving the water system will be impaired. In order to continue providing safe, adequate, and reliable water service, we have to file for the rate relief described above.

Q. Are you saying that this case is fundamentally about investment in infrastructure?

A. Yes, that is exactly what I'm saying -- with the corollary that this case is not about increased O&M expense. Rate increases are generally driven by O&M expense increases, increases in investment, and changes in revenue, both positive and negative. Our efforts to slow and mitigate cost increases have been very successful, in fact reversing the trend of escalating O&M expenses. We have been able to do so, in part, by prudent investments in ways that permit us to work smarter and more efficiently. At the same time, we need to upgrade and replace our systems and infrastructure that are at the end of their useful life - which also requires significant capital expenditures. KAWC's levels of ongoing capital investment are significant. The Company has invested more than $78 million in capital improvements since the last rate case without realizing any capital cost recovery or depreciation expense on that investment. Ongoing capital investment, together with the erosive impact of past and projected declines in revenues drive this rate increase. Moreover, as our capital needs are rising, our revenues per customer are falling. We are doing our best to control costs, but there are limits to what we can do to avoid increasing our revenues.

Q. You mentioned that O&M is not increasing. How did the Company achieve that significant result?

A. As I noted, KAWC's O&M expenses have remained virtually flat since our last rate case. This effort has involved an even greater focus on operating efficiencies, reassessing our costs and vendors, and an overarching commitment to improving efficiencies. Customers have benefited from KAWC's efforts. We are justifiably proud of the fact that we have contained costs and hope the Commission will recognize that achievement when setting rates.

In addition to our efforts to contain costs, as a good and careful steward of our precious natural resources, the Company has played a role through its customer education to promote the efficient use of water. Additionally, nation-wide and state-wide efforts to promote efficiency and conservation in plumbing fixtures and appliances have led to a relentless trend in lower annual water usage. Although beneficial from an environmental standpoint, this declining usage presents a significant economic challenge to the Company in our efforts to build and pay for the infrastructure needed to serve our customers. It would be inequitable if the Company were to be penalized in this rate case by an order failing to recognize the persistent and significant demand-side water efficiency and resulting falling revenue when setting rates.

CAPITAL INVESTMENT

Q. Does KAWC have significant capital investment requirements?

A. Yes, 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 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 and wastewater systems. Compared with other utilities, water and wastewater utilities are the most capital intensive utilities in the industry. According to AUS Consultants' Utility Reports (May 2010), the water industry is three times more capital intensive than the gas industry and nearly twice as capital intensive as electric utilities. 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.

Q. You mentioned that KAWC is currently constructing the Richmond Road Filter Building. Will this and other capital expenditures continue to occur?

A. Yes. KAWC will spend approximately $15.6 million constructing the Richmond Road Filter Building. In addition to the capital expenditures needed to improve our water treatment facilities, Mr. O'Neill explains that the Company is currently replacing its distribution system infrastructure on an approximately 500-year cycle. In other words, our distribution system, of mostly pipes and values, is being funded in a manner that will not provide for its replacement for almost half a millennium. This replacement rate is not optimal when the useful lives of these water mains and valves are a fraction of that. Accordingly, our goal must be to increase that rate of replacement to a more cost effective rate of replacement over time.

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 the distribution system infrastructure. The best way to ensure that appropriate levels of capital investment are consistently funded is through the predictable and timely recovery of a rate of return on the capital devoted to serving our customers' needs. The timely cost recovery of these expenditures in turn provides a mechanism for continued capital infusion by the investors who are called upon to put their capital at risk for our customers. Consequently, the Company is requesting approval of a QIP to provide a more current matching between making an investment and earning a return on it. This will provide a mechanism for KAWC to accelerate investment in non-revenue producing investment in infrastructure replacement in between general rate case filings.

We believe that the QIP is an important component of the Company's efforts to replace its aging infrastructure in a fiscally prudent manner by supporting necessary infrastructure replacements, while moderating future rate increases on customers. Brent O'Neill and Kevin Rogers's testimony demonstrate why the QIP is needed. Linda Bridwell's testimony provides a thorough explanation of how QIP will be implemented and addresses the Commission's concerns regarding the Distribution System Infrastructure ("DSIC") that was proposed in the Company's last rate case.

OPERATIONAL EFFICIENCIES

Q. You mentioned the Company's significant achievement in controlling the growth of O&M expense. Please describe some of KAWC's efforts to improve efficiency.

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 strive to manage our cost structure as efficiently as possible. KAWC uses various operational and efficiency reviews to further focus on improving customer service and efficiency of production and field operations. Through the size and breadth of American Water, KAWC has continued to increase its purchasing power and obtain significant discounts on the necessary equipment needed to manage and maintain our system – including pipes, meters, fittings, and water treatment chemicals - that we otherwise would be unable to obtain were we a separately owned water system.

Our intense focus on controlling expenses produces direct benefits to our customers. KAWC is continually evaluating the cost of doing business. These efforts will provide future efficiencies for the Company and its customers, which mitigates cost increases and results, over time, in less frequent rate cases.

Q. Does the Company invest in its employees, and do those investments lead to efficiencies?

A. Yes. The Company emphasizes continuing employee development, and our Continuous Improvement training program has created ascertainable benefits for our customers. As Mr. Rogers explains in his direct testimony, when practiced as a management system, the principles of Six Sigma and Lean are a high performance system for executing business strategy, and we have trained 39 KAWC employees on those principles.

Q. Is KAWC seeking to recover total employee compensation in this case?

A. Yes, we are. KAWC's salaries and wages are reasonable and designed to attract and retain skilled employees who allow KAWC to satisfy its obligation of providing clean, safe, and reliable water service. KAWC's compensation expense includes variable, performance-based compensation. While KAWC is mindful of the Commission's prior orders regarding the recovery of KAWC's performance-based compensation, we are requesting rate recovery of it in this case. I noted several times our significant achievement in controlling our O&M expenses. This achievement would not have been possible without dedicated, well-motivated and incented employees.

The Company's performance-based compensation plan is designed to provide compensation for financial and operational performance and to focus employees on delivering safe and reliable water services to our customers in as efficient a manner as possible. KAWC has engaged Robert Mustich, from Willis Towers Watson, to study and determine whether the Company's overall compensation, of which variable compensation is an important component, is competitive within the applicable markets. Willis Towers Watson, a leading global professional services company that offers consulting services regarding talent management to KAWC and American Water, has confirmed the reasonableness of KAWC's total compensation, including variable compensation. If overall compensation levels are reasonable, regardless of the combination of fixed and variable payments that the employees earn, then the Company's overall compensation expense is reasonable.

Q. Have other operating efficiencies been implemented since the last rate case?

A. Yes. KAWC has enhanced a range of its core functional areas in data management and dissemination, including: human resources; finance and accounting; purchasing and inventory management; capital planning; cash management; and customer and field services. The effect on our expense structure is clear – we have controlled our O&M expenses.

Q. Are these operating efficiencies sufficient to further delay a rate increase?

A. No, they are not. While these efforts have helped delay the filing of this case, without an increase in rates at this time, our return on equity for the forecasted test year in this case will be unacceptably deficient. As I explained, unfortunately our growing investment obligations and declining revenue due to falling usage per customer have overcome our cost cutting efforts.

<u>COMMITMENT TO OUR CUSTOMERS</u>

Q. Has KAWC made changes to its commitments to low income customers since the last rate case?

A. Yes, we have. For years, KAWC has operated the H20, or Help 2 Others, program, which assists eligible utility customers with their KAWC water bills. The program is funded by contributions from KAWC's shareholders, as well as customers. Another benefit to this program is that it often connects customers with other sources of aid in their communities, including other assistance programs for which they might qualify. Since the program began, it had been administered by a local community partner, the Community Action Council of Fayette, Bourbon, Harrison, and Nicholas Counties.

The Company continuously evaluates how it allocates its low income giving, and consistent with our operating philosophies, looks for ways in which to improve H20 by reaching additional customers. As part of this evaluation, KAWC now partners with the Dollar Energy Fund to administer the program. The Dollar Energy Fund is an 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. In operation for more than 30 years, the organization has provided $114 million in utility assistance grants to more than 400,000 low-income families and individuals. KAWC was aware of the organization because of the successful partnerships between the Dollar Energy Fund and other American Water operating affiliates.

Q. How is the Dollar Energy Fund expanding access to the H20 program?

A. The Dollar Energy Fund has enhanced access to the H20 program by diversifying the agencies where low income eligible customers can apply to receive assistance. Previously, applicants could only apply for benefits through Community Action Council locations. Now applicants can apply at United Way of the Bluegrass, Catholic Charities of the Diocese of Lexington, Inc., the Lexington Senior Center, the Bourbon County Senior Center, the Clark County Outreach Office, Jessamine County Community Development Office, Meeting the Needs Ministry in Owen County, Northern Kentucky Community Action Commission, Scott County Community Development Office, and the Woodford County Community Development Office. The Company is currently working with the Dollar Energy Fund to add additional partners in the other communities in which we serve, which will further enhance customers' access to the program. While Community Action Council elected not to take applications for the H20 program once administration of the program transitioned to the Dollar Energy Fund, KAWC makes sure that Community Action Council maintains a current list of application sites so that applicants who are accustomed to Community Action Council's association with the program are made aware of how to apply, and has extended an open invitation for Community Action Council to resume taking applications at any time in the future should it reconsider its decision.

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 $60,000 annually to low income assistance.

Q. Please explain KAWC'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 2015 KAWC hosted its sixth annual 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 2015, KAWC helped sponsor River Blast events in Frankfort and Ft. Boonesboro organized by the Kentucky River Keeper and Bluegrass Tomorrow, which are designed to create major public awareness of the Kentucky River and its watershed.

In addition, KAWC 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 five years ago, KAWC has contributed $35,500 to fire departments. With respect to having pride in our service areas, KAWC assists with the operational expenses for the fountains at Triangle Park, which are a landmark in the City of Lexington, and also participates in the Keep Lexington Beautiful efforts, which beautify Lexington's corridors.

Moreover, in 2015 KAWC helped sponsor the Salvation Army's LemonAiD fundraiser which supports local homeless children while empowering young people to make a positive difference in their community by operating lemonade stands. KAWC also provides Puddle's Hydration Station, which is 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, through the "Adopt-a-Highway" program sponsored by the Kentucky Transportation Cabinet. Many of our employees donate their time by performing trash pick-ups 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.

KAWC also offers a total of $20,000 each year to area organizations to assist with a variety of environmental initiatives. Organizations are eligible for grants up to $10,000 for community-based projects that improve, protect and restore drinking water supplies and surrounding watersheds. On an annual basis, KAWC awards Ripple Effect Scholarships to high school seniors who demonstrate academic excellence and an ongoing commitment to environmental stewardship. Since the program's inception in 2002, KAWC has awarded a total of $43,500 in Ripple Effect Scholarships to 71 students. Relatedly, KAWC continues to sponsor local science fairs, which are important events in which our youth exhibit their inventive and creative work. Finally, KAWC participates in local events aimed at environmental stewardship and conservation, such as Earth Day and Arbor Day.

Q. Does this conclude 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, 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

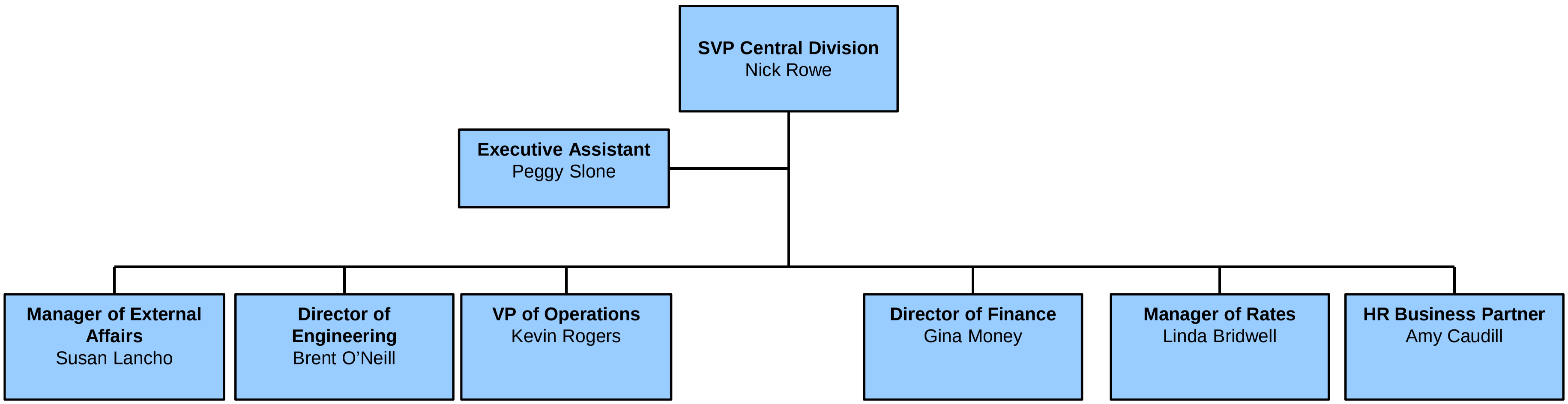
Subscribed and sworn to before me, a Notary Public in and before said County and State, this 14th day of January, 2016.

_______________ (SEAL)
Notary Public

My Commission Expires:
10/3/2016

AMERICAN WATER

Kentucky American Water
Sr. Leadership



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. 2015-00418**

DIRECT TESTIMONY OF SCOTT W. RUNGREN

January 29, 2016

BACKGROUND

Q. Please state your name and business address.

A. My name is Scott Rungren. 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 ("Service Company") as a Rates and Regulatory Analyst III. The Service Company is a subsidiary of American Water Works Company, Inc. ("American Water") that provides support services to American Water's utility subsidiaries.

Q. Please summarize your educational background.

A. In May 1983, I received a Bachelor of Science degree in Business Administration with a major in Energy Management from Eastern Illinois University. In May 1986, I received a Master of Business Administration degree with a specialization in Finance from Northern Illinois University.

Q. Please summarize your employment experience.

A. 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 using dividend discount and risk premium models. 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 1999. In March 1999, I began employment with Cinergy Corp., working in the Retail Commodity Services group and 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 2007, I joined the Service Company as a Senior Financial Analyst. My current duties as a Rates and Regulatory Analyst with the Service Company include the preparation of reports required by the various regulatory commissions governing the jurisdictions in which American Water operates, and assisting in the preparation of financing and rate-related filings for American Water's regulated operating companies.

Q. Have you previously filed testimony before this or any other commission?

A. Yes, I have testified before the Kentucky Public Service Commission ("KPSC"), as well as the Missouri Public Service Commission, the Illinois Commerce Commission, the Iowa Utilities Board, the Indiana Utility Regulatory Commission, and the Public Utilities Commission of Ohio.

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

A. The purpose of my testimony is to present and describe the Company's recommended capital structure to be used for computing Kentucky American Water Company's

("Company" or "KAWC") weighted average cost of capital ("WACC"). The Company's WACC reflects, among other things, the rate of return on common equity recommendation presented in the direct testimony of KAWC witness Dr. James Vander Weide. In addition, I will present the basis for why the KPSC should release KAWC from the requirement that it maintain its equity-to-capital ratio between 35 to 45 percent. This requirement is specified in Condition 16 of Appendix A of the KPSC's Order in Case No. 2006-00197.

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. What is the source of information used in those exhibits and schedules?

A. The information contained in the exhibits and schedules I am sponsoring was prepared from the financial and operational records of the Company.

Q. What forecast period has the company proposed in this case?

A. The Company's proposed forecast year is the twelve months ending August 31, 2017.

<u>CAPITAL STRUCTURE & OVERALL COST OF CAPITAL</u>

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 in calculating the cost of service (revenue requirement) in this case?

A. The Company used the capital structure for the thirteen month average of the forecasted test-year ending August 31, 2017. 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 reflected in the Company's cost of service and revenue requirement in this case. The proposed capital structure is comprised of 1.500% short-term debt, 50.585% long-term debt (52.085% total debt), 0.563% preferred stock, and 47.352% common equity.

Q. Is the capital structure proposed by the Company in line with the capital structures historically approved by the KPSC for setting the Company's rates?

A. Yes, it is. Subsequent to the KPSC 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 40-45% range. Although this historic equity 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 52.648% debt and preferred stock, and 47.352% common equity will enable the Company to attract capital at a reasonable cost, and balances the interests of stockholders and ratepayers. Although the common equity ratio of 47.352% in the Company's pro forma capital structure exceeds the 45% limit currently imposed on the Company by the

KPSC's Order in Case No. 2006-000197, the basis for why this restriction should be removed will be presented later in my 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 Company 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 Order in Case No. 2009-00156, 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. 2012-

00393, 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 safe, 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 $7.25 million and two equity infusions totaling $10 million through the forecast period ending August 31, 2017. 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 make the necessary capital investments at the least possible cost to its customers.

Q. Why is the level of ST debt included in the Company's forecast period 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 August 31, 2017. 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 describe the new LT debt financing included in the Company's proposed capital structure.

A. The Company's proposed capital structure includes $7.25 million of new LT debt to be placed in June 2016. The Company used an expected taxable interest rate of 4.70% for this financing. This rate is based on the projected rate for a 30-year U.S. Treasury bond for mid-2016, plus a credit spread.

Q. Please explain why you assumed a 30-year term to estimate the interest rate on the new LT debt.

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 cost rate for the new LT debt issuance?

A. The projection developed for the new LT debt issue in 2016 is based on the rate for a 30-year U.S. Treasury Bond taken from Bloomberg's forward yield curve on August 27, 2015. The projected rate for mid-2016 was 3.25%. To that rate I added 1.45% to capture the estimated spread at which 'A' rated utilities have issued above the 30-year U.S. Treasury bond rate. In other words, the spread is reflective of transactions comparable to that which would be expected of an AWCC issuance. 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 4.70% for the new LT debt issuance is reasonable.

Q. Has KAWC filed an application with the KPSC seeking authorization to issue new indebtedness?

A. Yes, on December 2, 2015, the Company filed its application in Case No. 2015-00400 asking for approval to issue up to $12,250,000 of new long-term debt. This amount includes the $7,250,000 of new LT debt discussed above. The remaining $5,000,000 is currently planned for November 2017, which is subsequent to the Company's future test year in this case.

Q. Have any changes occurred to the Company's preferred stock balance since the last rate case?

A. Yes. On December 15, 2015, the Company redeemed $2,250,000, or 22,500 shares, of its 8.47% Series of Preferred Stock. The amount of this redemption represented one-half of the balance of the Company's Preferred Stock outstanding. This redemption is reflected on Exhibit SWR-1, and on Schedules J-1, J-2, and J-5 of Exhibit 37. This redemption was financed with short-term debt, which will, in turn, be replaced with the new long-term debt planned for issuance in June 2016.

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 November 2015 through August 2017. As shown on Exhibit SWR-2 attached to this testimony, the projected ST debt interest rates are 0.788% for April 30, 2016 and 1.659% for August 31, 2017. Using the projections on SWR-2, I also computed the thirteen-month average ST debt cost of 1.369% for the period ending August 31, 2017. This cost rate, 1.369%, 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 will 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 total annual cost of each series, which is comprised of annual interest or dividends plus the annual amortization of the issuance expense, was divided by the carrying value to arrive at the effective interest rate. The carrying value is the face amount outstanding minus the unamortized issuance cost. The effective interest rate was then multiplied by the percentage of each series to the total for that capital component 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 forecast year is 6.05%, and the cost of preferred stock is 8.52%. 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 an issue in the Company's Case No. 2000-00120. The Commission Order in that case indicates 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 weighted average cost of capital is the Company requesting in this case?

A. The overall weighted average cost of capital being requested is 8.22%, 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 10.75%, which is within the ROE range recommended by Company witness Dr. James Vander Weide.

EQUITY-TO-CAPITAL RESTRICTION IN CASE NO. 2006-00197

Q. What relief is the Company seeking in this case with respect to its proposed capital structure?

A. In this case the Company is proposing an equity-to-total capital ratio of 47.352%; however, the Company is currently not allowed to have an equity-to-capital ratio higher than 45%. This limit was imposed on the Company by Condition 16 in the Commission's Order in Case No. 2006-00197, the proceeding in which the Commission approved Thames Water Aqua Holdings GmbH's sale of American Water's common stock to the public.

Q. Please provide the specifics of Condition 16.

A. Condition 16 states as follows:

> Kentucky-American's equity-to-capital ratio will be maintained between 35 to 45 percent. If the equity-to-capital ratio falls outside this range, AWWC and Kentucky-American will notify the Commission in writing within 30 days of this development and will submit to the Commission a detailed plan of action to return Kentucky-American's equity-to-capital ratio to this range (Order, Appendix, p. 3).

Q. Why did the Commission impose this restriction on KAWC?

A. Based on the Order in Case No. 2006-00197, the Commission imposed this restriction, along with 38 others, due to concerns that the proposed stock sale could create "significant financial risk and uncertainty" and have "potentially adverse effects on the quality of [KAWC's] service (Order at 19). Many of the other conditions contained a sunset provision or have expired, or were in effect only until completion of a future event. However, the Company must continue to comply with Condition 16 unless it is released from doing so by the Commission. In Case No. 2014-00362, the Company asked to be released from this condition. In an Order issued on May 15, 2015, the Commission denied this request, without prejudice, stating:

> The Commission recognizes that Kentucky-American agreed to Condition 16 at the request of the intervening parties in that case. Because those parties did not intervene in this proceeding and have not stated their position on Kentucky-American's request, and because removal of the condition may impact rates, Kentucky-American's request for removal of Condition 16 could be included in its next rate case filing where the impact to its rates and capital structure can be addressed by all stakeholders.

Q. Is it your position in this case that KAWC should be released from Condition 16?

A. Yes, it is.

Q. What is the basis for your position?

A. From a financial standpoint, the principal concern with prohibiting the Company from having an equity-to-capital ratio higher than 45% is that it could deny the Company the ability to manage its capital structure in an optimal manner. The fundamental advantage of removing the 45% equity ratio restriction is that it will enhance KAWC's financial flexibility by allowing management to adjust the Company's capitalization and target capitalization ratios based on the degree of business risk it faces. The ability to maintain an equity ratio that is more reflective of its business risk will increase the likelihood that the Company can maintain a capital structure that results in a WACC that is lower than it would have been under the current restriction.

Q. Please explain the relationship between capital structure and risk, and their impact on cost of capital.

A. As a company increases the percentage of debt in its capital structure, its financial risk increases and, conversely, as it reduces the percentage of debt in its capital structure, its financial risk decreases. Financial risk increases as the debt ratio increases due to the higher fixed financial obligation it imposes on the company. That is, interest payments to bondholders are contractual obligations, whereas dividend payments to equity owners are not. As a result, all else equal, a capital structure containing, for example, 55% debt represents a higher level of financial risk than one containing 50% debt. The higher level of financial risk associated with the 55% debt ratio results in the cost of each capital component in that capital structure being higher than it would be with a 50% debt ratio.

This relationship between a company's capital structure and its financial risk is a fundamental precept of finance. It is also true that a company must exercise caution when increasing its equity ratio since equity is the most costly capital component. A company will typically manage its equity ratio in large part based on the level of business risk it faces. Business risk for a utility arises from the potential for factors inherent in its operation, such as characteristics of its service territory, and economic factors, such as inflation, to negatively impact the company's financial condition. Therefore, to mitigate an increase in its business risk a company could reduce its leverage by increasing its equity ratio, thus reducing its financial risk. Firms often adjust their capital structures in response to changes in business risk in the effort to manage total risk. Because of the relationship between capital structure (i.e., leverage) and risk, and the impact of leverage on the WACC, there is no specific equity ratio that will produce the lowest overall WACC in all market conditions and potential levels of business risk the company could face.

Q. What is the relevance of the impact of capital structure on the WACC you have described to the current requirement that KAWC not exceed an equity-to-capital ratio of 45%?

A. The relevance of this for KAWC and its ratepayers is that the Company could potentially attain a lower WACC if this restriction is removed. Removing the restriction would allow KAWC's management the ability to use its discretion to increase the equity ratio if it believed doing so would decrease financial risk to such an extent that it reduced the WACC. Currently, the Company is limited in its ability to offset its business risk by increasing its equity ratio. As previously noted, increasing the equity ratio, all else equal, will lower KAWC's financial risk. Reduced financial risk would result in a lower marginal cost of debt and a lower market-required cost of equity which, in spite of the higher equity ratio, could result in a lower WACC. Put another way, increasing the Company's equity ratio above 45% could lower the WACC because the costs of equity and debt each decrease as the equity ratio increases. Thus, there is a reasonable basis to assume that removing the restriction could result in KAWC achieving a lower WACC, resulting in rates for utility service that are lower than they would have been otherwise.

Q. Could the release of this restriction potentially have an impact on the Company's financing flexibility?

A. Yes, it could. The flexibility to increase its equity ratio above the 45% limit currently allowed could provide KAWC the ability to issue new debt when needed without producing a capital structure too heavily weighted with debt. Currently, if KAWC were precluded from issuing equity due to the 45% limit, the only option would be issuing debt, which could push its debt ratio to a very highly leveraged position. The ability to increase its equity ratio would provide KAWC a layer of available debt capacity to meet external financing needs and to take advantage of favorable market conditions as they arise.

Q Can you illustrate what impact Condition 16 has on KAWC's financial risk?

A. Yes, I can. As noted, the Company is currently not allowed to raise its equity ratio above 45%, or conversely, reduce its debt ratio below 55%. The level of financial risk represented by a 55% debt ratio can be assessed by examining the indicative ratios for the debt-to-total-capital financial benchmark published by Standard & Poor's, shown in Table 1 below:

Table 1

Financial Benchmarks

Financial Risk Indicative Ratios (Corporates)

	Debt/Capital (%)
Minimal	less than 25
Modest	25-35
Intermediate	35-45
Significant	45-50
Aggressive	50-60
Highly Leveraged	greater than 60

Source: Standard & Poor's, RatingsDirect, September 18, 2012, page 4.

Based only on this criterion, which is one of three financial risk indicators considered by Standard & Poor's, KAWC's financial risk would fall in the "Aggressive" category. The significance of this can be determined when examining Standard & Poor's business and financial risk matrix, which plays a significant role in determining credit ratings. The matrix is shown in Table 2 below:

Table 2

Business and Financial Risk Profile Matrix

Business Risk Profile	- Financial Risk Profile -					
	Minimal	Modest	Intermediate	Significant	Aggressive	Highly Leveraged
Excellent	aaa/aa+	aa	a+/a	a-	bbb	bbb-/bb+
Strong	aa/aa-	a+/a	a-/bbb+	bbb	bb+	bb
Satisfactory	a/a-	bbb+	bbb/bbb-	bbb-/bb+	bb	b+
Fair	bbb/bbb-	bbb-	bb+	bb	bb-	b
Weak	bb+	bb+	bb	bb-	b+	b/b-
Vulnerable	bb-	bb-	bb-/b+	b+	b	b-

Source: Standard & Poor's, RatingsDirect, November 19, 2013, page 8.

As can be seen from Table 2, falling in the "Aggressive" financial risk category would require KAWC to achieve an "Excellent" business risk rating just to obtain a BBB rating. A BBB rating is the lowest investment grade rating assigned by Standard & Poor's. Assuming that KAWC's business risk profile would be rated "Excellent" by Standard & Poor's, the Company would need to attain at least a "Significant" financial risk profile to achieve an 'A-' rating. Referring back to Table 1, a "Significant" financial risk profile is achieved by a debt ratio in the 45%-50% range, rather than the Company's current minimum requirement of 55%. The Company believes that a reasonable financial objective is the attainment of a level of financial strength that would support a Standard & Poor's credit rating of at least 'A-'. KAWC's parent, American Water, is currently rated 'A' by Standard & Poor's.

Q. Are there additional benefits that removal of the equity ratio restriction would provide?

A. Yes, removal of the equity ratio restriction would provide additional benefits to the Company's risk profile. These benefits are listed below:

1. The ability to maintain a conservative capital structure (i.e., higher equity ratio) helps protect against declining revenues. A highly-leveraged company relies on consistent revenue to cover its debt interest payments and operating expenses. If revenue declines for an extended period of time, an aggressive capital structure such as that currently in place for KAWC, presents risks. A more conservative capital structure would allow the Company to effectively adjust for revenue declines. In addition, the business risks of many utilities, such as KAWC, are

increasing. The need for extensive capital expenditures for infrastructure improvement, the requirement for significant environmental expenditures that increase costs but not sales, and the threats of terrorist activity and risks to cyber security, are all factors facing KAWC and contributing to its increased business risk.

2. The ability to mitigate or avoid the impact of high market interest rates. If the Company's only financing option is issuing debt during periods of high interest rates, such as late 2008, then the Company could be burdened with high borrowing costs. Thus, the ability to issue common equity during such times would be desirable.

3. As noted previously, a higher equity ratio, all things equal, will lead to a better credit rating. A credit rating that reflects a strong financial condition is important because it will provide the Company with financial integrity, defined as the ability to raise capital at a reasonable cost in all market conditions. It is important for KAWC to have financial integrity so that it has the capability to issue debt and equity on its own through a third party, whether by choice or by necessity. If the Company would need to raise capital on its own, then poor credit quality would result in higher capital costs and higher rates for ratepayers, or could even render the Company unable to raise capital in tight market conditions.

4. A lower debt ratio, all else equal, will result in more free cash flow. Less debt results in lower fixed financial obligations (e.g., principal and interest payments) which will provide the Company more options for use of future cash flows. For

example, this could allow additional investment for capital expenditures and reduce the need for external financing.

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 a Rates and Regulatory Analyst III for American Water Works Service 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.

Scott W. Rungren

SCOTT W. RUNGREN

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 12th day of January, 2016.

MOLLIE L. OGDEN
Notary Public, Notary Seal
State of Missouri
St. Louis County
Commission # 12166844
My Commission Expires August 02, 2016

Mollie L. Ogden (SEAL)
Notary Public

My Commission Expires:

8/2/2016

Kentucky American Water Company
Case No. 2015-00418
Cost of Capital Summary
13-Month Average For Forecast Period Ending August 31, 2017

Data: ___ Base Period _X_ Forecasted Period
Type of Filing: __X__ Original _____ Updated _____ Revised

Exhibit 37, Schedule J-1
Capital\[Capital Structure 2015.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	$5,973,573	1.500%	$6,132	$5,979,705	1.369%	0.020%
3								
4	Long-Term Debt	W/P - 7-4	201,504,391	50.585%	206,803	201,711,194	6.050%	3.060%
5								
6	Preferred Stock	W/P - 7-5	2,242,372	0.563%	2,302	2,244,673	8.520%	0.050%
7								
8	Common Equity	W/P - 7-6	188,625,869	47.352%	193,586	188,819,455	10.750%	5.090%
9								
10	Total Capital		$398,346,204	100.000%	$408,823	$398,755,027		8.220%
11								
12								
13								
14								
15								
16	(1) JDITC:	W/P - 7-7	$408,823					

Kentucky-American Water Company

Short-Term Interest Rate Projections

Date	Fwd Rate
November-15	0.719%
December-15	0.796%
January-16	0.654%
February-16	0.711%
March-16	0.742%
April-16	**0.788%**
May-16	0.848%
June-16	0.912%
July-16	0.975%
August-16	1.036%
September-16	1.095%
October-16	1.156%
November-16	1.219%
December-16	1.283%
January-17	1.338%
February-17	1.384%
March-17	1.429%
April-17	1.475%
May-17	1.525%
June-17	1.574%
July-17	1.620%
August-17	**1.659%**
Test Year 13-Month Average	**1.369%**

Source: Bloomberg

KENTUCKY PUBLIC SERVICE COMMISSION

DIRECT TESTIMONY

OF

JOHN J. SPANOS

ON BEHALF OF

KENTUCKY AMERICAN WATER COMPANY

CASE NO. 2015-00418

January 29, 2016

FRANKFORT, KENTUCKY

TABLE OF CONTENTS

INTRODUCTION

1. Q. Please state your name and address.

A. John J. Spanos. My business address is 207 Senate Avenue, Camp Hill, Pennsylvania.

2. Q. With what firm are you associated?

A. I am associated with the firm of Gannett Fleming Valuation and Rate Consultants, LLC. ("Gannett Fleming")

3. Q. How long have you been associated with Gannett Fleming?

A. I have been associated with the firm since college graduation in June 1986.

4. Q. What is your position in the firm?

A. I am Senior Vice President.

5. Q. On whose behalf are you testifying in this proceeding?

A. I am testifying on behalf of Kentucky American Water Company ("KAWC" or the "Company").

6. Q. Please state your qualifications.

A. I have 29 years of depreciation experience, which includes giving expert testimony in over 200 cases before 40 regulatory commissions including this Commission. Please refer to Appendix A for my qualifications.

7. Q. What is the purpose of your testimony?

A. My testimony is in support of the depreciation study conducted under my direction and supervision for KAWC. Based upon that study, I am recommending that new depreciation accrual rates be adopted by the Company.

OVERVIEW

8. Q. Please describe what you mean by the term "depreciation".

A. "Depreciation" refers to the loss in service value not restored by current maintenance, incurred in connection with the consumption or prospective retirement of utility plant in the course of service from causes which can be reasonably anticipated or contemplated, against which the Company is not protected by insurance. Among the causes to be given consideration are wear and tear, decay, action of the elements, inadequacy, obsolescence, changes in the art, changes in demand, and the requirements of public authorities. Depreciation accrual rates are used to allocate, for accounting purposes, the cost of assets over their service lives.

In the study that I performed and that is the basis for my testimony, I used the straight line whole life method of depreciation, with the average service life procedure to develop recommended depreciation accrual rates. In addition, I calculated the amount required to amortize the variance between the book depreciation reserve and the calculated accrued depreciation. The total annual depreciation is based on a system of depreciation accounting which aims to distribute the cost of fixed capital assets over the estimated useful life of the unit, or group of assets, in a systematic and rational manner.

For General Plant Accounts 340.1, 340.15, 340.21, 340.22, 340.23, 340.3, 340.32, 340.5, 342, 343, 344, 346.1, 346.19, 346.2, 347 and 348; I used the straight line method of amortization. The annual amortization is based on amortization accounting which distributes the unrecovered cost of fixed capital assets over the remaining amortization period selected for each account and vintage.

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

A. Yes. The report titled, "2014 Depreciation Study – Calculated Annual Depreciation Accruals Related to Utility Plant as of December 31, 2014" which has been marked Exhibit No. JJS-1 sets forth the results of my study.

10. Q. How did you determine the recommended annual depreciation accrual rates?

A. The determination of annual depreciation accrual rates consists of two phases. In the first phase, service life and net salvage characteristics are estimated for each depreciable group, that is, each plant account or subaccount identified as having similar characteristics. In the second phase, the annual depreciation accrual rates are calculated based on the service life and net salvage estimates determined in the first phase.

ESTIMATION OF SERVICE LIFE AND NET SALVAGE

11. Q. Please describe the first phase of the study, that is, the manner in which you estimated the service life and net salvage characteristics for each depreciable group.

A. The service life and net salvage study consisted of compiling historical data from records related to the Company's plant; analyzing these data to obtain historical trends of survivor and salvage characteristics; obtaining supplementary information from management and operating personnel concerning the Company's practices and plans as they relate to plant operations; and interpreting the above data to form judgments of average service life and net salvage characteristics.

12. Q. What historical data did you analyze for the purpose of estimating the service life characteristics of the Company's plant?

A. The data consisted of the entries made by the Company to record plant transactions from 1995 through 2014. The transactions included additions, retirements, transfers and the related balances. The Company, in accordance with my instructions, classified the data by depreciable group, type of transaction, the year in which the transaction took place, and the year in which the plant was installed. The data included surviving plant balances as of December 31, 1994.

13. Q. What method did you use to analyze this service life data?

A. I used the retirement rate method. That method is the most appropriate when aged retirement data are available, because it develops the average rates of retirement actually experienced during the period of study. Other methods of life analysis infer the rates of retirement based on a selected type survivor curve.

14. Q. Please describe the results of your use of the retirement rate method.

A. Each retirement rate analysis resulted in a life table which, when plotted, formed an original survivor curve. Each original survivor curve as plotted from the life table represents the average survivor pattern experienced by the several vintage groups during the experience band studied. Inasmuch as this survivor pattern does not necessarily describe the life characteristics of the property group, interpretation of the original curves is required in order to use them as valid considerations in service life estimation. Iowa type survivor curves were used in these interpretations.

15. Q. Please explain briefly what an "Iowa-type survivor curve" is and how you use it in estimating service life characteristics for each depreciable group.

A. The range of survivor characteristics usually experienced by utility and industrial properties is encompassed by a system of generalized survivor curves known as the Iowa type curves. The Iowa curves were developed at the Iowa State College Engineering Experiment Station through an extensive process of observation and classification of the ages at which industrial property had been retired.

Iowa type curves are used to smooth and extrapolate original survivor curves determined by the retirement rate method. The Iowa curves and truncated Iowa curves were used in this study to describe the forecasted rates of retirement based on the observed rates of retirement and the outlook for future retirements.

The estimated survivor curve designations for each depreciable group indicate the average service life, the family within the Iowa system and the relative height of the mode. For example, the Iowa 52-R3 indicates an average service life of fifty-two years; a right-moded, or R, type curve (the mode occurs after average life for right-moded curves); and a moderate height, 3, for the mode (possible modes for R type curves range from 1 to 5).

16. Q. Did you physically observe the Company's plants and equipment as part of your depreciation study?

A. Yes. I made a field review of the Company's property on June 1 and 2, 2015 to observe representative portions of plant for this study. I have also taken two previous site visits over the last 10 years. Field reviews are conducted to become familiar with Company operations and obtain an understanding of the function of the plant and information with respect to the reasons for past retirements and the expected future causes of retirements. This knowledge, as well as information from other discussions with management, was incorporated in the interpretation and extrapolation of the statistical analyses.

17. Q. How did your experience in development of other depreciation studies affect your work in this case?

A. Because I customarily conduct field reviews for my depreciation studies, I have had the opportunity to visit scores of similar plants and meet with operation's personnel at other companies. The knowledge accumulated from those visits and meetings provide me useful information that I can draw on to confirm or challenge my numerical analyses concerning plant condition and remaining life estimates.

18. Q. What historical data did you analyze for the purpose of estimating net salvage characteristics?

A. The data consisted of the entries made by the Company to record retirements, cost of removal and gross salvage during the period 1980 through 2014.

19. Q. What method did you use to analyze this net salvage data?

A. The net salvage data were analyzed by expressing the net salvage and its two components, cost of removal and gross salvage, as percents of the original cost retired on annual, three-year moving average and most recent five-year average bases. The use of averages smooth the annual fluctuations and assists in identifying underlying trends.

20. Q. Please describe the manner in which you used the analyses of net salvage to estimate net salvage percents.

A. The results of the net salvage analyses provided indications of historical net salvage levels. The judgments of net salvage incorporated these historical indications and consideration of estimates made for other water companies.

CALCULATION OF DEPRECIATION

21. Q. Please describe the second phase of the process that you used, that is, the calculation of annual depreciation accrual rates.

A. After I estimated the service life and net salvage characteristics for each depreciable group, I calculated annual depreciation accrual rates for each group in accordance with the straight line remaining life method, using the average service life procedure.

22. Q. What group procedure is being used in this proceeding for depreciable accounts?

A. The average service life procedure is used in the current proceeding for all depreciable accounts and installation years. The average service procedure also was used in the Company's last depreciation study.

23. Q. Please describe briefly the amortization of certain General Plant accounts.

A. General Plant Accounts 340.1, 340.15, 340.21, 340.22, 340.23, 340.3, 340.32, 340.5, 342, 343, 344, 346.1, 346.19, 346.2, 347 and 348 include a very large number of units, but represent approximately four percent of depreciable utility plant. Depreciation accounting is difficult for these assets, inasmuch as periodic inventories are required to properly reflect plant in service. In amortization accounting, units of property are capitalized in the same manner as they are in depreciation accounting. However, retirements are recorded when a vintage is fully amortized rather than as the units are removed from service. That is, there is no dispersion of retirement. All units are retired when the age of the vintage reaches the amortization period.

DESCRIPTION OF REPORT

24. Q. Please outline the contents of your report.

A. My report is presented in nine parts. Part I, Introduction includes statement related to the scope and basis of the depreciation study. Part II, Estimation of Survivor Curves includes descriptions of the methodology of estimating survivor curves. Parts III and IV set forth the analysis of determining life and net salvage estimation. Part V, Calculation of Annual and Accrued Depreciation includes the concepts of depreciation and amortization using the remaining life. Part VI, Results of Study presents a description of the results, and a summary of the depreciation calculations. Parts VII, VIII and IX include graphs and tables that relate to the service life and net salvage analyses, and the detailed depreciation calculations.

The table on pages VI-5 through VI-7 presents the estimated survivor curve, the net salvage percent, the original cost as of December 31, 2014, the calculated annual depreciation accrual amount and rate, book depreciation reserve, future accruals and the composite remaining life for each account or subaccount. The section beginning on page VII-2 presents the results of the retirement rate analyses prepared as the historical bases for the service life estimates. The section beginning on page VIII-2 presents the results of the analyses of historical net salvage data. The section beginning on page IX-2 presents the depreciation calculations related to surviving original cost as of December 31, 2014.

25. Q. Please use an example to illustrate the manner in which the study is presented in the report.

A. I will use Account 331, Mains and Accessories, as my example, inasmuch as it is a large depreciable group and is representative of the presentation.

The retirement rate method was used to analyze the survivor characteristics of this group. The life table for the 1995-2014 experience band is presented on pages VII-54 through VII-56 of the report. The life table, or original survivor curve, is plotted along with the estimated smooth survivor curve, the 85-R3 on page VII-53. The net salvage analysis for the period 1980 through 2014 is presented on pages VIII-22 and VIII-23.

The calculation of the annual depreciation accrual rate related to the original cost at December 31, 2014 of utility plant is presented on pages IX-32 through IX-34. The calculation is based on the 85-R3 survivor curve, negative 25 percent net salvage and the attained age. The tabulation sets forth the installation year, the original cost, calculated accrued depreciation, allocated book reserve, future accruals, remaining life and annual accrual amount. The totals are brought forward to the table on page VI-6.

RECOMMENDATION

26. Q. What is your recommendation regarding annual depreciation accrual rates for the Company?

A. I recommend that the Company use a composite annual depreciation accrual rate for each account or subaccount. My recommended depreciation accrual rates, based on the depreciation study, are set forth for each account in column 8 of Table 1 on pages VI-5 through VI-7 of Exhibit JJS-1. In my opinion, these are reasonable and appropriate depreciation accrual rates for the Company.

27. Q. Are your recommended depreciation accrual rates reasonable for plant added subsequent to December 31, 2014?

A. Yes. The annual depreciation accrual rates calculated as of December 31, 2014, can reasonably be applied to the total balance including new plant additions during the next several years.

28. Q. Does this complete your direct testimony?

A. Yes, it does.

APPENDIX A

JOHN SPANOS

DEPRECIATION EXPERIENCE

Q. Please state your name.

A. My name is John J. Spanos.

Q. What is your educational background?

A. I have Bachelor of Science degrees in Industrial Management and Mathematics from Carnegie-Mellon University and a Master of Business Administration from York College.

Q. Do you belong to any professional societies?

A. Yes. I am a member and past President of the Society of Depreciation Professionals and a member of the American Gas Association/Edison Electric Institute Industry Accounting Committee.

Q. Do you hold any special certification as a depreciation expert?

A. Yes. The Society of Depreciation Professionals has established national standards for depreciation professionals. The Society administers an examination to become certified in this field. I passed the certification exam in September 1997 and was recertified in August 2003, February 2008 and January 2013.

Q. Please outline your experience in the field of depreciation.

A. In June, 1986, I was employed by Gannett Fleming Valuation and Rate Consultants, Inc. as a Depreciation Analyst. During the period from June, 1986 through December, 1995, I helped prepare numerous depreciation and original cost studies for utility companies in various industries. I helped perform depreciation studies for the following telephone companies: United Telephone of Pennsylvania, United Telephone of New Jersey, and Anchorage Telephone Utility. I helped perform depreciation studies for the following companies in the railroad industry: Union Pacific Railroad, Burlington Northern Railroad, and Wisconsin Central Transportation Corporation.

I helped perform depreciation studies for the following organizations in the electric utility industry: Chugach Electric Association, The Cincinnati Gas and Electric Company (CG&E), The Union Light, Heat and Power Company (ULH&P), Northwest Territories Power Corporation, and the City of Calgary - Electric System.

I helped perform depreciation studies for the following pipeline companies: TransCanada Pipelines Limited, Trans Mountain Pipe Line Company Ltd., Interprovincial Pipe Line Inc., Nova Gas Transmission Limited and Lakehead Pipeline Company.

I helped perform depreciation studies for the following gas utility companies: Columbia Gas of Pennsylvania, Columbia Gas of Maryland, The Peoples Natural Gas Company, T. W. Phillips Gas & Oil Company, CG&E, ULH&P, Lawrenceburg Gas Company and Penn Fuel Gas, Inc.

I helped perform depreciation studies for the following water utility companies: Indiana-American Water Company, Consumers Pennsylvania Water Company and The York Water Company; and depreciation and original cost studies for Philadelphia Suburban Water Company and Pennsylvania-American Water Company.

In each of the above studies, I assembled and analyzed historical and simulated data, performed field reviews, developed preliminary estimates of service life and net salvage, calculated annual depreciation, and prepared reports for submission to state public utility commissions or federal regulatory agencies. I performed these studies under the general direction of William M. Stout, P.E.

In January, 1996, I was assigned to the position of Supervisor of Depreciation Studies. In July, 1999, I was promoted to the position of Manager, Depreciation and Valuation Studies. In December, 2000, I was promoted to the position as Vice-President of Gannett Fleming Valuation and Rate Consultants, Inc. and in April 2012, I was promoted to my present position as Senior Vice President of the Valuation and Rate Division of Gannett Fleming Inc. (now doing business as Gannett Fleming Valuation and Rate Consultants, LLC). In my current position I am responsible for conducting all depreciation, valuation and original cost studies, including the preparation of final exhibits and responses to data requests for submission to the appropriate regulatory bodies.

Since January 1996, I have conducted depreciation studies similar to those previously listed including assignments for Pennsylvania-American Water Company; Aqua Pennsylvania; Kentucky-American Water Company; Virginia-American Water Company; Indiana-American Water Company; Hampton Water Works Company; Omaha Public Power District; Enbridge Pipe Line Company; Inc.; Columbia Gas of Virginia, Inc.; Virginia Natural Gas Company National Fuel Gas Distribution Corporation - New York and Pennsylvania Divisions; The City of Bethlehem - Bureau of Water; The City of Coatesville Authority; The City of Lancaster - Bureau of Water; Peoples Energy Corporation; The York Water Company; Public Service Company of Colorado; Enbridge Pipelines; Enbridge Gas Distribution, Inc.; Reliant Energy-HLP; Massachusetts-American Water Company; St. Louis County Water Company; Missouri-American Water Company; Chugach Electric Association; Alliant Energy; Oklahoma Gas & Electric Company; Nevada Power Company; Dominion Virginia Power; NUI-Virginia Gas Companies; Pacific Gas & Electric Company; PSI Energy; NUI - Elizabethtown Gas

Company; Cinergy Corporation – CG&E; Cinergy Corporation – ULH&P; Columbia Gas of Kentucky; South Carolina Electric & Gas Company; Idaho Power Company; El Paso Electric Company; Aqua North Carolina; Aqua Ohio; Aqua Texas, Inc.; Ameren Missouri; Central Hudson Gas & Electric; Centennial Pipeline Company; CenterPoint Energy-Arkansas; CenterPoint Energy – Oklahoma; CenterPoint Energy – Entex; CenterPoint Energy - Louisiana; NSTAR – Boston Edison Company; Westar Energy, Inc.; United Water Pennsylvania; PPL Electric Utilities; PPL Gas Utilities; Wisconsin Power & Light Company; TransAlaska Pipeline; Avista Corporation; Northwest Natural Gas; Allegheny Energy Supply, Inc.; Public Service Company of North Carolina; South Jersey Gas Company; Duquesne Light Company; MidAmerican Energy Company; Laclede Gas; Duke Energy Company; E.ON U.S. Services Inc.; Elkton Gas Services; Anchorage Water and Wastewater Utility; Kansas City Power and Light; Duke Energy North Carolina; Duke Energy South Carolina; Monongahela Power Company; Potomac Edison Company; Duke Energy Ohio Gas; Duke Energy Kentucky; Duke Energy Indiana; Northern Indiana Public Service Company; Tennessee-American Water Company; Columbia Gas of Maryland; Bonneville Power Administration; NSTAR Electric and Gas Company; EPCOR Distribution, Inc.; B. C. Gas Utility, Ltd; Entergy Arkansas; Entergy Texas; Entergy Mississippi; Entergy Louisiana; Entergy Gulf States Louisiana; the Borough of Hanover; Louisville Gas and Electric Company; Kentucky Utilities Company; Madison Gas and Electric; Central Maine Power; PEPCO; PacifiCorp; Minnesota Energy Resource Group; Jersey Central Power & Light Company; Cheyenne Light, Fuel and Power Company; United Water Arkansas; Central Vermont Public Service Corporation; Green Mountain Power; Portland General Electric Company; Atlantic City Electric; Nicor Gas Company; Black Hills Power; Black Hills Colorado

Gas; Black Hills Kansas Gas; Black Hills Service Company; Black Hills Utility Holdings; Public Service Company of Oklahoma; City of Dubois; Peoples Gas Light and Coke Company; North Shore Gas Company; Connecticut Light and Power; New York State Electric and Gas Corporation; Rochester Gas and Electric Corporation and Greater Missouri Operations. My additional duties include determining final life and salvage estimates, conducting field reviews, presenting recommended depreciation rates to management for its consideration and supporting such rates before regulatory bodies.

Q. Have you submitted testimony to any state utility commission on the subject of utility plant depreciation?

A. Yes. I have submitted testimony to the Pennsylvania Public Utility Commission; the Commonwealth of Kentucky Public Service Commission; the Public Utilities Commission of Ohio; the Nevada Public Utility Commission; the Public Utilities Board of New Jersey; the Missouri Public Service Commission; the Massachusetts Department of Telecommunications and Energy; the Alberta Energy & Utility Board; the Idaho Public Utility Commission; the Louisiana Public Service Commission; the State Corporation Commission of Kansas; the Oklahoma Corporate Commission; the Public Service Commission of South Carolina; Railroad Commission of Texas – Gas Services Division; the New York Public Service Commission; Illinois Commerce Commission; the Indiana Utility Regulatory Commission; the California Public Utilities Commission; the Federal Energy Regulatory Commission ("FERC"); the Arkansas Public Service Commission; the Public Utility Commission of Texas; Maryland Public Service Commission; Washington Utilities and Transportation Commission; The Tennessee Regulatory Commission; the Regulatory Commission of Alaska; Minnesota Public Utility Commission; Utah Public Service Commission; District of Columbia Public Service

Commission; the Mississippi Public Service Commission; Delaware Public Service Commission; Virginia State Corporation Commission; Colorado Public Utility Commission; Oregon Public Utility Commission; South Dakota Public Utilities Commission; Wisconsin Public Service Commission; Wyoming Public Service Commission; Maine Public Utility Commission; Iowa Utility Board; Connecticut Public Utilities Regulatory Authority; and the North Carolina Utilities Commission.

Q. Have you had any additional education relating to utility plant depreciation?

A. Yes. I have completed the following courses conducted by Depreciation Programs, Inc.: "Techniques of Life Analysis," "Techniques of Salvage and Depreciation Analysis," "Forecasting Life and Salvage," "Modeling and Life Analysis Using Simulation," and "Managing a Depreciation Study." I have also completed the "Introduction to Public Utility Accounting" program conducted by the American Gas Association.

Q. Does this conclude your qualification statement?

A. Yes.

VERIFICATION

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

The undersigned, **John J. Spanos**, being duly sworn, deposes and says he is the Senior Vice President of Gannett Fleming Valuation and Rate Consultants, 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.

John J. Spanos
JOHN J. SPANOS

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 13th day of January, 2016.

_______________ (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

LIST OF CASES IN WHICH JOHN J. SPANOS SUBMITTED TESTIMONY

	Year	Jurisdiction	Docket No.	Client/Utility	Subject
01.	1998	PA PUC	R-00984375	City of Bethlehem – Bureau of Water	Original Cost and Depreciation
02.	1998	PA PUC	R-00984567	City of Lancaster	Original Cost and Depreciation
03.	1999	PA PUC	R-00994605	The York Water Company	Depreciation
04.	2000	D.T.&E.	DTE 00-105	Massachusetts-American Water Company	Depreciation
05.	2001	PA PUC	R-00016114	City of Lancaster	Original Cost and Depreciation
06.	2001	PA PUC	R-00017236	The York Water Company	Depreciation
07.	2001	PA PUC	R-00016339	Pennsylvania-American Water Company	Depreciation
08.	2001	OH PUC	01-1228-GA-AIR	Cinergy Corp – Cincinnati Gas & Elect Co.	Depreciation
09.	2001	KY PSC	2001-092	Cinergy Corp – Union Light, Heat & Power Co.	Depreciation
10.	2002	PA PUC	R-00016750	Philadelphia Suburban Water Company	Depreciation
11.	2002	KY PSC	2002-00145	Columbia Gas of Kentucky	Depreciation
12.	2002	NJ BPU	GF02040245	NUI Corporation/Elizabethtown Gas Co.	Depreciation
13.	2002	ID PUC	IPC-E-03-7	Idaho Power Company	Depreciation
14.	2003	PA PUC	R-0027975	The York Water Company	Depreciation
15.	2003	IN URC	R-0027975	Cinergy Corp – PSI Energy, Inc.	Depreciation
16.	2003	PA PUC	R-00038304	Pennsylvania-American Water Co.	Depreciation
17.	2003	MO PSC	WR-2003-0500	Missouri-American Water Co.	Depreciation
18.	2003	FERC	ER-03-1274-000	NSTAR-Boston Edison Company	Depreciation
19.	2003	NJ BPU	BPU 03080683	South Jersey Gas Company	Depreciation
20.	2003	NV PUC	03-10001	Nevada Power Company	Depreciation
21.	2003	LA PSC	U-27676	CenterPoint Energy – Arkla	Depreciation
22.	2003	PA PUC	R-00038805	Pennsylvania Suburban Water Company	Depreciation
23.	2004	AB En/Util Bd	1306821	EPCOR Distribution, Inc.	Depreciation
24.	2004	PA PUC	R-00038168	National Fuel Gas Distribution Corp (PA)	Depreciation
25.	2004	PA PUC	R-00049255	PPL Electric Utilities	Depreciation
26.	2004	PA PUC	R-00049165	The York Water Company	Depreciation
27.	2004	OK Corp Cm	PUC 200400187	CenterPoint Energy – Arkla	Depreciation
28.	2004	OH PUC	04-680-El-AIR	Cinergy Corp. – Cincinnati Gas and Electric Company	Depreciation
29.	2004	RR Com of TX	GUD#	CenterPoint Energy – Entex Gas Services Div.	Depreciation
30.	2004	NY PUC	04-G-1047	National Fuel Gas Distribution Gas (NY)	Depreciation
31.	2004	AR PSC	04-121-U	CenterPoint Energy – Arkla	Depreciation
32.	2005	IL CC	05-	North Shore Gas Company	Depreciation
33.	2005	IL CC	05-	Peoples Gas Light and Coke Company	Depreciation

	Year	Jurisdiction	Docket No.	Client/Utility	Subject
34.	2005	KY PSC	2005-00042	Union Light Heat & Power	Depreciation
35.	2005	IL CC	05-0308	MidAmerican Energy Company	Depreciation
36.	2005	MO PSC	GF-2005	Laclede Gas Company	Depreciation
37.	2005	KS CC	05-WSEE-981-RTS	Westar Energy	Depreciation
38.	2005	RR Com of TX	GUD #	CenterPoint Energy – Entex Gas Services Div.	Depreciation
39.	2005	FERC		Cinergy Corporation	Accounting
40.	2005	OK CC	PUD 200500151	Oklahoma Gas and Electric Co.	Depreciation
41.	2005	MA Dept Tele-com & Ergy	DTE 05-85	NSTAR	Depreciation
42.	2005	NY PUC	05-E-934/05-G-0935	Central Hudson Gas & Electric Co.	Depreciation
43.	2005	AK Reg Com	U-04-102	Chugach Electric Association	Depreciation
44.	2005	CA PUC	A05-12-002	Pacific Gas & Electric	Depreciation
45.	2006	PA PUC	R-00051030	Aqua Pennsylvania, Inc.	Depreciation
46.	2006	PA PUC	R-00051178	T.W. Phillips Gas and Oil Co.	Depreciation
47.	2006	NC Util Cm.		Pub. Service Co. of North Carolina	Depreciation
48.	2006	PA PUC	R-00051167	City of Lancaster	Depreciation
49.	2006	PA PUC	R00061346	Duquesne Light Company	Depreciation
50.	2006	PA PUC	R-00061322	The York Water Company	Depreciation
51.	2006	PA PUC	R-00051298	PPL GAS Utilities	Depreciation
52.	2006	PUC of TX	32093	CenterPoint Energy – Houston Electric	Depreciation
53.	2006	KY PSC	2006-00172	Duke Energy Kentucky	Depreciation
54.	2006	SC PSC		SCANA	
55.	2006	AK Reg Com	U-06-6	Municipal Light and Power	Depreciation
56.	2006	DE PSC	06-284	Delmarva Power and Light	Depreciation
57.	2006	IN URC	IURC43081	Indiana American Water Company	Depreciation
58.	2006	AK Reg Com	U-06-134	Chugach Electric Association	Depreciation
59.	2006	MO PSC	WR-2007-0216	Missouri American Water Company	Depreciation
60.	2006	FERC	ISO82, ETC. AL	TransAlaska Pipeline	Depreciation
61.	2006	PA PUC	R-00061493	National Fuel Gas Distribution Corp. (PA)	Depreciation
62.	2007	NC Util Com.	E-7 SUB 828	Duke Energy Carolinas, LLC	Depreciation
63.	2007	OH PSC	08-709-EL-AIR	Duke Energy Ohio Gas	Depreciation
64.	2007	PA PUC	R-00072155	PPL Electric Utilities Corporation	Depreciation
65.	2007	KY PSC	2007-00143	Kentucky American Water Company	Depreciation
66.	2007	PA PUC	R-00072229	Pennsylvania American Water Company	Depreciation
67.	2007	KY PSC	2007-0008	NiSource – Columbia Gas of Kentucky	Depreciation
68.	2007	NY PSC	07-G-0141	National Fuel Gas Distribution Corp (NY)	Depreciation

	Year	Jurisdiction	Docket No.	Client/Utility	Subject
69.	2008	AK PSC	U-08-004	Anchorage Water & Wastewater Utility	Depreciation
70.	2008	TN Reg Auth	08-00039	Tennessee-American Water Company	Depreciation
71.	2008	DE PSC	08-96	Artesian Water Company	Depreciation
72.	2008	PA PUC	R-2008-2023067	The York Water Company	Depreciation
73.	2008	KS CC	08-WSEE1-RTS	Westar Energy	Depreciation
74.	2008	IN URC	43526	Northern Indiana Public Service Co.	Depreciation
75.	2008	IN URC	43501	Duke Energy Indiana	Depreciation
76.	2008	MD PSC	9159	NiSource – Columbia Gas of Maryland	Depreciation
77.	2008	KY PSC	2008-000251	Kentucky Utilities	Depreciation
78.	2008	KY PSC	2008-000252	Louisville Gas & Electric	Depreciation
79.	2008	PA PUC	2008-20322689	Pennsylvania American Water Co.-Wastewater	Depreciation
80.	2008	NY PSC	08-E887/08-00888	Central Hudson	Depreciation
81.	2008	WV TC	VE-080416/VG-8080417	Avista Corporation	Depreciation
82.	2008	IL CC	ICC-09-166	Peoples Gas, Light and Coke Co.	Depreciation
83.	2009	IL CC	ICC-09-167	North Shore Gas Company	Depreciation
84.	2009	DC PSC	1076	Potomac Electric Power Company	Depreciation
85.	2009	KY PSC	2009-00141	NiSource – Columbia Gas of Kentucky	Depreciation
86.	2009	FERC	ER08-1056-002	Entergy Services	Depreciation
87.	2009	PA PUC	R-2009-2097323	Pennsylvania American Water Co.	Depreciation
88.	2009	NC Util Cm	E-7, Sub 090	Duke Energy Carolinas, LLC	Depreciation
89.	2009	KY PSC	2009-00202	Duke Energy Kentucky	Depreciation
90.	2009	VA St. CC	PUE-2009-00059	Aqua Virginia, Inc.	Depreciation
91.	2009	PA PUC	2009-2132019	Aqua Pennsylvania, Inc.	Depreciation
92.	2009	MS PSC	09-	Entergy Mississippi	Depreciation
93.	2009	AK PSC	09-08-U	Entergy Arkansas	Depreciation
94.	2009	TX PUC	37744	Entergy Texas	Depreciation
95.	2009	TX PUC	37690	El Paso Electric Company	Depreciation
96.	2009	PA PUC	R-2009-2106908	The Borough of Hanover	Depreciation
97.	2009	KS CC	10-KCPE-415-RTS	Kansas City Power & Light	Depreciation
98.	2009	PA PUC	R-2009-	United Water Pennsylvania	Depreciation
99.	2009	OH PUC		Aqua Ohio Water Company	Depreciation
100.	2009	WI PSC	3270-DU-103	Madison Gas & Electric Co.	Depreciation
101.	2009	MO PSC	WR-2010	Missouri American Water Co.	Depreciation
102.	2009	AK Reg Cm	U-09-097	Chugach Electric Association	Depreciation
103.	2010	IN URC	43969	Northern Indiana Public Service Co.	Depreciation
104.	2010	WI PSC	6690-DU-104	Wisconsin Public Service Corp.	Depreciation
105.	2010	PA PUC	R-2010-2161694	PPL Electric Utilities Corp.	Depreciation

	Year	Jurisdiction	Docket No.	Client/Utility	Subject
106.	2010	KY PSC	2010-00036	Kentucky American Water Company	Depreciation
107.	2010	PA PUC	R-2009-2149262	Columbia Gas of Pennsylvania	Depreciation
108.	2010	MO PSC	GR-2010-0171	Laclede Gas Company	Depreciation
109.	2010	SC PSC	2009-489-E	South Carolina Electric & Gas Co.	Depreciation
110.	2010	NJ BD OF PU	ER09080664	Atlantic City Electric	Depreciation
111.	2010	VA St. CC	PUE-2010-00001	Virginia American Water Company	Depreciation
112.	2010	PA PUC	R-2010-2157140	The York Water Company	Depreciation
113.	2010	MO PSC	ER-2010-0356	Greater Missouri Operations Co.	Depreciation
114.	2010	MO PSC	ER-2010-0355	Kansas City Power and Light	Depreciation
115.	2010	PA PUC	R-2010-2167797	T.W. Phillips Gas and Oil Co.	Depreciation
116.	2010	PSC SC	2009-489-E	SCANA – Electric	Depreciation
117.	2010	PA PUC	R-2010-22010702	Peoples Natural Gas, LLC	Depreciation
118.	2010	AK PSC	10-067-U	Oklahoma Gas and Electric Co.	Depreciation
119.	2010	IN URC		Northern Indiana Public Serv. Co. - NIFL	Depreciation
120.	2010	IN URC		Northern Indiana Public Serv. Co. - Kokomo	Depreciation
121.	2010	PA PUC	R-2010-2166212	Pennsylvania American Water Co - WW	Depreciation
122.	2010	NC Util Cn.	W-218,SUB310	Aqua North Carolina, Inc.	Depreciation
123.	2011	OH PUC	11-4161-WS-AIR	Ohio American Water Company	Depreciation
124.	2011	MS PSC	EC-123-0082-00	Entergy Mississippi	Depreciation
125.	2011	CO PUC	11AL-387E	Black Hills Colorado	Depreciation
126.	2011	PA PUC	R-2010-2215623	Columbia Gas of Pennsylvania	Depreciation
127.	2011	PA PUC	R-2010-2179103	Lancaster, City of – Bureau of Water	Depreciation
128.	2011	IN URC	43114 IGCC 4S	Duke Energy Indiana	Depreciation
129.	2011	FERC	IS11-146-000	Enbridge Pipelines (Southern Lights)	Depreciation
130.	2011	Il CC	11-0217	MidAmerican Energy Corporation	Depreciation
131.	2011	OK CC	201100087	Oklahoma Gas & Electric Co.	Depreciation
132.	2011	PA PUC	2011-2232243	Pennsylvania American Water Company	Depreciation
133.	2011	FERC	2011-2232243	Carolina Gas Transmission	Depreciation
134.	2012	WA UTC	UE-120436/UG-120437	Avista Corporation	Depreciation
135.	2012	AK Reg Cm	U-12-009	Chugach Electric Association	Depreciation
136.	2012	MA PUC	DPU 12-25	Columbia Gas of Massachusetts	Depreciation
137.	2012	TX PUC	40094	El Paso Electric Company	Depreciation
138.	2012	ID PUC	IPC-E-12	Idaho Power Company	Depreciation
139.	2012	PA PUC	R-2012-2290597	PPL Electric Utilities	Depreciation
140.	2012	PA PUC	R-2012-2311725	Hanover, Borough of – Bureau of Water	Depreciation
141.	2012	KY PSC	2012-00222	Louisville Gas and Electric Company	Depreciation
142.	2012	KY PSC	2012-00221	Kentucky Utilities Company	Depreciation
143.	2012	PA PUC	R-2012-2285985	Peoples Natural Gas Company	Depreciation

	Year	Jurisdiction	Docket No.	Client/Utility	Subject
144.	2012	DC PSC	Case 1087	Potomac Electric Power Company	Depreciation
145.	2012	OH PSC	12-1682-EL-AIR	Duke Energy Ohio (Electric)	Depreciation
146.	2012	OH PSC	12-1685-GA-AIR	Duke Energy Ohio (Gas)	Depreciation
147.	2012	PA PUC	R-2012-2310366	Lancaster, City of – Sewer Fund	Depreciation
148.	2012	PA PUC	R-2012-2321748	Columbia Gas of Pennsylvania	Depreciation
149.	2012	FERC	ER-12-2681-000	ITC Holdings	Depreciation
150.	2012	MO PSC	ER-2012-0174	Kansas City Power and Light	Depreciation
151.	2012	MO PSC	ER-2012-0175	KCPL Greater Missouri Operations Co.	Depreciation
152.	2012	MO PSC	GO-2012-0363	Laclede Gas Company	Depreciation
153.	2012	MN PUC	G007,001/D-12-533	Integrys – MN Energy Resource Group	Depreciation
153.	2012	TX PUC		Aqua Texas	Depreciation
155.	2012	PA PUC	2012-2336379	York Water Company	Depreciation
156.	2013	NJ BPU	ER12121071	PHI Service Co.– Atlantic City Electric	Depreciation
157.	2013	KY PSC	2013-00167	Columbia Gas of Kentucky	Depreciation
158.	2013	VA St CC	2013-00020	Virginia Electric and Power Co.	Depreciation
159.	2013	IA Util Bd	2013-0004	MidAmerican Energy Corporation	Depreciation
160.	2013	PA PUC	2013-2355276	Pennsylvania American Water Co.	Depreciation
161.	2013	NY PSC	13-E-0030, 13-G-0031, 13-S-0032	Consolidated Edison of New York	Depreciation
162.	2013	PA PUC	2013-2355886	Peoples TWP LLC	Depreciation
163.	2013	TN Reg Auth	12-0504	Tennessee American Water	Depreciation
164.	2013	ME PUC	2013-168	Central Maine Power Company	Depreciation
165.	2013	DC PSC	Case 1103	PHI Service Co. – PEPCO	Depreciation
166.	2013	WY PSC	2003-ER-13	Cheyenne Light, Fuel and Power Co.	Depreciation
167.	2013	FERC	ER13- -0000	Kentucky Utilities	Depreciation
168.	2013	FERC	ER13- -0000	MidAmerican Energy Company	Depreciation
169.	2013	FERC	ER13- -0000	PPL Utilities	Depreciation
170.	2013	PA PUC	R-2013-2372129	Duquesne Light Company	Depreciation
171.	2013	NJ BPU	ER12111052	Jersey Central Power and Light Co.	Depreciation
172.	2013	PA PUC	R-2013-2390244	Bethlehem, City of – Bureau of Water	Depreciation
173.	2013	OK CC	UM 1679	Oklahoma, Public Service Company of	Depreciation
174.	2013	IL CC	13-0500	Nicor Gas Company	Depreciation
175.	2013	WY PSC	20000-427-EA-13	PacifiCorp	Depreciation
176.	2013	UT PSC	13-035-02	PacifiCorp	Depreciation
177.	2013	OR PUC	UM 1647	PacifiCorp	Depreciation
178.	2013	PA PUC	2013-2350509	Dubois, City of	Depreciation
179.	2014	IL CC	14-0224	North Shore Gas Company	Depreciation
180.	2014	FERC	ER14-	Duquesne Light Company	Depreciation

	Year	Jurisdiction	Docket No.	Client/Utility	Subject
181.	2014	SD PUC	EL14-026	Black Hills Power Company	Depreciation
182.	2014	WY PSC	20002-91-ER-14	Black Hills Power Company	Depreciation
183.	2014	PA PUC	2014-2428304	Hanover, Borough of – Municipal Water Works	Depreciation
184.	2014	PA PUC	2014-2406274	Columbia Gas of Pennsylvania	Depreciation
185.	2014	IL CC	14-0225	Peoples Gas Light and Coke Company	Depreciation
186.	2014	MO PSC	ER-2014-0258	Ameren Missouri	Depreciation
187.	2014	KS CC	14-BHCG-502-RTS	Black Hills Service Company	Depreciation
188.	2014	KS CC	14-BHCG-502-RTS	Black Hills Utility Holdings	Depreciation
189.	2014	KS CC	14-BHCG-502-RTS	Black Hills Kansas Gas	Depreciation
190.	2014	PA PUC	2014-2418872	Lancaster, City of – Bureau of Water	Depreciation
191.	2014	WV PSC	14-0701-E-D	First Energy – MonPower/PotomacEdison	Depreciation
192	2014	VA St CC	PUC-2014-00045	Aqua Virginia	Depreciation
193.	2014	VA St CC	PUE-2013	Virginia American	Depreciation
194.	2014	OK CC	PUD201400229	Oklahoma Gas and Electric	Depreciation
195.	2014	OR PUC	UM1679	Portland General Electric	Depreciation
196.	2014	IN URC	Cause No. 44576	Indianapolis Power & Light	Depreciation
197.	2014	MA DPU	DPU. 14-150	NSTAR Gas	Depreciation
198.	2014	CT PURA	14-05-06	Connecticut Light and Power	Depreciation
199.	2014	MO PSC	ER-2014-0370	Kansas City Power & Light	Depreciation
200.	2014	KY PSC	2014-00371	Kentucky Utilities Company	Depreciation
201.	2014	KY PSC	2014-00372	Louisville Gas and Electric Company	Depreciation
202.	2015	PA PUC	R-2015-2462723	United Water Pennsylvania Inc.	Depreciation
203.	2015	PA PUC	R-2015-2468056	Columbia Gas of Pennsylvania	Depreciation
204.	2015	NY PSC	15-E-0283/15-G-0284	New York State Electric and Gas Corporation	Depreciation
205.	2015	NY PSC	15-E-0285/15-G-0286	Rochester Gas and Electric Corporation	Depreciation
206.	2015	MO PSC	WR-2015-0301/SR-2015-0302	Missouri American Water Company	Depreciation
207.	2015	OK CC	PUD 201500208	Oklahoma, Public Service Company of	Depreciation
208.	2015	WV PSC	15-0676-W-42T	West Virginia American Water Company	Depreciation
209.	2015	PA PUC	2015-2469275	PPL Electric Utilities	Depreciation
210.	2015	IN URC	Cause No. 44688	Northern Indiana Public Service Company	Depreciation
211.	2015	OH PSC	14-1929-EL-RDR	First Energy-Ohio Edison/Cleveland Electric/ Toledo Edison	Depreciation
212.	2015	NM PRC	15-00127-UT	El Paso Electric	Depreciation
213.	2015	TX PUC	PUC-44941; SOAH 473-15-5257	El Paso Electric	Depreciation
214.	2015	WI PSC	3370-DU-104	Madison Gas and Electric Company	Depreciation
215.	2015	OK CC	PUD 201500273	Oklahoma Gas and Electric	Depreciation

Exhibit JJS-1

KENTUCKY

AMERICAN WATER

2014 DEPRECIATION STUDY

CALCULATED ANNUAL DEPRECIATION ACCRUALS RELATED TO UTILITY PLANT AS OF DECEMBER 31, 2014

Prepared by:

Gannett Fleming

Excellence Delivered ***As Promised***

KENTUCKY AMERICAN WATER COMPANY
Lexington, Kentucky

2014 DEPRECIATION STUDY

CALCULATED ANNUAL DEPRECIATION ACCRUALS RELATED TO UTILITY PLANT AS OF DECEMBER 31, 2014

GANNETT FLEMING VALUATION AND RATE CONSULTANTS, LLC
Camp Hill, Pennsylvania

January 11, 2016

Kentucky American Water Company
2300 Richmond Road
Lexington, KY 40502

Attention Mr. Nick O. Rowe, President

Ladies and Gentlemen:

Pursuant to your request, we have conducted a depreciation study related to the utility plant of Kentucky American Water Company as of December 31, 2014. The attached report presents a description of the methods used in the estimation of depreciation, the summary of annual depreciation accrual rates, the statistical support for the life and net salvage estimates and the detailed tabulations of annual and accrued depreciation.

Respectfully submitted,

GANNETT FLEMING VALUATION
AND RATE CONSULTANTS, LLC

John J. Spanos

JOHN J. SPANOS
Sr. Vice President

JJS:krm

059867

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EXECUTIVE SUMMARY

Pursuant to Kentucky American Water Company's ("KAWC") request, Gannett Fleming Valuation and Rate Consultants, LLC ("Gannett Fleming") has conducted a depreciation study related to KAWC plant as of December 31, 2014. The purpose of this study was to determine the annual depreciation accrual rates and amounts for book and ratemaking purposes.

The depreciation rates are based on the straight line method using the average service life ("ASL") procedure and were applied on a remaining life basis. The calculations were based on attained ages and estimated average service life as well as forecasted net salvage characteristics for each depreciable group of assets.

KAWC's accounting policy has not changed since the previous depreciation study was prepared, nor were there any significant policy changes that might affect the results of the study presented here. Thus, the net salvage and average service life estimates proposed in this study do not vary significantly from the approved estimates that are currently in place, and the overall depreciation accrual rate at 2.61 percent is slightly higher due to plant growth.

Gannett Fleming recommends the calculated annual depreciation accrual rates proposed herein apply specifically to KAWC's plant in service as of December 31, 2014 as summarized in Table 1 of the study. The study sets forth a total annual depreciation expense of $13.7 million as applied to the depreciable original cost of $532.7 million as of December 31, 2014.

PART I. INTRODUCTION

KENTUCKY AMERICAN WATER COMPANY
DEPRECIATION STUDY

PART I. INTRODUCTION

SCOPE

This report presents the results of the depreciation study prepared for the Kentucky American Water Company as applied to utility plant in service as of December 31, 2014. It relates to the concepts, methods, and basic judgments which underlie recommended annual depreciation accrual rates related to current utility plant in service.

The service life and net salvage estimates resulting from the study were based on informed judgment which incorporated analyses of historical plant retirement data as recorded through 2014; a review of Company practice and outlook as they relate to plant operation and retirement; and consideration of current practice in the water industry, including knowledge of service life and salvage estimates used for other water properties.

PLAN OF REPORT

Part I, Introduction, contains statements with respect to the plan of the report, and the basis of the study. Part II, Estimation of Survivor Curves, presents descriptions of the considerations and the methods used in the service life and net salvage studies. Part III, Service Life Considerations, presents the factors and judgment utilized in the average service life analysis. Part IV, Net Salvage Considerations, presents the judgment utilized of the net salvage study. Part V, Calculation of Annual and Accrued Depreciation, describes the procedures used in the calculation of group depreciation. Part VI, Results of Study, presents summaries by depreciable group of annual depreciation accrual rates and amounts, as well as composite remaining lives. Part VII, Service Life Statistics presents the statistical analysis of service life estimates, Part VIII, Net Salvage Statistics sets forth the statistical indications of net salvage percents, and Part IX, Detailed Depreciation Calculations presents the detailed tabulations of annual depreciation.

BASIS OF THE STUDY

Depreciation

Depreciation, in public utility regulation, is the loss in service value not restored by current maintenance, incurred in connection with the consumption or prospective retirement of utility plant in the course of service from causes which are known to be in current operation and against which the utility is not protected by insurance. Among causes to be given consideration are wear and tear, deterioration, action of the elements, inadequacy, obsolescence, changes in the art, changes in demand, and the requirements of public authorities.

Depreciation, as used in accounting, is a method of distributing fixed capital costs, less net salvage, over a period of time by allocating annual amounts to expense. Each annual amount of such depreciation expense is part of that year's total cost of providing water utility service. Normally, the period of time over which the fixed capital cost is allocated to the cost of service is equal to the period of time over which an item renders service, that is, the item's service life. The most prevalent method of allocation is to distribute an equal amount of cost to each year of service life. This method is known as the straight-line method of depreciation.

For most accounts, the annual depreciation was calculated by the straight line method using the average service life procedure and the remaining life basis. For certain General Plant accounts, the annual depreciation is based on amortization accounting. Both types of calculations were based on original cost, attained ages, and estimates of service lives and net salvage.

The straight line method, average service life procedure is a commonly used depreciation calculation procedure that has been widely accepted in jurisdictions throughout North America. Gannett Fleming recommends its continued use. Amortization accounting is used for certain General Plant accounts because of the disproportionate plant accounting effort required when compared to the minimal original cost of the large number of items in these accounts. An explanation of the calculation of annual and accrued amortization is presented beginning on page V-4 of the report.

Service Life and Net Salvage Estimates

The service life and net salvage estimates used in the depreciation and amortization calculations were based on informed judgment which incorporated a review of management's plans, policies and outlook, a general knowledge of the water utility industry, and comparisons of the service life and net salvage estimates from our studies of other water utilities. The use of survivor curves to reflect the expected dispersion of retirement provides a consistent method of estimating depreciation for water plant. Iowa type survivor curves were used to depict the estimated survivor curves for the plant accounts not subject to amortization accounting.

The procedure for estimating service lives consisted of compiling historical data for the plant accounts or depreciable groups, analyzing this history through the use of widely accepted techniques, and forecasting the survivor characteristics for each depreciable group on the basis of interpretations of the historical data analyses and the probable future. The combination of the historical experience and the estimated future yielded estimated survivor curves from which the average service lives were derived.

PART II. ESTIMATION OF SURVIVOR CURVES

PART II. ESTIMATION OF SURVIVOR CURVES

The calculation of annual depreciation based on the straight line method requires the estimation of survivor curves and the selection of group depreciation procedures. The estimation of survivor curves is discussed below and the development of net salvage is discussed in later sections of this report.

SURVIVOR CURVES

The use of an average service life for a property group implies that the various units in the group have different lives. Thus, the average life may be obtained by determining the separate lives of each of the units, or by constructing a survivor curve by plotting the number of units which survive at successive ages.

The survivor curve graphically depicts the amount of property existing at each age throughout the life of an original group. From the survivor curve, the average life of the group, the remaining life expectancy, the probable life, and the frequency curve can be calculated. In Figure 1, a typical smooth survivor curve and the derived curves are illustrated. The average life is obtained by calculating the area under the survivor curve, from age zero to the maximum age, and dividing this area by the ordinate at age zero. The remaining life expectancy at any age can be calculated by obtaining the area under the curve, from the observation age to the maximum age, and dividing this area by the percent surviving at the observation age. For example, in Figure 1, the remaining life at age 30 is equal to the crosshatched area under the survivor curve divided by 29.5 percent surviving at age 30. The probable life at any age is developed by adding the age and remaining life. If the probable life of the property is calculated for each year of age, the probable life curve shown in the chart can be developed. The frequency curve presents the number of units retired in each age interval. It is derived by obtaining the differences between the amount of property surviving at the beginning and at the end of each interval.

This study has incorporated the use of Iowa curves developed from a retirement rate analysis of historical retirement history. A discussion of the concepts of survivor curves and of the development of survivor curves using the retirement rate method is presented below.

Iowa Type Curves

The range of survivor characteristics usually experienced by utility and industrial properties is encompassed by a system of generalized survivor curves known as the Iowa type curves. There are four families in the Iowa system, labeled in accordance with the location of the modes of the retirements in relationship to the average life and the relative height of the modes. The left moded curves, presented in Figure 2, are those in which the greatest frequency of retirement occurs to the left of, or prior to, average service life. The symmetrical moded curves, presented in Figure 3, are those in which the greatest frequency of retirement occurs at average service life. The right moded curves, presented in Figure 4, are those in which the greatest frequency occurs to the right of, or after, average service life. The origin moded curves, presented in Figure 5, are those in which the greatest frequency of retirement occurs at the origin, or immediately after age zero. The letter designation of each family of curves (L, S, R or O) represents the location of the mode of the associated frequency curve with respect to the average service life. The numbers represent the relative heights of the modes of the frequency curves within each family.

The Iowa curves were developed at the Iowa State College Engineering Experiment Station through an extensive process of observation and classification of the ages at which industrial property had been retired. A report of the study which resulted in the classification of property survivor characteristics into 18 type curves,

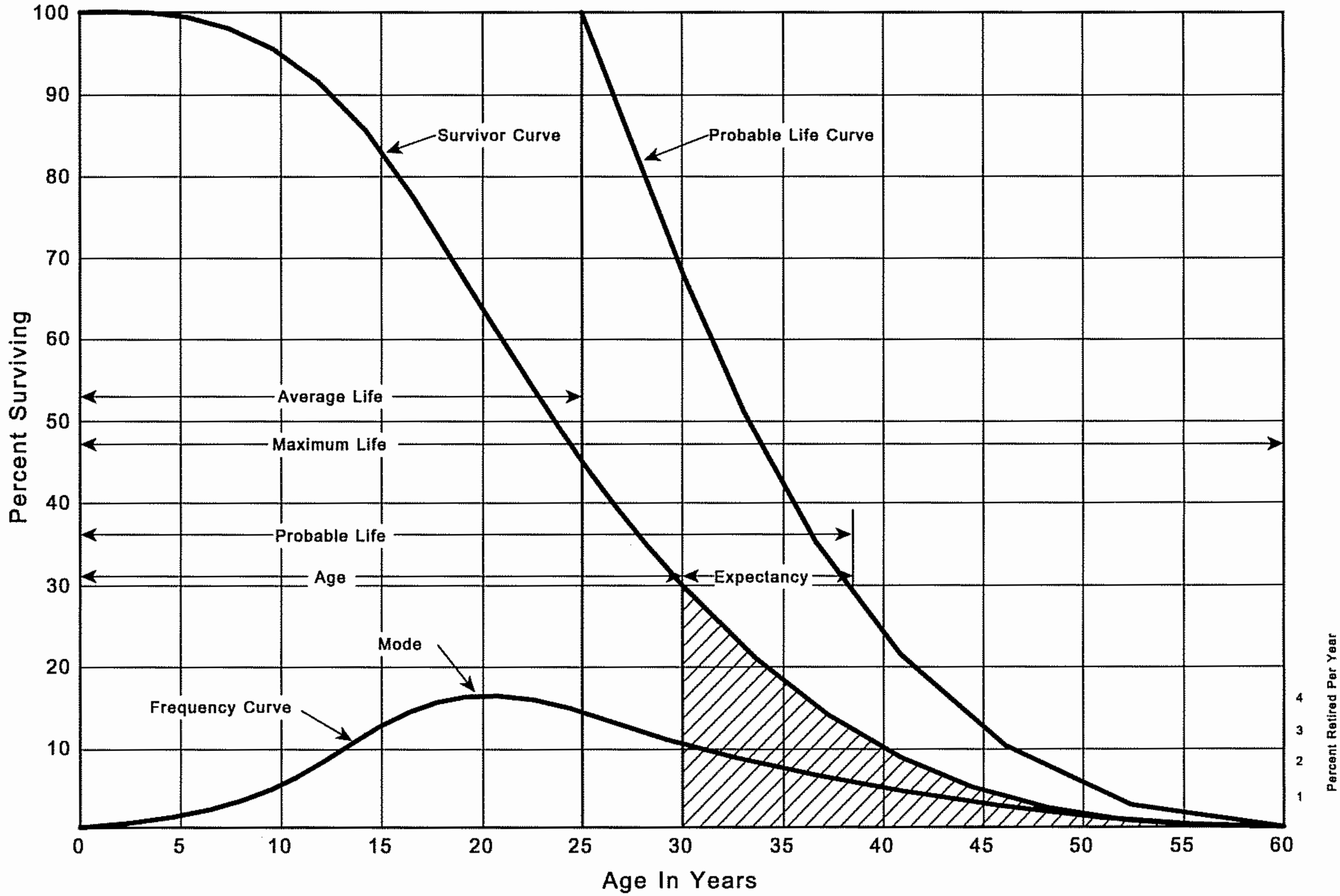

Figure 1. A Typical Survivor Curve and Derived Curves

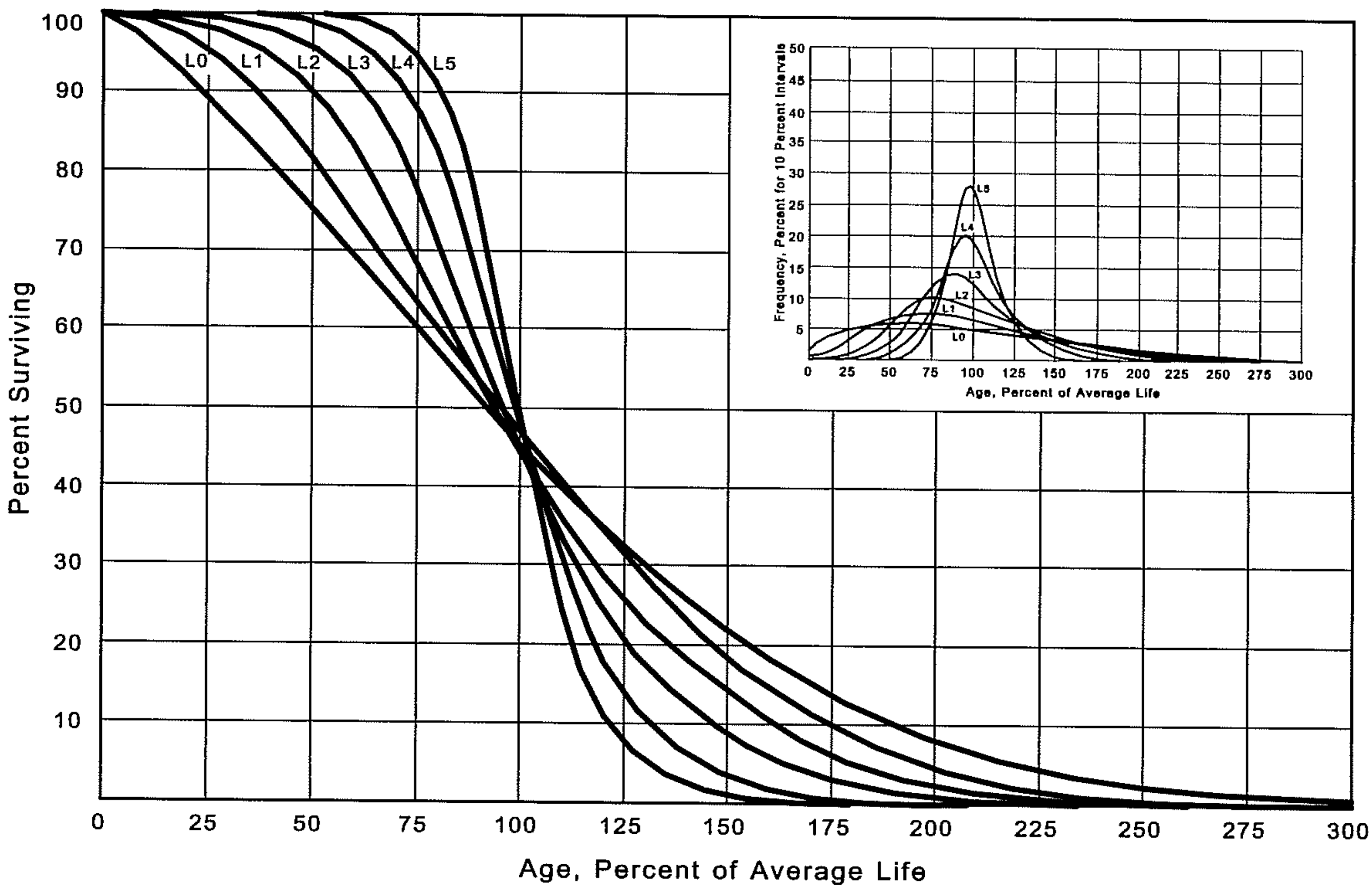

Figure 2. Left Modal or "L" Iowa Type Survivor Curves

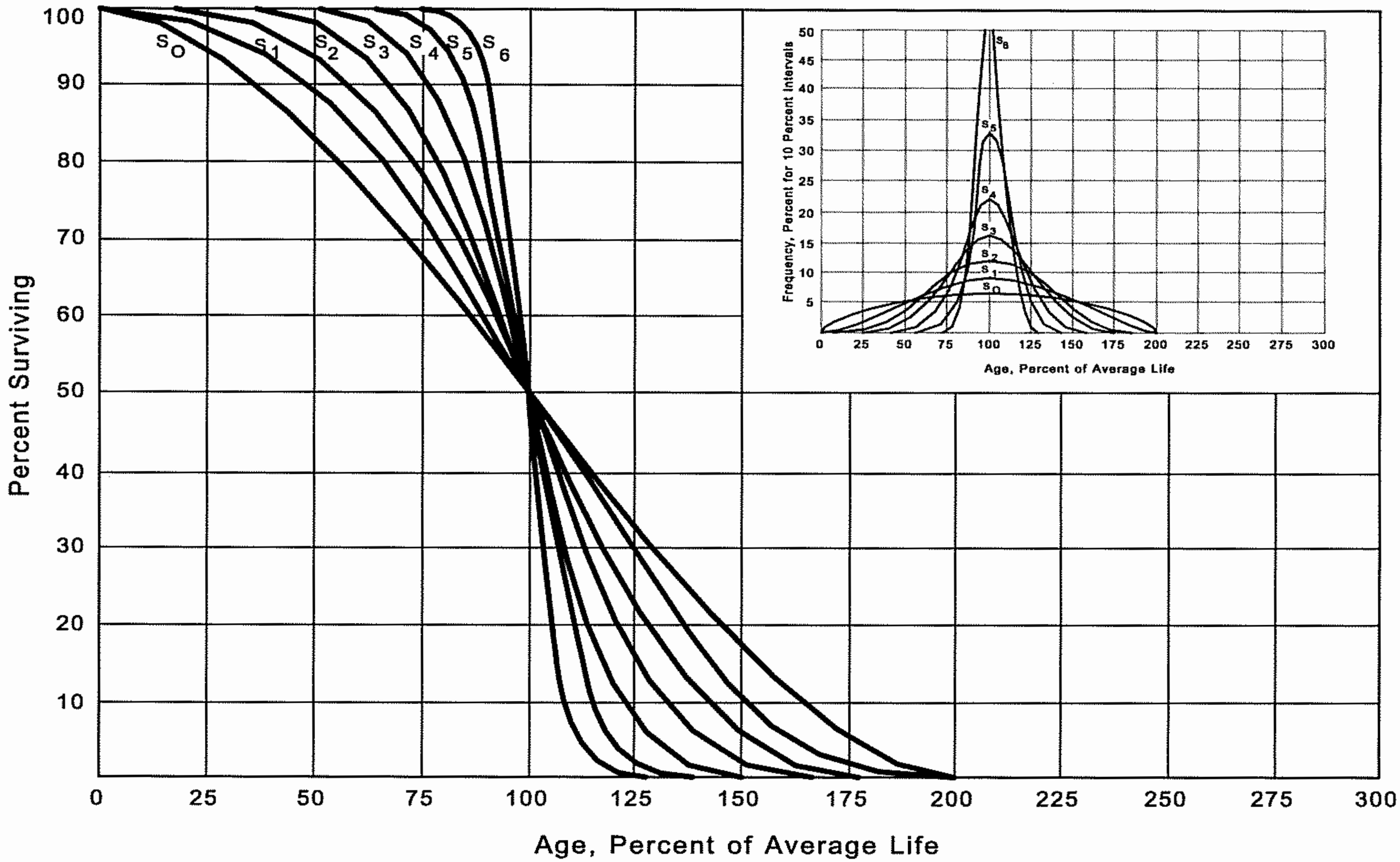

Figure 3. Symmetrical or "S" Iowa Type Survivor Curves

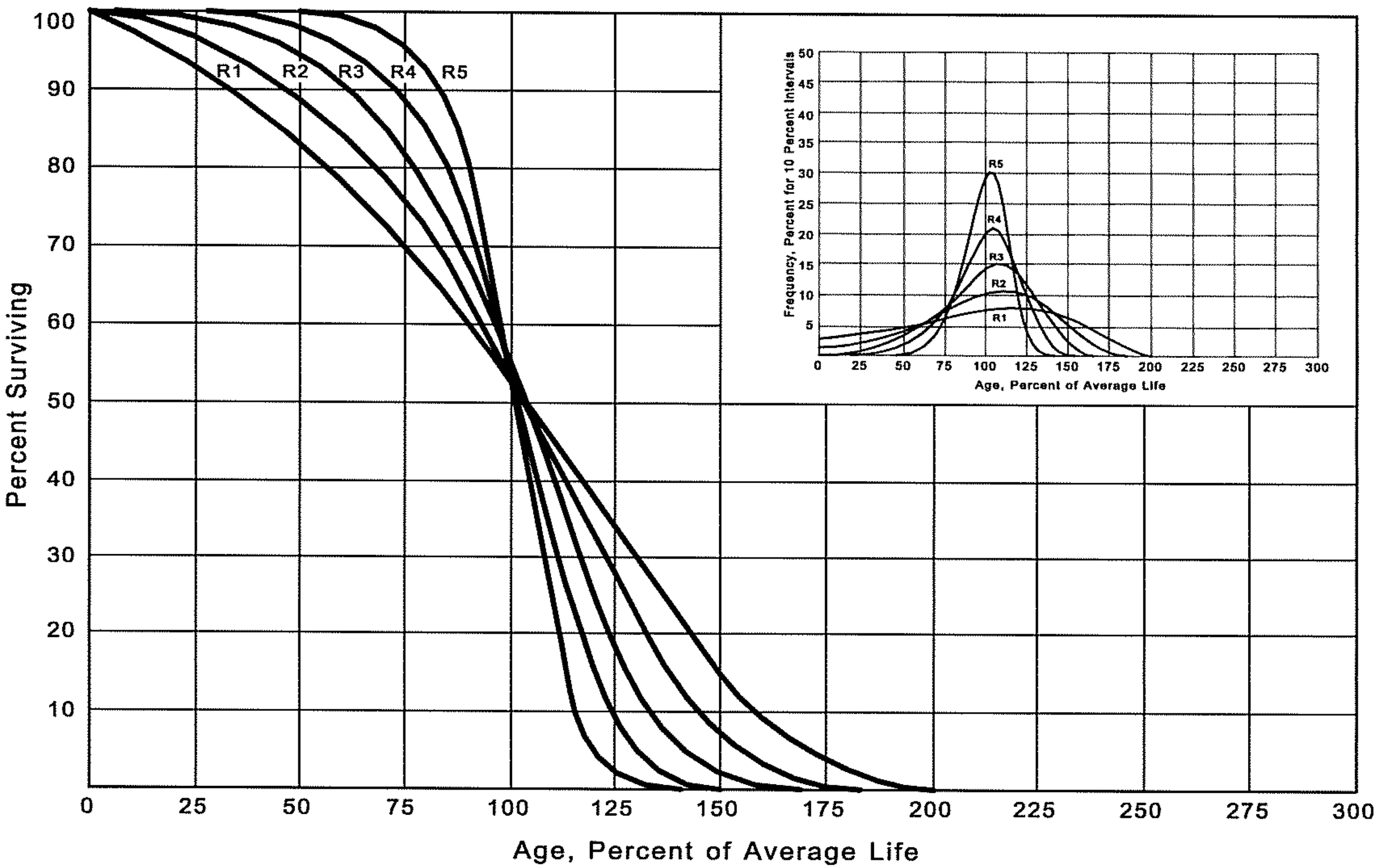

Figure 4. Right Modal or "R" Iowa Type Survivor Curves

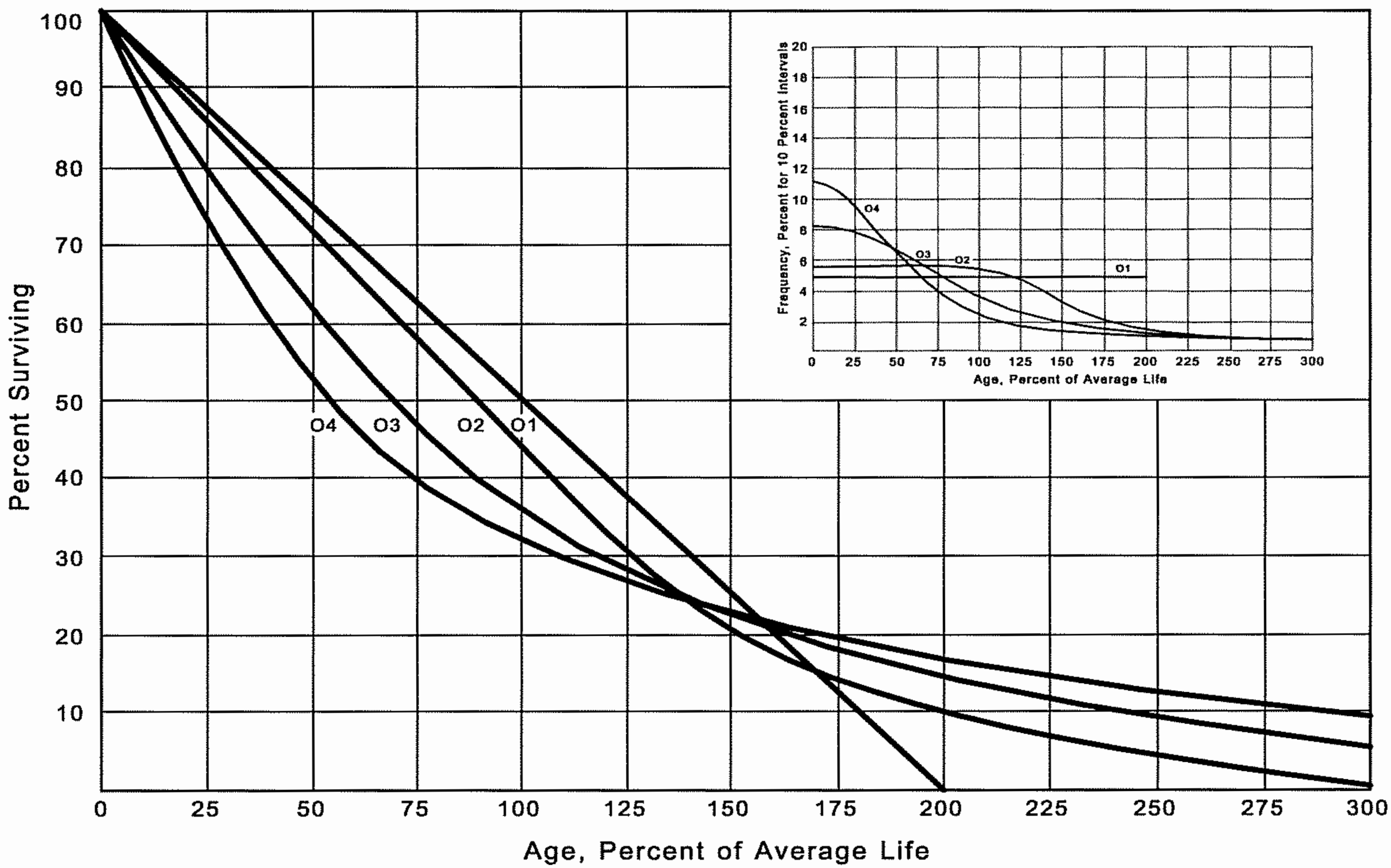

Figure 5. Origin Modal or "O" Iowa Type Survivor Curves

which constitute three of the four families, was published in 1935 in the form of the Experiment Station's Bulletin 125. These curve types have also been presented in subsequent Experiment Station bulletins and in the text, "Engineering Valuation and Depreciation."[1] In 1957, Frank V. B. Couch, Jr., an Iowa State College graduate student submitted a thesis presenting his development of the fourth family consisting of the four O type survivor curves.

Retirement Rate Method of Analysis

The retirement rate method is an actuarial method of deriving survivor curves using the average rates at which property of each age group is retired. The method relates to property groups for which aged accounting experience is available and is the method used to develop the original stub survivor curves in this study. The method (also known as the annual rate method) is illustrated through the use of an example in the following text, and is also explained in several publications, including "Statistical Analyses of Industrial Property Retirements,"[2] "Engineering Valuation and Depreciation,"[3] and "Depreciation Systems."[4]

The average rate of retirement used in the calculation of the percent surviving for the survivor curve (life table) requires two sets of data: first, the property retired during a period of observation, identified by the property's age at retirement; and second, the property exposed to retirement at the beginning of the age intervals during the same period. The period of observation is referred to as the experience band, and the band of years which represent the installation dates of the property exposed to retirement during the experience band is referred to as the placement band. An example of the calculations used in the development of a life table follows. The example includes

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[1]Marston, Anson, Robley Winfrey and Jean C. Hempstead. Engineering Valuation and Depreciation, 2nd Edition. New York, McGraw-Hill Book Company. 1953.

[2]Winfrey, Robley, Statistical Analyses of Industrial Property Retirements. Iowa State College Engineering Experiment Station, Bulletin 125. 1935.

[3]Marston, Anson, Robley Winfrey, and Jean C. Hempstead, Supra Note 1.

[4]Wolf, Frank K. and W. Chester Fitch. Depreciation Systems. Iowa State University Press. 1994.

schedules of annual aged property transactions, a schedule of plant exposed to retirement, a life table and illustrations of smoothing the stub survivor curve.

Schedules of Annual Transactions in Plant Records

The property group used to illustrate the retirement rate method is observed for the experience band 2005-2014 during which there were placements during the years 2000-2014. In order to illustrate the summation of the aged data by age interval, the data were compiled in the manner presented in Schedules 1 and 2 on pages II-11 and II-12 In Schedule 1, the year of installation (year placed) and the year of retirement are shown. The age interval during which a retirement occurred is determined from this information. In the example which follows, $10,000 of the dollars invested in 2000 were retired in 2005. The $10,000 retirement occurred during the age interval between 4½ and 5½ years on the basis that approximately one-half of the amount of property was installed prior to and subsequent to July 1 of each year. That is, on the average, property installed during a year is placed in service at the midpoint of the year for the purpose of the analysis. All retirements also are stated as occurring at the midpoint of a one-year age interval of time, except the first age interval which encompasses only one-half year.

The total retirements occurring in each age interval in a band are determined by summing the amounts for each transaction year-installation year combination for that age interval. For example, the total of $143,000 retired for age interval 4½-5½ is the sum of the retirements entered on Schedule 1 immediately above the stair step line drawn on the table beginning with the 2005 retirements of 2000 installations and ending with the 2014 retirements of the 2009 installations. Thus, the total amount of 143 for age interval 4½-5½ equals the sum of:

10 + 12 + 13 + 11 + 13 + 13 + 15 + 17 + 19 + 20.

SCHEDULE 1. RETIREMENTS FOR EACH YEAR 2005-2014
SUMMARIZED BY AGE INTERVAL

Experience Band 2005-2014

Placement Band 2000-2014

Year Placed	Retirements, Thousands of Dollars During Year 2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total During Age Interval	Age Interval
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
2000	10	11	12	13	14	16	23	24	25	26	26	13½-14½
2001	11	12	13	15	16	18	20	21	22	19	44	12½-13½
2002	11	12	13	14	16	17	19	21	22	18	64	11½-12½
2003	8	9	10	11	11	13	14	15	16	17	83	10½-11½
2004	9	10	11	12	13	14	16	17	19	20	93	9½-10½
2005	4	9	10	11	12	13	14	15	16	20	105	8½-9½
2006		5	11	12	13	14	15	16	18	20	113	7½-8½
2007			6	12	13	15	16	17	19	19	124	6½-7½
2008				6	13	15	16	17	19	19	131	5½-6½
2009					7	14	16	17	19	20	143	4½-5½
2010						8	18	20	22	23	146	3½-4½
2011							9	20	22	25	150	2½-3½
2012								11	23	25	151	1½-2½
2013									11	24	153	½-1½
2014										13	80	0-½
Total	53	68	86	106	128	157	196	231	273	308	1,606	

SCHEDULE 2. OTHER TRANSACTIONS FOR EACH YEAR 2005-2014
SUMMARIZED BY AGE INTERVAL

Experience Band 2005-2014 | Placement Band 2000-2014

Year Placed (1)	Acquisitions, Transfers and Sales, Thousands of Dollars During Year 2005 (2)	2006 (3)	2007 (4)	2008 (5)	2009 (6)	2010 (7)	2011 (8)	2012 (9)	2013 (10)	2014 (11)	Total During Age Interval (12)	Age Interval (13)
2000	-	-	-	-	-	-	60[a]	-	-	-	-	13½-14½
2001	-	-	-	-	-	-	-	-	-	-	-	12½-13½
2002	-	-	-	-	-	-	-	-	-	-	-	11½-12½
2003	-	-	-	-	-	-	-	(5)[b]	-	-	60	10½-11½
2004	-	-	-	-	-	-	-	6[a]	-	-	-	9½-10½
2005	-	-	-	-	-	-	-	-	-	-	(5)	8½-9½
2006		-	-	-	-	-	-	-	-	-	6	7½-8½
2007			-	-	-	-	-	-	-	-	-	6½-7½
2008				-	-	-	-	(12)[b]	-	-	-	5½-6½
2009					-	-	-	-	22[a]	-	-	4½-5½
2010						-	-	(19)[b]	-	-	10	3½-4½
2011							-	-	-	-	-	2½-3½
2012								-	-	(102)[c]	(121)	1½-2½
2013									-	-	-	½-1½
2014											-	0-½
Total	-	-	-	-	-	-	60	(30)	22	(102)	(50)	

[a] Transfer Affecting Exposures at Beginning of Year
[b] Transfer Affecting Exposures at End of Year
[c] Sale with Continued Use
Parentheses Denote Credit Amount.

In Schedule 2, other transactions which affect the group are recorded in a similar manner. The entries illustrated include transfers and sales. The entries which are credits to the plant account are shown in parentheses. The items recorded on this schedule are not totaled with the retirements, but are used in developing the exposures at the beginning of each age interval.

Schedule of Plant Exposed to Retirement

The development of the amount of plant exposed to retirement at the beginning of each age interval is illustrated in Schedule 3 on page II-14.

The surviving plant at the beginning of each year from 2005 through 2014 is recorded by year in the portion of the table headed "Annual Survivors at the Beginning of the Year." The last amount entered in each column is the amount of new plant added to the group during the year. The amounts entered in Schedule 3 for each successive year following the beginning balance or addition are obtained by adding or subtracting the net entries shown on Schedules 1 and 2. For the purpose of determining the plant exposed to retirement, transfers-in are considered as being exposed to retirement in this group at the beginning of the year in which they occurred, and the sales and transfers-out are considered to be removed from the plant exposed to retirement at the beginning of the following year. Thus, the amounts of plant shown at the beginning of each year are the amounts of plant from each placement year considered to be exposed to retirement at the beginning of each successive transaction year. For example, the exposures for the installation year 2010 are calculated in the following manner:

Exposures at age 0	= amount of addition	= $750,000
Exposures at age ½	= $750,000 - $ 8,000	= $742,000
Exposures at age 1½	= $742,000 - $18,000	= $724,000
Exposures at age 2½	= $724,000 - $20,000 - $19,000	= $685,000
Exposures at age 3½	= $685,000 - $22,000	= $663,000

SCHEDULE 3. PLANT EXPOSED TO RETIREMENT
JANUARY 1 OF EACH YEAR 2005-2014
SUMMARIZED BY AGE INTERVAL

Experience Band 2005-2014 | Placement Band 2000-2014

Year	Exposures, Thousands of Dollars										Total at	Age
	Annual Survivors at the Beginning of the Year										Beginning of	
Placed	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Age Interval	Interval
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
2000	255	245	234	222	209	195	239	216	192	167	167	13½-14½
2001	279	268	256	243	228	212	194	174	153	131	323	12½-13½
2002	307	296	284	271	257	241	224	205	184	162	531	11½-12½
2003	338	330	321	311	300	289	276	262	242	226	823	10½-11½
2004	376	367	357	346	334	321	307	297	280	261	1,097	9½-10½
2005	420[a]	416	407	397	386	374	361	347	332	316	1,503	8½-9½
2006		460[a]	455	444	432	419	405	390	374	356	1,952	7½-8½
2007			510[a]	504	492	479	464	448	431	412	2,463	6½-7½
2008				580[a]	574	561	546	530	501	482	3,057	5½-6½
2009					660[a]	653	639	623	628	609	3,789	4½-5½
2010						750[a]	742	724	685	663	4,332	3½-4½
2011							850[a]	841	821	799	4,955	2½-3½
2012								960[a]	949	926	5,719	1½-2½
2013									1,080[a]	1,069	6,579	½-1½
2014										1,220[a]	7,490	0-½
Total	1,975	2,382	2,824	3,318	3,872	4,494	5,247	6,017	6,852	7,799	44,780	

For the entire experience band 2005-2014, the total exposures at the beginning of an age interval are obtained by summing diagonally in a manner similar to the summing of the retirements during an age interval (Table 1). For example, the figure of 3,789, shown as the total exposures at the beginning of age interval 4½-5½, is obtained by summing:

255 + 268 + 284 + 311 + 334 + 374 + 405 + 448 + 501 + 609.

Original Life Table

The original life table, illustrated in Schedule 4 on page II-16, is developed from the totals shown on the schedules of retirements and exposures, Schedules 1 and 3, respectively. The exposures at the beginning of the age interval are obtained from the corresponding age interval of the exposure schedule, and the retirements during the age interval are obtained from the corresponding age interval of the retirement schedule. The retirement ratio is the result of dividing the retirements during the age interval by the exposures at the beginning of the age interval. The percent surviving at the beginning of each age interval is derived from survivor ratios, each of which equals one minus the retirement ratio. The percent surviving is developed by starting with 100% at age zero and successively multiplying the percent surviving at the beginning of each interval by the survivor ratio, i.e., one minus the retirement ratio for that age interval. The calculations necessary to determine the percent surviving at age 5½ are as follows:

Percent surviving at age 4½	=	88.15			
Exposures at age 4½	=	3,789,000			
Retirements from age 4½ to 5½	=	143,000			
Retirement Ratio	=	143,000 ÷	3,789,000	=	0.0377
Survivor Ratio	=	1.000 -	0.0377	=	0.9623
Percent surviving at age 5½	=	(88.15) x	(0.9623)	=	84.83

The totals of the exposures and retirements (columns 2 and 3) are shown for the purpose of checking with the respective totals in Schedules 1 and 3. The ratio of the total retirements to the total exposures, other than for each age interval, is meaningless.

SCHEDULE 4. ORIGINAL LIFE TABLE
CALCULATED BY THE RETIREMENT RATE METHOD

Experience Band 2005-2014 Placement Band 2000-2014

(Exposure and Retirement Amounts are in Thousands of Dollars)

Age at Beginning of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retirement Ratio	Survivor Ratio	Percent Surviving at Beginning of Age Interval
(1)	(2)	(3)	(4)	(5)	(6)
0.0	7,490	80	0.0107	0.9893	100.00
0.5	6,579	153	0.0233	0.9767	98.93
1.5	5,719	151	0.0264	0.9736	96.62
2.5	4,955	150	0.0303	0.9697	94.07
3.5	4,332	146	0.0337	0.9663	91.22
4.5	3,789	143	0.0377	0.9623	88.15
5.5	3,057	131	0.0429	0.9571	84.83
6.5	2,463	124	0.0503	0.9497	81.19
7.5	1,952	113	0.0579	0.9421	77.11
8.5	1,503	105	0.0699	0.9301	72.65
9.5	1,097	93	0.0848	0.9152	67.57
10.5	823	83	0.1009	0.8991	61.84
11.5	531	64	0.1205	0.8795	55.60
12.5	323	44	0.1362	0.8638	48.90
13.5	167	26	0.1557	0.8443	42.24
14.5					35.66
Total	44,780	1,606			

Column 2 from Schedule 3, Column 12, Plant Exposed to Retirement.
Column 3 from Schedule 1, Column 12, Retirements for Each Year.
Column 4 = Column 3 Divided by Column 2.
Column 5 = 1.0000 Minus Column 4.
Column 6 = Column 5 Multiplied by Column 6 as of the Preceding Age Interval.

The original survivor curve is plotted from the original life table (column 6, Schedule 4). When the curve terminates at a percent surviving greater than zero, it is called a stub survivor curve. Survivor curves developed from retirement rate studies generally are stub curves.

Smoothing the Original Survivor Curve

The smoothing of the original survivor curve eliminates any irregularities and serves as the basis for the preliminary extrapolation to zero percent surviving of the original stub curve. Even if the original survivor curve is complete from 100% to zero percent, it is desirable to eliminate any irregularities, as there is still an extrapolation for the vintages which have not yet lived to the age at which the curve reaches zero percent. In this study, the smoothing of the original curve with established type curves was used to eliminate irregularities in the original curve.

The Iowa type curves are used in this study to smooth those original stub curves which are expressed as percents surviving at ages in years. Each original survivor curve was compared to the Iowa curves using visual and mathematical matching in order to determine the better fitting smooth curves. In Figures 6, 7, and 8, the original curve developed in Schedule 4 is compared with the L, S, and R Iowa type curves which most nearly fit the original survivor curve. In Figure 6, the L1 curve with an average life between 12 and 13 years appears to be the best fit. In Figure 7, the S0 type curve with a 12-year average life appears to be the best fit and appears to be better than the L1 fitting. In Figure 8, the R1 type curve with a 12-year average life appears to be the best fit and appears to be better than either the L1 or the S0.

In Figure 9, the three fittings, 12-L1, 12-S0 and 12-R1 are drawn for comparison purposes. It is probable that the 12-R1 Iowa curve would be selected as the most representative of the plotted survivor characteristics of the group.

FIGURE 6. ILLUSTRATION OF THE MATCHING OF AN ORIGINAL SURVIVOR CURVE WITH AN L1 IOWA TYPE CURVE
ORIGINAL AND SMOOTH SURVIVOR CURVES

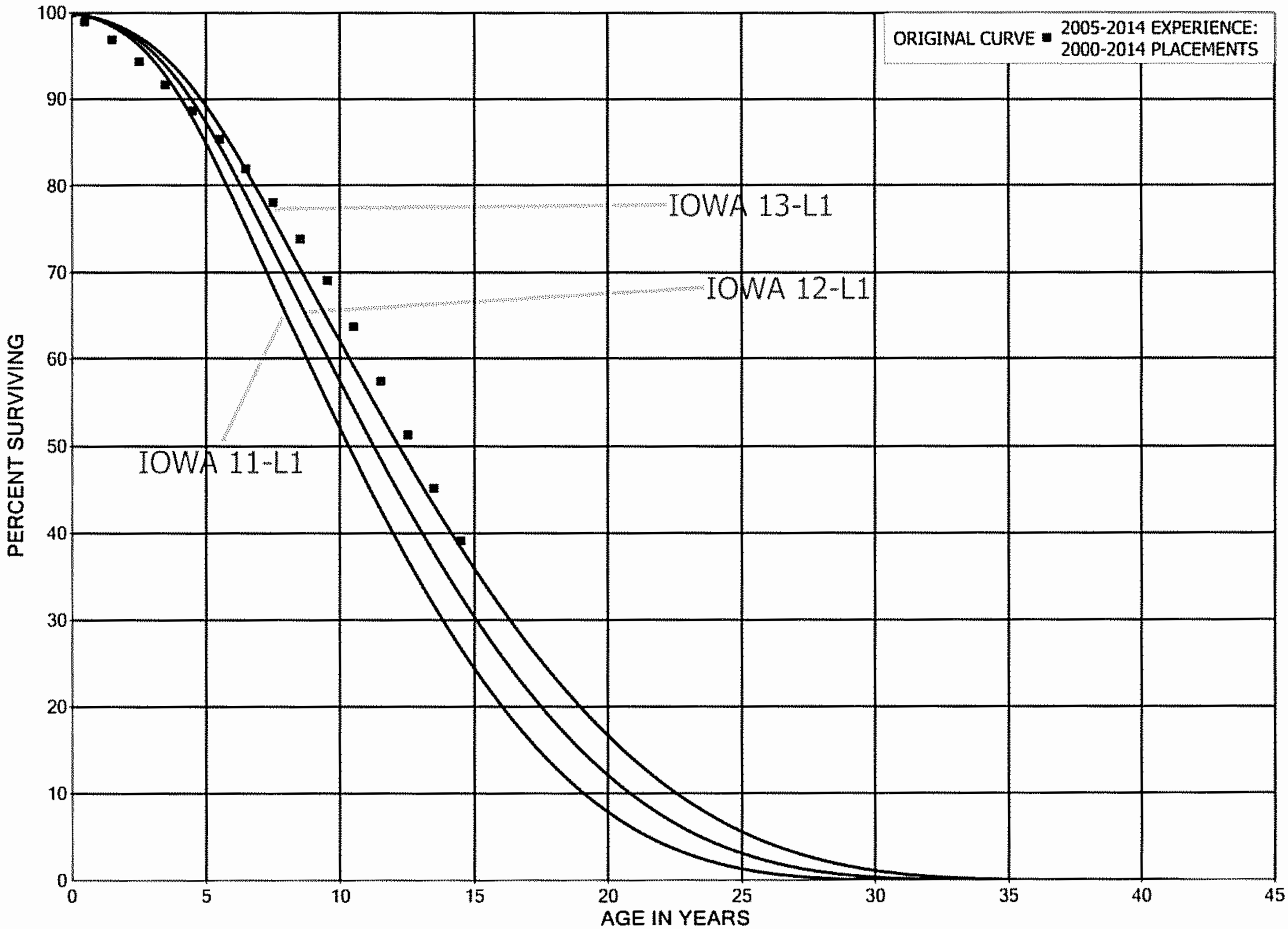


FIGURE 7. ILLUSTRATION OF THE MATCHING OF AN ORIGINAL SURVIVOR CURVE WITH AN S0 IOWA TYPE CURVE
ORIGINAL AND SMOOTH SURVIVOR CURVES

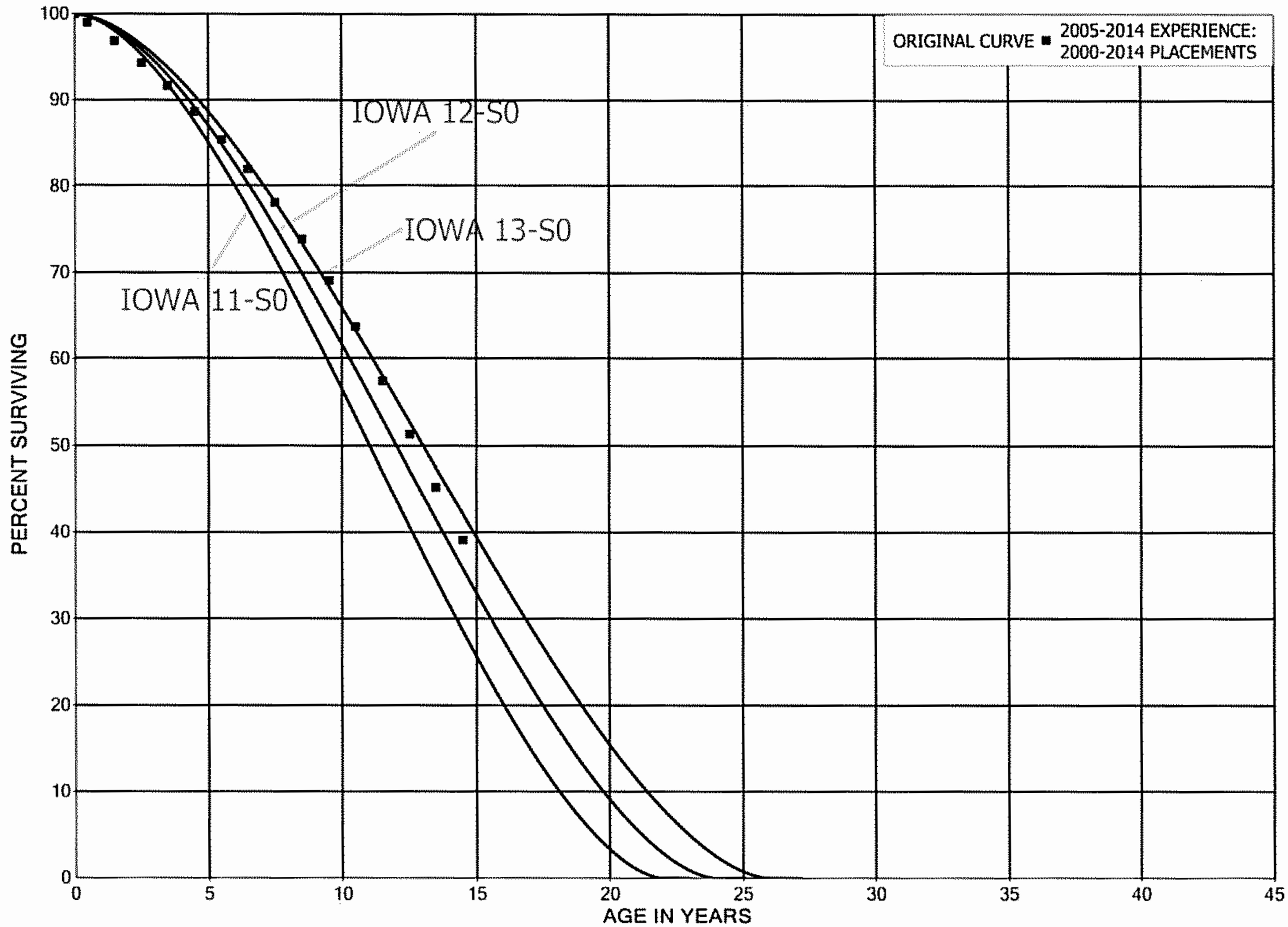


FIGURE 8. ILLUSTRATION OF THE MATCHING OF AN ORIGINAL SURVIVOR CURVE WITH AN R1 IOWA TYPE CURVE
ORIGINAL AND SMOOTH SURVIVOR CURVES

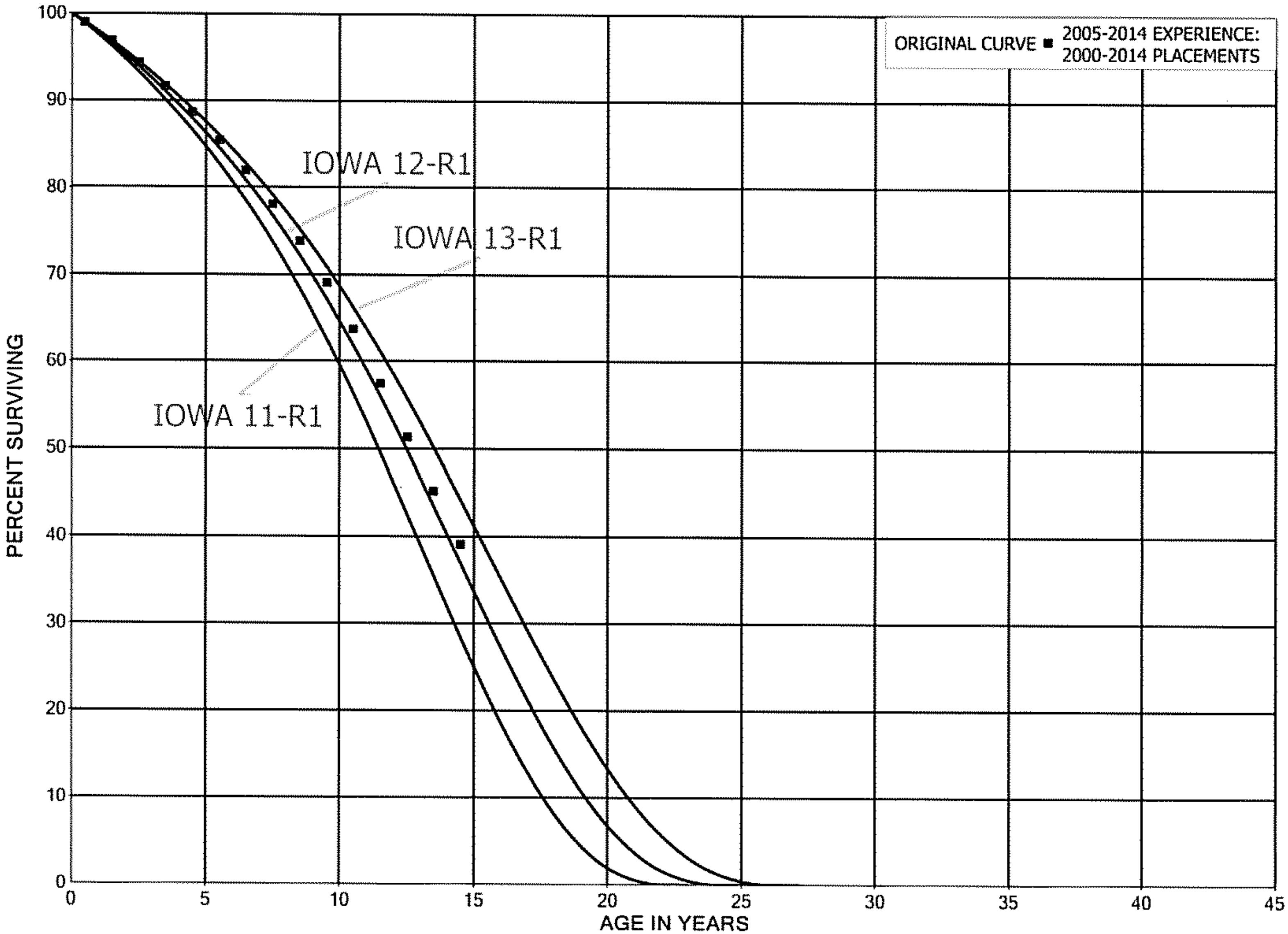
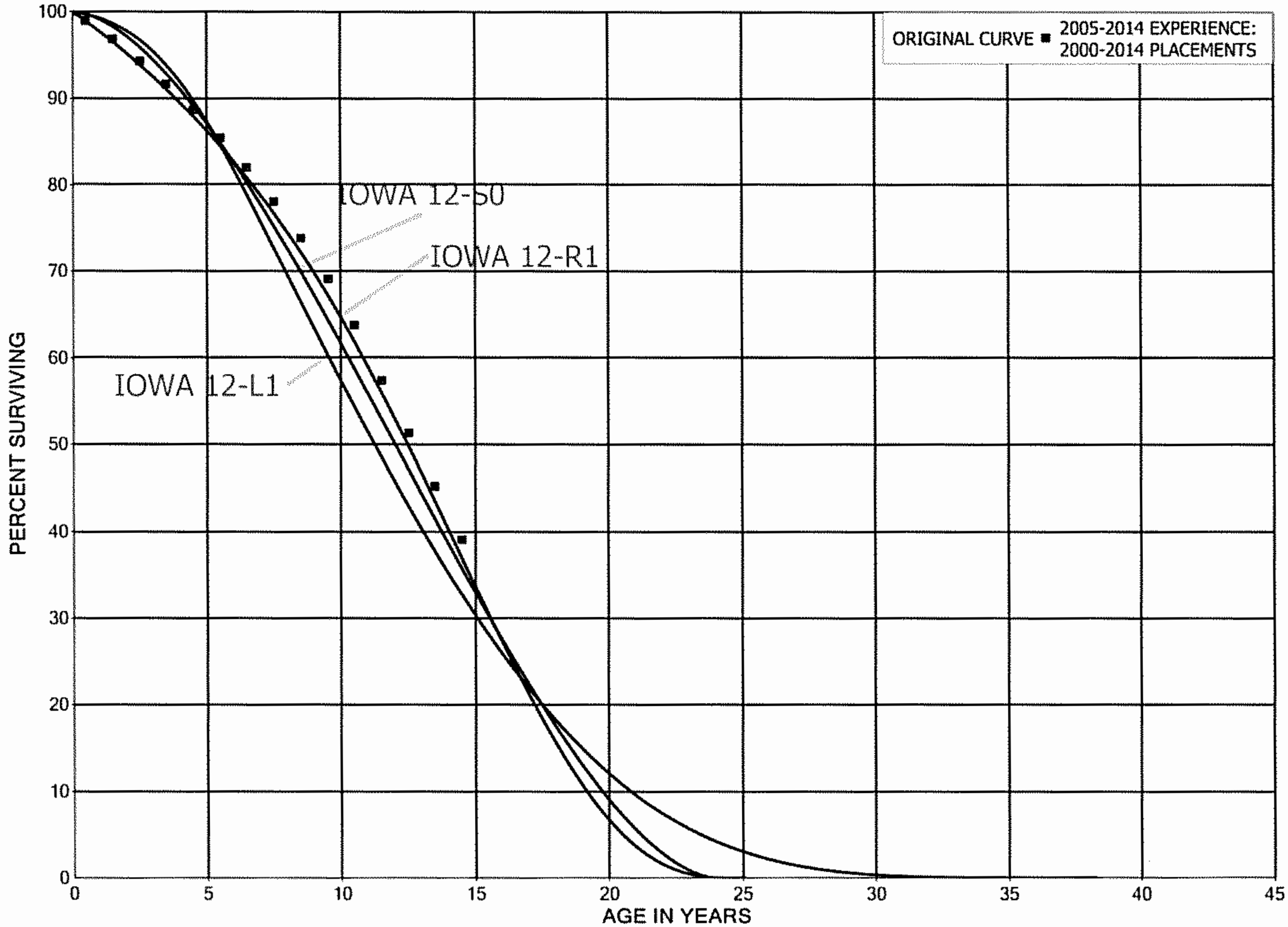


FIGURE 9. ILLUSTRATION OF THE MATCHING OF AN ORIGINAL SURVIVOR CURVE WITH AN L1, S0 AND R1 IOWA TYPE CURVE
ORIGINAL AND SMOOTH SURVIVOR CURVES



PART III. SERVICE LIFE CONSIDERATIONS

PART III. SERVICE LIFE CONSIDERATIONS

FIELD TRIPS

In order to be familiar with the operation of the Company and observe representative portions of the plant, field trips have been conducted. A general understanding of the function of the plant and information with respect to the reasons for past retirements and the expected future causes of retirements are obtained during field trips. This knowledge and information were incorporated in the interpretation and extrapolation of the statistical analyses.

The following is a list of the locations visited during the most recent field trips.

<u>June 2, 2015</u>
- Field Operations Center
- Richmond Road Station
- Jacobsen Reservoir
- Kentucky River Station #1
- Kentucky River Station #2
- Brock Tank and Booster Station
- Fairgrounds Tank
- Owenton Wastewater Plant
- Lexington Headquarters Building

<u>March 13 & 14, 2007</u>
- Newtown Pike Booster Station
- Hume Road Booster Station
- Clays Mill Booster Station
- Richmond Road Booster Station
- Owenton Treatment Plant
- North Booster Station
- Kentucky River Treatment Plant
- Kentucky River Intake
- Russell Cave Booster Station
- Hall Booster Station
- Briar Hill Booster Station
- Cox Street Booster Station
- Mercer Road Booster Station
- Kentucky Power Treatment Plant
- Rockdale Chlorine Booster Station

Service Life Analysis

The service life estimates were based on judgment which considered a number of factors. The primary factors were the statistical analyses of data; current company policies and outlook as determined during field reviews of the property and other conversations with management; and the survivor curve estimates from previous studies of this company and other water companies.

For most of the mass plant accounts and subaccounts, the statistical analyses resulted in good to excellent indications of significant survivor patterns. These accounts represent 82 percent of depreciable plant. Generally, the information external to the statistics led to no significant departure from the indicated survivor curves for the accounts listed below.

Account No.	Account Description
304.01	Structures and Improvements - Source of Supply
304.2 & 304.3	Structures and Improvements
304.4	Structures and Improvements - Transmission and Distribution
304.6	Structures and Improvements - Office Buildings
304.7	Structures and Improvements - Store, Shop and Garage
304.8	Structures and Improvements - Miscellaneous
306	Lake, River and Other Intakes
310.1	Other Power Generation Equipment
311.2, 311.3, 311.4 311.52, & 311.54	Pumping Equipment
320.1	Purification System - Structures
320.11	Purification System - Equipment
331	Mains and Accessories
333	Services
335	Fire Hydrants
341.1	Transportation Equipment - Light Duty Trucks
341.2	Transportation Equipment - Heavy Duty Trucks
341.3	Transportation Equipment - Autos
341.4	Transportation Equipment - Other
345	Power Operated Equipment

Account 331, Mains and Accessories, is used to illustrate the manner in which the study was conducted for the accounts in the preceding list. Aged plant accounting data have been compiled for the years through 2014. These data have been coded according to account or property group, type of transaction, year in which the transaction took place, and year in which the utility plant was placed in service. The retirements, other plant transactions and plant additions were analyzed by the retirement rate method.

The survivor curve estimate for this account is the 85-R3 and is based on the statistical indication for the period 1995 through 2014. The 85-R3 is a good fit of the significant portion of the original survivor curve as set forth on page VII-53, is consistent with management outlook for a continuation of the historical experience and is within the typical service life range of 75 to 100 years for water mains.

The life span estimates for major structures and equipment in Accounts 304.2, 304.3, 304.6 and 320.1 which represent 15 percent of depreciable plant, were based on the type construction, attained age, observed features and conditions at the time of the filed visit, and the plans of management.

Amortization accounting is proposed for certain General Plant accounts that represent numerous units of property, but a small portion of the depreciable plant in service. These accounts represent approximately 4 percent of total utility plant. A discussion of the basis for the amortization periods is presented in the section "Calculation of Annual and Accrued Amortization".

Generally, the estimates for the remaining accounts were based on judgments which considered the nature of the plant and equipment, the previous estimate for this company and a general knowledge of service lives for similar equipment in other water companies.

PART IV. NET SALVAGE CONSIDERATIONS

PART IV. NET SALVAGE CONSIDERATIONS

SALVAGE ANALYSIS

The estimates of net salvage by account were based in part on historical data compiled for the years 1980 through 2014. Cost of removal and salvage were expressed as percents of the original cost of plant retired, both on annual and three-year moving average bases. The most recent five-year average also was calculated for consideration. The net salvage estimates by account are expressed as a percent of the original cost of plant retired.

Net Salvage Considerations

The estimates of salvage were based primarily on judgment which considered a number of factors. The primary factors were the analyses of historical data; a knowledge of management's plans and operating policies; and net salvage estimates from previous studies of this company and other water companies. The accounts for which the historical analyses were representative of expectations for future net salvage levels represent 87 percent of the depreciable plant balance and are presented below:

304.2 & 304.3	Structures and Improvements
304.4	Structures and Improvements - Transmission and Distribution
304.6	Structures and Improvements - Office Buildings
304.7	Structures and Improvements - Store, Shop and Garage
304.8	Structures and Improvements - Miscellaneous
309	Supply Mains
311.2, 311.3, 311.4, 311.52 & 311.54	Pumping Equipment
320.1 & 320.11	Purification System
330.0 & 330.1	Distribution Reservoirs, Elevated Tanks and Standpipes
331	Mains and Accessories
333	Services
334.1, 334.11, 334.12, 334.13, 334.2 & 334.3	Meters and Meter Installations
341.1	Transportation Equipment - Light Duty Trucks
341.2	Transportation Equipment - Heavy Duty Trucks
341.3	Transportation Equipment - Autos
345	Power Operated Equipment

The combined analysis for Accounts 334.1 through 334.3, Meters and Meter Installations, is used to illustrate the manner in which the study was conducted for the accounts in the preceding list. Depreciation reserve accounting data were compiled for the years 1980 through 2014. These data include the retirements, cost of removal and gross salvage.

The net salvage estimate for this account is negative 20 percent and is based on the trends in cost of removal and salvage percents as shown in the tabulation on pages VIII-26 and VIII-27. Cost of removal as a percent of the original cost retired has fluctuated during the experience and most recently increased as a percentage of plant retired. The overall and most recent five-year bands averaged 29 and 55 percent removal cost, respectively. Gross salvage has been sporadic, averaging 12 percent for the 35-year period, but trending to 16 percent in recent years. The negative 20 percent net salvage estimate is based primarily on the overall cost of removal and gross salvage percent, but considers the upward trend in recent years.

Amortization accounting is proposed for certain General Plant accounts which represent 4 percent of depreciable property. Future gross salvage and removal cost for these accounts will be recorded against the oldest vintage being retired. Inasmuch as there will be minimal to no depreciation reserve entries related to salvage, the estimate of net salvage for accounts subject to amortization is zero percent.

Generally, the net salvage estimates for the remaining accounts, which comprise 9 percent of the total depreciable plant in service, were based on judgments which considered the nature of the plant and equipment, reviews of available historical data, and a general knowledge of net salvage percents for similar equipment in other water companies.

PART V. CALCULATION OF ANNUAL AND ACCRUED DEPRECIATION

PART V. CALCULATION OF ANNUAL AND ACCRUED DEPRECIATION

GROUP DEPRECIATION PROCEDURES

A group procedure for depreciation is appropriate when considering more than a single item of property. Normally the items within a group do not have identical service lives, but have lives that are dispersed over a range of time. There are two primary group procedures, namely, average service life and equal life group. In the average service life procedure, the rate of annual depreciation is based on the average life or average remaining life of the group, and this rate is applied to the surviving balances of the group's cost. A characteristic of this procedure is that the cost of plant retired prior to average life is not fully recouped at the time of retirement, whereas the cost of plant retired subsequent to average life is more than fully recouped. Over the entire life cycle, the portion of cost not recouped prior to average life is balanced by the cost recouped subsequent to average life.

Single Unit of Property

The calculation of straight line depreciation for a single unit of property is straightforward. For example, if a $1,000 unit of property attains an age of four years and has a life expectancy of six years, the annual accrual over the total life is:

$$\frac{\$1,000}{(4 + 6)} = \$100 \text{ per year.}$$

The accrued depreciation is:

$$\$1,000\left(1 - \frac{6}{10}\right) = \$400.$$

Remaining Life Annual Accruals

For the purpose of calculating remaining life accruals as of December 31, 2014, the depreciation reserve for each plant account is allocated among vintages in proportion to the calculated accrued depreciation for the account. Explanations of remaining life accruals and calculated accrued depreciation follow. The detailed calculations as of December 31, 2014, are set forth in the Results of Study section of the report.

Average Service Life Procedure

In the average service life procedure, the remaining life annual accrual for each vintage is determined by dividing future book accruals (original cost less book reserve) by the average remaining life of the vintage. The average remaining life is a directly weighted average derived from the estimated future survivor curve in accordance with the average service life procedure.

The calculated accrued depreciation for each depreciable property group represents that portion of the depreciable cost of the group which would not be allocated to expense through future depreciation accruals, if current forecasts of life characteristics are used as the basis for such accruals. The accrued depreciation calculation consists of applying an appropriate ratio to the surviving original cost of each vintage of each account, based upon the attained age and service life. The straight line accrued depreciation ratios are calculated as follows for the average service life procedure:

$$Ratio = 1 - \frac{Average\ Remaining\ Life}{Average\ Service\ Life}.$$

CALCULATION OF ANNUAL AND ACCRUED AMORTIZATION

Amortization is the gradual extinguishment of an amount in an account by distributing such amount over a fixed period, over the life of the asset or liability to which it applies, or over the period during which it is anticipated the benefit will be realized. Normally, the distribution of the amount is in equal amounts to each year of the amortization period.

The calculation of annual and accrued amortization requires the selection of an amortization period. The amortization periods used in this report were based on judgment which incorporated a consideration of the period during which the assets will render most of their service, the amortization period and service lives used by other utilities, and the service life estimates previously used for the asset under depreciation accounting.

Amortization accounting is proposed for certain General Plant accounts that represent numerous units of property, but a very small portion of depreciable utility plant in service. The accounts and their amortization periods are as follows:

Account		Amortization Period, Years
	Office Furniture and Equipment	
340.10	Furniture	20
340.15	Computer Software - Special Rate	10
340.21	Mainframe	5
340.22	Personal Computers	5
340.23	Peripheral - Other	5
340.30	Computer Software	5
340.32	Computer Software - Personal	5
340.33	Computer Software - Other	5
340.50	Other	15
342.00	Stores Equipment	25
343.00	Tools, Shop and Garage Equipment	20

Account		Amortization Period, Years
344.00	Laboratory Equipment	15
346.10	Communication Equip. - Non-Telephone	15
346.19	Communication Equip. - Remote Control and Control and Instrumentation	15
346.20	Communication Equip. - Telephone	15
347.00	Miscellaneous Equipment	20
348.00	Other Tangible Property	20

The calculated accrued amortization is equal to the original cost multiplied by the ratio of the vintage's age to its amortization period. The annual amortization amount is determined by dividing the original cost by the period of amortization for the account.

PART VI. RESULTS OF STUDY

PART VI. RESULTS OF STUDY

QUALIFICATION OF RESULTS

The calculated annual and accrued depreciation are the principal results of the study. Continued surveillance and periodic revisions are normally required to maintain continued use of appropriate annual depreciation accrual rates. An assumption that accrual rates can remain unchanged over a long period of time implies a disregard for the inherent variability in service lives and salvage and for the change of the composition of property in service. The annual accrual rates were calculated in accordance with the straight line remaining life method of depreciation, using the average service life procedure based on estimates which reflect considerations of current historical evidence and expected future conditions.

The annual depreciation accrual rates are applicable specifically to the water plant in service as of December 31, 2014. For most plant accounts, the application of such rates to future balances that reflect additions subsequent to December 31, 2014, is reasonable for a period of three to five years.

DESCRIPTION OF DETAILED TABULATIONS

A summary of the results of the study, as applied to the original cost of water plant in service as of December 31, 2014, is presented on pages VI-5 through VI-7 of this report. The table sets forth the original cost, the book depreciation reserve, future accruals, the calculated annual depreciation rate and amount, and the composite remaining life related to water plant for all districts.

The service life estimates were based on judgment that incorporated statistical analysis of retirement data, discussions with management and consideration of estimates made for other water utilities. The results of the statistical analysis of service life are presented in the section beginning on page VII-2, within the supporting documents of this report.

For each depreciable group analyzed by the retirement rate method, a chart depicting the original and estimated survivor curves followed by a tabular presentation of the original life table(s) plotted on the chart. The survivor curves estimated for the depreciable groups are shown as dark smooth curves on the charts. Each smooth survivor curve is denoted by a numeral followed by the curve type designation. The numeral used is the average life derived from the entire curve from 100 percent to zero percent surviving. The titles of the chart indicate the group, the symbol used to plot the points of the original life table, and the experience and placement bands of the life tables which where plotted. The experience band indicates the range of years for which retirements were used to develop the stub survivor curve. The placements indicate, for the related experience band, the range of years of installations which appear in the experience.

The analyses of salvage data are presented in the section titled, "Net Salvage Statistics". The tabulations present annual cost of removal and salvage data, three-year moving averages and the most recent five-year average. Data are shown in dollars and as percentages of original costs retired.

The tables of the calculated annual depreciation applicable to depreciable assets as of December 31, 2014 are presented in account sequence starting on page IX-2 of the supporting documents. The tables indicate the estimated survivor curve and net salvage percent for the account and set forth, for each installation year, the original cost, the calculated accrued depreciation, the allocated book reserve, future accruals, the remaining life, and the calculated annual accrual amount.

TABLE 1. ESTIMATED SURVIVOR CURVE, NET SALVAGE, ORIGINAL COST, BOOK DEPRECIATION RESERVE AND CALCULATED ANNUAL DEPRECIATION ACCRUALS RELATED TO UTILITY PLANT AS OF DECEMBER 31, 2014

	DEPRECIABLE GROUP (1)	SURVIVOR CURVE (2)	NET SALVAGE (3)	ORIGINAL COST AS OF DECEMBER 31, 2014 (4)	BOOK DEPRECIATION RESERVE (5)	FUTURE ACCRUALS (6)	CALCULATED ANNUAL ACCRUAL AMOUNT (7)	CALCULATED ANNUAL ACCRUAL RATE (8)=(7)/(4)	COMPOSITE REMAINING LIFE (9)
	DEPRECIABLE PLANT								
	STRUCTURES AND IMPROVEMENTS								
304.10	SOURCE OF SUPPLY	50-S0.5	(10)	19,702,930.67	1,555,709	20,117,515	441,280	2.24	45.6
304.20	POWER AND PUMPING STRUCTURES								
	KENTUCKY RIVER STATION	60-R1.5 *	(15)	2,864,305.93	1,337,928	1,956,024	81,256	2.84	24.1
	FRANKLIN COUNTY TANK AND BOOSTER STATION	60-R1.5 *	(15)	4,720,826.87	407,928	5,021,023	116,770	2.47	43.0
	OTHER STRUCTURES	60-R1.5	(15)	1,970,900.24	536,859	1,729,676	38,739	1.97	44.6
	TOTAL ACCOUNT 304.20			9,556,033.04	2,282,715	8,706,723	236,765	2.48	36.8
304.30	WATER TREATMENT								
	KENTUCKY RIVER STATION	60-R1.5 *	(15)	3,738,064.57	1,138,051	3,160,723	128,415	3.44	24.6
	KENTUCKY RIVER STATION II	60-R1.5 *	(15)	28,113,173.56	1,530,713	30,799,436	714,061	2.54	43.1
	RICHMOND ROAD STATION TREATMENT PLANT	60-R1.5 *	(15)	3,010,913.05	1,015,501	2,447,049	114,663	3.81	21.3
	OTHER STRUCTURES	60-R1.5	(15)	1,947,460.65	273,569	1,966,011	40,069	2.06	49.1
	TOTAL ACCOUNT 304.30			36,809,611.83	3,957,834	38,373,219	997,208	2.71	38.5
304.40	TRANSMISSION AND DISTRIBUTION	40-R2.5	(5)	917,658.95	609,642	353,900	12,794	1.39	27.7
304.60	OFFICE BUILDINGS								
	MAIN OFFICE	60-R2 *	(15)	6,580,259.63	1,261,113	6,306,185	238,686	3.63	26.4
	OTHER STRUCTURES	60-R2	(15)	3,511,986.66	627,728	3,411,057	71,560	2.04	47.7
	TOTAL ACCOUNT 304.60			10,092,246.29	1,888,841	9,717,242	310,246	3.07	31.3
304.70	STORE, SHOP AND GARAGE	55-R2	0	1,757,378.21	417,594	1,339,784	30,959	1.76	43.3
304.80	MISCELLANEOUS	25-S0.5	0	1,386,565.83	63,343	1,323,222	85,670	6.18	15.4
	TOTAL STRUCTURES AND IMPROVEMENTS			80,222,424.82	10,775,679	79,931,605	2,114,922	2.64	37.8
305.00	COLLECTING AND IMPOUNDING RESERVOIRS	70-R3	0	854,646.28	269,131	585,515	13,465	1.58	43.5
306.00	LAKE, RIVER AND OTHER INTAKES	50-S1	(10)	1,630,781.88	380,905	1,412,955	33,012	2.02	42.8
309.00	SUPPLY MAINS	70-R3	(10)	18,571,338.59	3,403,704	17,024,768	284,883	1.53	59.8
310.10	OTHER POWER GENERATION EQUIPMENT	35-R3	(5)	2,797,503.82	543,437	2,393,942	87,385	3.12	27.4
	PUMPING EQUIPMENT								
311.20	ELECTRIC	43-S0.5	(15)	15,190,660.84	2,395,649	15,073,611	459,708	3.03	32.8
311.30	DIESEL	43-S0.5	(15)	433,456.17	143,807	354,668	14,012	3.23	25.3
311.40	HYDRAULIC	43-S0.5	(15)	382,746.71	9,117	431,042	15,612	4.08	27.6
311.52	SOURCE OF SUPPLY	43-S0.5	(15)	11,847,163.43	1,154,628	12,469,610	323,751	2.73	38.5
311.54	TRANSMISSION AND DISTRIBUTION PUMPING EQUIPMENT	43-S0.5	(15)	94,347.20	3,036	105,463	2,852	3.02	37.0
	TOTAL ACCOUNT 311			27,948,374.35	3,706,238	28,434,394	815,935	2.92	34.8
320.10	PURIFICATION SYSTEM - STRUCTURES								
	KENTUCKY RIVER STATION	55-R3 *	(15)	4,643,710.65	2,646,540	2,693,727	146,952	3.16	18.3
	KENTUCKY RIVER STATION II	55-R3 *	(15)	14,644,017.18	1,225,747	15,614,873	350,765	2.40	44.5
	RICHMOND ROAD STATION TREATMENT PLANT	55-R3 *	(15)	6,952,424.28	2,815,216	5,180,072	241,948	3.48	21.4
	OTHER STRUCTURES	55-R3	(15)	2,435,413.37	688,310	2,112,415	55,248	2.27	38.2
	TOTAL ACCOUNT 320.10			28,675,565.48	7,375,813	25,601,087	794,913	2.77	32.2
320.11	PURIFICATION SYSTEM - EQUIPMENT	27-L2	(15)	10,164,816.80	3,213,416	8,476,123	495,648	4.88	17.1
320.20	PURIFICATION SYSTEM - FILTER MEDIA	10-S3	0	742,339.73	624,686	117,654	19,689	2.65	6.0
	TOTAL PURIFICATION SYSTEM			10,907,156.53	3,838,102	8,593,777	515,337	4.72	16.7

TABLE 1. ESTIMATED SURVIVOR CURVE, NET SALVAGE, ORIGINAL COST, BOOK DEPRECIATION RESERVE AND CALCULATED ANNUAL DEPRECIATION ACCRUALS RELATED TO UTILITY PLANT AS OF DECEMBER 31, 2014

	DEPRECIABLE GROUP	SURVIVOR CURVE	NET SALVAGE	ORIGINAL COST AS OF DECEMBER 31, 2014	BOOK DEPRECIATION RESERVE	FUTURE ACCRUALS	CALCULATED ANNUAL ACCRUAL AMOUNT	CALCULATED ANNUAL ACCRUAL RATE	COMPOSITE REMAINING LIFE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)=(7)/(4)	(9)
	DEPRECIABLE PLANT								
330.00	DISTRIBUTION RESERVOIRS AND STANDPIPES	55-R4	(10)	1,771,358.24	342,105	1,606,389	35,777	2.02	44.9
330.10	ELEVATED TANKS AND STANDPIPES	55-R4	(10)	10,930,352.61	3,890,223	8,133,165	206,749	1.89	39.3
330.20	GROUND LEVEL FACILITIES	55-R4	0	2,912,613.49	186,216	2,726,398	53,378	1.83	51.1
330.40	CLEARWELLS	55-R4	0	1,096,315.61	132,801	963,514	19,077	1.74	50.5
	TOTAL ACCOUNT 330			16,710,639.95	4,551,345	13,429,466	314,981	1.88	42.6
331.00	MAINS AND ACCESSORIES	85-R3	(25)	231,000,140.04	36,888,213	251,861,962	3,538,431	1.53	71.2
333.00	SERVICES	52-R3	(75)	33,537,375.18	16,738,259	41,952,148	1,085,493	3.24	38.6
	<u>METERS</u>								
334.10	METERS	40-R0.5	(20)	10,190,322.35	(1,243,290)	13,471,677	356,906	3.50	37.7
334.11	BRONZE CASE	40-R0.5	(20)	1,601,962.99	250,819	1,671,536	46,530	2.90	35.9
334.12	PLASTIC CASE	40-R0.5	(20)	281,243.57	(43,413)	380,905	12,333	4.39	30.9
334.13	OTHER	40-R0.5	(20)	4,829,282.51	(43,035)	5,838,174	178,786	3.70	32.7
	TOTAL ACCOUNT 334.1			16,902,811.42	(1,078,918)	21,362,292	594,555	3.52	35.9
334.20	METER INSTALLATIONS	40-R0.5	(20)	16,136,245.69	4,752,257	14,611,238	466,359	2.89	31.3
334.30	METER VAULTS	40-R0.5	(20)	751,479.59	(46,782)	948,557	24,869	3.31	38.1
335.00	FIRE HYDRANTS	70-R4	(40)	14,842,364.09	3,219,068	17,560,241	319,775	2.15	54.9
339.60	OTHER P/E COMPANY PLANNING STUDY	10-SQ	0	615,609.75	211,951	403,659	61,560	10.00	6.6
	<u>OFFICE FURNITURE AND EQUIPMENT</u>								
340.10	FURNITURE	20-SQ	0	627,473.47	300,948	326,525	31,371	5.00	10.4
340.15	COMPUTER SOFTWARE - SPECIAL RATE	10-SQ	0	11,943,983.92	2,357,819	9,586,165	1,194,399	10.00	8.0
340.21	MAINFRAME	5-SQ	0	67,231.24	33,681	33,550	13,447	20.00	2.5
340.22	PERSONAL COMPUTERS	5-SQ	0	494,722.87	304,236	190,487	98,945	20.00	1.9
340.23	PERIPHERAL-OTHER	5-SQ	0	1,309,552.78	404,285	905,268	261,911	20.00	3.5
340.30	COMPUTER SOFTWARE	5-SQ	0	1,032,031.37	255,232	776,799	206,406	20.00	3.8
340.32	COMPUTER SOFTWARE-PERSONAL	5-SQ	0	297,838.26	32,156	265,682	59,567	20.00	4.5
340.50	OTHER	15-SQ	0	16,685.41	11,811	4,874	1,113	6.67	4.4
	TOTAL OFFICE FURNITURE AND EQUIPMENT			15,789,519.32	3,700,168	12,089,350	1,867,159	11.83	6.5
	<u>TRANSPORTATION EQUIPMENT</u>								
341.10	LIGHT DUTY TRUCKS	10-L2.5	15	1,902,195.84	508,477	1,108,389	166,653	8.76	6.7
341.20	HEAVY DUTY TRUCKS	11-L2	15	2,049,860.95	356,697	1,385,685	166,481	8.12	8.3
341.30	AUTOS	10-S2.5	20	63,562.74	20,435	30,415	6,424	10.11	4.7
341.40	OTHER	9-L2.5	20	868,391.52	187,103	507,611	87,374	10.06	5.8
	TOTAL ACCOUNT 341			4,884,011.05	1,072,713	3,032,100	426,932	8.74	7.1

KENTUCKY AMERICAN WATER COMPANY

TABLE 1. ESTIMATED SURVIVOR CURVE, NET SALVAGE, ORIGINAL COST, BOOK DEPRECIATION RESERVE AND CALCULATED ANNUAL DEPRECIATION ACCRUALS RELATED TO UTILITY PLANT AS OF DECEMBER 31, 2014

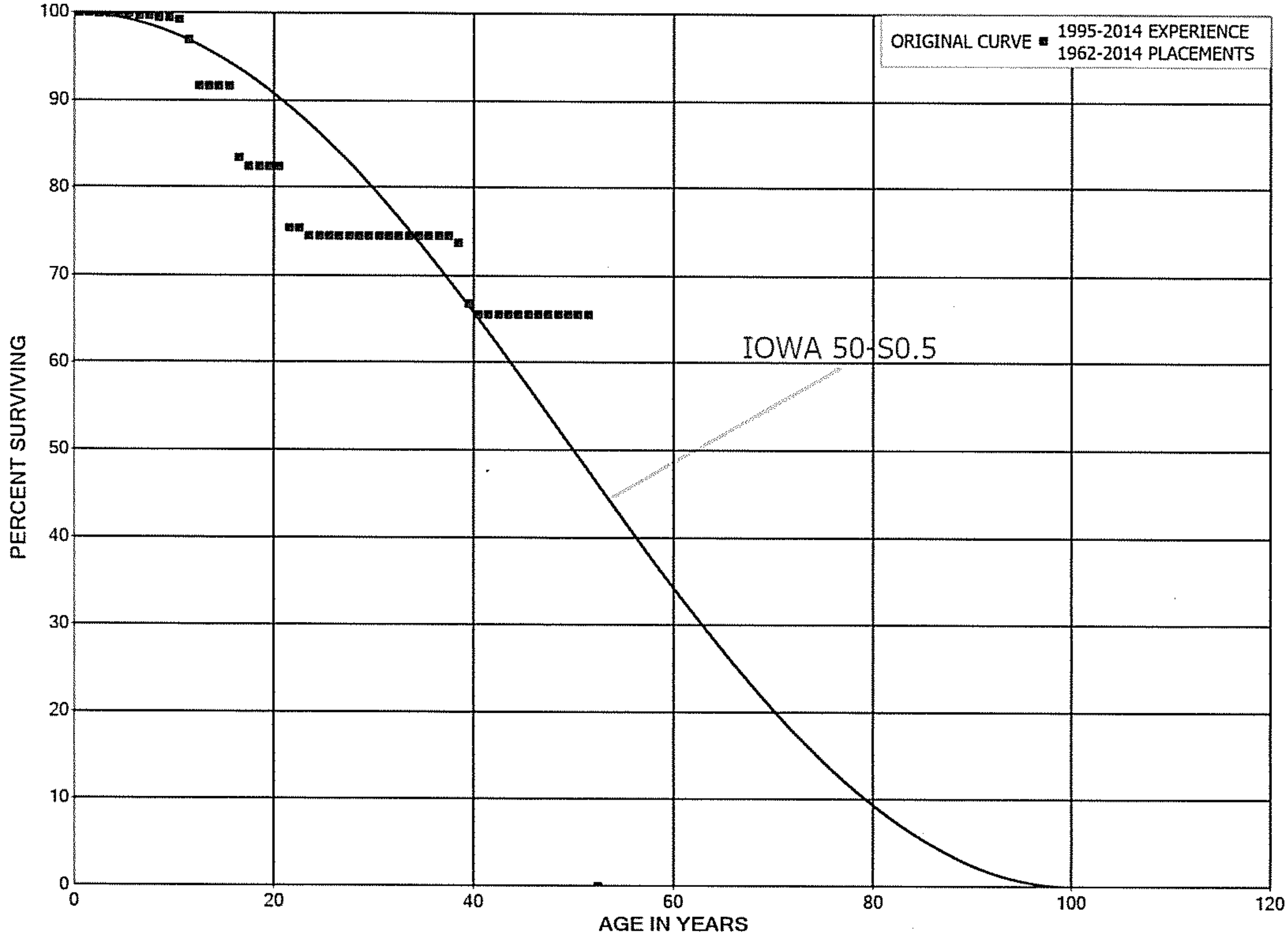
	DEPRECIABLE GROUP	SURVIVOR CURVE	NET SALVAGE	ORIGINAL COST AS OF DECEMBER 31, 2014	BOOK DEPRECIATION RESERVE	FUTURE ACCRUALS	CALCULATED ANNUAL ACCRUAL AMOUNT	CALCULATED ANNUAL ACCRUAL RATE	COMPOSITE REMAINING LIFE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)=(7)/(4)	(9)
	DEPRECIABLE PLANT								
342.00	STORES EQUIPMENT	25-SQ	0	30,241.65	6,436	23,806	1,210	4.00	19.7
343.00	TOOLS, SHOP AND GARAGE EQUIPMENT	20-SQ	0	2,210,012.40	862,859	1,347,153	110,501	5.00	12.2
344.00	LABORATORY EQUIPMENT	15-SQ	0	1,274,096.10	348,564	925,532	84,941	6.67	10.9
345.00	POWER OPERATED EQUIPMENT	23-S1.5	10	1,359,771.07	686,858	536,936	37,162	2.73	14.4
346.10	COMMUNICATION EQUIPMENT - NON-TELEPHONE	15-SQ	0	310,520.43	83,195	227,325	20,702	6.67	11.0
346.19	REMOTE CONTROL AND INSTRUMENTATION	15-SQ	0	2,885,851.25	665,334	2,220,517	192,389	6.67	11.5
346.20	COMMUNICATION EQUIPMENT - TELEPHONE	15-SQ	0	92,694.65	24,614	68,081	6,180	6.67	11.0
347.00	MISCELLANEOUS EQUIPMENT	20-SQ	0	1,687,584.70	596,654	1,090,931	84,379	5.00	12.9
348.00	OTHER TANGIBLE PROPERTY	20-SQ	0	117,627.86	93,996	23,632	5,881	5.00	4.0
	TOTAL DEPRECIABLE PLANT			**532,746,387.94**	**103,669,792**	**547,692,969**	**13,903,311**	**2.61**	**39.4**
	OVERRECOVERED RESERVE FOR AMORTIZATION								
339.60	OTHER P/E COMPANY PLANNING STUDY				71,284		(14,257) **		
340.10	FURNITURE				26,554		(5,311) **		
340.15	COMPUTER SOFTWARE - SPECIAL RATE				827,624		(165,525) **		
340.21	MAINFRAME				16,981		(3,396) **		
340.22	PERSONAL COMPUTERS				172,468		(34,494) **		
340.23	PERIPHERAL-OTHER				27,541		(5,508) **		
340.30	COMPUTER SOFTWARE				418,616		(83,723) **		
340.32	COMPUTER SOFTWARE-PERSONAL				69,772		(13,954) **		
340.50	OTHER				894		(179) **		
342.00	STORES EQUIPMENT				(6,436)		1,287 **		
343.00	TOOLS, SHOP AND GARAGE EQUIPMENT				(1,211)		242 **		
344.00	LABORATORY EQUIPMENT				(120,764)		24,153 **		
346.10	COMMUNICATION EQUIPMENT - NON-TELEPHONE				(75,272)		15,054 **		
346.19	REMOTE CONTROL AND INSTRUMENTATION				(206,727)		41,345 **		
346.20	COMMUNICATION EQUIPMENT - TELEPHONE				(20,878)		4,176 **		
347.00	MISCELLANEOUS EQUIPMENT				(93,072)		18,614 **		
348.00	OTHER TANGIBLE PROPERTY				2,569		(514) **		
	TOTAL OVERRECOVERED RESERVE FOR AMORTIZATION				**1,109,944**		**(221,989)**		
	NONDEPRECIABLE PLANT								
301.00	ORGANIZATION			37,450.43					
302.00	FRANCHISES AND CONSENTS			70,260.82					
303.20	LAND - SOURCE OF SUPPLY			1,078,374.40					
303.30	LAND - PUMPING			218,054.70					
303.40	LAND - WATER TREATMENT			800,183.34					
303.50	LAND - TRANSMISSION AND DISTRIBUTION			7,473,930.66					
	TOTAL NONDEPRECIABLE PLANT			**9,678,254.35**					
	TOTAL UTILITY PLANT			**542,424,642.29**	**104,779,735**	**547,692,969**	**13,681,322**		

* LIFESPAN PROCEDURE WAS USED. CURVE SHOWN IS INTERIM SURVIVOR CURVE.

** 5-YEAR AMORTIZATION OF UNRECOVERED RESERVE RELATED TO UTILIZATION OF AMORTIZATION ACCOUNTING.

PART VII. SERVICE LIFE STATISTICS

KENTUCKY AMERICAN WATER COMPANY
ACCOUNT 304.10 STRUCTURES AND IMPROVEMENTS - SOURCE OF SUPPLY
ORIGINAL AND SMOOTH SURVIVOR CURVES



KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 304.10 STRUCTURES AND IMPROVEMENTS - SOURCE OF SUPPLY

ORIGINAL LIFE TABLE

PLACEMENT BAND 1962-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	18,959,036		0.0000	1.0000	100.00
0.5	18,295,881	9,152	0.0005	0.9995	100.00
1.5	18,117,276	11,676	0.0006	0.9994	99.95
2.5	17,284,014	6,621	0.0004	0.9996	99.89
3.5	18,171,906		0.0000	1.0000	99.85
4.5	2,614,993		0.0000	1.0000	99.85
5.5	2,655,776	7,089	0.0027	0.9973	99.85
6.5	2,592,240		0.0000	1.0000	99.58
7.5	2,590,465	3,999	0.0015	0.9985	99.58
8.5	930,337		0.0000	1.0000	99.43
9.5	930,337	2,378	0.0026	0.9974	99.43
10.5	873,189	20,277	0.0232	0.9768	99.17
11.5	400,021	21,588	0.0540	0.9460	96.87
12.5	125,035		0.0000	1.0000	91.64
13.5	86,153		0.0000	1.0000	91.64
14.5	86,153		0.0000	1.0000	91.64
15.5	86,153	7,742	0.0899	0.9101	91.64
16.5	78,410	984	0.0125	0.9875	83.41
17.5	77,426		0.0000	1.0000	82.36
18.5	77,560		0.0000	1.0000	82.36
19.5	77,560		0.0000	1.0000	82.36
20.5	77,782	6,593	0.0848	0.9152	82.36
21.5	71,189		0.0000	1.0000	75.38
22.5	71,189	788	0.0111	0.9889	75.38
23.5	46,871		0.0000	1.0000	74.54
24.5	46,871		0.0000	1.0000	74.54
25.5	6,089		0.0000	1.0000	74.54
26.5	3,556		0.0000	1.0000	74.54
27.5	3,556		0.0000	1.0000	74.54
28.5	3,556		0.0000	1.0000	74.54
29.5	3,556		0.0000	1.0000	74.54
30.5	356		0.0000	1.0000	74.54
31.5	356		0.0000	1.0000	74.54
32.5	11,832		0.0000	1.0000	74.54
33.5	11,832		0.0000	1.0000	74.54
34.5	11,832		0.0000	1.0000	74.54
35.5	11,832		0.0000	1.0000	74.54
36.5	11,832		0.0000	1.0000	74.54
37.5	11,832	134	0.0113	0.9887	74.54
38.5	11,698	1,100	0.0940	0.9060	73.70

KENTUCKY AMERICAN WATER COMPANY

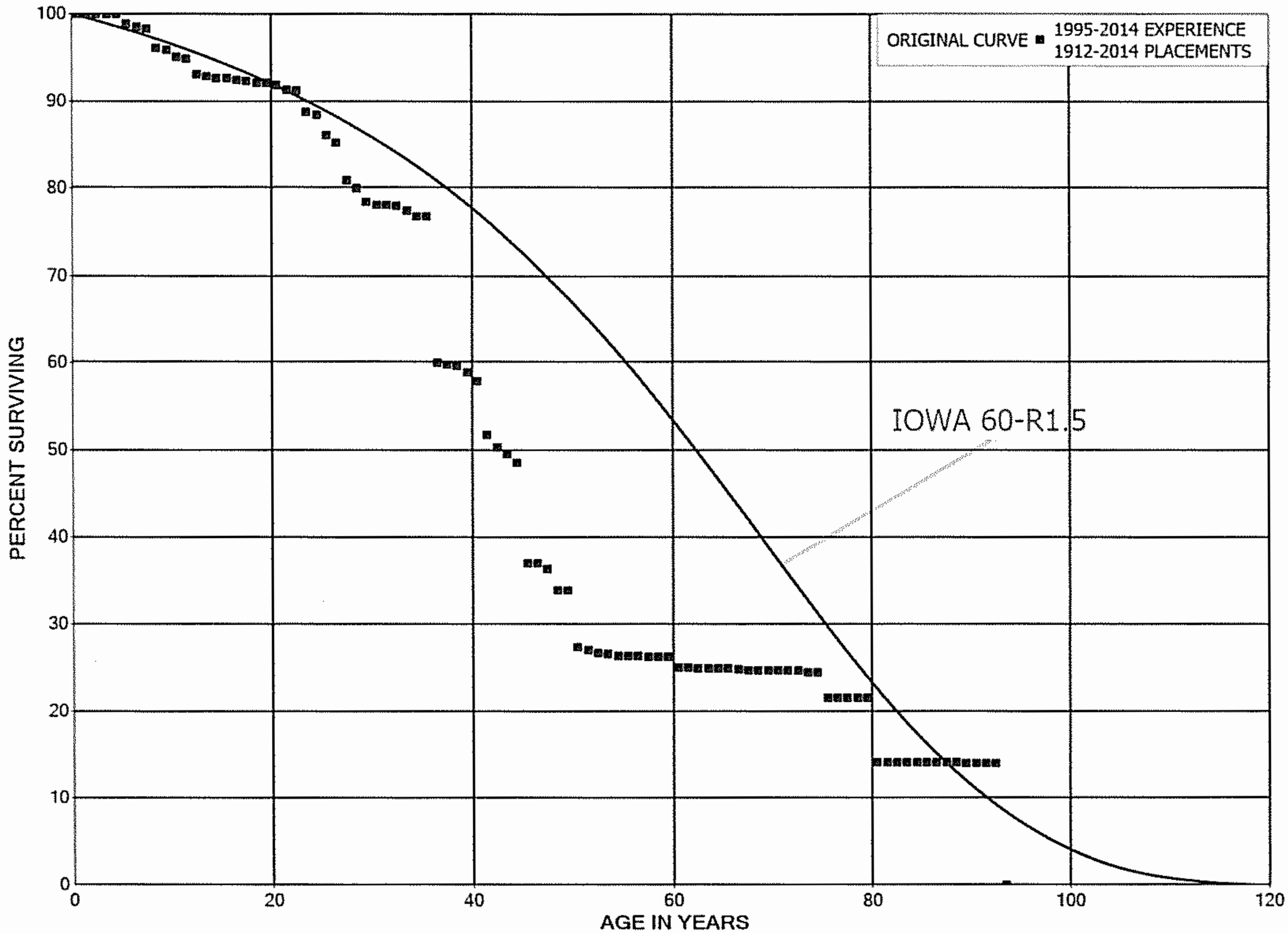
ACCOUNT 304.10 STRUCTURES AND IMPROVEMENTS - SOURCE OF SUPPLY

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1962-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	11,698	222	0.0189	0.9811	66.77
40.5	11,477		0.0000	1.0000	65.51
41.5	11,477		0.0000	1.0000	65.51
42.5	11,477		0.0000	1.0000	65.51
43.5	11,477		0.0000	1.0000	65.51
44.5	11,477		0.0000	1.0000	65.51
45.5	11,477		0.0000	1.0000	65.51
46.5	11,477		0.0000	1.0000	65.51
47.5	11,477		0.0000	1.0000	65.51
48.5	11,477		0.0000	1.0000	65.51
49.5	11,477		0.0000	1.0000	65.51
50.5	11,477		0.0000	1.0000	65.51
51.5	11,477	11,477	1.0000		65.51
52.5					

KENTUCKY AMERICAN WATER COMPANY
ACCOUNTS 304.20 AND 304.30 STRUCTURES AND IMPROVEMENTS
ORIGINAL AND SMOOTH SURVIVOR CURVES



KENTUCKY AMERICAN WATER COMPANY

ACCOUNTS 304.20 AND 304.30 STRUCTURES AND IMPROVEMENTS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1912-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	42,194,148		0.0000	1.0000	100.00
0.5	42,153,473		0.0000	1.0000	100.00
1.5	43,167,893		0.0000	1.0000	100.00
2.5	45,121,655	7,512	0.0002	0.9998	100.00
3.5	44,385,290	19,587	0.0004	0.9996	99.98
4.5	11,653,975	126,736	0.0109	0.9891	99.94
5.5	12,060,074	37,447	0.0031	0.9969	98.85
6.5	13,521,847	41,373	0.0031	0.9969	98.55
7.5	12,729,921	277,134	0.0218	0.9782	98.24
8.5	11,525,088	34,427	0.0030	0.9970	96.11
9.5	11,229,769	84,183	0.0075	0.9925	95.82
10.5	10,884,476	34,648	0.0032	0.9968	95.10
11.5	10,839,771	204,287	0.0188	0.9812	94.80
12.5	10,778,166	24,792	0.0023	0.9977	93.01
13.5	10,377,292	25,744	0.0025	0.9975	92.80
14.5	9,959,367		0.0000	1.0000	92.57
15.5	9,041,828	18,767	0.0021	0.9979	92.57
16.5	9,007,349	13,191	0.0015	0.9985	92.37
17.5	8,445,487	18,221	0.0022	0.9978	92.24
18.5	5,990,891	692	0.0001	0.9999	92.04
19.5	5,971,011	10,767	0.0018	0.9982	92.03
20.5	5,981,111	38,661	0.0065	0.9935	91.86
21.5	5,212,949	2,680	0.0005	0.9995	91.27
22.5	3,577,331	98,564	0.0276	0.9724	91.22
23.5	3,467,050	14,082	0.0041	0.9959	88.71
24.5	3,436,828	88,862	0.0259	0.9741	88.35
25.5	2,985,113	31,581	0.0106	0.9894	86.06
26.5	1,419,620	72,133	0.0508	0.9492	85.15
27.5	1,121,843	12,660	0.0113	0.9887	80.83
28.5	1,141,252	20,971	0.0184	0.9816	79.92
29.5	1,119,538	6,110	0.0055	0.9945	78.45
30.5	1,102,166		0.0000	1.0000	78.02
31.5	1,103,644	1,447	0.0013	0.9987	78.02
32.5	953,529	6,075	0.0064	0.9936	77.92
33.5	948,429	8,250	0.0087	0.9913	77.42
34.5	945,335	480	0.0005	0.9995	76.75
35.5	1,003,161	218,730	0.2180	0.7820	76.71
36.5	889,742	3,602	0.0040	0.9960	59.98
37.5	928,729	1,602	0.0017	0.9983	59.74
38.5	926,013	13,279	0.0143	0.9857	59.64

KENTUCKY AMERICAN WATER COMPANY

ACCOUNTS 304.20 AND 304.30 STRUCTURES AND IMPROVEMENTS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1912-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	905,716	14,186	0.0157	0.9843	58.78
40.5	884,798	93,259	0.1054	0.8946	57.86
41.5	787,189	22,809	0.0290	0.9710	51.76
42.5	680,639	10,680	0.0157	0.9843	50.26
43.5	585,643	11,914	0.0203	0.9797	49.47
44.5	486,356	115,071	0.2366	0.7634	48.47
45.5	371,742	370	0.0010	0.9990	37.00
46.5	373,936	7,073	0.0189	0.9811	36.96
47.5	294,937	19,595	0.0664	0.9336	36.26
48.5	266,143		0.0000	1.0000	33.85
49.5	266,143	51,589	0.1938	0.8062	33.85
50.5	214,554	2,755	0.0128	0.9872	27.29
51.5	211,798	2,600	0.0123	0.9877	26.94
52.5	205,084	975	0.0048	0.9952	26.61
53.5	204,879	1,322	0.0065	0.9935	26.48
54.5	199,724		0.0000	1.0000	26.31
55.5	148,332	403	0.0027	0.9973	26.31
56.5	129,710	542	0.0042	0.9958	26.24
57.5	37,128		0.0000	1.0000	26.13
58.5	37,128		0.0000	1.0000	26.13
59.5	30,923	1,427	0.0461	0.9539	26.13
60.5	57,525		0.0000	1.0000	24.93
61.5	57,525	88	0.0015	0.9985	24.93
62.5	57,437	90	0.0016	0.9984	24.89
63.5	48,647	39	0.0008	0.9992	24.85
64.5	48,607		0.0000	1.0000	24.83
65.5	48,721	108	0.0022	0.9978	24.83
66.5	46,447	283	0.0061	0.9939	24.77
67.5	44,830		0.0000	1.0000	24.62
68.5	46,770		0.0000	1.0000	24.62
69.5	59,036		0.0000	1.0000	24.62
70.5	59,036		0.0000	1.0000	24.62
71.5	59,036	103	0.0017	0.9983	24.62
72.5	58,933	412	0.0070	0.9930	24.58
73.5	58,151		0.0000	1.0000	24.41
74.5	58,151	6,930	0.1192	0.8808	24.41
75.5	51,221		0.0000	1.0000	21.50
76.5	42,496		0.0000	1.0000	21.50
77.5	42,496		0.0000	1.0000	21.50
78.5	42,496		0.0000	1.0000	21.50

KENTUCKY AMERICAN WATER COMPANY

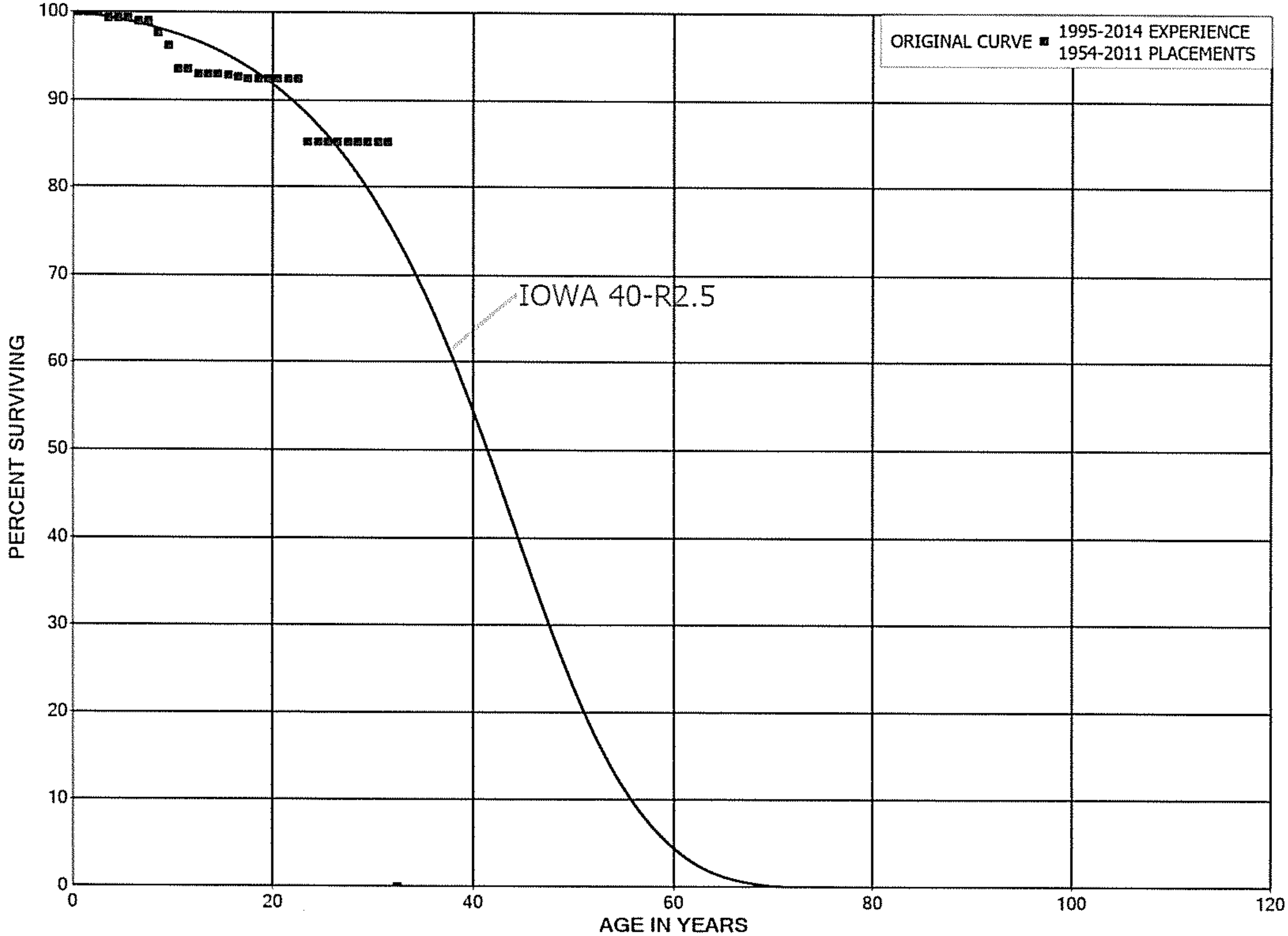
ACCOUNTS 304.20 AND 304.30 STRUCTURES AND IMPROVEMENTS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1912-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
79.5	42,496	14,721	0.3464	0.6536	21.50
80.5	14,770		0.0000	1.0000	14.05
81.5	14,770	0	0.0000	1.0000	14.05
82.5	15,613	28	0.0018	0.9982	14.05
83.5	15,584		0.0000	1.0000	14.03
84.5	15,584		0.0000	1.0000	14.03
85.5	15,021		0.0000	1.0000	14.03
86.5	15,021		0.0000	1.0000	14.03
87.5	15,021		0.0000	1.0000	14.03
88.5	13,081	49	0.0038	0.9962	14.03
89.5	843		0.0000	1.0000	13.97
90.5	843		0.0000	1.0000	13.97
91.5	843		0.0000	1.0000	13.97
92.5	843	843	1.0000		13.97
93.5					

KENTUCKY AMERICAN WATER COMPANY
ACCOUNT 304.40 STRUCTURES AND IMPROVEMENTS - TRANSMISSION AND DISTRIBUTION
ORIGINAL AND SMOOTH SURVIVOR CURVES



KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 304.40 STRUCTURES AND IMPROVEMENTS - TRANSMISSION AND DISTRIBUTION

ORIGINAL LIFE TABLE

PLACEMENT BAND 1954-2011 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	510,562		0.0000	1.0000	100.00
0.5	510,562		0.0000	1.0000	100.00
1.5	521,313		0.0000	1.0000	100.00
2.5	935,819	6,233	0.0067	0.9933	100.00
3.5	967,947	708	0.0007	0.9993	99.33
4.5	941,723		0.0000	1.0000	99.26
5.5	850,735	2,822	0.0033	0.9967	99.26
6.5	822,525	53	0.0001	0.9999	98.93
7.5	822,473	11,337	0.0138	0.9862	98.93
8.5	732,618	10,340	0.0141	0.9859	97.56
9.5	710,708	20,000	0.0281	0.9719	96.19
10.5	690,708		0.0000	1.0000	93.48
11.5	690,708	4,340	0.0063	0.9937	93.48
12.5	666,625		0.0000	1.0000	92.89
13.5	666,625		0.0000	1.0000	92.89
14.5	658,345	199	0.0003	0.9997	92.89
15.5	606,350	1,527	0.0025	0.9975	92.86
16.5	465,718	1,200	0.0026	0.9974	92.63
17.5	464,491		0.0000	1.0000	92.39
18.5	457,265		0.0000	1.0000	92.39
19.5	457,265		0.0000	1.0000	92.39
20.5	457,265		0.0000	1.0000	92.39
21.5	457,265		0.0000	1.0000	92.39
22.5	44,286	3,468	0.0783	0.9217	92.39
23.5	1,420		0.0000	1.0000	85.16
24.5	1,420		0.0000	1.0000	85.16
25.5	1,420		0.0000	1.0000	85.16
26.5	1,420		0.0000	1.0000	85.16
27.5	1,420		0.0000	1.0000	85.16
28.5	1,420		0.0000	1.0000	85.16
29.5	1,420		0.0000	1.0000	85.16
30.5	1,420		0.0000	1.0000	85.16
31.5	1,420	1,420	1.0000		85.16
32.5					
33.5					
34.5					
35.5					
36.5					
37.5					
38.5					

KENTUCKY AMERICAN WATER COMPANY

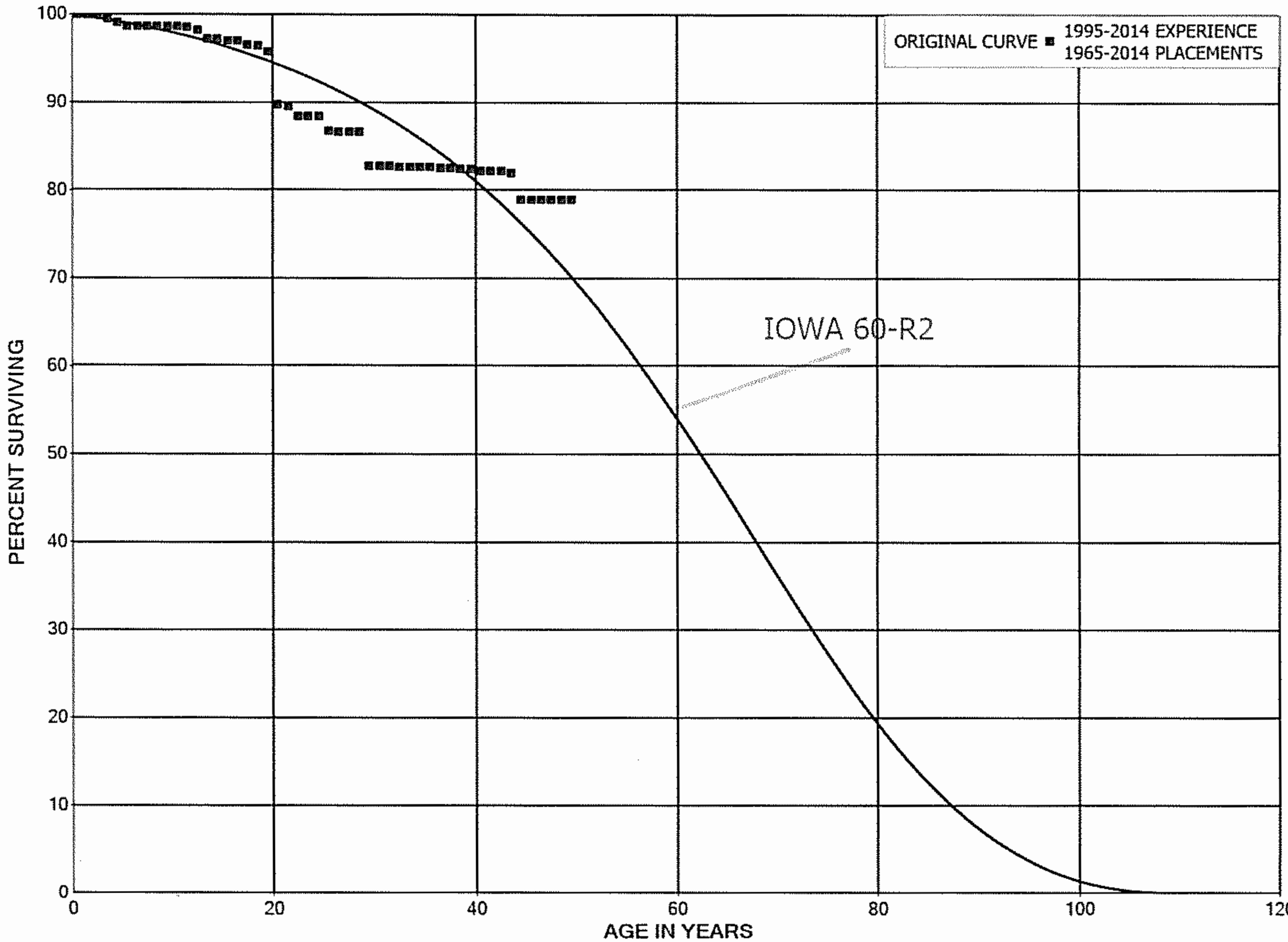
ACCOUNT 304.40 STRUCTURES AND IMPROVEMENTS - TRANSMISSION AND DISTRIBUTION

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1954-2011 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5					
40.5	1,100		0.0000		
41.5	1,100		0.0000		
42.5	1,100		0.0000		
43.5	1,100		0.0000		
44.5	1,100		0.0000		
45.5	1,100		0.0000		
46.5	1,100		0.0000		
47.5	1,100		0.0000		
48.5	1,100		0.0000		
49.5	1,100		0.0000		
50.5	1,100		0.0000		
51.5	1,100	1,100	1.0000		
52.5					

KENTUCKY AMERICAN WATER COMPANY
ACCOUNT 304.60 STRUCTURES AND IMPROVEMENTS - OFFICE BUILDINGS
ORIGINAL AND SMOOTH SURVIVOR CURVES



KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 304.60 STRUCTURES AND IMPROVEMENTS - OFFICE BUILDINGS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1965-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	9,309,722		0.0000	1.0000	100.00
0.5	9,015,697		0.0000	1.0000	100.00
1.5	8,622,783	4,361	0.0005	0.9995	100.00
2.5	8,580,403	39,394	0.0046	0.9954	99.95
3.5	7,888,322	33,675	0.0043	0.9957	99.49
4.5	5,094,779	21,094	0.0041	0.9959	99.07
5.5	5,104,454		0.0000	1.0000	98.66
6.5	3,153,219		0.0000	1.0000	98.66
7.5	3,209,438	1	0.0000	1.0000	98.66
8.5	3,182,547		0.0000	1.0000	98.66
9.5	3,124,921		0.0000	1.0000	98.66
10.5	3,112,298	3,018	0.0010	0.9990	98.66
11.5	3,058,725	13,257	0.0043	0.9957	98.56
12.5	3,119,840	31,563	0.0101	0.9899	98.13
13.5	3,064,506		0.0000	1.0000	97.14
14.5	3,062,773	4,303	0.0014	0.9986	97.14
15.5	2,897,009		0.0000	1.0000	97.00
16.5	2,670,886	14,252	0.0053	0.9947	97.00
17.5	569,813	487	0.0009	0.9991	96.49
18.5	559,334	4,184	0.0075	0.9925	96.40
19.5	529,093	32,709	0.0618	0.9382	95.68
20.5	469,286	1,413	0.0030	0.9970	89.77
21.5	473,819	5,864	0.0124	0.9876	89.50
22.5	472,057		0.0000	1.0000	88.39
23.5	473,811		0.0000	1.0000	88.39
24.5	1,150,232	21,861	0.0190	0.9810	88.39
25.5	1,076,953	937	0.0009	0.9991	86.71
26.5	992,327	814	0.0008	0.9992	86.63
27.5	854,543		0.0000	1.0000	86.56
28.5	826,803	36,730	0.0444	0.9556	86.56
29.5	797,876		0.0000	1.0000	82.72
30.5	795,990		0.0000	1.0000	82.72
31.5	795,990	1,229	0.0015	0.9985	82.72
32.5	721,865		0.0000	1.0000	82.59
33.5	721,865		0.0000	1.0000	82.59
34.5	721,865		0.0000	1.0000	82.59
35.5	716,767	926	0.0013	0.9987	82.59
36.5	715,841		0.0000	1.0000	82.48
37.5	710,895	484	0.0007	0.9993	82.48
38.5	710,411		0.0000	1.0000	82.43

KENTUCKY AMERICAN WATER COMPANY

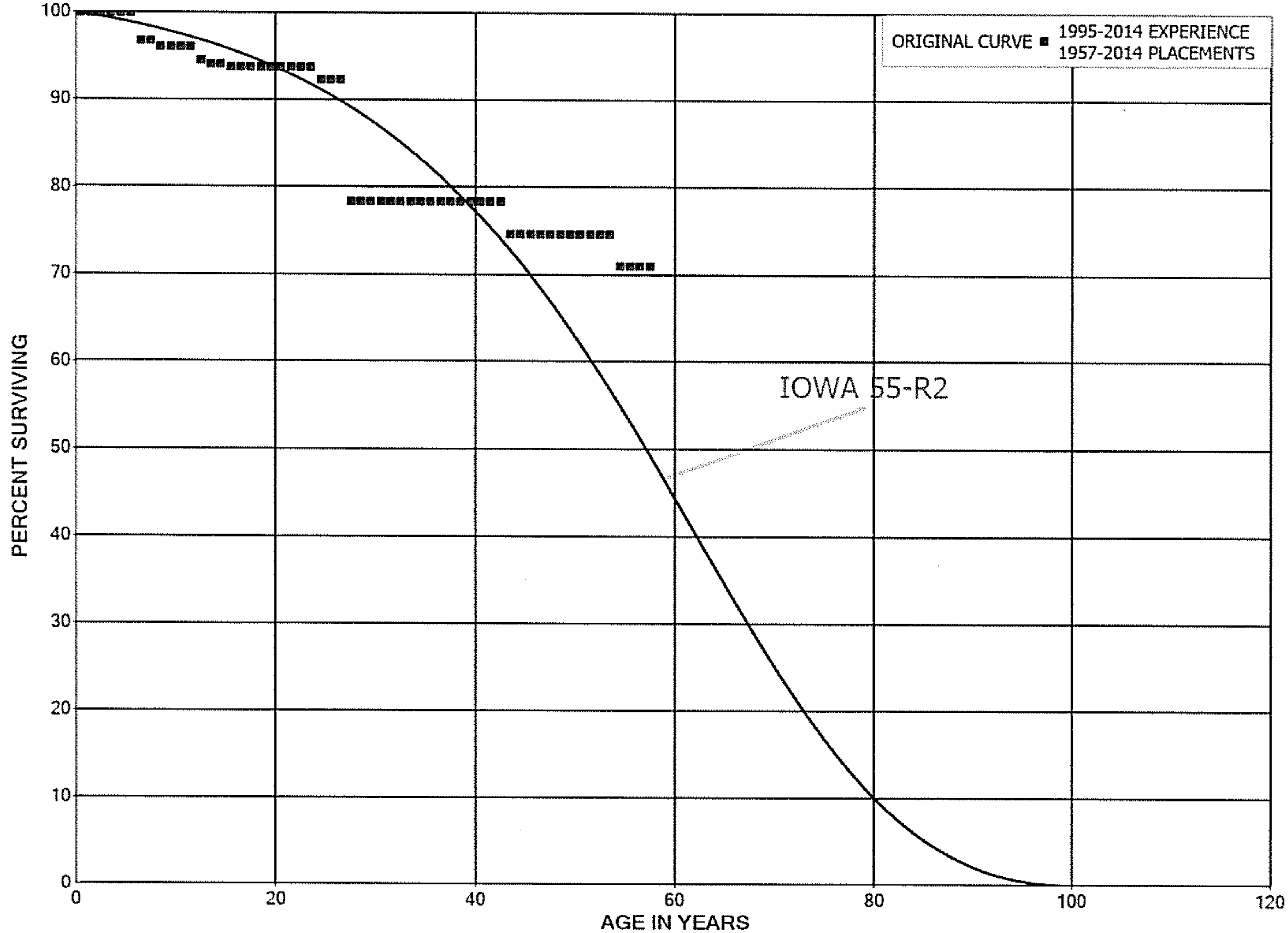
ACCOUNT 304.60 STRUCTURES AND IMPROVEMENTS - OFFICE BUILDINGS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1965-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	710,411	2,081	0.0029	0.9971	82.43
40.5	708,330		0.0000	1.0000	82.19
41.5	703,320		0.0000	1.0000	82.19
42.5	683,424	1,813	0.0027	0.9973	82.19
43.5	678,971	24,635	0.0363	0.9637	81.97
44.5	7,142		0.0000	1.0000	78.99
45.5	7,142		0.0000	1.0000	78.99
46.5	7,142		0.0000	1.0000	78.99
47.5	7,142		0.0000	1.0000	78.99
48.5	7,142		0.0000	1.0000	78.99
49.5					78.99

KENTUCKY AMERICAN WATER COMPANY
ACCOUNT 304.70 STRUCTURES AND IMPROVEMENTS - STORE, SHOP AND GARAGE
ORIGINAL AND SMOOTH SURVIVOR CURVES



KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 304.70 STRUCTURES AND IMPROVEMENTS - STORE, SHOP AND GARAGE

ORIGINAL LIFE TABLE

PLACEMENT BAND 1957-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	1,145,473		0.0000	1.0000	100.00
0.5	1,142,161		0.0000	1.0000	100.00
1.5	1,688,263		0.0000	1.0000	100.00
2.5	1,688,263		0.0000	1.0000	100.00
3.5	1,680,714		0.0000	1.0000	100.00
4.5	1,700,557		0.0000	1.0000	100.00
5.5	901,201	29,115	0.0323	0.9677	100.00
6.5	914,612		0.0000	1.0000	96.77
7.5	968,131	7,226	0.0075	0.9925	96.77
8.5	960,904		0.0000	1.0000	96.05
9.5	958,286		0.0000	1.0000	96.05
10.5	958,286		0.0000	1.0000	96.05
11.5	958,286	15,694	0.0164	0.9836	96.05
12.5	898,632	3,588	0.0040	0.9960	94.47
13.5	883,382		0.0000	1.0000	94.10
14.5	883,382	3,506	0.0040	0.9960	94.10
15.5	809,244		0.0000	1.0000	93.72
16.5	809,244		0.0000	1.0000	93.72
17.5	814,894		0.0000	1.0000	93.72
18.5	667,640		0.0000	1.0000	93.72
19.5	667,640		0.0000	1.0000	93.72
20.5	667,640		0.0000	1.0000	93.72
21.5	121,538		0.0000	1.0000	93.72
22.5	122,287		0.0000	1.0000	93.72
23.5	123,011	1,930	0.0157	0.9843	93.72
24.5	103,168		0.0000	1.0000	92.25
25.5	103,168		0.0000	1.0000	92.25
26.5	60,642	9,119	0.1504	0.8496	92.25
27.5	7,123		0.0000	1.0000	78.38
28.5	7,123		0.0000	1.0000	78.38
29.5	7,123		0.0000	1.0000	78.38
30.5	7,123		0.0000	1.0000	78.38
31.5	7,123		0.0000	1.0000	78.38
32.5	7,123		0.0000	1.0000	78.38
33.5	7,123		0.0000	1.0000	78.38
34.5	7,831		0.0000	1.0000	78.38
35.5	7,831		0.0000	1.0000	78.38
36.5	7,831		0.0000	1.0000	78.38
37.5	15,875		0.0000	1.0000	78.38
38.5	15,875		0.0000	1.0000	78.38

KENTUCKY AMERICAN WATER COMPANY

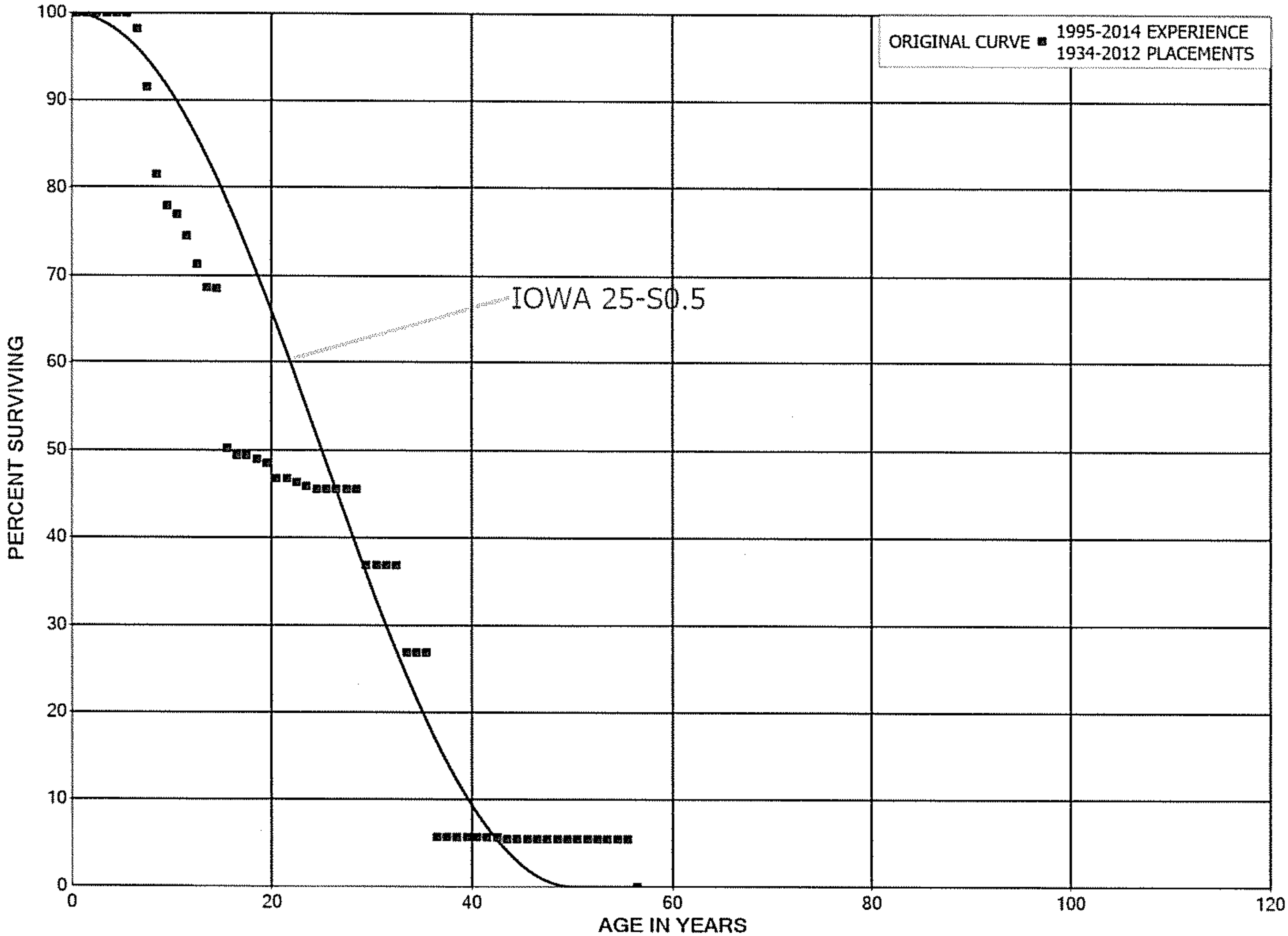
ACCOUNT 304.70 STRUCTURES AND IMPROVEMENTS - STORE, SHOP AND GARAGE

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1957-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	15,875		0.0000	1.0000	78.38
40.5	15,875		0.0000	1.0000	78.38
41.5	15,875		0.0000	1.0000	78.38
42.5	15,126	724	0.0479	0.9521	78.38
43.5	14,402		0.0000	1.0000	74.63
44.5	14,402		0.0000	1.0000	74.63
45.5	14,402		0.0000	1.0000	74.63
46.5	14,402		0.0000	1.0000	74.63
47.5	14,402		0.0000	1.0000	74.63
48.5	14,402		0.0000	1.0000	74.63
49.5	14,402		0.0000	1.0000	74.63
50.5	14,402		0.0000	1.0000	74.63
51.5	14,402		0.0000	1.0000	74.63
52.5	14,402		0.0000	1.0000	74.63
53.5	14,402	708	0.0492	0.9508	74.63
54.5	13,694		0.0000	1.0000	70.96
55.5	13,694		0.0000	1.0000	70.96
56.5	13,694		0.0000	1.0000	70.96
57.5					70.96

KENTUCKY AMERICAN WATER COMPANY
ACCOUNT 304.80 STRUCTURES AND IMPROVEMENTS - MISCELLANEOUS
ORIGINAL AND SMOOTH SURVIVOR CURVES



KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 304.80 STRUCTURES AND IMPROVEMENTS - MISCELLANEOUS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1934-2012 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	1,764,826		0.0000	1.0000	100.00
0.5	1,767,972		0.0000	1.0000	100.00
1.5	1,896,760		0.0000	1.0000	100.00
2.5	1,781,102		0.0000	1.0000	100.00
3.5	1,787,225		0.0000	1.0000	100.00
4.5	1,801,800		0.0000	1.0000	100.00
5.5	1,869,211	33,501	0.0179	0.9821	100.00
6.5	1,835,710	125,540	0.0684	0.9316	98.21
7.5	1,716,124	186,971	0.1089	0.8911	91.49
8.5	1,309,063	56,599	0.0432	0.9568	81.52
9.5	934,101	12,171	0.0130	0.9870	78.00
10.5	914,055	29,516	0.0323	0.9677	76.98
11.5	294,031	12,893	0.0438	0.9562	74.50
12.5	247,090	9,215	0.0373	0.9627	71.23
13.5	218,835	50	0.0002	0.9998	68.57
14.5	209,741	56,276	0.2683	0.7317	68.56
15.5	208,002	3,200	0.0154	0.9846	50.16
16.5	191,347		0.0000	1.0000	49.39
17.5	168,124	1,300	0.0077	0.9923	49.39
18.5	166,824	1,893	0.0113	0.9887	49.01
19.5	164,931	6,000	0.0364	0.9636	48.45
20.5	155,785		0.0000	1.0000	46.69
21.5	151,744	1,400	0.0092	0.9908	46.69
22.5	145,231	1,476	0.0102	0.9898	46.26
23.5	138,166	701	0.0051	0.9949	45.79
24.5	123,591		0.0000	1.0000	45.56
25.5	56,229		0.0000	1.0000	45.56
26.5	56,229		0.0000	1.0000	45.56
27.5	31,199		0.0000	1.0000	45.56
28.5	31,205	6,000	0.1923	0.8077	45.56
29.5	2,205		0.0000	1.0000	36.80
30.5	2,205		0.0000	1.0000	36.80
31.5	2,205		0.0000	1.0000	36.80
32.5	2,205	600	0.2722	0.7278	36.80
33.5	1,605		0.0000	1.0000	26.78
34.5	1,605		0.0000	1.0000	26.78
35.5	1,605	1,266	0.7888	0.2112	26.78
36.5	22,219		0.0000	1.0000	5.66
37.5	22,219		0.0000	1.0000	5.66
38.5	22,219		0.0000	1.0000	5.66

KENTUCKY AMERICAN WATER COMPANY

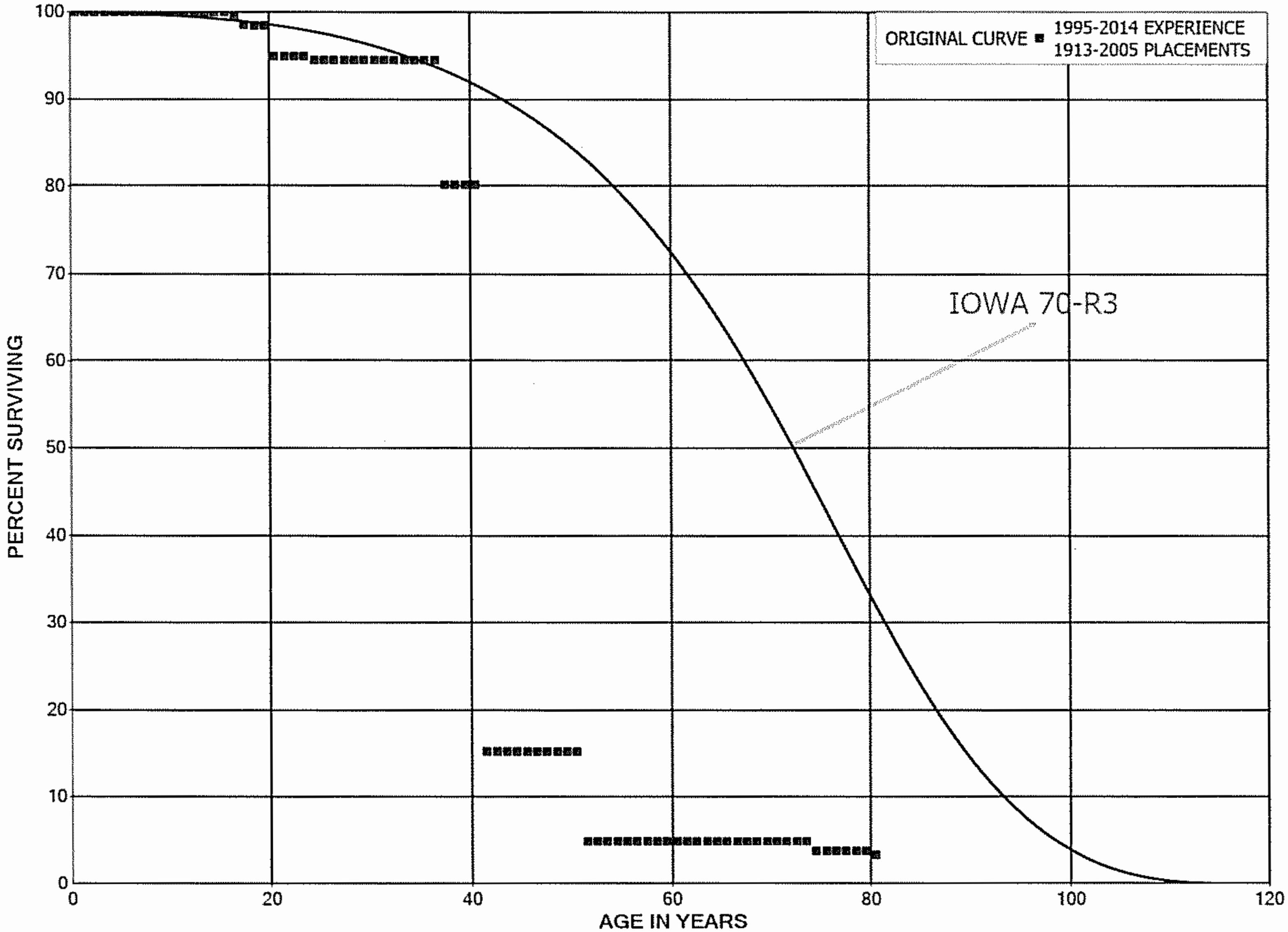
ACCOUNT 304.80 STRUCTURES AND IMPROVEMENTS - MISCELLANEOUS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1934-2012 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	22,219		0.0000	1.0000	5.66
40.5	22,219		0.0000	1.0000	5.66
41.5	22,219		0.0000	1.0000	5.66
42.5	22,219	1,054	0.0474	0.9526	5.66
43.5	21,165		0.0000	1.0000	5.39
44.5	21,165		0.0000	1.0000	5.39
45.5	21,165		0.0000	1.0000	5.39
46.5	21,165		0.0000	1.0000	5.39
47.5	21,165	5	0.0003	0.9997	5.39
48.5	21,159		0.0000	1.0000	5.39
49.5	21,159		0.0000	1.0000	5.39
50.5	21,159		0.0000	1.0000	5.39
51.5	21,159		0.0000	1.0000	5.39
52.5	21,159		0.0000	1.0000	5.39
53.5	21,159		0.0000	1.0000	5.39
54.5	21,159		0.0000	1.0000	5.39
55.5	21,159	21,159	1.0000		5.39
56.5					
57.5					
58.5					
59.5					
60.5	291		0.0000		
61.5	291		0.0000		
62.5	291		0.0000		
63.5	291		0.0000		
64.5	291		0.0000		
65.5	291		0.0000		
66.5	291		0.0000		
67.5	291		0.0000		
68.5	291		0.0000		
69.5	291		0.0000		
70.5	291		0.0000		
71.5	291		0.0000		
72.5	291		0.0000		
73.5	291		0.0000		
74.5	291		0.0000		
75.5	291		0.0000		
76.5	291		0.0000		
77.5	291		0.0000		
78.5	291		0.0000		
79.5	291		0.0000		
80.5					

KENTUCKY AMERICAN WATER COMPANY
ACCOUNT 305.00 COLLECTING AND IMPOUNDING RESERVOIRS
ORIGINAL AND SMOOTH SURVIVOR CURVES



KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 305.00 COLLECTING AND IMPOUNDING RESERVOIRS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1913-2005 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	5,534		0.0000	1.0000	100.00
0.5	75,873		0.0000	1.0000	100.00
1.5	79,459		0.0000	1.0000	100.00
2.5	92,707		0.0000	1.0000	100.00
3.5	106,720		0.0000	1.0000	100.00
4.5	106,720		0.0000	1.0000	100.00
5.5	109,004		0.0000	1.0000	100.00
6.5	872,764		0.0000	1.0000	100.00
7.5	872,764		0.0000	1.0000	100.00
8.5	872,764		0.0000	1.0000	100.00
9.5	869,482		0.0000	1.0000	100.00
10.5	869,482		0.0000	1.0000	100.00
11.5	869,482		0.0000	1.0000	100.00
12.5	869,482		0.0000	1.0000	100.00
13.5	869,482		0.0000	1.0000	100.00
14.5	869,482		0.0000	1.0000	100.00
15.5	869,482	4,096	0.0047	0.9953	100.00
16.5	865,386	9,156	0.0106	0.9894	99.53
17.5	861,382	660	0.0008	0.9992	98.48
18.5	859,130		0.0000	1.0000	98.40
19.5	859,130	30,591	0.0356	0.9644	98.40
20.5	797,948		0.0000	1.0000	94.90
21.5	817,802		0.0000	1.0000	94.90
22.5	813,717		0.0000	1.0000	94.90
23.5	799,704	3,536	0.0044	0.9956	94.90
24.5	796,168		0.0000	1.0000	94.48
25.5	793,884		0.0000	1.0000	94.48
26.5	33,659		0.0000	1.0000	94.48
27.5	33,659		0.0000	1.0000	94.48
28.5	33,659		0.0000	1.0000	94.48
29.5	33,659		0.0000	1.0000	94.48
30.5	33,659		0.0000	1.0000	94.48
31.5	34,050		0.0000	1.0000	94.48
32.5	34,050		0.0000	1.0000	94.48
33.5	34,050		0.0000	1.0000	94.48
34.5	34,050		0.0000	1.0000	94.48
35.5	34,050		0.0000	1.0000	94.48
36.5	34,050	5,152	0.1513	0.8487	94.48
37.5	28,898		0.0000	1.0000	80.18
38.5	28,898		0.0000	1.0000	80.18

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 305.00 COLLECTING AND IMPOUNDING RESERVOIRS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1913-2005 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	28,898		0.0000	1.0000	80.18
40.5	28,898	23,441	0.8111	0.1889	80.18
41.5	5,640		0.0000	1.0000	15.14
42.5	574		0.0000	1.0000	15.14
43.5	574		0.0000	1.0000	15.14
44.5	574		0.0000	1.0000	15.14
45.5	574		0.0000	1.0000	15.14
46.5	574		0.0000	1.0000	15.14
47.5	574		0.0000	1.0000	15.14
48.5	574		0.0000	1.0000	15.14
49.5	574		0.0000	1.0000	15.14
50.5	574	392	0.6825	0.3175	15.14
51.5	182		0.0000	1.0000	4.81
52.5	182		0.0000	1.0000	4.81
53.5	182		0.0000	1.0000	4.81
54.5	722		0.0000	1.0000	4.81
55.5	722		0.0000	1.0000	4.81
56.5	722		0.0000	1.0000	4.81
57.5	722		0.0000	1.0000	4.81
58.5	722		0.0000	1.0000	4.81
59.5	722		0.0000	1.0000	4.81
60.5	36,524	182	0.0050	0.9950	4.81
61.5	36,342		0.0000	1.0000	4.78
62.5	36,342		0.0000	1.0000	4.78
63.5	36,342		0.0000	1.0000	4.78
64.5	36,342		0.0000	1.0000	4.78
65.5	36,342		0.0000	1.0000	4.78
66.5	36,342		0.0000	1.0000	4.78
67.5	36,342		0.0000	1.0000	4.78
68.5	36,342		0.0000	1.0000	4.78
69.5	36,342		0.0000	1.0000	4.78
70.5	36,342		0.0000	1.0000	4.78
71.5	36,342		0.0000	1.0000	4.78
72.5	36,342		0.0000	1.0000	4.78
73.5	36,342	7,912	0.2177	0.7823	4.78
74.5	28,430		0.0000	1.0000	3.74
75.5	28,430		0.0000	1.0000	3.74
76.5	28,430		0.0000	1.0000	3.74
77.5	28,430		0.0000	1.0000	3.74
78.5	28,430		0.0000	1.0000	3.74

KENTUCKY AMERICAN WATER COMPANY

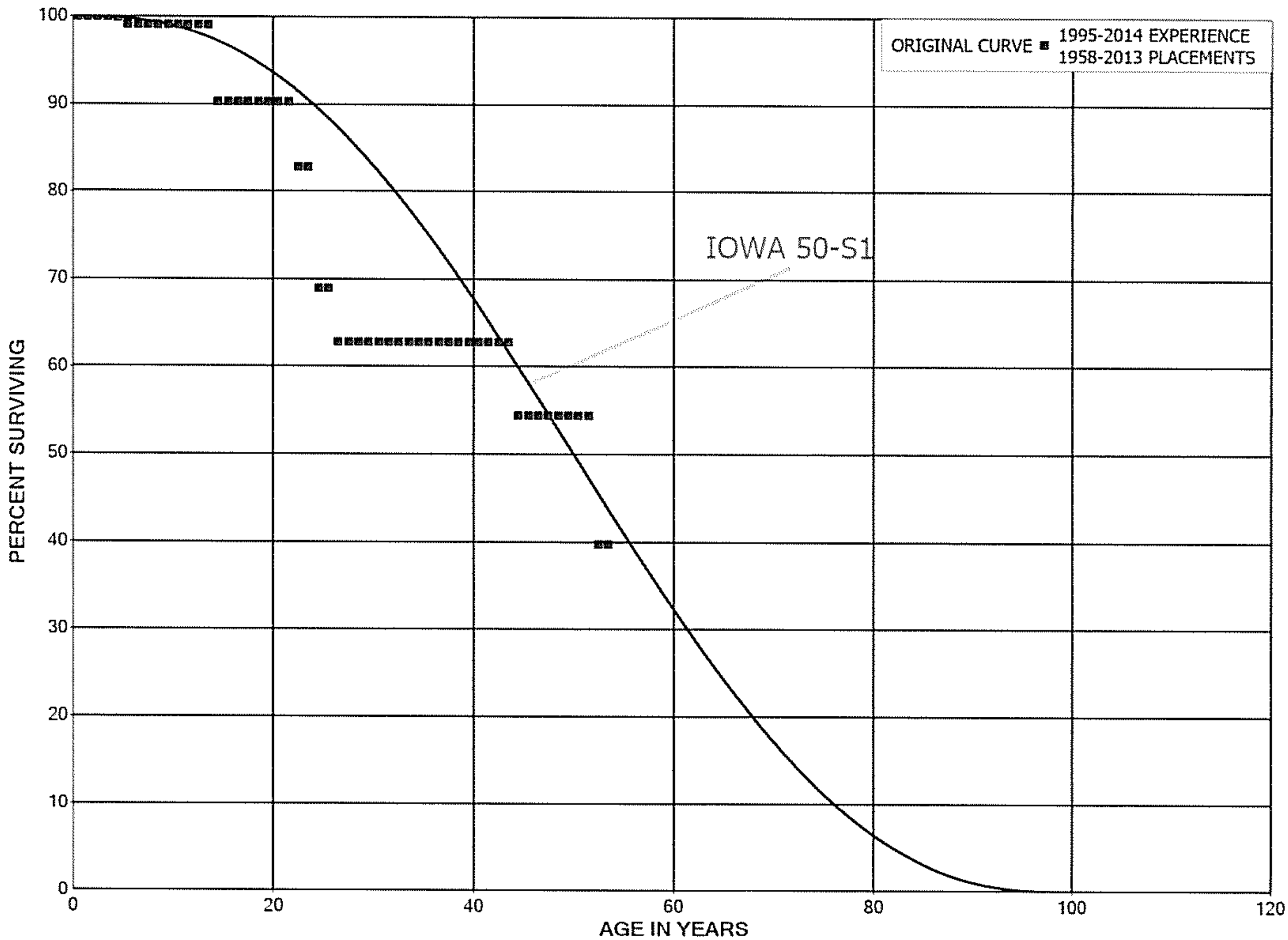
ACCOUNT 305.00 COLLECTING AND IMPOUNDING RESERVOIRS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1913-2005 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
79.5	28,430	3,576	0.1258	0.8742	3.74
80.5					3.27
81.5	73,214		0.0000		
82.5	73,214		0.0000		
83.5	73,214		0.0000		
84.5	73,214		0.0000		
85.5	73,214		0.0000		
86.5	73,214		0.0000		
87.5	73,214		0.0000		
88.5	73,214		0.0000		
89.5	73,214		0.0000		
90.5	73,214		0.0000		
91.5	73,214		0.0000		
92.5	73,214		0.0000		
93.5	73,214		0.0000		
94.5	73,214		0.0000		
95.5	73,214		0.0000		
96.5	73,214		0.0000		
97.5	73,214		0.0000		
98.5	73,214		0.0000		
99.5	73,214		0.0000		
100.5	73,214	73,214	1.0000		
101.5					

KENTUCKY AMERICAN WATER COMPANY
ACCOUNT 306.00 LAKE, RIVER AND OTHER INTAKES
ORIGINAL AND SMOOTH SURVIVOR CURVES



KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 306.00 LAKE, RIVER AND OTHER INTAKES

ORIGINAL LIFE TABLE

PLACEMENT BAND 1958-2013 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	1,409,320		0.0000	1.0000	100.00
0.5	1,409,490		0.0000	1.0000	100.00
1.5	1,367,314		0.0000	1.0000	100.00
2.5	1,152,524		0.0000	1.0000	100.00
3.5	1,317,644	2,379	0.0018	0.9982	100.00
4.5	500,984	3,666	0.0073	0.9927	99.82
5.5	497,317		0.0000	1.0000	99.09
6.5	497,317		0.0000	1.0000	99.09
7.5	494,939		0.0000	1.0000	99.09
8.5	494,939		0.0000	1.0000	99.09
9.5	475,114		0.0000	1.0000	99.09
10.5	475,114		0.0000	1.0000	99.09
11.5	475,114		0.0000	1.0000	99.09
12.5	229,820		0.0000	1.0000	99.09
13.5	229,820	20,500	0.0892	0.9108	99.09
14.5	209,320		0.0000	1.0000	90.25
15.5	209,320		0.0000	1.0000	90.25
16.5	209,320		0.0000	1.0000	90.25
17.5	205,954		0.0000	1.0000	90.25
18.5	205,954		0.0000	1.0000	90.25
19.5	205,954		0.0000	1.0000	90.25
20.5	205,784		0.0000	1.0000	90.25
21.5	198,799	16,301	0.0820	0.9180	90.25
22.5	176,548		0.0000	1.0000	82.85
23.5	34,525	5,779	0.1674	0.8326	82.85
24.5	63,178		0.0000	1.0000	68.98
25.5	63,178	5,598	0.0886	0.9114	68.98
26.5	57,580		0.0000	1.0000	62.87
27.5	57,580		0.0000	1.0000	62.87
28.5	77,112		0.0000	1.0000	62.87
29.5	77,112		0.0000	1.0000	62.87
30.5	77,112		0.0000	1.0000	62.87
31.5	77,112		0.0000	1.0000	62.87
32.5	77,278		0.0000	1.0000	62.87
33.5	77,727		0.0000	1.0000	62.87
34.5	77,727		0.0000	1.0000	62.87
35.5	77,727		0.0000	1.0000	62.87
36.5	82,916		0.0000	1.0000	62.87
37.5	82,916		0.0000	1.0000	62.87
38.5	82,916		0.0000	1.0000	62.87

KENTUCKY AMERICAN WATER COMPANY

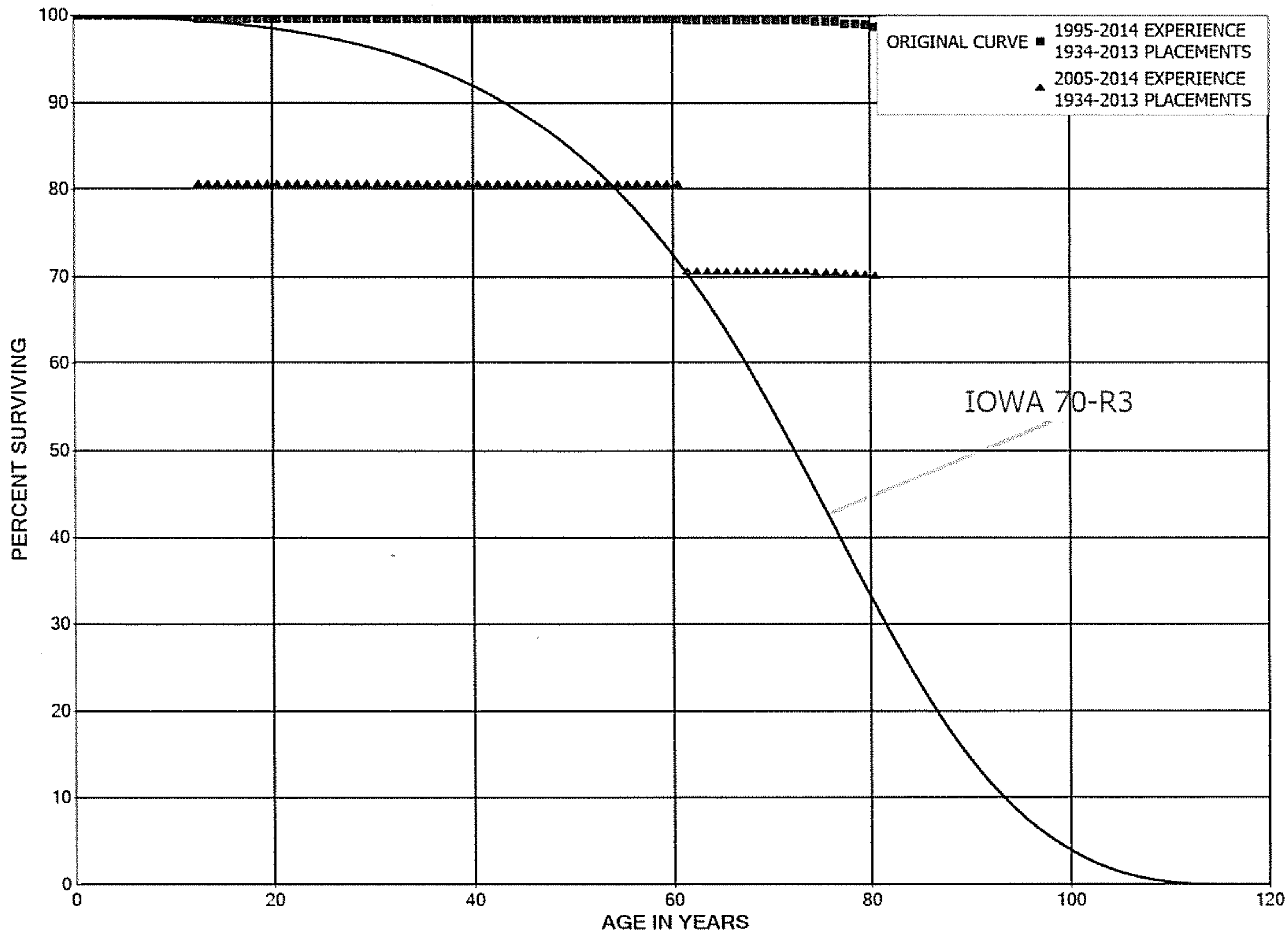
ACCOUNT 306.00 LAKE, RIVER AND OTHER INTAKES

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1958-2013 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	82,916		0.0000	1.0000	62.87
40.5	82,916		0.0000	1.0000	62.87
41.5	82,916	50	0.0006	0.9994	62.87
42.5	82,866		0.0000	1.0000	62.83
43.5	59,768	8,047	0.1346	0.8654	62.83
44.5	20,147		0.0000	1.0000	54.37
45.5	20,147		0.0000	1.0000	54.37
46.5	20,147		0.0000	1.0000	54.37
47.5	20,147		0.0000	1.0000	54.37
48.5	615		0.0000	1.0000	54.37
49.5	615		0.0000	1.0000	54.37
50.5	615		0.0000	1.0000	54.37
51.5	615	166	0.2694	0.7306	54.37
52.5	449		0.0000	1.0000	39.72
53.5					39.72

KENTUCKY AMERICAN WATER COMPANY
ACCOUNT 309.00 SUPPLY MAINS
ORIGINAL AND SMOOTH SURVIVOR CURVES



KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 309.00 SUPPLY MAINS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1934-2013 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	13,527,002		0.0000	1.0000	100.00
0.5	13,582,708		0.0000	1.0000	100.00
1.5	13,538,972		0.0000	1.0000	100.00
2.5	15,301,938		0.0000	1.0000	100.00
3.5	15,284,893		0.0000	1.0000	100.00
4.5	1,907,103		0.0000	1.0000	100.00
5.5	3,883,331		0.0000	1.0000	100.00
6.5	3,978,069		0.0000	1.0000	100.00
7.5	4,021,960		0.0000	1.0000	100.00
8.5	4,021,960		0.0000	1.0000	100.00
9.5	4,021,960		0.0000	1.0000	100.00
10.5	4,036,123		0.0000	1.0000	100.00
11.5	4,036,482	14,520	0.0036	0.9964	100.00
12.5	4,075,113		0.0000	1.0000	99.64
13.5	4,077,484		0.0000	1.0000	99.64
14.5	4,055,720		0.0000	1.0000	99.64
15.5	4,055,720		0.0000	1.0000	99.64
16.5	4,055,720		0.0000	1.0000	99.64
17.5	4,055,720		0.0000	1.0000	99.64
18.5	4,183,505		0.0000	1.0000	99.64
19.5	4,183,505		0.0000	1.0000	99.64
20.5	4,154,173		0.0000	1.0000	99.64
21.5	4,148,698		0.0000	1.0000	99.64
22.5	2,393,820		0.0000	1.0000	99.64
23.5	2,384,490		0.0000	1.0000	99.64
24.5	2,387,716		0.0000	1.0000	99.64
25.5	411,488		0.0000	1.0000	99.64
26.5	317,225		0.0000	1.0000	99.64
27.5	224,031		0.0000	1.0000	99.64
28.5	224,031		0.0000	1.0000	99.64
29.5	664,522		0.0000	1.0000	99.64
30.5	650,359		0.0000	1.0000	99.64
31.5	650,000		0.0000	1.0000	99.64
32.5	596,848		0.0000	1.0000	99.64
33.5	594,477		0.0000	1.0000	99.64
34.5	590,979		0.0000	1.0000	99.64
35.5	700,710		0.0000	1.0000	99.64
36.5	700,710		0.0000	1.0000	99.64
37.5	700,710		0.0000	1.0000	99.64
38.5	632,808		0.0000	1.0000	99.64

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 309.00 SUPPLY MAINS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1934-2013 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	632,808		0.0000	1.0000	99.64
40.5	632,808		0.0000	1.0000	99.64
41.5	634,704		0.0000	1.0000	99.64
42.5	624,030		0.0000	1.0000	99.64
43.5	624,249		0.0000	1.0000	99.64
44.5	621,022		0.0000	1.0000	99.64
45.5	621,022	207	0.0003	0.9997	99.64
46.5	615,093		0.0000	1.0000	99.61
47.5	612,218		0.0000	1.0000	99.61
48.5	612,218		0.0000	1.0000	99.61
49.5	188,131		0.0000	1.0000	99.61
50.5	171,769		0.0000	1.0000	99.61
51.5	171,769		0.0000	1.0000	99.61
52.5	171,783		0.0000	1.0000	99.61
53.5	172,217		0.0000	1.0000	99.61
54.5	172,720		0.0000	1.0000	99.61
55.5	62,990		0.0000	1.0000	99.61
56.5	62,990		0.0000	1.0000	99.61
57.5	62,990		0.0000	1.0000	99.61
58.5	3,107		0.0000	1.0000	99.61
59.5	3,107		0.0000	1.0000	99.61
60.5	228,297	266	0.0012	0.9988	99.61
61.5	226,401		0.0000	1.0000	99.49
62.5	226,401		0.0000	1.0000	99.49
63.5	226,183		0.0000	1.0000	99.49
64.5	226,183		0.0000	1.0000	99.49
65.5	226,183	49	0.0002	0.9998	99.49
66.5	226,133		0.0000	1.0000	99.47
67.5	226,133		0.0000	1.0000	99.47
68.5	226,133		0.0000	1.0000	99.47
69.5	226,133		0.0000	1.0000	99.47
70.5	226,092		0.0000	1.0000	99.47
71.5	226,092	14	0.0001	0.9999	99.47
72.5	226,077		0.0000	1.0000	99.46
73.5	225,644	412	0.0018	0.9982	99.46
74.5	224,729		0.0000	1.0000	99.28
75.5	224,729	1	0.0000	1.0000	99.28
76.5	224,728	391	0.0017	0.9983	99.28
77.5	224,337	21	0.0001	0.9999	99.11
78.5	224,316	305	0.0014	0.9986	99.10
79.5	224,011	489	0.0022	0.9978	98.96
80.5					98.75

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 309.00 SUPPLY MAINS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1934-2013 EXPERIENCE BAND 2005-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	13,487,220		0.0000	1.0000	100.00
0.5	13,513,595		0.0000	1.0000	100.00
1.5	13,464,383		0.0000	1.0000	100.00
2.5	13,476,318		0.0000	1.0000	100.00
3.5	13,449,943		0.0000	1.0000	100.00
4.5	97,415		0.0000	1.0000	100.00
5.5	97,415		0.0000	1.0000	100.00
6.5	91,961		0.0000	1.0000	100.00
7.5	39,782		0.0000	1.0000	100.00
8.5	39,782		0.0000	1.0000	100.00
9.5	39,782		0.0000	1.0000	100.00
10.5	69,114		0.0000	1.0000	100.00
11.5	74,589	14,520	0.1947	0.8053	100.00
12.5	1,825,620		0.0000	1.0000	80.53
13.5	1,834,950		0.0000	1.0000	80.53
14.5	1,809,688		0.0000	1.0000	80.53
15.5	3,785,917		0.0000	1.0000	80.53
16.5	3,886,108		0.0000	1.0000	80.53
17.5	3,982,178		0.0000	1.0000	80.53
18.5	3,982,178		0.0000	1.0000	80.53
19.5	3,982,178		0.0000	1.0000	80.53
20.5	3,967,009		0.0000	1.0000	80.53
21.5	3,961,893		0.0000	1.0000	80.53
22.5	2,249,493		0.0000	1.0000	80.53
23.5	2,242,534		0.0000	1.0000	80.53
24.5	2,246,032		0.0000	1.0000	80.53
25.5	269,804		0.0000	1.0000	80.53
26.5	169,612		0.0000	1.0000	80.53
27.5	73,543		0.0000	1.0000	80.53
28.5	201,327		0.0000	1.0000	80.53
29.5	201,327		0.0000	1.0000	80.53
30.5	187,164		0.0000	1.0000	80.53
31.5	186,805		0.0000	1.0000	80.53
32.5	144,327		0.0000	1.0000	80.53
33.5	141,956		0.0000	1.0000	80.53
34.5	141,684		0.0000	1.0000	80.53
35.5	141,684		0.0000	1.0000	80.53
36.5	147,613		0.0000	1.0000	80.53
37.5	150,488		0.0000	1.0000	80.53
38.5	22,704		0.0000	1.0000	80.53

KENTUCKY AMERICAN WATER COMPANY

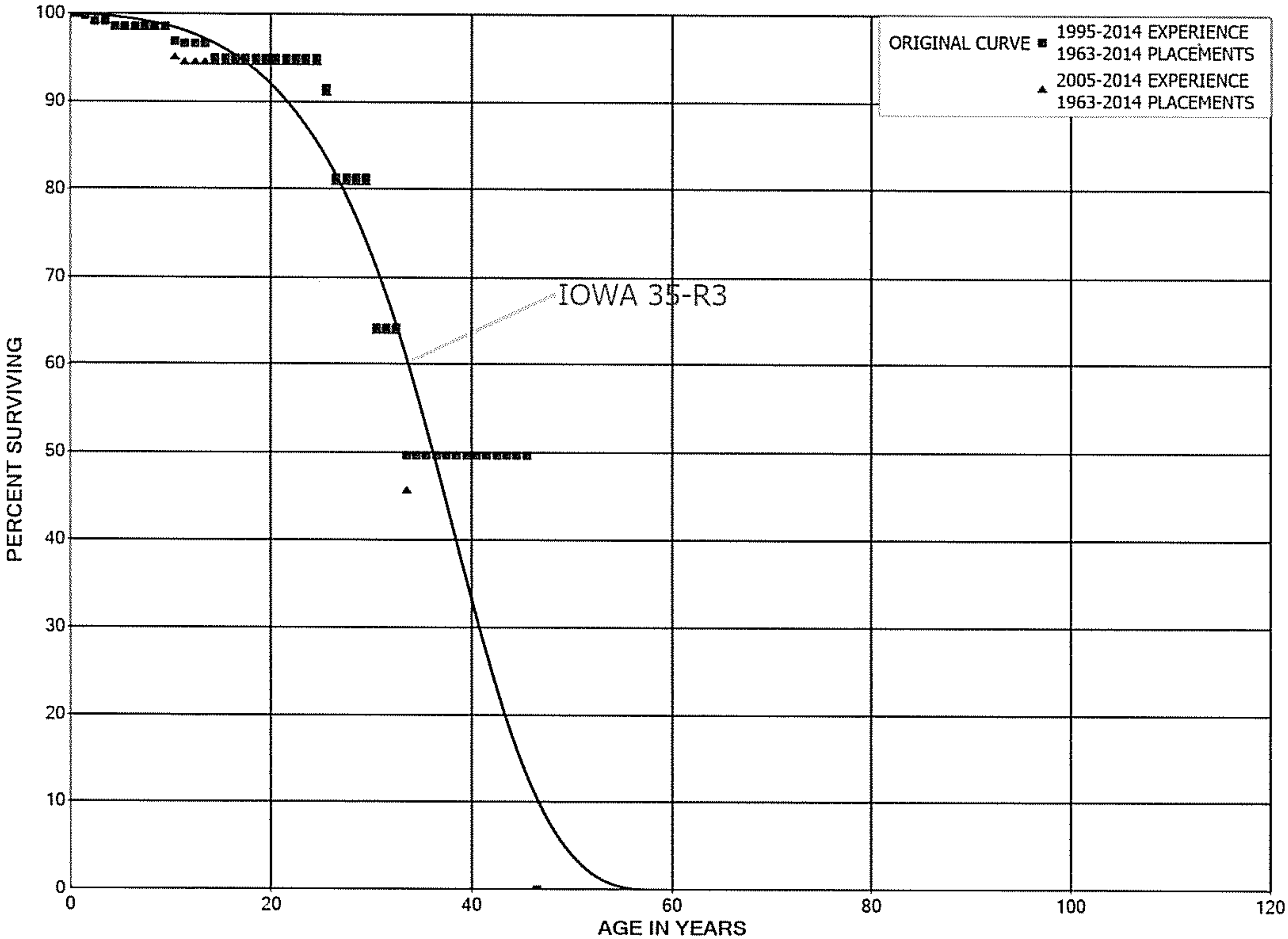
ACCOUNT 309.00 SUPPLY MAINS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1934-2013 EXPERIENCE BAND 2005-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	463,194		0.0000	1.0000	80.53
40.5	463,194		0.0000	1.0000	80.53
41.5	463,194		0.0000	1.0000	80.53
42.5	452,521		0.0000	1.0000	80.53
43.5	452,521		0.0000	1.0000	80.53
44.5	449,295		0.0000	1.0000	80.53
45.5	559,026	207	0.0004	0.9996	80.53
46.5	553,097		0.0000	1.0000	80.50
47.5	550,221		0.0000	1.0000	80.50
48.5	610,104		0.0000	1.0000	80.50
49.5	186,017		0.0000	1.0000	80.50
50.5	169,613		0.0000	1.0000	80.50
51.5	171,509		0.0000	1.0000	80.50
52.5	171,509		0.0000	1.0000	80.50
53.5	171,727		0.0000	1.0000	80.50
54.5	171,727		0.0000	1.0000	80.50
55.5	61,997		0.0000	1.0000	80.50
56.5	61,997		0.0000	1.0000	80.50
57.5	61,997		0.0000	1.0000	80.50
58.5	2,114		0.0000	1.0000	80.50
59.5	2,114		0.0000	1.0000	80.50
60.5	2,156	266	0.1236	0.8764	80.50
61.5	260		0.0000	1.0000	70.55
62.5	274		0.0000	1.0000	70.55
63.5	490		0.0000	1.0000	70.55
64.5	993		0.0000	1.0000	70.55
65.5	993		0.0000	1.0000	70.55
66.5	993		0.0000	1.0000	70.55
67.5	993		0.0000	1.0000	70.55
68.5	993		0.0000	1.0000	70.55
69.5	993		0.0000	1.0000	70.55
70.5	226,092		0.0000	1.0000	70.55
71.5	226,092	14	0.0001	0.9999	70.55
72.5	226,077		0.0000	1.0000	70.55
73.5	225,644	412	0.0018	0.9982	70.55
74.5	224,729		0.0000	1.0000	70.42
75.5	224,729	1	0.0000	1.0000	70.42
76.5	224,728	391	0.0017	0.9983	70.42
77.5	224,337	21	0.0001	0.9999	70.30
78.5	224,316	305	0.0014	0.9986	70.29
79.5	224,011	489	0.0022	0.9978	70.19
80.5					70.04

KENTUCKY AMERICAN WATER COMPANY
ACCOUNT 310.10 OTHER POWER GENERATION EQUIPMENT
ORIGINAL AND SMOOTH SURVIVOR CURVES



KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 310.10 OTHER POWER GENERATION EQUIPMENT

ORIGINAL LIFE TABLE

PLACEMENT BAND 1963-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	2,589,551		0.0000	1.0000	100.00
0.5	2,585,765	6,249	0.0024	0.9976	100.00
1.5	2,510,119	16,447	0.0066	0.9934	99.76
2.5	2,473,570		0.0000	1.0000	99.10
3.5	2,428,106	15,929	0.0066	0.9934	99.10
4.5	592,504		0.0000	1.0000	98.45
5.5	627,629		0.0000	1.0000	98.45
6.5	694,869		0.0000	1.0000	98.45
7.5	498,828		0.0000	1.0000	98.45
8.5	498,828		0.0000	1.0000	98.45
9.5	498,828	7,941	0.0159	0.9841	98.45
10.5	490,887	1,325	0.0027	0.9973	96.89
11.5	476,776		0.0000	1.0000	96.63
12.5	476,776		0.0000	1.0000	96.63
13.5	545,370	9,442	0.0173	0.9827	96.63
14.5	535,928	27	0.0001	0.9999	94.95
15.5	535,901		0.0000	1.0000	94.95
16.5	535,901		0.0000	1.0000	94.95
17.5	535,901		0.0000	1.0000	94.95
18.5	326,749		0.0000	1.0000	94.95
19.5	326,749		0.0000	1.0000	94.95
20.5	326,749		0.0000	1.0000	94.95
21.5	326,749		0.0000	1.0000	94.95
22.5	326,749		0.0000	1.0000	94.95
23.5	326,749		0.0000	1.0000	94.95
24.5	326,749	11,986	0.0367	0.9633	94.95
25.5	259,564	28,935	0.1115	0.8885	91.47
26.5	68,594		0.0000	1.0000	81.27
27.5	68,594		0.0000	1.0000	81.27
28.5	68,594		0.0000	1.0000	81.27
29.5	68,594	14,473	0.2110	0.7890	81.27
30.5	54,121		0.0000	1.0000	64.12
31.5	68,622		0.0000	1.0000	64.12
32.5	68,622	15,511	0.2260	0.7740	64.12
33.5	14,501		0.0000	1.0000	49.63
34.5	14,501		0.0000	1.0000	49.63
35.5	14,501		0.0000	1.0000	49.63
36.5	14,501		0.0000	1.0000	49.63
37.5	14,501		0.0000	1.0000	49.63
38.5	14,501		0.0000	1.0000	49.63

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 310.10 OTHER POWER GENERATION EQUIPMENT

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1963-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	14,501		0.0000	1.0000	49.63
40.5	14,501		0.0000	1.0000	49.63
41.5	14,501		0.0000	1.0000	49.63
42.5	14,501		0.0000	1.0000	49.63
43.5	14,501		0.0000	1.0000	49.63
44.5	14,501		0.0000	1.0000	49.63
45.5	14,501	14,501	1.0000		49.63
46.5					

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 310.10 OTHER POWER GENERATION EQUIPMENT

ORIGINAL LIFE TABLE

PLACEMENT BAND 1963-2014 EXPERIENCE BAND 2005-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	2,358,347		0.0000	1.0000	100.00
0.5	2,354,561	6,249	0.0027	0.9973	100.00
1.5	2,293,026	16,447	0.0072	0.9928	99.73
2.5	2,264,418		0.0000	1.0000	99.02
3.5	2,218,954	15,929	0.0072	0.9928	99.02
4.5	383,352		0.0000	1.0000	98.31
5.5	351,292		0.0000	1.0000	98.31
6.5	218,093		0.0000	1.0000	98.31
7.5	22,052		0.0000	1.0000	98.31
8.5	231,204		0.0000	1.0000	98.31
9.5	231,204	7,941	0.0343	0.9657	98.31
10.5	223,263	1,325	0.0059	0.9941	94.93
11.5	209,152		0.0000	1.0000	94.37
12.5	209,152		0.0000	1.0000	94.37
13.5	209,152		0.0000	1.0000	94.37
14.5	209,152		0.0000	1.0000	94.37
15.5	276,337		0.0000	1.0000	94.37
16.5	467,307		0.0000	1.0000	94.37
17.5	467,307		0.0000	1.0000	94.37
18.5	258,156		0.0000	1.0000	94.37
19.5	258,156		0.0000	1.0000	94.37
20.5	258,156		0.0000	1.0000	94.37
21.5	258,156		0.0000	1.0000	94.37
22.5	258,156		0.0000	1.0000	94.37
23.5	326,749		0.0000	1.0000	94.37
24.5	326,749	11,986	0.0367	0.9633	94.37
25.5	259,564	28,935	0.1115	0.8885	90.91
26.5	68,594		0.0000	1.0000	80.77
27.5	68,594		0.0000	1.0000	80.77
28.5	68,594		0.0000	1.0000	80.77
29.5	68,594	14,473	0.2110	0.7890	80.77
30.5	54,121		0.0000	1.0000	63.73
31.5	54,121		0.0000	1.0000	63.73
32.5	54,121	15,511	0.2866	0.7134	63.73
33.5					45.46
34.5					
35.5					
36.5					
37.5					
38.5					

KENTUCKY AMERICAN WATER COMPANY

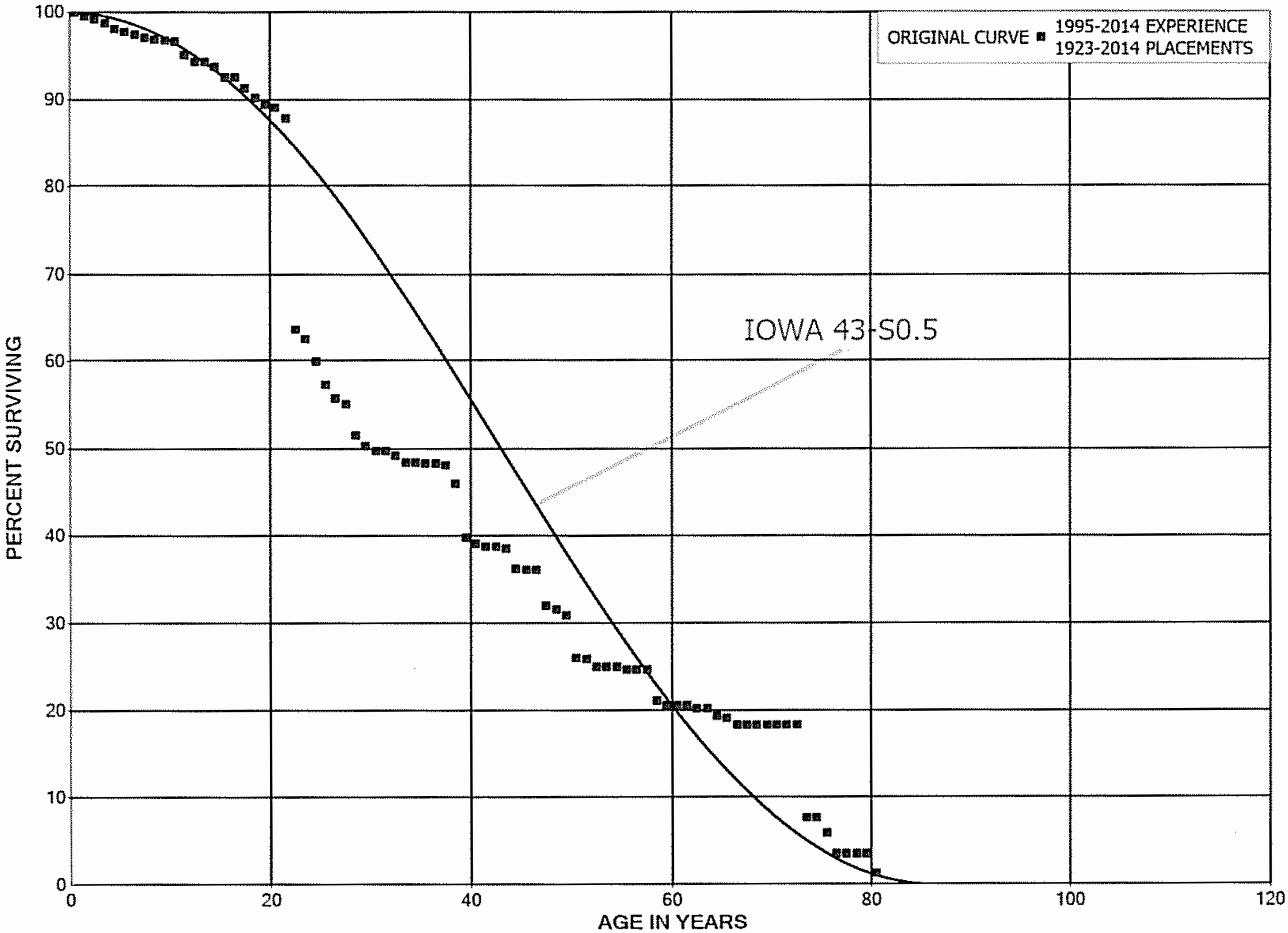
ACCOUNT 310.10 OTHER POWER GENERATION EQUIPMENT

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1963-2014 EXPERIENCE BAND 2005-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5					
40.5					
41.5	14,501		0.0000		
42.5	14,501		0.0000		
43.5	14,501		0.0000		
44.5	14,501		0.0000		
45.5	14,501	14,501	1.0000		
46.5					

KENTUCKY AMERICAN WATER COMPANY
ACCOUNTS 311.20 THRU 311.54 PUMPING EQUIPMENT
ORIGINAL AND SMOOTH SURVIVOR CURVES



KENTUCKY AMERICAN WATER COMPANY

ACCOUNTS 311.20 THRU 311.54 PUMPING EQUIPMENT

ORIGINAL LIFE TABLE

PLACEMENT BAND 1923-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	23,804,614		0.0000	1.0000	100.00
0.5	22,454,500	107,717	0.0048	0.9952	100.00
1.5	19,900,435	69,455	0.0035	0.9965	99.52
2.5	23,664,048	100,308	0.0042	0.9958	99.17
3.5	23,189,356	161,537	0.0070	0.9930	98.75
4.5	15,613,722	45,583	0.0029	0.9971	98.06
5.5	12,752,455	55,756	0.0044	0.9956	97.78
6.5	9,494,063	30,534	0.0032	0.9968	97.35
7.5	9,220,210	15,024	0.0016	0.9984	97.04
8.5	9,164,156	12,228	0.0013	0.9987	96.88
9.5	8,827,469	15,795	0.0018	0.9982	96.75
10.5	8,827,002	137,924	0.0156	0.9844	96.58
11.5	8,644,944	69,031	0.0080	0.9920	95.07
12.5	8,577,216		0.0000	1.0000	94.31
13.5	8,725,824	56,298	0.0065	0.9935	94.31
14.5	8,517,121	107,853	0.0127	0.9873	93.70
15.5	8,179,060	1,500	0.0002	0.9998	92.51
16.5	7,827,389	102,542	0.0131	0.9869	92.50
17.5	7,007,209	88,130	0.0126	0.9874	91.29
18.5	7,110,676	60,030	0.0084	0.9916	90.14
19.5	7,015,212	26,860	0.0038	0.9962	89.38
20.5	7,022,791	93,457	0.0133	0.9867	89.03
21.5	6,754,491	1,862,585	0.2758	0.7242	87.85
22.5	2,643,745	48,750	0.0184	0.9816	63.62
23.5	2,591,482	103,300	0.0399	0.9601	62.45
24.5	2,590,055	115,099	0.0444	0.9556	59.96
25.5	2,080,842	56,158	0.0270	0.9730	57.30
26.5	1,465,372	17,602	0.0120	0.9880	55.75
27.5	1,031,334	67,555	0.0655	0.9345	55.08
28.5	1,011,145	22,799	0.0225	0.9775	51.47
29.5	954,336	10,337	0.0108	0.9892	50.31
30.5	929,428		0.0000	1.0000	49.77
31.5	890,856	11,064	0.0124	0.9876	49.77
32.5	871,527	14,228	0.0163	0.9837	49.15
33.5	593,428		0.0000	1.0000	48.35
34.5	593,428	688	0.0012	0.9988	48.35
35.5	652,110		0.0000	1.0000	48.29
36.5	690,434	2,841	0.0041	0.9959	48.29
37.5	686,964	29,938	0.0436	0.9564	48.09
38.5	533,086	73,102	0.1371	0.8629	46.00

KENTUCKY AMERICAN WATER COMPANY

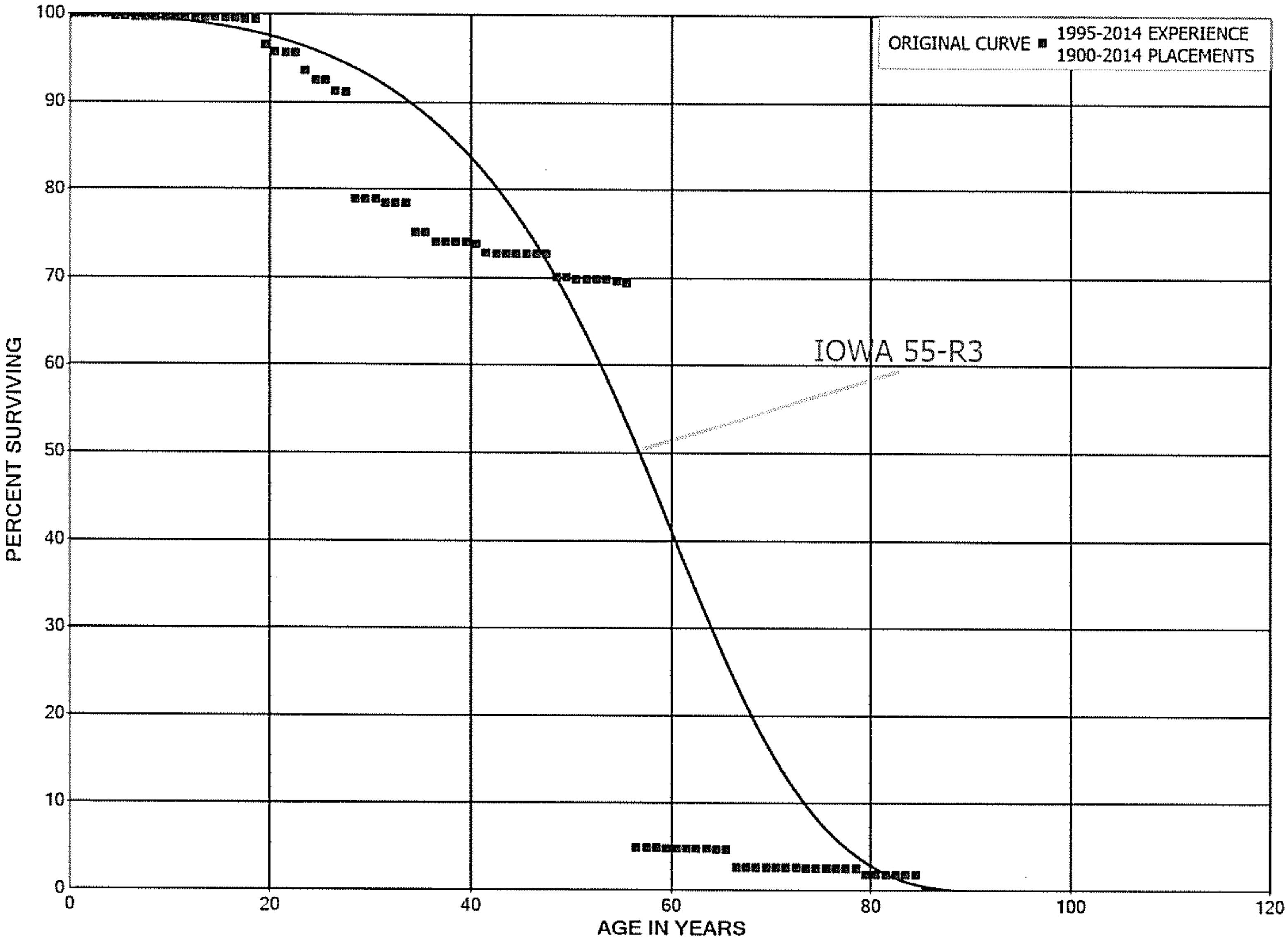
ACCOUNTS 311.20 THRU 311.54 PUMPING EQUIPMENT

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1923-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	586,990	9,606	0.0164	0.9836	39.69
40.5	568,040	4,434	0.0078	0.9922	39.04
41.5	563,735		0.0000	1.0000	38.73
42.5	562,732	4,114	0.0073	0.9927	38.73
43.5	605,217	36,103	0.0597	0.9403	38.45
44.5	460,953	1,613	0.0035	0.9965	36.16
45.5	476,264		0.0000	1.0000	36.03
46.5	484,777	55,663	0.1148	0.8852	36.03
47.5	415,952	4,834	0.0116	0.9884	31.89
48.5	355,420	8,137	0.0229	0.9771	31.52
49.5	321,565	50,529	0.1571	0.8429	30.80
50.5	271,036	1,762	0.0065	0.9935	25.96
51.5	269,273	8,684	0.0323	0.9677	25.79
52.5	255,196	285	0.0011	0.9989	24.96
53.5	254,926		0.0000	1.0000	24.93
54.5	257,264	3,135	0.0122	0.9878	24.93
55.5	218,833		0.0000	1.0000	24.63
56.5	197,202	30	0.0002	0.9998	24.63
57.5	197,172	28,404	0.1441	0.8559	24.63
58.5	167,673	4,968	0.0296	0.9704	21.08
59.5	49,664		0.0000	1.0000	20.45
60.5	123,164		0.0000	1.0000	20.45
61.5	122,469	1,663	0.0136	0.9864	20.45
62.5	120,806		0.0000	1.0000	20.18
63.5	141,444	6,475	0.0458	0.9542	20.18
64.5	134,503	1,022	0.0076	0.9924	19.25
65.5	117,490	5,091	0.0433	0.9567	19.11
66.5	112,399		0.0000	1.0000	18.28
67.5	91,441		0.0000	1.0000	18.28
68.5	91,441	223	0.0024	0.9976	18.28
69.5	91,218		0.0000	1.0000	18.23
70.5	91,218		0.0000	1.0000	18.23
71.5	91,640		0.0000	1.0000	18.23
72.5	91,640	53,191	0.5804	0.4196	18.23
73.5	38,449		0.0000	1.0000	7.65
74.5	36,111	8,687	0.2406	0.7594	7.65
75.5	27,423	10,710	0.3906	0.6094	5.81
76.5	16,713		0.0000	1.0000	3.54
77.5	16,713		0.0000	1.0000	3.54
78.5	16,713		0.0000	1.0000	3.54
79.5	16,713	10,809	0.6467	0.3533	3.54
80.5					1.25

KENTUCKY AMERICAN WATER COMPANY
ACCOUNT 320.10 PURIFICATION SYSTEM - STRUCTURES
ORIGINAL AND SMOOTH SURVIVOR CURVES



KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 320.10 PURIFICATION SYSTEM - STRUCTURES

ORIGINAL LIFE TABLE

PLACEMENT BAND 1900-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	21,325,114		0.0000	1.0000	100.00
0.5	21,335,267		0.0000	1.0000	100.00
1.5	21,350,974		0.0000	1.0000	100.00
2.5	21,466,697	4,658	0.0002	0.9998	100.00
3.5	21,463,739	62,636	0.0029	0.9971	99.98
4.5	6,757,637		0.0000	1.0000	99.69
5.5	6,652,539	1,935	0.0003	0.9997	99.69
6.5	9,748,101		0.0000	1.0000	99.66
7.5	9,332,416		0.0000	1.0000	99.66
8.5	11,826,158		0.0000	1.0000	99.66
9.5	11,812,900		0.0000	1.0000	99.66
10.5	11,814,719		0.0000	1.0000	99.66
11.5	11,807,727	10,624	0.0009	0.9991	99.66
12.5	10,843,589		0.0000	1.0000	99.57
13.5	10,961,496		0.0000	1.0000	99.57
14.5	10,961,496	1,195	0.0001	0.9999	99.57
15.5	10,954,719	11,565	0.0011	0.9989	99.56
16.5	10,988,808	1,558	0.0001	0.9999	99.45
17.5	10,880,498		0.0000	1.0000	99.44
18.5	8,426,135	247,973	0.0294	0.9706	99.44
19.5	8,174,937	64,334	0.0079	0.9921	96.51
20.5	8,135,135	7,318	0.0009	0.9991	95.75
21.5	8,167,220		0.0000	1.0000	95.67
22.5	8,120,060	170,557	0.0210	0.9790	95.67
23.5	7,954,117	93,353	0.0117	0.9883	93.66
24.5	8,305,061	3,288	0.0004	0.9996	92.56
25.5	8,257,847	114,352	0.0138	0.9862	92.52
26.5	4,033,426	4,350	0.0011	0.9989	91.24
27.5	3,809,086	510,628	0.1341	0.8659	91.14
28.5	2,665,038		0.0000	1.0000	78.92
29.5	2,665,038		0.0000	1.0000	78.92
30.5	2,673,979	14,276	0.0053	0.9947	78.92
31.5	2,659,704		0.0000	1.0000	78.50
32.5	2,578,819		0.0000	1.0000	78.50
33.5	2,475,664	105,661	0.0427	0.9573	78.50
34.5	2,382,259		0.0000	1.0000	75.15
35.5	2,989,249	44,906	0.0150	0.9850	75.15
36.5	4,932,319	224	0.0000	1.0000	74.02
37.5	4,483,156		0.0000	1.0000	74.02
38.5	4,482,142		0.0000	1.0000	74.02

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 320.10 PURIFICATION SYSTEM - STRUCTURES

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1900-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	4,484,013	13,000	0.0029	0.9971	74.02
40.5	4,431,298	61,447	0.0139	0.9861	73.80
41.5	4,334,595	494	0.0001	0.9999	72.78
42.5	4,322,770		0.0000	1.0000	72.77
43.5	4,316,458		0.0000	1.0000	72.77
44.5	3,892,350		0.0000	1.0000	72.77
45.5	3,892,350	725	0.0002	0.9998	72.77
46.5	3,899,630		0.0000	1.0000	72.76
47.5	3,899,630	141,891	0.0364	0.9636	72.76
48.5	2,612,784		0.0000	1.0000	70.11
49.5	2,612,784	8,379	0.0032	0.9968	70.11
50.5	2,602,128	105	0.0000	1.0000	69.89
51.5	2,602,022	622	0.0002	0.9998	69.88
52.5	2,597,180	477	0.0002	0.9998	69.87
53.5	2,596,869	7,735	0.0030	0.9970	69.85
54.5	2,581,320	7,954	0.0031	0.9969	69.65
55.5	2,028,624	1,887,207	0.9303	0.0697	69.43
56.5	65,442		0.0000	1.0000	4.84
57.5	65,442		0.0000	1.0000	4.84
58.5	65,784	1,870	0.0284	0.9716	4.84
59.5	63,914		0.0000	1.0000	4.70
60.5	65,420	102	0.0016	0.9984	4.70
61.5	42,527		0.0000	1.0000	4.70
62.5	42,527		0.0000	1.0000	4.70
63.5	42,527	231	0.0054	0.9946	4.70
64.5	14,769		0.0000	1.0000	4.67
65.5	18,345	8,111	0.4421	0.5579	4.67
66.5	5,903		0.0000	1.0000	2.61
67.5	5,903		0.0000	1.0000	2.61
68.5	5,903		0.0000	1.0000	2.61
69.5	5,903		0.0000	1.0000	2.61
70.5	5,903		0.0000	1.0000	2.61
71.5	5,903		0.0000	1.0000	2.61
72.5	5,903	165	0.0280	0.9720	2.61
73.5	5,737		0.0000	1.0000	2.53
74.5	5,737	175	0.0305	0.9695	2.53
75.5	5,563		0.0000	1.0000	2.46
76.5	5,424		0.0000	1.0000	2.46
77.5	5,424		0.0000	1.0000	2.46
78.5	5,082	1,355	0.2667	0.7333	2.46

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 320.10 PURIFICATION SYSTEM - STRUCTURES

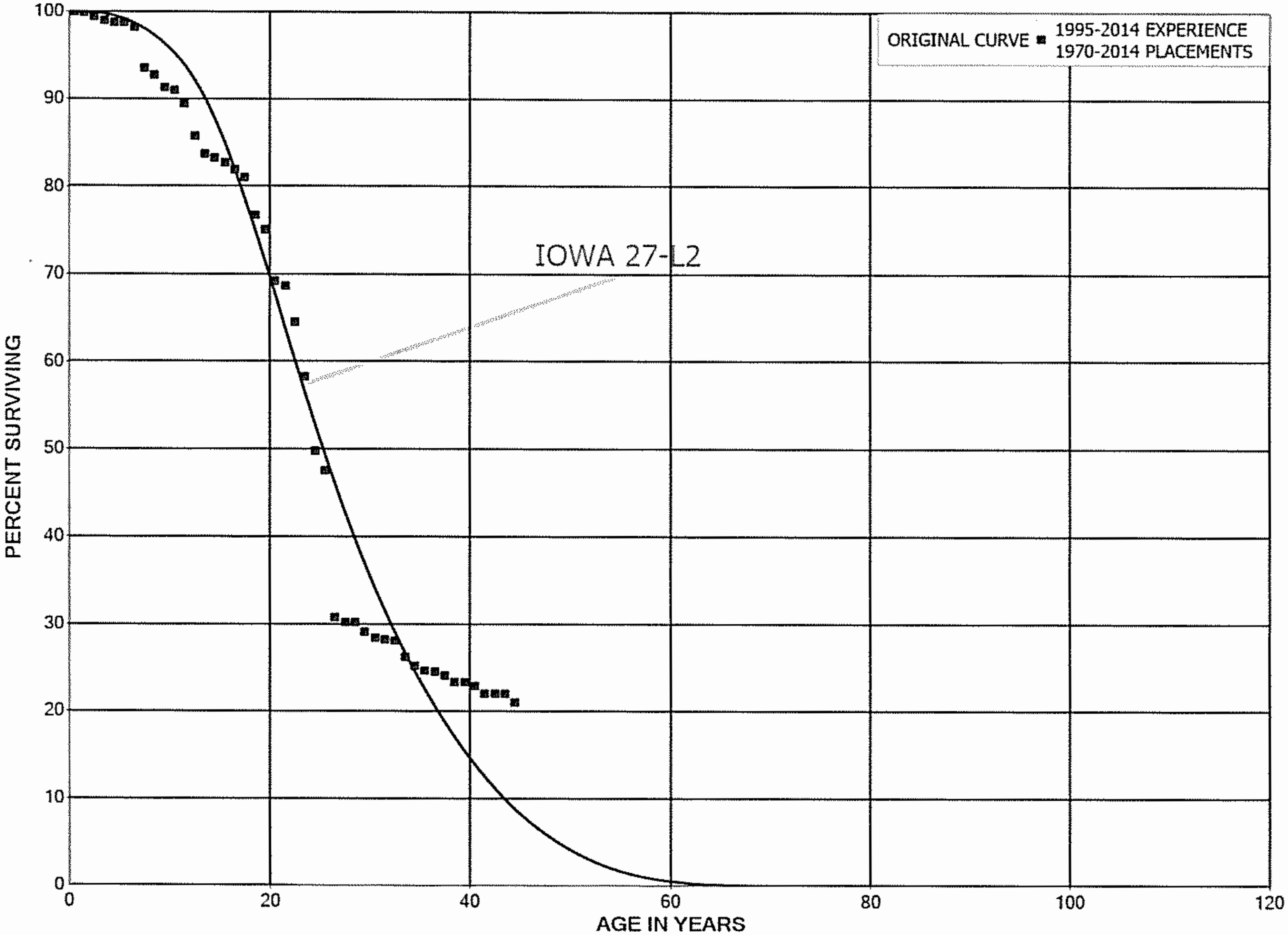
ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1900-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
79.5	3,727		0.0000	1.0000	1.80
80.5	2,221		0.0000	1.0000	1.80
81.5	2,221	2	0.0007	0.9993	1.80
82.5	2,219		0.0000	1.0000	1.80
83.5	2,219		0.0000	1.0000	1.80
84.5	2,219	2,193	0.9881	0.0119	1.80
85.5					0.02
86.5					
87.5					
88.5					
89.5					
90.5					
91.5					
92.5					
93.5					
94.5	11,753		0.0000		
95.5	11,753		0.0000		
96.5	11,753		0.0000		
97.5	11,753		0.0000		
98.5	11,753		0.0000		
99.5	11,753		0.0000		
100.5	11,753		0.0000		
101.5	11,753		0.0000		
102.5	11,753		0.0000		
103.5	11,753		0.0000		
104.5	11,753		0.0000		
105.5	11,753		0.0000		
106.5	11,753		0.0000		
107.5	11,753		0.0000		
108.5	11,753		0.0000		
109.5	11,753		0.0000		
110.5	11,753		0.0000		
111.5	11,753		0.0000		
112.5	11,753		0.0000		
113.5	11,753	2,400	0.2042		
114.5					

Gannett Fleming

KENTUCKY AMERICAN WATER COMPANY
ACCOUNT 320.11 PURIFICATION SYSTEM - EQUIPMENT
ORIGINAL AND SMOOTH SURVIVOR CURVES



KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 320.11 PURIFICATION SYSTEM - EQUIPMENT

ORIGINAL LIFE TABLE

PLACEMENT BAND 1970-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	9,293,691		0.0000	1.0000	100.00
0.5	8,472,544	9,455	0.0011	0.9989	100.00
1.5	7,756,673	35,082	0.0045	0.9955	99.89
2.5	8,305,176	36,043	0.0043	0.9957	99.44
3.5	8,432,297	22,407	0.0027	0.9973	99.01
4.5	8,362,059	3,180	0.0004	0.9996	98.74
5.5	8,414,734	45,276	0.0054	0.9946	98.70
6.5	9,854,335	466,653	0.0474	0.9526	98.17
7.5	8,092,856	71,994	0.0089	0.9911	93.52
8.5	7,996,189	123,194	0.0154	0.9846	92.69
9.5	7,786,730	27,107	0.0035	0.9965	91.26
10.5	7,751,967	131,186	0.0169	0.9831	90.95
11.5	7,605,254	311,375	0.0409	0.9591	89.41
12.5	7,042,827	164,873	0.0234	0.9766	85.75
13.5	7,963,985	43,224	0.0054	0.9946	83.74
14.5	7,446,489	51,352	0.0069	0.9931	83.29
15.5	6,436,730	61,734	0.0096	0.9904	82.71
16.5	6,282,501	68,861	0.0110	0.9890	81.92
17.5	6,198,441	332,613	0.0537	0.9463	81.02
18.5	5,574,737	113,696	0.0204	0.9796	76.67
19.5	5,461,041	433,444	0.0794	0.9206	75.11
20.5	5,018,855	41,052	0.0082	0.9918	69.15
21.5	4,351,408	256,663	0.0590	0.9410	68.58
22.5	4,086,166	395,049	0.0967	0.9033	64.54
23.5	3,343,132	494,125	0.1478	0.8522	58.30
24.5	3,093,213	134,249	0.0434	0.9566	49.68
25.5	2,941,197	1,039,425	0.3534	0.6466	47.52
26.5	1,644,038	27,162	0.0165	0.9835	30.73
27.5	1,473,942	679	0.0005	0.9995	30.22
28.5	1,473,263	58,259	0.0395	0.9605	30.21
29.5	1,415,004	27,758	0.0196	0.9804	29.01
30.5	1,385,065	13,512	0.0098	0.9902	28.44
31.5	1,371,553	2,389	0.0017	0.9983	28.17
32.5	1,369,164	93,883	0.0686	0.9314	28.12
33.5	304,948	11,568	0.0379	0.9621	26.19
34.5	293,380	6,182	0.0211	0.9789	25.20
35.5	287,198	2,245	0.0078	0.9922	24.66
36.5	284,952	5,352	0.0188	0.9812	24.47
37.5	279,600	7,876	0.0282	0.9718	24.01
38.5	271,724		0.0000	1.0000	23.34

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 320.11 PURIFICATION SYSTEM - EQUIPMENT

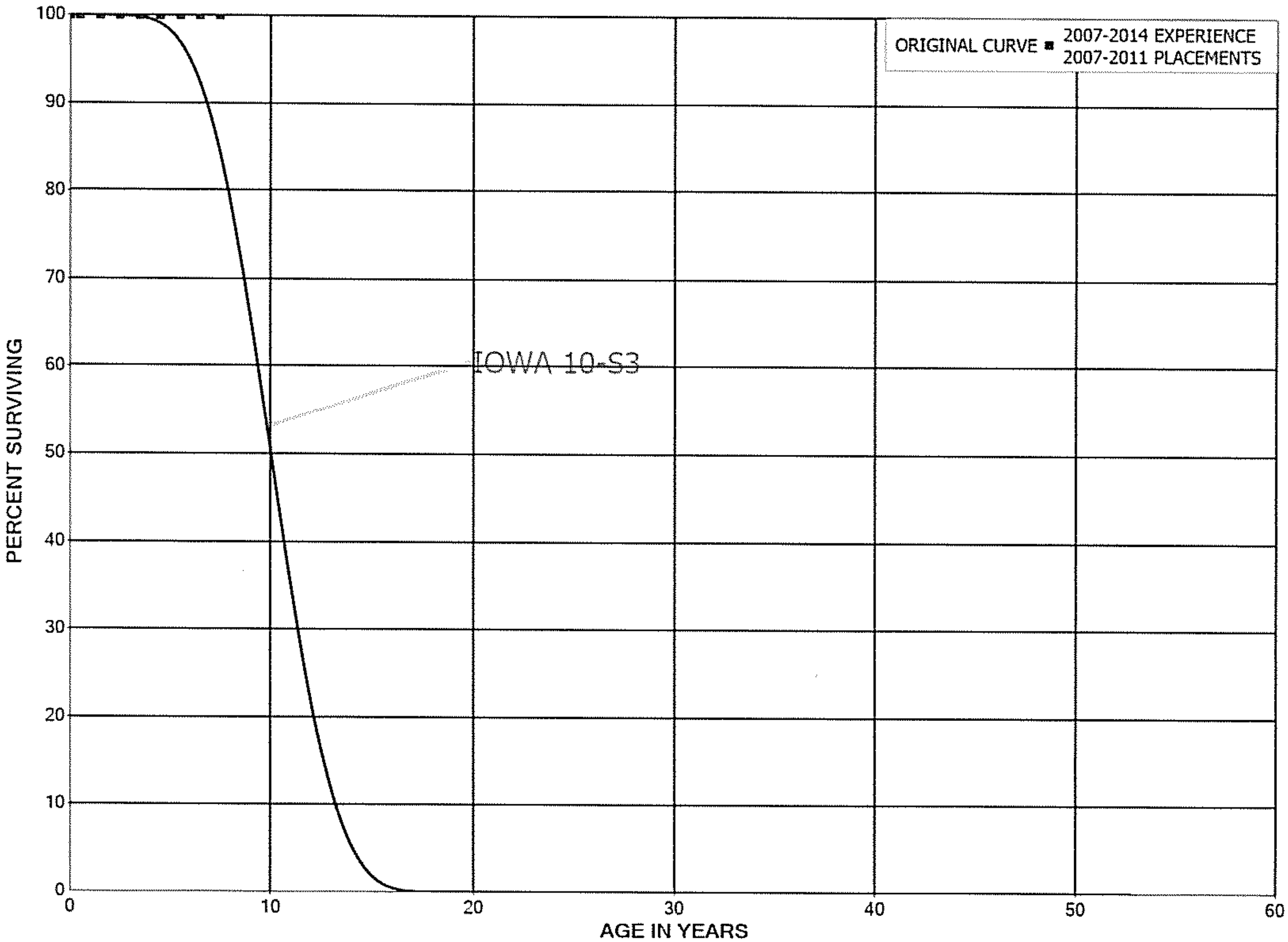
ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1970-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	271,724	5,342	0.0197	0.9803	23.34
40.5	266,274	10,454	0.0393	0.9607	22.88
41.5	255,820	243	0.0010	0.9990	21.98
42.5	255,577	77	0.0003	0.9997	21.96
43.5	255,500	11,048	0.0432	0.9568	21.95
44.5					21.00

Gannett Fleming

KENTUCKY AMERICAN WATER COMPANY
ACCOUNT 320.20 PURIFICATION SYSTEM - FILTER MEDIA
ORIGINAL AND SMOOTH SURVIVOR CURVES



KENTUCKY AMERICAN WATER COMPANY

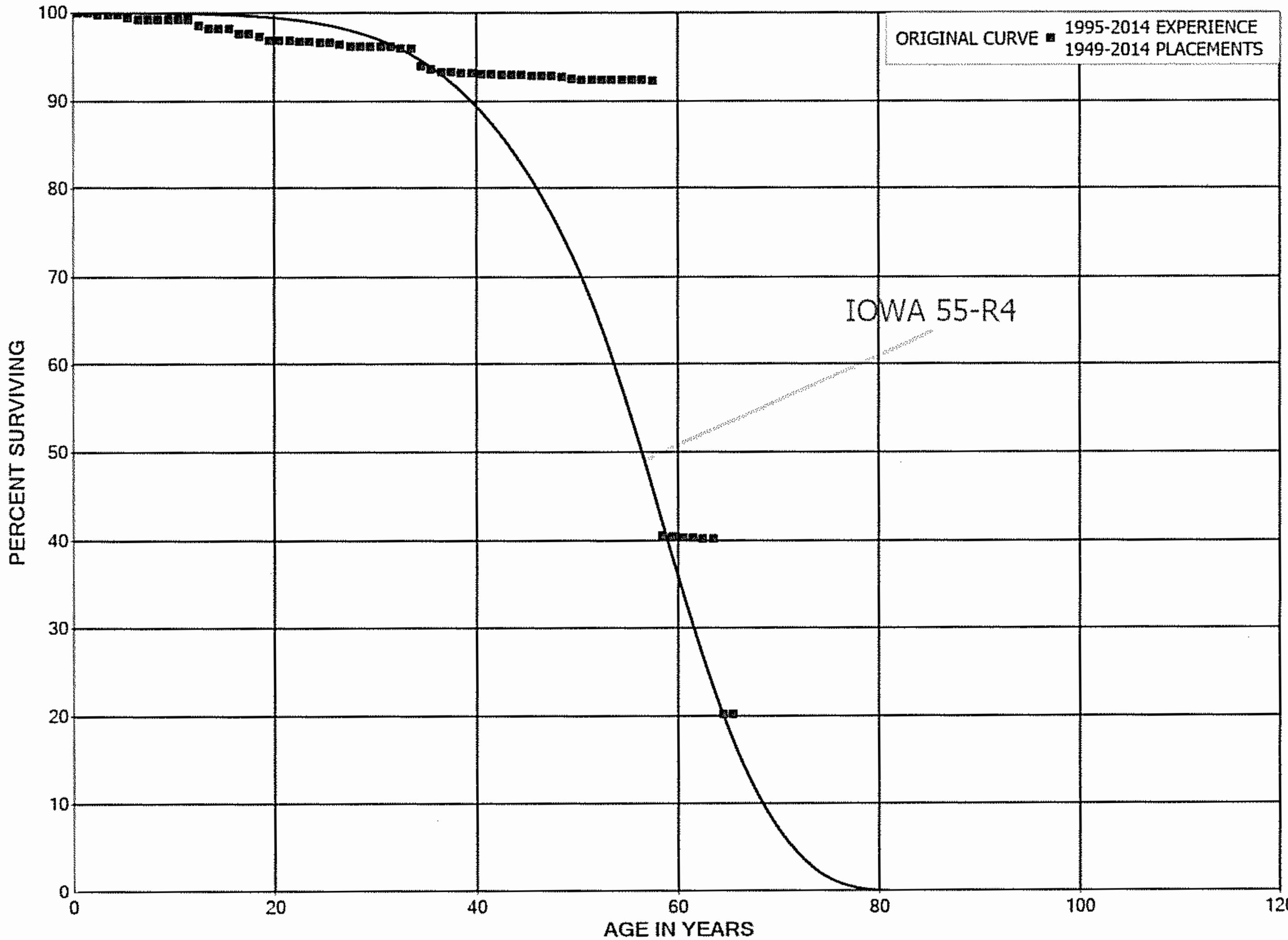
ACCOUNT 320.20 PURIFICATION SYSTEM - FILTER MEDIA

ORIGINAL LIFE TABLE

PLACEMENT BAND 2007-2011 EXPERIENCE BAND 2007-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	742,340		0.0000	1.0000	100.00
0.5	742,340		0.0000	1.0000	100.00
1.5	742,340		0.0000	1.0000	100.00
2.5	742,340		0.0000	1.0000	100.00
3.5	574,019		0.0000	1.0000	100.00
4.5	168,569		0.0000	1.0000	100.00
5.5	27,968		0.0000	1.0000	100.00
6.5	27,968		0.0000	1.0000	100.00
7.5					100.00

KENTUCKY AMERICAN WATER COMPANY
ACCOUNTS 330.00 THRU 330.40 DISTRIBUTION RESERVOIRS AND STANDPIPES
ORIGINAL AND SMOOTH SURVIVOR CURVES



KENTUCKY AMERICAN WATER COMPANY

ACCOUNTS 330.00 THRU 330.40 DISTRIBUTION RESERVOIRS AND STANDPIPES

ORIGINAL LIFE TABLE

PLACEMENT BAND 1949-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	13,475,390		0.0000	1.0000	100.00
0.5	12,467,830		0.0000	1.0000	100.00
1.5	11,893,955	29,652	0.0025	0.9975	100.00
2.5	11,728,470		0.0000	1.0000	99.75
3.5	11,750,115		0.0000	1.0000	99.75
4.5	9,160,126	30,837	0.0034	0.9966	99.75
5.5	10,107,963	23,378	0.0023	0.9977	99.41
6.5	10,084,049	3,531	0.0004	0.9996	99.18
7.5	10,742,457		0.0000	1.0000	99.15
8.5	10,573,414		0.0000	1.0000	99.15
9.5	7,258,557		0.0000	1.0000	99.15
10.5	5,601,657	1,128	0.0002	0.9998	99.15
11.5	5,600,529	32,954	0.0059	0.9941	99.13
12.5	5,529,401	19,247	0.0035	0.9965	98.55
13.5	4,601,168		0.0000	1.0000	98.20
14.5	4,586,753		0.0000	1.0000	98.20
15.5	3,801,327	23,351	0.0061	0.9939	98.20
16.5	3,658,561		0.0000	1.0000	97.60
17.5	3,663,588	10,495	0.0029	0.9971	97.60
18.5	2,642,363	13,450	0.0051	0.9949	97.32
19.5	2,744,959		0.0000	1.0000	96.83
20.5	2,743,157	517	0.0002	0.9998	96.83
21.5	2,743,890	2,044	0.0007	0.9993	96.81
22.5	2,739,303		0.0000	1.0000	96.74
23.5	2,717,659	3,632	0.0013	0.9987	96.74
24.5	2,050,561	641	0.0003	0.9997	96.61
25.5	979,411	1,451	0.0015	0.9985	96.58
26.5	1,142,435	3,375	0.0030	0.9970	96.43
27.5	371,298		0.0000	1.0000	96.15
28.5	372,767		0.0000	1.0000	96.15
29.5	726,313		0.0000	1.0000	96.15
30.5	726,313		0.0000	1.0000	96.15
31.5	726,313	1,331	0.0018	0.9982	96.15
32.5	724,983		0.0000	1.0000	95.97
33.5	725,041	15,622	0.0215	0.9785	95.97
34.5	706,933	1,820	0.0026	0.9974	93.90
35.5	705,113	2,835	0.0040	0.9960	93.66
36.5	702,278		0.0000	1.0000	93.29
37.5	697,251	1,060	0.0015	0.9985	93.29
38.5	877,103		0.0000	1.0000	93.14

KENTUCKY AMERICAN WATER COMPANY

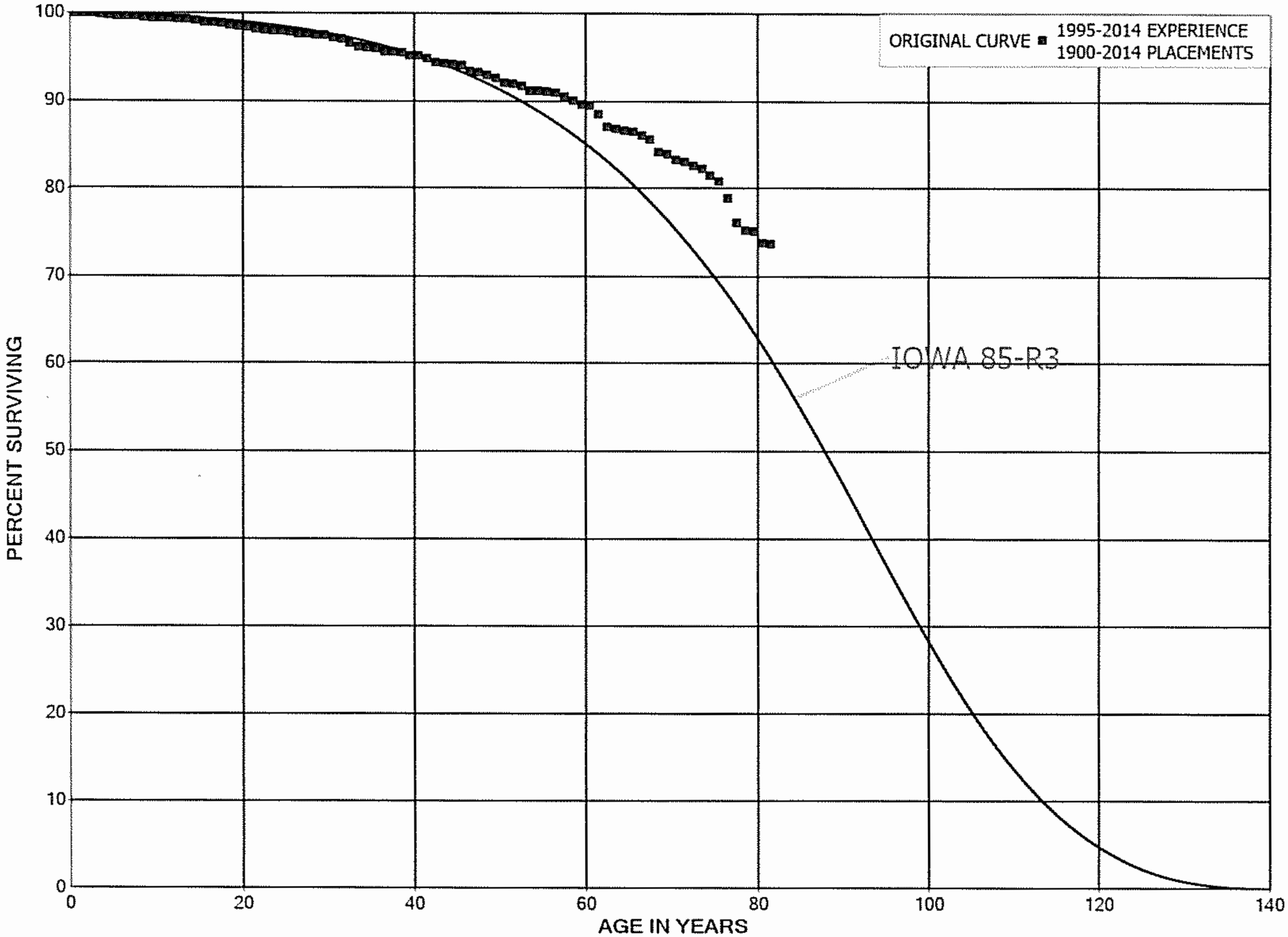
ACCOUNTS 330.00 THRU 330.40 DISTRIBUTION RESERVOIRS AND STANDPIPES

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1949-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	761,193	450	0.0006	0.9994	93.14
40.5	824,195		0.0000	1.0000	93.09
41.5	823,008	1,161	0.0014	0.9986	93.09
42.5	822,314		0.0000	1.0000	92.96
43.5	822,314	113	0.0001	0.9999	92.96
44.5	851,444	1,213	0.0014	0.9986	92.94
45.5	880,096		0.0000	1.0000	92.81
46.5	705,394		0.0000	1.0000	92.81
47.5	705,394	746	0.0011	0.9989	92.81
48.5	703,925	2,000	0.0028	0.9972	92.71
49.5	334,254	200	0.0006	0.9994	92.45
50.5	334,054		0.0000	1.0000	92.40
51.5	334,054		0.0000	1.0000	92.40
52.5	334,054	58	0.0002	0.9998	92.40
53.5	333,995		0.0000	1.0000	92.38
54.5	333,995		0.0000	1.0000	92.38
55.5	333,995		0.0000	1.0000	92.38
56.5	333,995	237	0.0007	0.9993	92.38
57.5	333,759	187,467	0.5617	0.4383	92.31
58.5	146,292	137	0.0009	0.9991	40.46
59.5	146,155	433	0.0030	0.9970	40.42
60.5	59,551	31	0.0005	0.9995	40.31
61.5	59,489	231	0.0039	0.9961	40.28
62.5	59,259		0.0000	1.0000	40.13
63.5	59,259	29,394	0.4960	0.5040	40.13
64.5	29,865		0.0000	1.0000	20.22
65.5					20.22

KENTUCKY AMERICAN WATER COMPANY
ACCOUNT 331.00 MAINS AND ACCESSORIES
ORIGINAL AND SMOOTH SURVIVOR CURVES



KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 331.00 MAINS AND ACCESSORIES

ORIGINAL LIFE TABLE

PLACEMENT BAND 1900-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	211,679,057		0.0000	1.0000	100.00
0.5	196,460,770	21,374	0.0001	0.9999	100.00
1.5	194,972,552	100,669	0.0005	0.9995	99.99
2.5	194,834,067	100,177	0.0005	0.9995	99.94
3.5	192,395,161	370,803	0.0019	0.9981	99.89
4.5	119,834,229	78,967	0.0007	0.9993	99.69
5.5	119,673,723	8,005	0.0001	0.9999	99.63
6.5	115,705,267	66,655	0.0006	0.9994	99.62
7.5	91,534,077	67,034	0.0007	0.9993	99.56
8.5	88,337,197	44,371	0.0005	0.9995	99.49
9.5	92,336,671	60,266	0.0007	0.9993	99.44
10.5	92,631,576	13,577	0.0001	0.9999	99.38
11.5	90,399,458	35,980	0.0004	0.9996	99.36
12.5	87,612,806	38,322	0.0004	0.9996	99.32
13.5	81,149,883	126,800	0.0016	0.9984	99.28
14.5	75,522,281	125,270	0.0017	0.9983	99.12
15.5	70,003,040	43,780	0.0006	0.9994	98.96
16.5	65,628,848	29,004	0.0004	0.9996	98.90
17.5	60,682,202	172,324	0.0028	0.9972	98.85
18.5	55,816,265	15,293	0.0003	0.9997	98.57
19.5	52,822,893	90,248	0.0017	0.9983	98.55
20.5	49,315,409	128,242	0.0026	0.9974	98.38
21.5	46,832,797	34,068	0.0007	0.9993	98.12
22.5	44,761,449	45,629	0.0010	0.9990	98.05
23.5	43,389,477	15,220	0.0004	0.9996	97.95
24.5	40,733,330	21,287	0.0005	0.9995	97.92
25.5	38,058,298	85,920	0.0023	0.9977	97.86
26.5	33,215,397	20,815	0.0006	0.9994	97.64
27.5	25,745,232	11,133	0.0004	0.9996	97.58
28.5	28,518,579	9,787	0.0003	0.9997	97.54
29.5	23,878,366	81,237	0.0034	0.9966	97.51
30.5	22,420,272	20,014	0.0009	0.9991	97.18
31.5	22,187,779	116,891	0.0053	0.9947	97.09
32.5	21,992,487	81,540	0.0037	0.9963	96.58
33.5	21,670,278	33,512	0.0015	0.9985	96.22
34.5	21,068,871	19,333	0.0009	0.9991	96.07
35.5	20,072,842	71,231	0.0035	0.9965	95.98
36.5	19,475,984	13,515	0.0007	0.9993	95.64
37.5	18,585,514	20,715	0.0011	0.9989	95.57
38.5	18,912,771	50,802	0.0027	0.9973	95.47

ACCOUNT 331.00 MAINS AND ACCESSORIES

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1900-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	18,850,889	14,294	0.0008	0.9992	95.21
40.5	15,900,440	54,963	0.0035	0.9965	95.14
41.5	15,328,135	59,720	0.0039	0.9961	94.81
42.5	13,803,274	20,418	0.0015	0.9985	94.44
43.5	13,240,757	21,135	0.0016	0.9984	94.30
44.5	12,920,124	17,037	0.0013	0.9987	94.15
45.5	12,222,286	85,160	0.0070	0.9930	94.03
46.5	11,677,166	7,596	0.0007	0.9993	93.37
47.5	11,025,313	45,303	0.0041	0.9959	93.31
48.5	6,660,145	19,099	0.0029	0.9971	92.93
49.5	6,163,083	40,582	0.0066	0.9934	92.66
50.5	5,717,289	7,744	0.0014	0.9986	92.05
51.5	5,389,149	13,642	0.0025	0.9975	91.93
52.5	5,052,455	29,155	0.0058	0.9942	91.69
53.5	4,804,079	1,193	0.0002	0.9998	91.16
54.5	4,386,575	4,989	0.0011	0.9989	91.14
55.5	3,932,252	5,205	0.0013	0.9987	91.04
56.5	3,295,526	15,390	0.0047	0.9953	90.92
57.5	2,961,576	13,135	0.0044	0.9956	90.49
58.5	1,944,674	9,291	0.0048	0.9952	90.09
59.5	1,410,779	2,829	0.0020	0.9980	89.66
60.5	1,735,645	19,899	0.0115	0.9885	89.48
61.5	1,435,799	22,808	0.0159	0.9841	88.46
62.5	1,261,282	3,598	0.0029	0.9971	87.05
63.5	1,201,481	1,985	0.0017	0.9983	86.80
64.5	1,072,465	1,838	0.0017	0.9983	86.66
65.5	983,691	4,556	0.0046	0.9954	86.51
66.5	859,045	5,040	0.0059	0.9941	86.11
67.5	830,137	13,355	0.0161	0.9839	85.60
68.5	802,325	2,951	0.0037	0.9963	84.23
69.5	789,710	5,747	0.0073	0.9927	83.92
70.5	783,291	2,294	0.0029	0.9971	83.31
71.5	778,651	4,608	0.0059	0.9941	83.06
72.5	772,203	2,497	0.0032	0.9968	82.57
73.5	755,346	7,320	0.0097	0.9903	82.30
74.5	732,110	5,656	0.0077	0.9923	81.51
75.5	706,241	17,169	0.0243	0.9757	80.88
76.5	672,396	23,555	0.0350	0.9650	78.91
77.5	533,376	6,053	0.0113	0.9887	76.15
78.5	494,147	1,027	0.0021	0.9979	75.28

KENTUCKY AMERICAN WATER COMPANY

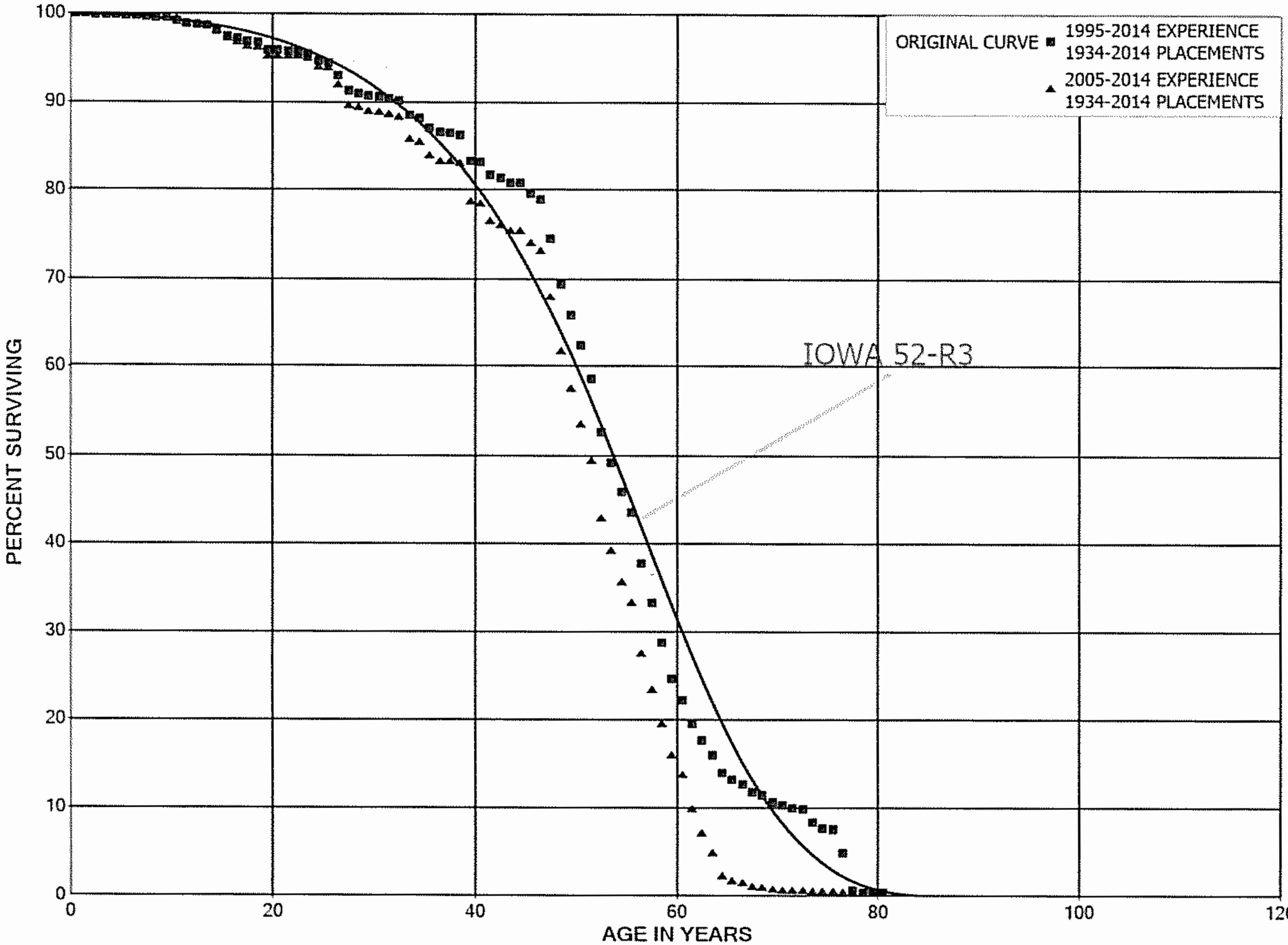
ACCOUNT 331.00 MAINS AND ACCESSORIES

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1900-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
79.5	450,106	7,903	0.0176	0.9824	75.13
80.5	50,708	30	0.0006	0.9994	73.81
81.5					73.76
82.5					
83.5					
84.5					
85.5					
86.5					
87.5					
88.5	30		0.0000		
89.5	30		0.0000		
90.5	30		0.0000		
91.5	30		0.0000		
92.5	30		0.0000		
93.5	30		0.0000		
94.5	2,194		0.0000		
95.5	2,194		0.0000		
96.5	2,194		0.0000		
97.5	2,194		0.0000		
98.5	2,194		0.0000		
99.5	2,194		0.0000		
100.5	2,194		0.0000		
101.5	2,194		0.0000		
102.5	2,194		0.0000		
103.5	2,194		0.0000		
104.5	2,194		0.0000		
105.5	2,194		0.0000		
106.5	2,194	2,164	0.9863		
107.5	30		0.0000		
108.5					

KENTUCKY AMERICAN WATER COMPANY
ACCOUNT 333.00 SERVICES
ORIGINAL AND SMOOTH SURVIVOR CURVES



KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 333.00 SERVICES

ORIGINAL LIFE TABLE

PLACEMENT BAND 1934-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	38,307,481		0.0000	1.0000	100.00
0.5	38,507,034	23,020	0.0006	0.9994	100.00
1.5	38,165,875	23,517	0.0006	0.9994	99.94
2.5	36,726,736	20,147	0.0005	0.9995	99.88
3.5	35,769,228	12,311	0.0003	0.9997	99.82
4.5	34,610,967	20,401	0.0006	0.9994	99.79
5.5	31,559,534	10,022	0.0003	0.9997	99.73
6.5	29,787,414	16,351	0.0005	0.9995	99.70
7.5	29,341,343	39,317	0.0013	0.9987	99.64
8.5	28,651,364	5,628	0.0002	0.9998	99.51
9.5	28,319,200	96,060	0.0034	0.9966	99.49
10.5	28,031,404	104,115	0.0037	0.9963	99.15
11.5	27,505,019	21,242	0.0008	0.9992	98.79
12.5	27,056,227	36,769	0.0014	0.9986	98.71
13.5	17,082,231	83,204	0.0049	0.9951	98.58
14.5	15,391,039	103,392	0.0067	0.9933	98.09
15.5	13,968,664	39,111	0.0028	0.9972	97.44
16.5	12,847,442	47,844	0.0037	0.9963	97.16
17.5	12,143,169	13,508	0.0011	0.9989	96.80
18.5	11,294,101	95,848	0.0085	0.9915	96.69
19.5	10,401,040	3,777	0.0004	0.9996	95.87
20.5	9,797,851	15,774	0.0016	0.9984	95.84
21.5	9,148,736	6,100	0.0007	0.9993	95.68
22.5	8,444,266	21,474	0.0025	0.9975	95.62
23.5	7,786,027	64,053	0.0082	0.9918	95.38
24.5	7,080,791	14,196	0.0020	0.9980	94.59
25.5	6,400,515	98,042	0.0153	0.9847	94.40
26.5	5,690,582	103,768	0.0182	0.9818	92.96
27.5	5,021,522	14,271	0.0028	0.9972	91.26
28.5	4,610,582	15,075	0.0033	0.9967	91.00
29.5	4,263,556	4,530	0.0011	0.9989	90.70
30.5	4,025,004	8,435	0.0021	0.9979	90.61
31.5	3,878,982	12,797	0.0033	0.9967	90.42
32.5	3,701,903	68,526	0.0185	0.9815	90.12
33.5	3,532,116	10,873	0.0031	0.9969	88.45
34.5	3,295,728	43,152	0.0131	0.9869	88.18
35.5	2,990,541	15,671	0.0052	0.9948	87.02
36.5	2,737,322	3,682	0.0013	0.9987	86.57
37.5	2,490,784	4,239	0.0017	0.9983	86.45
38.5	2,320,447	80,407	0.0347	0.9653	86.31

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 333.00 SERVICES

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1934-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	2,145,434	4,346	0.0020	0.9980	83.31
40.5	1,942,071	32,563	0.0168	0.9832	83.15
41.5	1,840,696	8,266	0.0045	0.9955	81.75
42.5	1,694,870	10,831	0.0064	0.9936	81.38
43.5	1,591,176	1,592	0.0010	0.9990	80.86
44.5	1,514,932	22,365	0.0148	0.9852	80.78
45.5	1,386,308	11,458	0.0083	0.9917	79.59
46.5	1,279,365	71,240	0.0557	0.9443	78.93
47.5	1,122,582	76,960	0.0686	0.9314	74.54
48.5	945,220	49,076	0.0519	0.9481	69.43
49.5	814,833	42,579	0.0523	0.9477	65.82
50.5	741,662	44,573	0.0601	0.9399	62.38
51.5	627,430	64,179	0.1023	0.8977	58.63
52.5	476,787	31,070	0.0652	0.9348	52.64
53.5	426,223	28,763	0.0675	0.9325	49.21
54.5	368,918	18,732	0.0508	0.9492	45.89
55.5	318,435	42,816	0.1345	0.8655	43.56
56.5	271,480	31,524	0.1161	0.8839	37.70
57.5	235,147	32,406	0.1378	0.8622	33.32
58.5	208,952	29,897	0.1431	0.8569	28.73
59.5	187,956	18,358	0.0977	0.9023	24.62
60.5	271,923	32,516	0.1196	0.8804	22.21
61.5	238,917	24,041	0.1006	0.8994	19.56
62.5	214,876	19,559	0.0910	0.9090	17.59
63.5	195,317	25,275	0.1294	0.8706	15.99
64.5	168,257	8,443	0.0502	0.9498	13.92
65.5	159,814	7,220	0.0452	0.9548	13.22
66.5	152,594	10,721	0.0703	0.9297	12.62
67.5	141,872	4,591	0.0324	0.9676	11.74
68.5	137,000	9,509	0.0694	0.9306	11.36
69.5	127,490	4,009	0.0314	0.9686	10.57
70.5	123,482	3,258	0.0264	0.9736	10.24
71.5	120,224	1,501	0.0125	0.9875	9.97
72.5	117,920	18,918	0.1604	0.8396	9.84
73.5	98,931	8,132	0.0822	0.9178	8.26
74.5	90,640	1,185	0.0131	0.9869	7.58
75.5	89,275	32,156	0.3602	0.6398	7.48
76.5	57,119	49,860	0.8729	0.1271	4.79
77.5	6,892	2,362	0.3427	0.6573	0.61
78.5	4,530	2	0.0005	0.9995	0.40
79.5	4,528	129	0.0284	0.9716	0.40
80.5					0.39

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 333.00 SERVICES

ORIGINAL LIFE TABLE

PLACEMENT BAND 1934-2014 EXPERIENCE BAND 2005-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	17,358,356		0.0000	1.0000	100.00
0.5	17,244,959	492	0.0000	1.0000	100.00
1.5	16,854,933		0.0000	1.0000	100.00
2.5	15,239,513	58	0.0000	1.0000	100.00
3.5	23,810,056	4,312	0.0002	0.9998	100.00
4.5	23,834,459	456	0.0000	1.0000	99.98
5.5	21,639,458	1,841	0.0001	0.9999	99.98
6.5	20,553,750	4,368	0.0002	0.9998	99.97
7.5	20,681,323	36,659	0.0018	0.9982	99.95
8.5	20,591,663	2,024	0.0001	0.9999	99.77
9.5	20,805,604	94,407	0.0045	0.9955	99.76
10.5	21,014,420	98,116	0.0047	0.9953	99.31
11.5	20,985,203	14,667	0.0007	0.9993	98.84
12.5	21,165,135	28,073	0.0013	0.9987	98.77
13.5	11,680,097	80,719	0.0069	0.9931	98.64
14.5	10,436,087	100,376	0.0096	0.9904	97.96
15.5	9,492,540	35,966	0.0038	0.9962	97.02
16.5	8,782,867	44,980	0.0051	0.9949	96.65
17.5	8,482,725	7,468	0.0009	0.9991	96.16
18.5	7,969,430	86,337	0.0108	0.9892	96.07
19.5	7,381,961		0.0000	1.0000	95.03
20.5	6,927,305	980	0.0001	0.9999	95.03
21.5	6,432,130		0.0000	1.0000	95.02
22.5	5,807,256	12,928	0.0022	0.9978	95.02
23.5	5,299,187	51,873	0.0098	0.9902	94.81
24.5	4,811,075	5,612	0.0012	0.9988	93.88
25.5	4,345,843	90,459	0.0208	0.9792	93.77
26.5	3,864,218	97,369	0.0252	0.9748	91.82
27.5	3,353,516	9,967	0.0030	0.9970	89.50
28.5	3,007,061	13,313	0.0044	0.9956	89.24
29.5	2,703,752	2,261	0.0008	0.9992	88.84
30.5	2,624,565	6,283	0.0024	0.9976	88.77
31.5	2,506,865	10,957	0.0044	0.9956	88.56
32.5	2,451,842	66,512	0.0271	0.9729	88.17
33.5	2,329,839	9,762	0.0042	0.9958	85.78
34.5	2,137,931	40,357	0.0189	0.9811	85.42
35.5	1,892,727	13,150	0.0069	0.9931	83.81
36.5	1,693,865	1,306	0.0008	0.9992	83.22
37.5	1,547,875	3,370	0.0022	0.9978	83.16
38.5	1,498,216	79,759	0.0532	0.9468	82.98

KENTUCKY AMERICAN WATER COMPANY

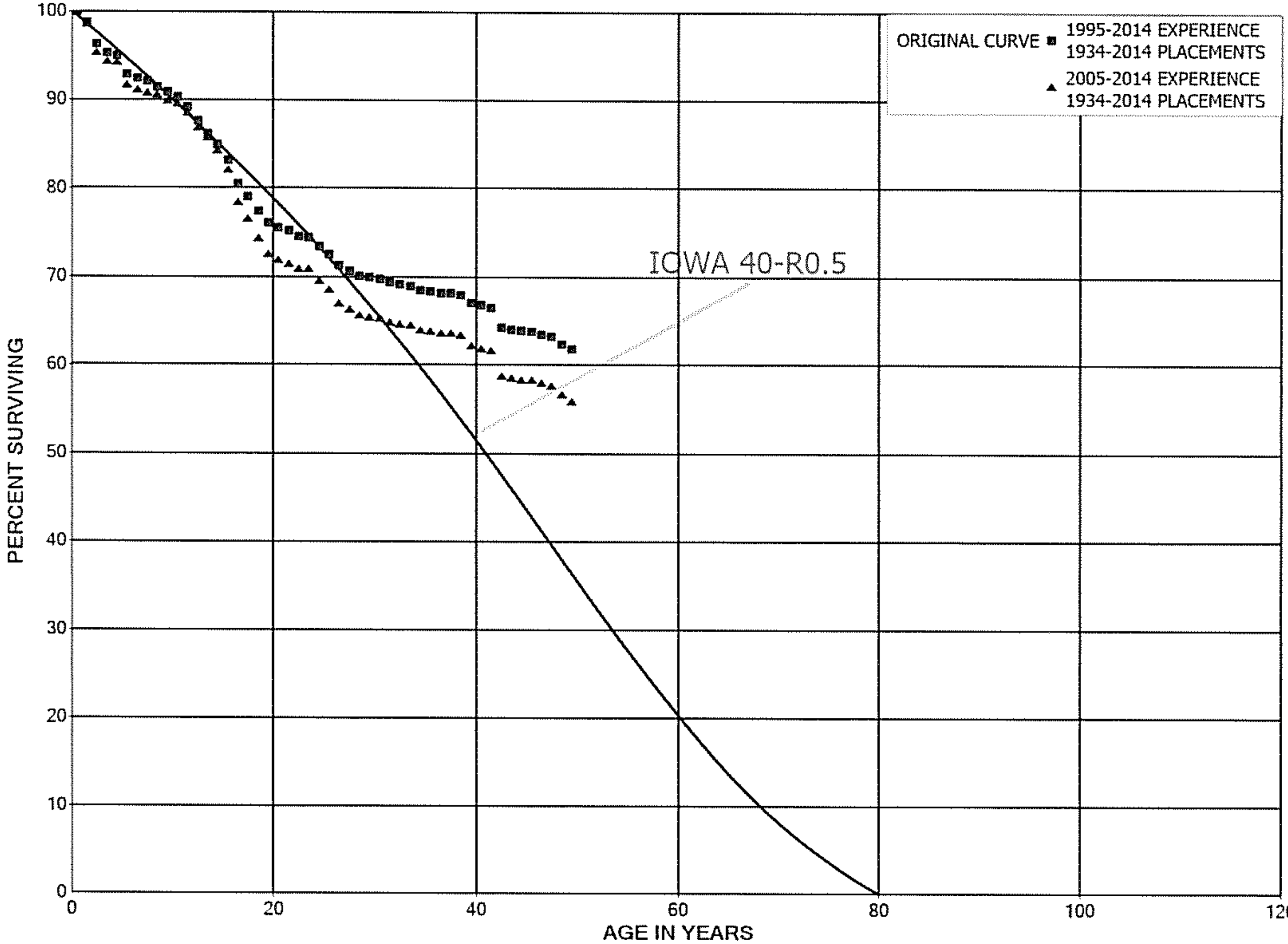
ACCOUNT 333.00 SERVICES

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1934-2014 EXPERIENCE BAND 2005-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	1,408,489	3,424	0.0024	0.9976	78.56
40.5	1,278,234	31,852	0.0249	0.9751	78.37
41.5	1,259,064	7,309	0.0058	0.9942	76.42
42.5	1,196,264	10,100	0.0084	0.9916	75.97
43.5	1,139,807	910	0.0008	0.9992	75.33
44.5	1,101,915	20,129	0.0183	0.9817	75.27
45.5	1,024,362	10,959	0.0107	0.9893	73.90
46.5	965,161	70,177	0.0727	0.9273	73.11
47.5	846,393	76,464	0.0903	0.9097	67.79
48.5	701,065	48,678	0.0694	0.9306	61.67
49.5	610,142	41,985	0.0688	0.9312	57.38
50.5	563,067	43,993	0.0781	0.9219	53.44
51.5	472,672	62,379	0.1320	0.8680	49.26
52.5	346,443	30,290	0.0874	0.9126	42.76
53.5	314,033	28,551	0.0909	0.9091	39.02
54.5	278,288	18,262	0.0656	0.9344	35.47
55.5	244,488	42,559	0.1741	0.8259	33.15
56.5	212,362	31,492	0.1483	0.8517	27.38
57.5	191,449	32,244	0.1684	0.8316	23.32
58.5	161,699	29,798	0.1843	0.8157	19.39
59.5	131,523	18,250	0.1388	0.8612	15.82
60.5	113,909	32,410	0.2845	0.7155	13.62
61.5	81,477	23,549	0.2890	0.7110	9.75
62.5	60,060	19,174	0.3193	0.6807	6.93
63.5	46,361	25,107	0.5416	0.4584	4.72
64.5	28,661	7,829	0.2731	0.7269	2.16
65.5	26,882	2,948	0.1096	0.8904	1.57
66.5	34,367	9,859	0.2869	0.7131	1.40
67.5	25,059	4,049	0.1616	0.8384	1.00
68.5	27,252	7,062	0.2591	0.7409	0.84
69.5	30,261	4,009	0.1325	0.8675	0.62
70.5	123,482	3,258	0.0264	0.9736	0.54
71.5	120,224	1,501	0.0125	0.9875	0.52
72.5	117,920	18,918	0.1604	0.8396	0.52
73.5	98,931	8,132	0.0822	0.9178	0.43
74.5	90,640	1,185	0.0131	0.9869	0.40
75.5	89,275	32,156	0.3602	0.6398	0.39
76.5	57,119	49,860	0.8729	0.1271	0.25
77.5	6,892	2,362	0.3427	0.6573	0.03
78.5	4,530	2	0.0005	0.9995	0.02
79.5	4,528	129	0.0284	0.9716	0.02
80.5					0.02

KENTUCKY AMERICAN WATER COMPANY
ACCOUNTS 334.10 THRU 334.30 METERS AND METER INSTALLATIONS
ORIGINAL AND SMOOTH SURVIVOR CURVES



KENTUCKY AMERICAN WATER COMPANY

ACCOUNTS 334.10 THRU 334.30 METERS AND METER INSTALLATIONS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1934-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	43,581,832	1,755	0.0000	1.0000	100.00
0.5	42,513,673	538,936	0.0127	0.9873	100.00
1.5	37,274,944	926,052	0.0248	0.9752	98.73
2.5	33,809,989	339,048	0.0100	0.9900	96.28
3.5	28,012,188	98,132	0.0035	0.9965	95.31
4.5	25,303,578	563,399	0.0223	0.9777	94.98
5.5	23,233,725	129,677	0.0056	0.9944	92.86
6.5	20,642,601	70,470	0.0034	0.9966	92.34
7.5	20,419,106	129,651	0.0063	0.9937	92.03
8.5	18,062,248	120,221	0.0067	0.9933	91.44
9.5	17,133,441	103,487	0.0060	0.9940	90.83
10.5	15,510,864	196,729	0.0127	0.9873	90.29
11.5	13,720,236	234,738	0.0171	0.9829	89.14
12.5	12,293,767	198,222	0.0161	0.9839	87.62
13.5	10,906,944	162,364	0.0149	0.9851	86.20
14.5	10,132,666	209,916	0.0207	0.9793	84.92
15.5	9,248,438	291,010	0.0315	0.9685	83.16
16.5	8,497,621	153,731	0.0181	0.9819	80.54
17.5	7,676,843	161,423	0.0210	0.9790	79.09
18.5	7,044,605	123,518	0.0175	0.9825	77.42
19.5	6,644,280	46,041	0.0069	0.9931	76.07
20.5	6,271,577	34,351	0.0055	0.9945	75.54
21.5	5,808,526	43,918	0.0076	0.9924	75.13
22.5	5,332,565	7,973	0.0015	0.9985	74.56
23.5	4,984,616	72,329	0.0145	0.9855	74.45
24.5	4,606,482	52,933	0.0115	0.9885	73.37
25.5	4,085,023	72,525	0.0178	0.9822	72.52
26.5	3,678,366	29,535	0.0080	0.9920	71.24
27.5	3,272,400	27,600	0.0084	0.9916	70.66
28.5	2,959,993	6,918	0.0023	0.9977	70.07
29.5	2,642,146	7,330	0.0028	0.9972	69.90
30.5	2,447,576	12,291	0.0050	0.9950	69.71
31.5	2,307,354	7,788	0.0034	0.9966	69.36
32.5	2,130,730	4,291	0.0020	0.9980	69.13
33.5	1,990,880	12,615	0.0063	0.9937	68.99
34.5	1,802,500	4,798	0.0027	0.9973	68.55
35.5	1,607,397	3,757	0.0023	0.9977	68.37
36.5	1,425,464	1,055	0.0007	0.9993	68.21
37.5	1,312,322	4,107	0.0031	0.9969	68.16
38.5	1,230,751	15,933	0.0129	0.9871	67.94

KENTUCKY AMERICAN WATER COMPANY

ACCOUNTS 334.10 THRU 334.30 METERS AND METER INSTALLATIONS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1934-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	1,151,576	4,838	0.0042	0.9958	67.06
40.5	1,018,495	3,493	0.0034	0.9966	66.78
41.5	966,375	32,718	0.0339	0.9661	66.55
42.5	857,472	2,620	0.0031	0.9969	64.30
43.5	808,070	2,096	0.0026	0.9974	64.10
44.5	758,403	832	0.0011	0.9989	63.94
45.5	732,551	4,102	0.0056	0.9944	63.87
46.5	692,083	2,735	0.0040	0.9960	63.51
47.5	627,596	8,313	0.0132	0.9868	63.26
48.5	545,744	5,522	0.0101	0.9899	62.42
49.5	464,165	549	0.0012	0.9988	61.79
50.5	404,924	652	0.0016	0.9984	61.72
51.5	351,531	930	0.0026	0.9974	61.62
52.5	320,553	848	0.0026	0.9974	61.45
53.5	288,938	775	0.0027	0.9973	61.29
54.5	253,102	883	0.0035	0.9965	61.13
55.5	237,402	435	0.0018	0.9982	60.91
56.5	217,843	211	0.0010	0.9990	60.80
57.5	185,528	21	0.0001	0.9999	60.74
58.5	163,312	670	0.0041	0.9959	60.74
59.5	142,061	180	0.0013	0.9987	60.49
60.5	161,756	406	0.0025	0.9975	60.41
61.5	140,824	864	0.0061	0.9939	60.26
62.5	121,952	78	0.0006	0.9994	59.89
63.5	112,273	43	0.0004	0.9996	59.85
64.5	110,007	756	0.0069	0.9931	59.83
65.5	89,097	2,311	0.0259	0.9741	59.42
66.5	67,074	696	0.0104	0.9896	57.88
67.5	59,754	823	0.0138	0.9862	57.28
68.5	58,316	1,991	0.0341	0.9659	56.49
69.5	56,044	349	0.0062	0.9938	54.56
70.5	55,568	717	0.0129	0.9871	54.22
71.5	54,811	3,624	0.0661	0.9339	53.52
72.5	50,187	5,504	0.1097	0.8903	49.98
73.5	41,204	938	0.0228	0.9772	44.50
74.5	39,390	995	0.0252	0.9748	43.49
75.5	36,366	1,318	0.0362	0.9638	42.39
76.5	34,238	542	0.0158	0.9842	40.85
77.5	33,459	1,304	0.0390	0.9610	40.20
78.5	31,601	1,086	0.0344	0.9656	38.64
79.5	27,969	598	0.0214	0.9786	37.31
80.5					36.51

KENTUCKY AMERICAN WATER COMPANY

ACCOUNTS 334.10 THRU 334.30 METERS AND METER INSTALLATIONS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1934-2014 EXPERIENCE BAND 2005-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	31,653,913	1,396	0.0000	1.0000	100.00
0.5	31,857,064	523,386	0.0164	0.9836	100.00
1.5	27,791,459	891,724	0.0321	0.9679	98.35
2.5	24,953,233	277,483	0.0111	0.9889	95.20
3.5	20,052,338	5,737	0.0003	0.9997	94.14
4.5	17,815,841	490,380	0.0275	0.9725	94.11
5.5	16,160,763	99,627	0.0062	0.9938	91.52
6.5	13,891,686	44,497	0.0032	0.9968	90.96
7.5	14,077,233	49,476	0.0035	0.9965	90.67
8.5	12,112,179	85,746	0.0071	0.9929	90.35
9.5	11,313,259	39,436	0.0035	0.9965	89.71
10.5	9,963,696	111,108	0.0112	0.9888	89.39
11.5	8,648,158	166,799	0.0193	0.9807	88.40
12.5	7,812,477	98,203	0.0126	0.9874	86.69
13.5	6,871,101	112,116	0.0163	0.9837	85.60
14.5	6,404,302	172,038	0.0269	0.9731	84.21
15.5	5,969,476	263,493	0.0441	0.9559	81.94
16.5	5,475,342	136,854	0.0250	0.9750	78.33
17.5	4,990,316	143,572	0.0288	0.9712	76.37
18.5	4,641,637	111,312	0.0240	0.9760	74.17
19.5	4,603,258	40,377	0.0088	0.9912	72.39
20.5	4,414,972	25,787	0.0058	0.9942	71.76
21.5	4,111,235	32,960	0.0080	0.9920	71.34
22.5	3,783,741	2,576	0.0007	0.9993	70.77
23.5	3,552,467	66,424	0.0187	0.9813	70.72
24.5	3,347,979	48,359	0.0144	0.9856	69.40
25.5	2,996,111	70,579	0.0236	0.9764	68.39
26.5	2,757,416	26,310	0.0095	0.9905	66.78
27.5	2,435,749	25,061	0.0103	0.9897	66.15
28.5	2,144,047	6,070	0.0028	0.9972	65.47
29.5	1,834,648	3,860	0.0021	0.9979	65.28
30.5	1,713,665	10,774	0.0063	0.9937	65.14
31.5	1,593,499	6,344	0.0040	0.9960	64.73
32.5	1,483,118	2,046	0.0014	0.9986	64.48
33.5	1,375,092	11,015	0.0080	0.9920	64.39
34.5	1,200,435	3,580	0.0030	0.9970	63.87
35.5	1,035,888	2,210	0.0021	0.9979	63.68
36.5	888,768	120	0.0001	0.9999	63.54
37.5	811,932	3,613	0.0044	0.9956	63.54
38.5	794,994	14,950	0.0188	0.9812	63.25

KENTUCKY AMERICAN WATER COMPANY

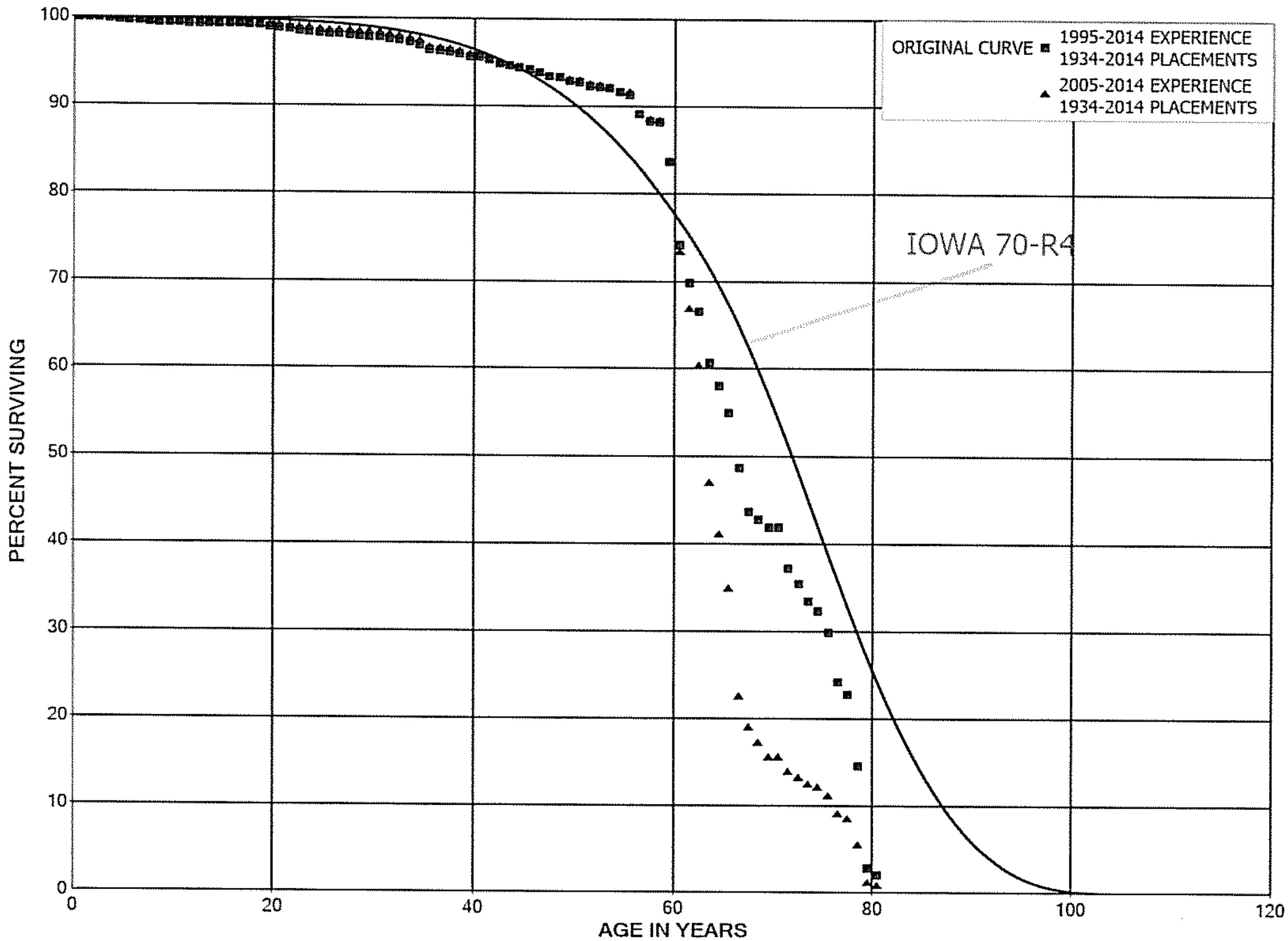
ACCOUNTS 334.10 THRU 334.30 METERS AND METER INSTALLATIONS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1934-2014 EXPERIENCE BAND 2005-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	773,747	4,341	0.0056	0.9944	62.06
40.5	703,461	2,644	0.0038	0.9962	61.72
41.5	685,906	31,809	0.0464	0.9536	61.48
42.5	591,044	2,389	0.0040	0.9960	58.63
43.5	566,237	1,774	0.0031	0.9969	58.40
44.5	551,774	168	0.0003	0.9997	58.21
45.5	524,030	3,659	0.0070	0.9930	58.19
46.5	486,514	2,401	0.0049	0.9951	57.79
47.5	454,682	7,938	0.0175	0.9825	57.50
48.5	397,496	5,391	0.0136	0.9864	56.50
49.5	340,318	415	0.0012	0.9988	55.73
50.5	301,961	283	0.0009	0.9991	55.66
51.5	269,899	598	0.0022	0.9978	55.61
52.5	255,970	686	0.0027	0.9973	55.49
53.5	230,923	703	0.0030	0.9970	55.34
54.5	195,409	549	0.0028	0.9972	55.17
55.5	198,174	124	0.0006	0.9994	55.02
56.5	195,319	128	0.0007	0.9993	54.98
57.5	168,270	4	0.0000	1.0000	54.95
58.5	145,066	526	0.0036	0.9964	54.95
59.5	120,510	50	0.0004	0.9996	54.75
60.5	99,493	197	0.0020	0.9980	54.72
61.5	78,809	54	0.0007	0.9993	54.61
62.5	61,840	0	0.0000	1.0000	54.58
63.5	56,098		0.0000	1.0000	54.58
64.5	55,625	81	0.0015	0.9985	54.58
65.5	37,546	1,305	0.0348	0.9652	54.50
66.5	20,592	46	0.0022	0.9978	52.60
67.5	15,282	240	0.0157	0.9843	52.49
68.5	15,718	1,360	0.0865	0.9135	51.66
69.5	17,286	138	0.0080	0.9920	47.19
70.5	55,568	717	0.0129	0.9871	46.82
71.5	54,811	3,624	0.0661	0.9339	46.21
72.5	50,187	5,504	0.1097	0.8903	43.16
73.5	41,204	938	0.0228	0.9772	38.42
74.5	39,390	995	0.0252	0.9748	37.55
75.5	36,366	1,318	0.0362	0.9638	36.60
76.5	34,238	542	0.0158	0.9842	35.28
77.5	33,459	1,304	0.0390	0.9610	34.72
78.5	31,601	1,086	0.0344	0.9656	33.36
79.5	27,969	598	0.0214	0.9786	32.22
80.5					31.53

KENTUCKY AMERICAN WATER COMPANY
ACCOUNT 335.00 FIRE HYDRANTS
ORIGINAL AND SMOOTH SURVIVOR CURVES



KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 335.00 FIRE HYDRANTS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1934-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	12,587,185		0.0000	1.0000	100.00
0.5	10,489,756	2,131	0.0002	0.9998	100.00
1.5	9,550,361	4,728	0.0005	0.9995	99.98
2.5	9,241,787	7,209	0.0008	0.9992	99.93
3.5	8,946,545	8,997	0.0010	0.9990	99.85
4.5	8,557,178	12,976	0.0015	0.9985	99.75
5.5	8,239,601	2,001	0.0002	0.9998	99.60
6.5	7,961,772	4,898	0.0006	0.9994	99.58
7.5	7,489,967	8,365	0.0011	0.9989	99.52
8.5	6,607,463	731	0.0001	0.9999	99.40
9.5	6,021,092	1,415	0.0002	0.9998	99.39
10.5	5,627,553	2,191	0.0004	0.9996	99.37
11.5	5,126,995		0.0000	1.0000	99.33
12.5	4,733,580	2,281	0.0005	0.9995	99.33
13.5	4,413,029	69	0.0000	1.0000	99.28
14.5	4,292,384	723	0.0002	0.9998	99.28
15.5	4,079,690	734	0.0002	0.9998	99.26
16.5	3,951,349	1,693	0.0004	0.9996	99.25
17.5	3,814,321	2,563	0.0007	0.9993	99.20
18.5	3,566,682	5,043	0.0014	0.9986	99.14
19.5	3,449,227	3,853	0.0011	0.9989	99.00
20.5	3,539,289	5,392	0.0015	0.9985	98.89
21.5	3,457,889	8,174	0.0024	0.9976	98.74
22.5	3,198,128	2,490	0.0008	0.9992	98.50
23.5	3,055,490	4,944	0.0016	0.9984	98.43
24.5	2,778,121	1,672	0.0006	0.9994	98.27
25.5	2,617,207	1,370	0.0005	0.9995	98.21
26.5	2,454,969	3,459	0.0014	0.9986	98.16
27.5	2,294,213	1,153	0.0005	0.9995	98.02
28.5	2,290,485	1,860	0.0008	0.9992	97.97
29.5	2,183,177	1,646	0.0008	0.9992	97.89
30.5	2,065,489	3,981	0.0019	0.9981	97.82
31.5	2,029,760	2,583	0.0013	0.9987	97.63
32.5	1,999,436	5,214	0.0026	0.9974	97.50
33.5	1,949,751	5,305	0.0027	0.9973	97.25
34.5	1,841,111	10,917	0.0059	0.9941	96.98
35.5	1,718,719	1,705	0.0010	0.9990	96.41
36.5	1,595,755	1,944	0.0012	0.9988	96.31
37.5	1,490,457	3,679	0.0025	0.9975	96.20
38.5	1,431,266	4,466	0.0031	0.9969	95.96

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 335.00 FIRE HYDRANTS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1934-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	1,347,494	998	0.0007	0.9993	95.66
40.5	988,215	3,643	0.0037	0.9963	95.59
41.5	858,645	3,144	0.0037	0.9963	95.24
42.5	783,401	2,579	0.0033	0.9967	94.89
43.5	726,309	1,600	0.0022	0.9978	94.57
44.5	659,647	1,575	0.0024	0.9976	94.37
45.5	603,036	1,933	0.0032	0.9968	94.14
46.5	537,437	2,325	0.0043	0.9957	93.84
47.5	473,629	556	0.0012	0.9988	93.43
48.5	367,998	1,908	0.0052	0.9948	93.32
49.5	308,999	423	0.0014	0.9986	92.84
50.5	265,450	1,090	0.0041	0.9959	92.71
51.5	236,733	345	0.0015	0.9985	92.33
52.5	192,218	303	0.0016	0.9984	92.20
53.5	164,241	817	0.0050	0.9950	92.05
54.5	140,162	425	0.0030	0.9970	91.59
55.5	102,996	2,594	0.0252	0.9748	91.32
56.5	85,786	727	0.0085	0.9915	89.02
57.5	65,982	98	0.0015	0.9985	88.26
58.5	50,251	2,598	0.0517	0.9483	88.13
59.5	30,652	3,453	0.1126	0.8874	83.57
60.5	32,756	1,891	0.0577	0.9423	74.16
61.5	23,576	1,136	0.0482	0.9518	69.88
62.5	19,022	1,662	0.0874	0.9126	66.51
63.5	16,714	726	0.0435	0.9565	60.70
64.5	15,751	832	0.0528	0.9472	58.06
65.5	14,370	1,658	0.1154	0.8846	55.00
66.5	12,397	1,285	0.1036	0.8964	48.65
67.5	11,078	220	0.0199	0.9801	43.61
68.5	10,820	226	0.0209	0.9791	42.74
69.5	10,594		0.0000	1.0000	41.85
70.5	10,594	1,184	0.1118	0.8882	41.85
71.5	9,410	437	0.0464	0.9536	37.17
72.5	8,961	530	0.0591	0.9409	35.45
73.5	8,343	253	0.0304	0.9696	33.35
74.5	8,059	637	0.0790	0.9210	32.34
75.5	7,337	1,373	0.1871	0.8129	29.78
76.5	5,933	365	0.0614	0.9386	24.21
77.5	5,552	1,997	0.3597	0.6403	22.72
78.5	3,555	2,871	0.8077	0.1923	14.55
79.5	684	171	0.2494	0.7506	2.80
80.5					2.10

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 335.00 FIRE HYDRANTS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1934-2014 EXPERIENCE BAND 2005-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	8,871,483		0.0000	1.0000	100.00
0.5	7,052,607	1,013	0.0001	0.9999	100.00
1.5	6,443,835	1,147	0.0002	0.9998	99.99
2.5	6,278,321	2,820	0.0004	0.9996	99.97
3.5	6,188,694	3,507	0.0006	0.9994	99.92
4.5	5,723,556	12,976	0.0023	0.9977	99.87
5.5	5,553,385	1,440	0.0003	0.9997	99.64
6.5	5,315,889	4,095	0.0008	0.9992	99.61
7.5	4,888,025	5,619	0.0011	0.9989	99.54
8.5	4,211,708		0.0000	1.0000	99.42
9.5	3,675,925	614	0.0002	0.9998	99.42
10.5	3,395,195	2,191	0.0006	0.9994	99.41
11.5	3,062,696		0.0000	1.0000	99.34
12.5	2,922,487	2,281	0.0008	0.9992	99.34
13.5	2,730,427	69	0.0000	1.0000	99.26
14.5	2,817,585	525	0.0002	0.9998	99.26
15.5	2,674,893		0.0000	1.0000	99.24
16.5	2,635,962	1,061	0.0004	0.9996	99.24
17.5	2,593,530	753	0.0003	0.9997	99.20
18.5	2,389,058	2,247	0.0009	0.9991	99.17
19.5	2,335,687	1,366	0.0006	0.9994	99.08
20.5	2,221,179	2,554	0.0012	0.9988	99.02
21.5	2,051,843	2,504	0.0012	0.9988	98.91
22.5	1,795,897		0.0000	1.0000	98.79
23.5	1,666,819	3,730	0.0022	0.9978	98.79
24.5	1,451,431	543	0.0004	0.9996	98.57
25.5	1,377,568		0.0000	1.0000	98.53
26.5	1,288,619	478	0.0004	0.9996	98.53
27.5	1,193,748	1,153	0.0010	0.9990	98.49
28.5	1,154,919	684	0.0006	0.9994	98.40
29.5	1,091,811	387	0.0004	0.9996	98.34
30.5	1,300,212	3,291	0.0025	0.9975	98.31
31.5	1,385,592	2,583	0.0019	0.9981	98.06
32.5	1,386,766	3,316	0.0024	0.9976	97.87
33.5	1,367,993	3,812	0.0028	0.9972	97.64
34.5	1,304,937	10,245	0.0079	0.9921	97.37
35.5	1,207,384	1,231	0.0010	0.9990	96.60
36.5	1,136,079	877	0.0008	0.9992	96.51
37.5	1,073,682	2,732	0.0025	0.9975	96.43
38.5	1,106,347	4,321	0.0039	0.9961	96.19

KENTUCKY AMERICAN WATER COMPANY

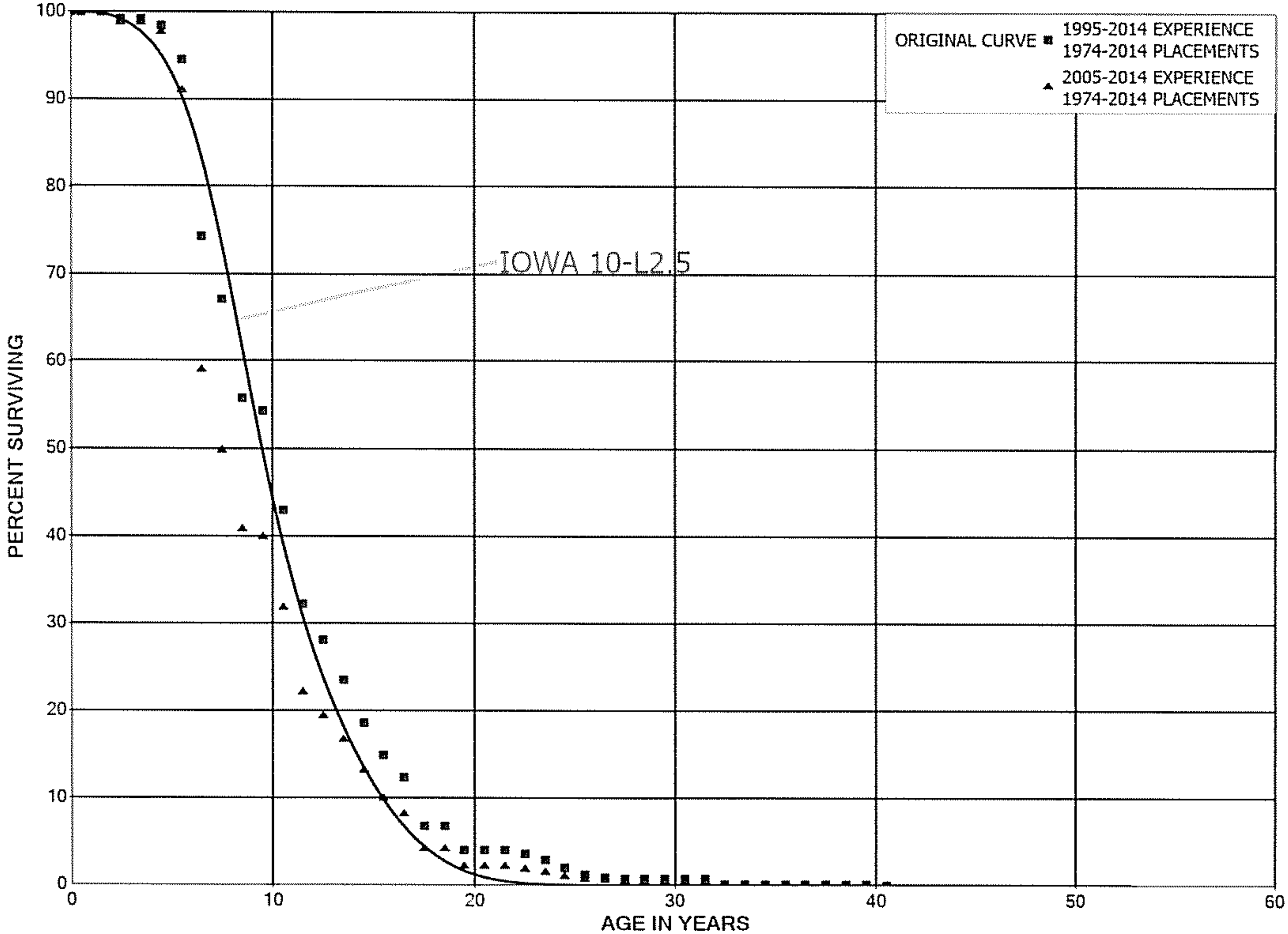
ACCOUNT 335.00 FIRE HYDRANTS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1934-2014 EXPERIENCE BAND 2005-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	1,059,228	998	0.0009	0.9991	95.81
40.5	738,478	3,490	0.0047	0.9953	95.72
41.5	627,699	2,793	0.0044	0.9956	95.27
42.5	595,207	2,220	0.0037	0.9963	94.84
43.5	566,783	1,078	0.0019	0.9981	94.49
44.5	522,473	1,433	0.0027	0.9973	94.31
45.5	501,805	1,570	0.0031	0.9969	94.05
46.5	451,748	2,084	0.0046	0.9954	93.76
47.5	408,116	556	0.0014	0.9986	93.32
48.5	317,452	875	0.0028	0.9972	93.20
49.5	279,575	423	0.0015	0.9985	92.94
50.5	241,592	1,090	0.0045	0.9955	92.80
51.5	222,508	302	0.0014	0.9986	92.38
52.5	182,410	303	0.0017	0.9983	92.26
53.5	155,391	817	0.0053	0.9947	92.10
54.5	132,989	183	0.0014	0.9986	91.62
55.5	97,351	2,594	0.0266	0.9734	91.49
56.5	82,159	623	0.0076	0.9924	89.05
57.5	62,699	98	0.0016	0.9984	88.38
58.5	47,829	2,532	0.0529	0.9471	88.24
59.5	28,077	3,453	0.1230	0.8770	83.57
60.5	21,007	1,891	0.0900	0.9100	73.29
61.5	11,828	1,136	0.0960	0.9040	66.70
62.5	7,420	1,662	0.2240	0.7760	60.29
63.5	5,787	726	0.1255	0.8745	46.79
64.5	5,179	786	0.1517	0.8483	40.92
65.5	4,528	1,600	0.3534	0.6466	34.71
66.5	2,730	444	0.1627	0.8373	22.44
67.5	2,477	220	0.0889	0.9111	18.79
68.5	2,298	226	0.0985	0.9015	17.12
69.5	2,262		0.0000	1.0000	15.43
70.5	10,594	1,184	0.1118	0.8882	15.43
71.5	9,410	437	0.0464	0.9536	13.71
72.5	8,961	530	0.0591	0.9409	13.07
73.5	8,343	253	0.0304	0.9696	12.30
74.5	8,059	637	0.0790	0.9210	11.93
75.5	7,337	1,373	0.1871	0.8129	10.98
76.5	5,933	365	0.0614	0.9386	8.93
77.5	5,552	1,997	0.3597	0.6403	8.38
78.5	3,555	2,871	0.8077	0.1923	5.36
79.5	684	171	0.2494	0.7506	1.03
80.5					0.77

KENTUCKY AMERICAN WATER COMPANY
ACCOUNT 341.10 TRANSPORTATION EQUIPMENT - LIGHT DUTY TRUCKS
ORIGINAL AND SMOOTH SURVIVOR CURVES



KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 341.10 TRANSPORTATION EQUIPMENT - LIGHT DUTY TRUCKS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1974-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	4,010,638		0.0000	1.0000	100.00
0.5	3,829,582		0.0000	1.0000	100.00
1.5	3,847,758	32,938	0.0086	0.9914	100.00
2.5	3,312,446		0.0000	1.0000	99.14
3.5	3,267,050	24,286	0.0074	0.9926	99.14
4.5	2,558,105	102,459	0.0401	0.9599	98.41
5.5	2,422,518	516,816	0.2133	0.7867	94.47
6.5	1,907,066	187,075	0.0981	0.9019	74.31
7.5	1,658,486	279,606	0.1686	0.8314	67.02
8.5	1,378,881	34,956	0.0254	0.9746	55.72
9.5	1,343,925	281,692	0.2096	0.7904	54.31
10.5	1,062,233	265,999	0.2504	0.7496	42.93
11.5	796,233	100,902	0.1267	0.8733	32.18
12.5	715,477	117,348	0.1640	0.8360	28.10
13.5	596,377	125,817	0.2110	0.7890	23.49
14.5	470,560	94,237	0.2003	0.7997	18.54
15.5	376,323	65,381	0.1737	0.8263	14.82
16.5	310,942	141,600	0.4554	0.5446	12.25
17.5	169,342		0.0000	1.0000	6.67
18.5	178,559	73,037	0.4090	0.5910	6.67
19.5	105,522		0.0000	1.0000	3.94
20.5	106,261		0.0000	1.0000	3.94
21.5	106,261	12,573	0.1183	0.8817	3.94
22.5	93,688	16,288	0.1739	0.8261	3.48
23.5	77,400	24,313	0.3141	0.6859	2.87
24.5	53,087	21,690	0.4086	0.5914	1.97
25.5	31,397	8,945	0.2849	0.7151	1.16
26.5	22,452	1,567	0.0698	0.9302	0.83
27.5	20,885		0.0000	1.0000	0.77
28.5	20,885		0.0000	1.0000	0.77
29.5	20,885		0.0000	1.0000	0.77
30.5	20,885		0.0000	1.0000	0.77
31.5	20,885	20,146	0.9646	0.0354	0.77
32.5	739		0.0000	1.0000	0.03
33.5	739		0.0000	1.0000	0.03
34.5	739		0.0000	1.0000	0.03
35.5	739		0.0000	1.0000	0.03
36.5	739		0.0000	1.0000	0.03
37.5	739		0.0000	1.0000	0.03
38.5	739		0.0000	1.0000	0.03
39.5	739	739	1.0000		0.03
40.5					

KENTUCKY AMERICAN WATER COMPANY

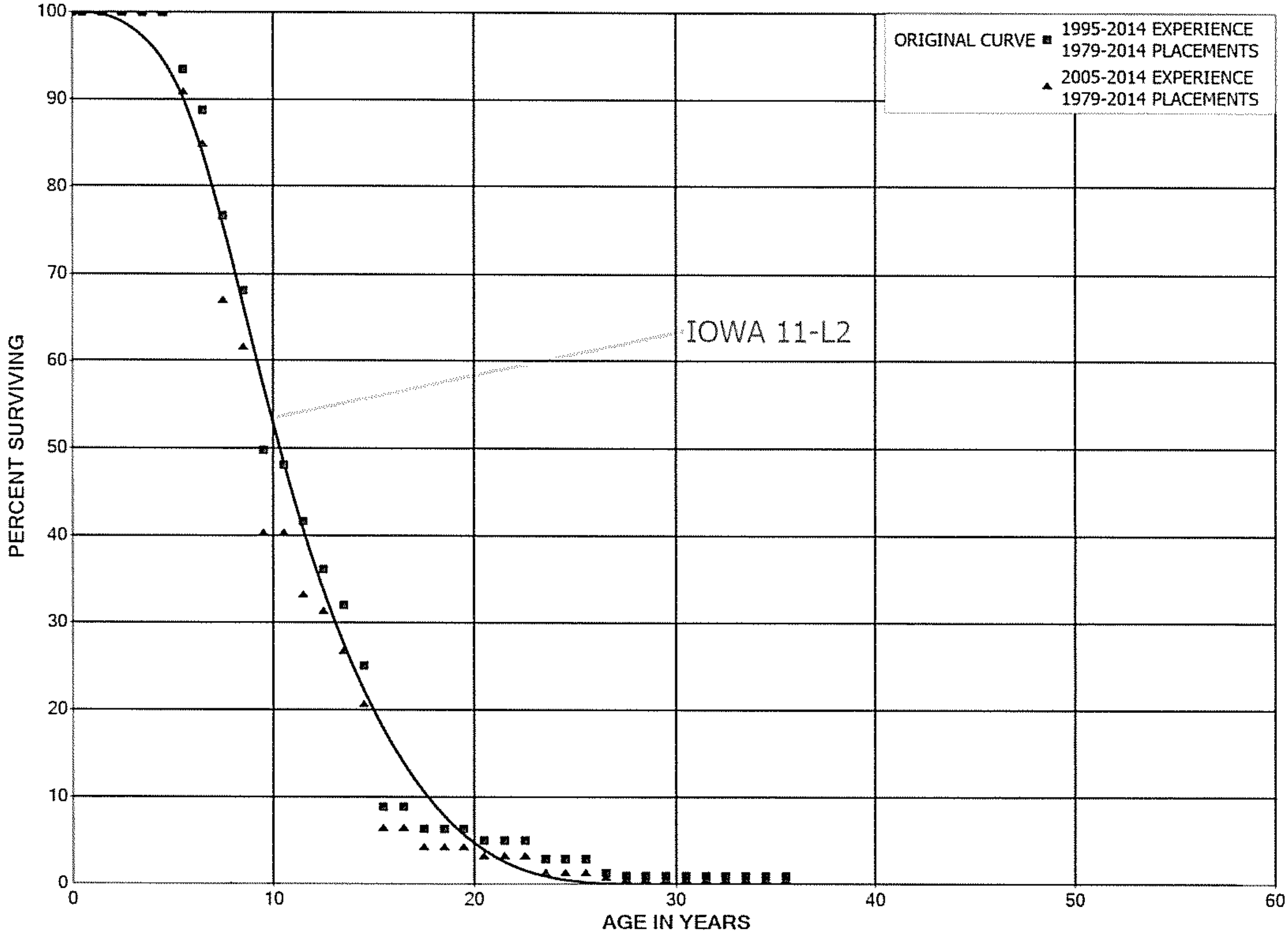
ACCOUNT 341.10 TRANSPORTATION EQUIPMENT - LIGHT DUTY TRUCKS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1974-2014 EXPERIENCE BAND 2005-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	2,770,698		0.0000	1.0000	100.00
0.5	2,547,342		0.0000	1.0000	100.00
1.5	2,547,342	32,938	0.0129	0.9871	100.00
2.5	2,144,824		0.0000	1.0000	98.71
3.5	2,169,352	24,286	0.0112	0.9888	98.71
4.5	1,501,754	102,459	0.0682	0.9318	97.60
5.5	1,469,402	516,816	0.3517	0.6483	90.94
6.5	1,082,812	168,720	0.1558	0.8442	58.96
7.5	1,059,147	191,812	0.1811	0.8189	49.77
8.5	962,415	20,715	0.0215	0.9785	40.76
9.5	1,034,093	211,166	0.2042	0.7958	39.88
10.5	838,015	254,155	0.3033	0.6967	31.74
11.5	583,861	73,282	0.1255	0.8745	22.11
12.5	523,151	74,038	0.1415	0.8585	19.34
13.5	463,650	99,099	0.2137	0.7863	16.60
14.5	388,864	94,237	0.2423	0.7577	13.05
15.5	345,664	65,381	0.1891	0.8109	9.89
16.5	289,229	141,600	0.4896	0.5104	8.02
17.5	149,196		0.0000	1.0000	4.09
18.5	149,196	73,037	0.4895	0.5105	4.09
19.5	76,159		0.0000	1.0000	2.09
20.5	76,159		0.0000	1.0000	2.09
21.5	76,159	12,573	0.1651	0.8349	2.09
22.5	83,733	16,288	0.1945	0.8055	1.74
23.5	67,444	24,313	0.3605	0.6395	1.40
24.5	43,131	12,473	0.2892	0.7108	0.90
25.5	30,658	8,945	0.2918	0.7082	0.64
26.5	21,713	1,567	0.0722	0.9278	0.45
27.5	20,146		0.0000	1.0000	0.42
28.5	20,146		0.0000	1.0000	0.42
29.5	20,146		0.0000	1.0000	0.42
30.5	20,885		0.0000	1.0000	0.42
31.5	20,885	20,146	0.9646	0.0354	0.42
32.5	739		0.0000	1.0000	0.01
33.5	739		0.0000	1.0000	0.01
34.5	739		0.0000	1.0000	0.01
35.5	739		0.0000	1.0000	0.01
36.5	739		0.0000	1.0000	0.01
37.5	739		0.0000	1.0000	0.01
38.5	739		0.0000	1.0000	0.01
39.5	739	739	1.0000		0.01
40.5					

KENTUCKY AMERICAN WATER COMPANY
ACCOUNT 341.20 TRANSPORTATION EQUIPMENT - HEAVY DUTY TRUCKS
ORIGINAL AND SMOOTH SURVIVOR CURVES



KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 341.20 TRANSPORTATION EQUIPMENT - HEAVY DUTY TRUCKS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1979-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	2,983,298		0.0000	1.0000	100.00
0.5	2,577,994		0.0000	1.0000	100.00
1.5	2,122,034		0.0000	1.0000	100.00
2.5	1,791,085		0.0000	1.0000	100.00
3.5	1,667,732		0.0000	1.0000	100.00
4.5	1,364,452	89,729	0.0658	0.9342	100.00
5.5	1,274,723	63,646	0.0499	0.9501	93.42
6.5	1,075,632	147,181	0.1368	0.8632	88.76
7.5	860,938	96,117	0.1116	0.8884	76.61
8.5	764,821	206,522	0.2700	0.7300	68.06
9.5	558,299	18,235	0.0327	0.9673	49.68
10.5	540,064	72,057	0.1334	0.8666	48.06
11.5	468,007	62,456	0.1335	0.8665	41.65
12.5	405,551	46,467	0.1146	0.8854	36.09
13.5	359,084	77,181	0.2149	0.7851	31.95
14.5	281,903	182,450	0.6472	0.3528	25.09
15.5	116,877		0.0000	1.0000	8.85
16.5	116,877	34,320	0.2936	0.7064	8.85
17.5	82,557		0.0000	1.0000	6.25
18.5	82,557		0.0000	1.0000	6.25
19.5	82,557	16,692	0.2022	0.7978	6.25
20.5	65,865		0.0000	1.0000	4.99
21.5	65,865		0.0000	1.0000	4.99
22.5	65,865	28,900	0.4388	0.5612	4.99
23.5	36,964		0.0000	1.0000	2.80
24.5	36,964		0.0000	1.0000	2.80
25.5	36,964	19,540	0.5286	0.4714	2.80
26.5	17,424	5,000	0.2870	0.7130	1.32
27.5	12,424		0.0000	1.0000	0.94
28.5	12,424		0.0000	1.0000	0.94
29.5	12,424		0.0000	1.0000	0.94
30.5	12,424		0.0000	1.0000	0.94
31.5	12,424		0.0000	1.0000	0.94
32.5	12,424		0.0000	1.0000	0.94
33.5	12,424		0.0000	1.0000	0.94
34.5	12,424		0.0000	1.0000	0.94
35.5					0.94

KENTUCKY AMERICAN WATER COMPANY

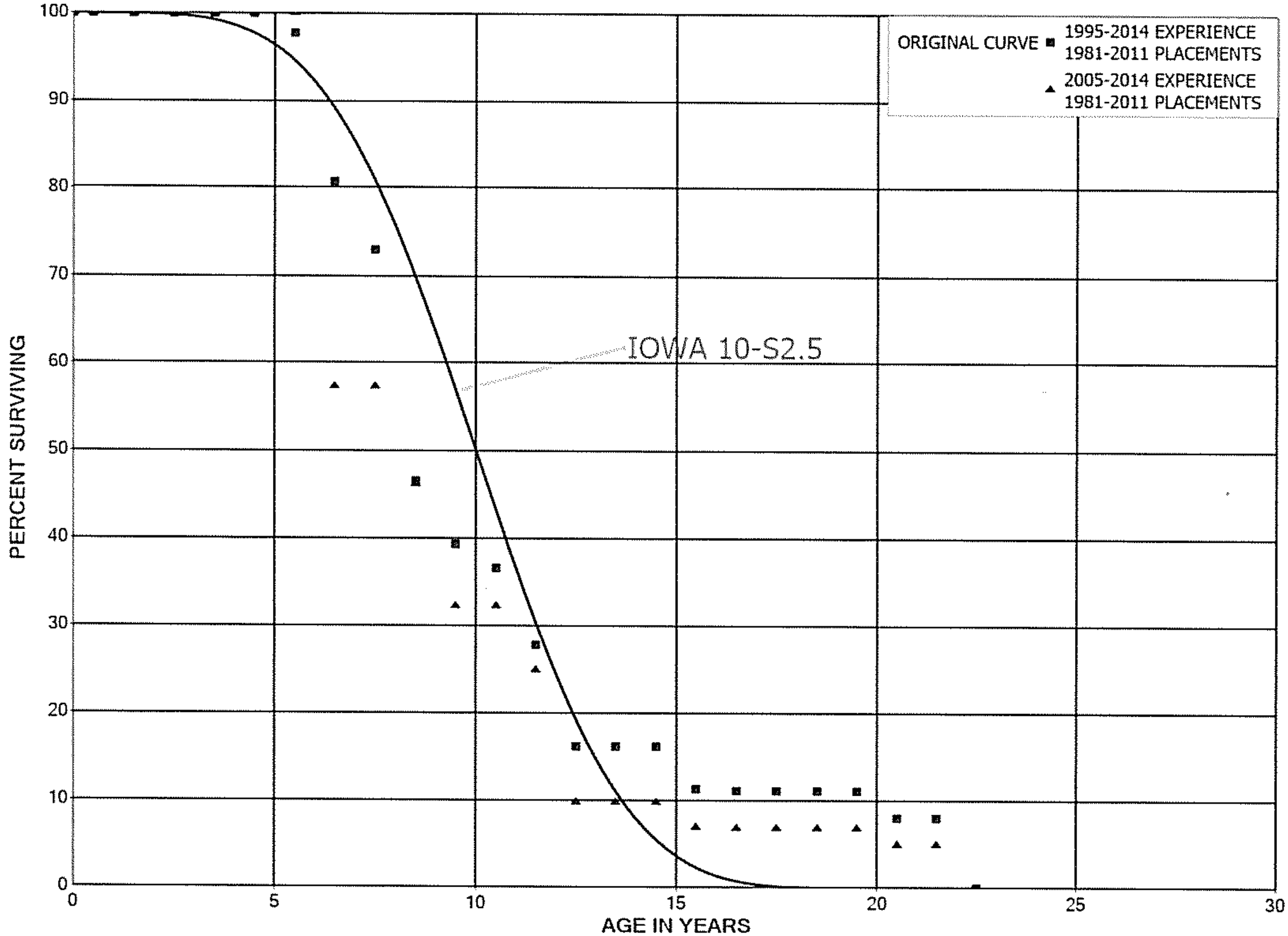
ACCOUNT 341.20 TRANSPORTATION EQUIPMENT - HEAVY DUTY TRUCKS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1979-2014 EXPERIENCE BAND 2005-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	2,503,636		0.0000	1.0000	100.00
0.5	2,081,640		0.0000	1.0000	100.00
1.5	1,625,680		0.0000	1.0000	100.00
2.5	1,248,560		0.0000	1.0000	100.00
3.5	1,182,693		0.0000	1.0000	100.00
4.5	966,401	89,729	0.0928	0.9072	100.00
5.5	961,379	63,646	0.0662	0.9338	90.72
6.5	699,313	147,181	0.2105	0.7895	84.71
7.5	626,737	49,945	0.0797	0.9203	66.88
8.5	595,359	206,522	0.3469	0.6531	61.55
9.5	388,838		0.0000	1.0000	40.20
10.5	405,530	72,057	0.1777	0.8223	40.20
11.5	333,473	19,022	0.0570	0.9430	33.06
12.5	314,451	46,467	0.1478	0.8522	31.17
13.5	339,544	77,181	0.2273	0.7727	26.57
14.5	262,363	182,450	0.6954	0.3046	20.53
15.5	79,913		0.0000	1.0000	6.25
16.5	99,453	34,320	0.3451	0.6549	6.25
17.5	65,133		0.0000	1.0000	4.09
18.5	65,133		0.0000	1.0000	4.09
19.5	65,133	16,692	0.2563	0.7437	4.09
20.5	48,441		0.0000	1.0000	3.05
21.5	48,441		0.0000	1.0000	3.05
22.5	48,441	28,900	0.5966	0.4034	3.05
23.5	19,540		0.0000	1.0000	1.23
24.5	19,540		0.0000	1.0000	1.23
25.5	36,964	19,540	0.5286	0.4714	1.23
26.5	17,424	5,000	0.2870	0.7130	0.58
27.5	12,424		0.0000	1.0000	0.41
28.5	12,424		0.0000	1.0000	0.41
29.5	12,424		0.0000	1.0000	0.41
30.5	12,424		0.0000	1.0000	0.41
31.5	12,424		0.0000	1.0000	0.41
32.5	12,424		0.0000	1.0000	0.41
33.5	12,424		0.0000	1.0000	0.41
34.5	12,424		0.0000	1.0000	0.41
35.5					0.41

KENTUCKY AMERICAN WATER COMPANY
ACCOUNT 341.30 TRANSPORTATION EQUIPMENT - AUTOS
ORIGINAL AND SMOOTH SURVIVOR CURVES



KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 341.30 TRANSPORTATION EQUIPMENT - AUTOS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1981-2011 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	252,253		0.0000	1.0000	100.00
0.5	252,253		0.0000	1.0000	100.00
1.5	252,253		0.0000	1.0000	100.00
2.5	265,152		0.0000	1.0000	100.00
3.5	243,668		0.0000	1.0000	100.00
4.5	322,901	7,185	0.0223	0.9777	100.00
5.5	377,445	65,876	0.1745	0.8255	97.77
6.5	354,086	33,902	0.0957	0.9043	80.71
7.5	303,613	109,996	0.3623	0.6377	72.98
8.5	193,617	30,159	0.1558	0.8442	46.54
9.5	163,458	11,515	0.0704	0.9296	39.29
10.5	151,943	36,700	0.2415	0.7585	36.52
11.5	115,243	47,841	0.4151	0.5849	27.70
12.5	67,402		0.0000	1.0000	16.20
13.5	67,402		0.0000	1.0000	16.20
14.5	67,402	20,493	0.3040	0.6960	16.20
15.5	46,909	734	0.0156	0.9844	11.28
16.5	46,175	62	0.0013	0.9987	11.10
17.5	46,114		0.0000	1.0000	11.08
18.5	46,114		0.0000	1.0000	11.08
19.5	46,114	12,899	0.2797	0.7203	11.08
20.5	33,215		0.0000	1.0000	7.98
21.5	33,215	33,215	1.0000		7.98
22.5					
23.5					
24.5					
25.5					
26.5					
27.5					
28.5					
29.5					
30.5					
31.5					
32.5	2,270		0.0000		
33.5					

KENTUCKY AMERICAN WATER COMPANY

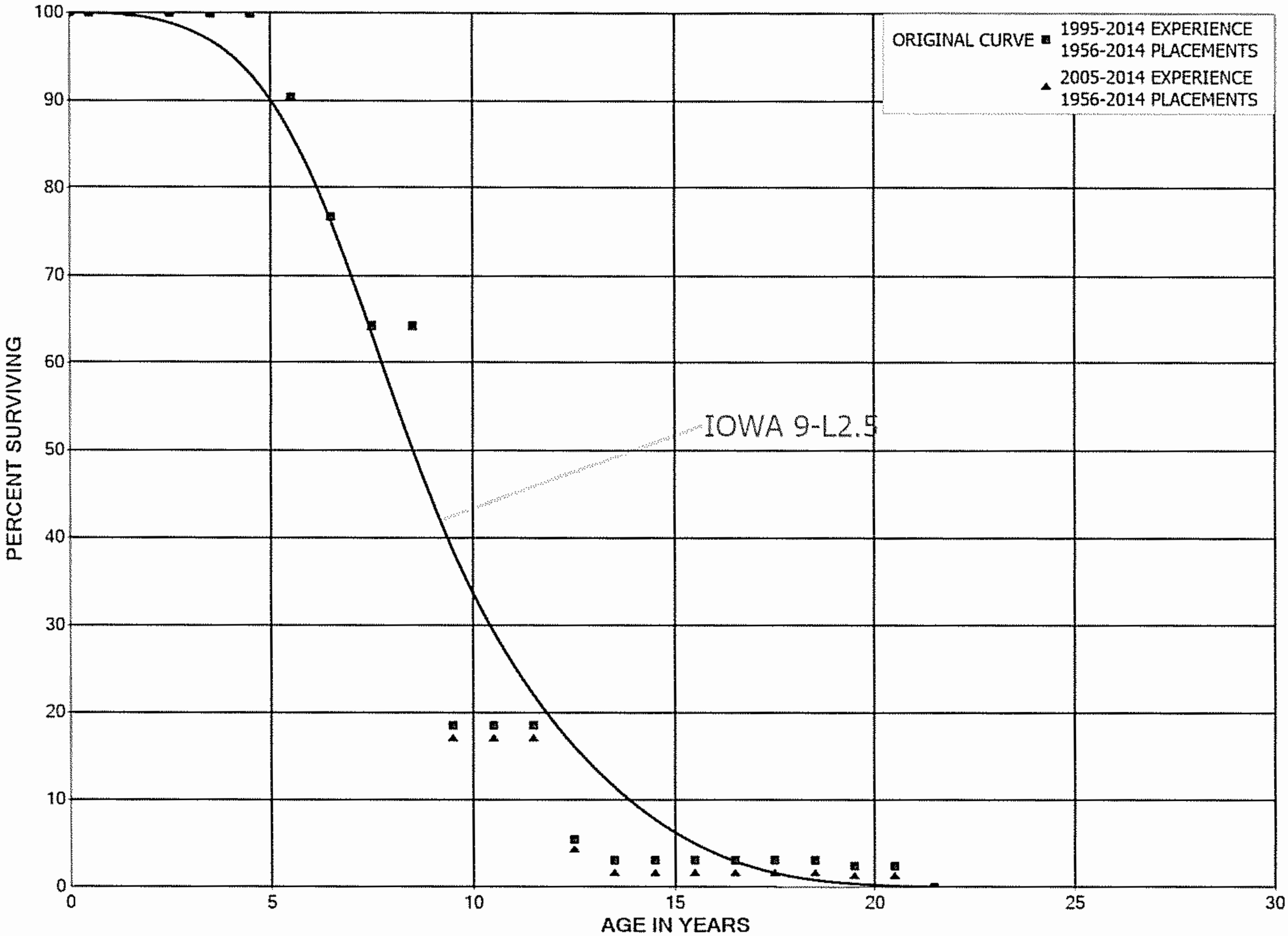
ACCOUNT 341.30 TRANSPORTATION EQUIPMENT - AUTOS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1981-2011 EXPERIENCE BAND 2005-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	135,673		0.0000	1.0000	100.00
0.5	151,848		0.0000	1.0000	100.00
1.5	151,848		0.0000	1.0000	100.00
2.5	151,848		0.0000	1.0000	100.00
3.5	120,279		0.0000	1.0000	100.00
4.5	120,279		0.0000	1.0000	100.00
5.5	154,371	65,876	0.4267	0.5733	100.00
6.5	89,069		0.0000	1.0000	57.33
7.5	125,084	24,679	0.1973	0.8027	57.33
8.5	100,405	30,159	0.3004	0.6996	46.02
9.5	70,246		0.0000	1.0000	32.19
10.5	70,246	16,133	0.2297	0.7703	32.19
11.5	54,113	32,825	0.6066	0.3934	24.80
12.5	34,188		0.0000	1.0000	9.76
13.5	34,188		0.0000	1.0000	9.76
14.5	67,402	20,493	0.3040	0.6960	9.76
15.5	46,909	734	0.0156	0.9844	6.79
16.5	46,175	62	0.0013	0.9987	6.68
17.5	46,114		0.0000	1.0000	6.68
18.5	46,114		0.0000	1.0000	6.68
19.5	46,114	12,899	0.2797	0.7203	6.68
20.5	33,215		0.0000	1.0000	4.81
21.5	33,215	33,215	1.0000		4.81
22.5					
23.5					
24.5					
25.5					
26.5					
27.5					
28.5					
29.5					
30.5					
31.5					
32.5	2,270		0.0000		
33.5					

KENTUCKY AMERICAN WATER COMPANY
ACCOUNT 341.40 TRANSPORTATION EQUIPMENT - OTHER
ORIGINAL AND SMOOTH SURVIVOR CURVES



KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 341.40 TRANSPORTATION EQUIPMENT - OTHER

ORIGINAL LIFE TABLE

PLACEMENT BAND 1956-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	1,076,430		0.0000	1.0000	100.00
0.5	1,003,604		0.0000	1.0000	100.00
1.5	851,370		0.0000	1.0000	100.00
2.5	563,803	972	0.0017	0.9983	100.00
3.5	527,352		0.0000	1.0000	99.83
4.5	416,106	39,251	0.0943	0.9057	99.83
5.5	362,647	54,910	0.1514	0.8486	90.41
6.5	210,118	34,081	0.1622	0.8378	76.72
7.5	83,287		0.0000	1.0000	64.28
8.5	83,287	59,337	0.7124	0.2876	64.28
9.5	26,943		0.0000	1.0000	18.48
10.5	26,943		0.0000	1.0000	18.48
11.5	26,943	19,097	0.7088	0.2912	18.48
12.5	7,846	3,384	0.4313	0.5687	5.38
13.5	2,626		0.0000	1.0000	3.06
14.5	2,626		0.0000	1.0000	3.06
15.5	2,626		0.0000	1.0000	3.06
16.5	2,626		0.0000	1.0000	3.06
17.5	2,626		0.0000	1.0000	3.06
18.5	2,626	589	0.2241	0.7759	3.06
19.5	2,038		0.0000	1.0000	2.38
20.5	2,038	2,038	1.0000		2.38
21.5					
22.5					
23.5					
24.5					
25.5					
26.5					
27.5					
28.5					
29.5					
30.5					
31.5					
32.5					
33.5					
34.5					
35.5					
36.5					
37.5					
38.5	440		0.0000		

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 341.40 TRANSPORTATION EQUIPMENT - OTHER

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1956-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	440	220	0.4999		
40.5	220		0.0000		
41.5	220		0.0000		
42.5	220		0.0000		
43.5	220		0.0000		
44.5	220		0.0000		
45.5	220		0.0000		
46.5	220		0.0000		
47.5	220		0.0000		
48.5	220		0.0000		
49.5	220		0.0000		
50.5	220		0.0000		
51.5	220		0.0000		
52.5	220		0.0000		
53.5	220		0.0000		
54.5	220		0.0000		
55.5	220		0.0000		
56.5	220		0.0000		
57.5	220	220	1.0000		
58.5					

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 341.40 TRANSPORTATION EQUIPMENT - OTHER

ORIGINAL LIFE TABLE

PLACEMENT BAND 1956-2014 EXPERIENCE BAND 2005-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	994,798		0.0000	1.0000	100.00
0.5	982,280		0.0000	1.0000	100.00
1.5	830,046		0.0000	1.0000	100.00
2.5	558,583	972	0.0017	0.9983	100.00
3.5	524,726		0.0000	1.0000	99.83
4.5	413,480	39,251	0.0949	0.9051	99.83
5.5	360,021	54,910	0.1525	0.8475	90.35
6.5	207,492	34,081	0.1643	0.8357	76.57
7.5	80,661		0.0000	1.0000	63.99
8.5	80,661	59,337	0.7356	0.2644	63.99
9.5	21,324		0.0000	1.0000	16.92
10.5	21,324		0.0000	1.0000	16.92
11.5	21,324	16,104	0.7552	0.2448	16.92
12.5	5,220	3,384	0.6482	0.3518	4.14
13.5	2,626		0.0000	1.0000	1.46
14.5	2,626		0.0000	1.0000	1.46
15.5	2,626		0.0000	1.0000	1.46
16.5	2,626		0.0000	1.0000	1.46
17.5	2,626		0.0000	1.0000	1.46
18.5	2,626	589	0.2241	0.7759	1.46
19.5	2,038		0.0000	1.0000	1.13
20.5	2,038	2,038	1.0000		1.13
21.5					
22.5					
23.5					
24.5					
25.5					
26.5					
27.5					
28.5					
29.5					
30.5					
31.5					
32.5					
33.5					
34.5					
35.5					
36.5					
37.5					
38.5					

KENTUCKY AMERICAN WATER COMPANY

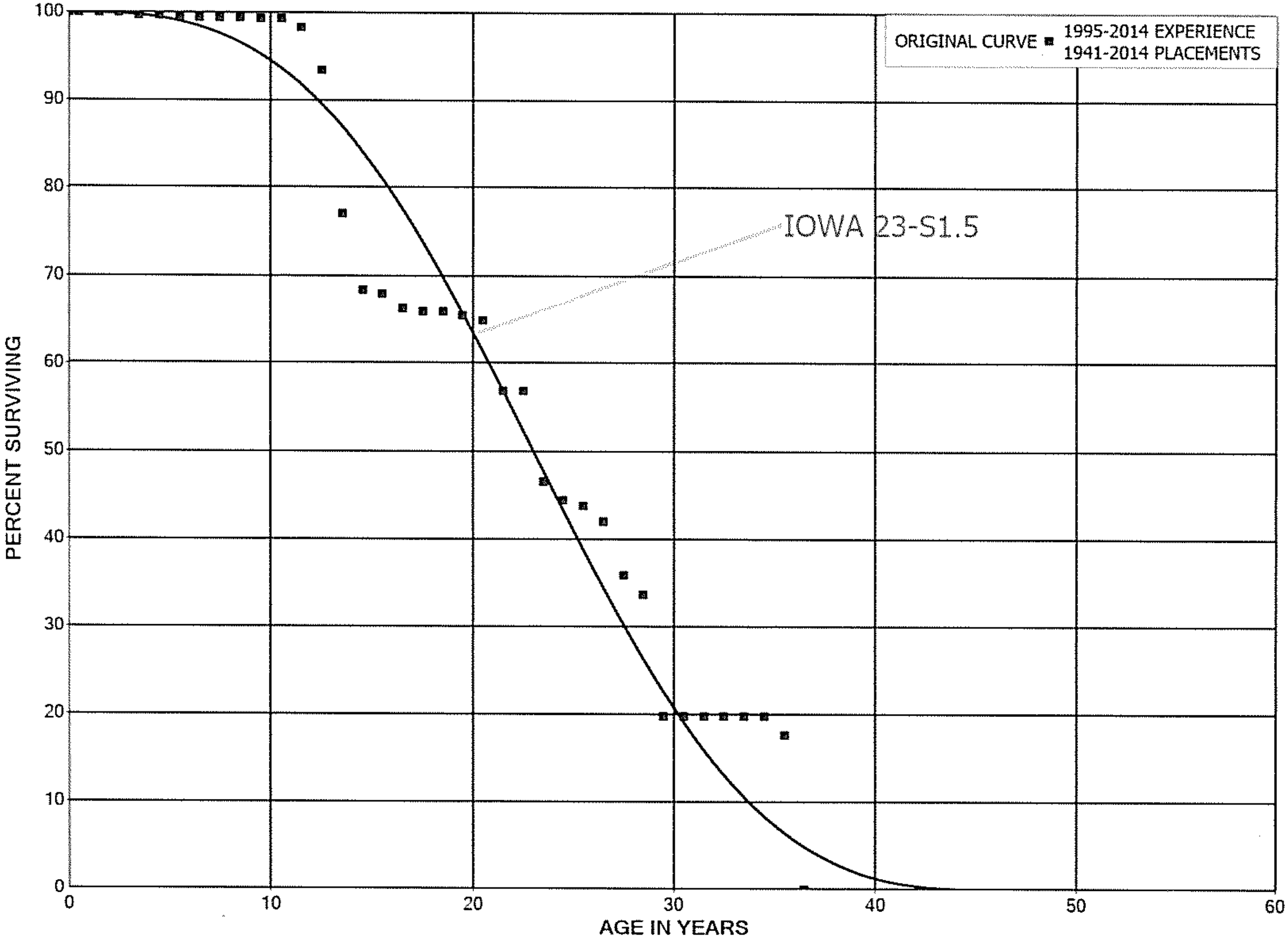
ACCOUNT 341.40 TRANSPORTATION EQUIPMENT - OTHER

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1956-2014 EXPERIENCE BAND 2005-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5					
40.5					
41.5					
42.5					
43.5					
44.5					
45.5					
46.5					
47.5					
48.5	220		0.0000		
49.5	220		0.0000		
50.5	220		0.0000		
51.5	220		0.0000		
52.5	220		0.0000		
53.5	220		0.0000		
54.5	220		0.0000		
55.5	220		0.0000		
56.5	220		0.0000		
57.5	220	220	1.0000		
58.5					

KENTUCKY AMERICAN WATER COMPANY
ACCOUNT 345 POWER OPERATED EQUIPMENT
ORIGINAL AND SMOOTH SURVIVOR CURVES



KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 345 POWER OPERATED EQUIPMENT

ORIGINAL LIFE TABLE

PLACEMENT BAND 1941-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	1,444,926		0.0000	1.0000	100.00
0.5	1,443,272		0.0000	1.0000	100.00
1.5	1,454,975		0.0000	1.0000	100.00
2.5	1,451,034	5,061	0.0035	0.9965	100.00
3.5	1,463,845		0.0000	1.0000	99.65
4.5	1,511,642	4,157	0.0027	0.9973	99.65
5.5	1,525,874		0.0000	1.0000	99.38
6.5	1,553,515		0.0000	1.0000	99.38
7.5	1,558,015		0.0000	1.0000	99.38
8.5	1,559,667	779	0.0005	0.9995	99.38
9.5	576,703		0.0000	1.0000	99.33
10.5	576,703	5,876	0.0102	0.9898	99.33
11.5	555,949	27,605	0.0497	0.9503	98.32
12.5	528,344	92,367	0.1748	0.8252	93.43
13.5	432,573	48,734	0.1127	0.8873	77.10
14.5	383,839	2,620	0.0068	0.9932	68.41
15.5	354,802	8,499	0.0240	0.9760	67.95
16.5	359,266	1,861	0.0052	0.9948	66.32
17.5	291,254		0.0000	1.0000	65.98
18.5	263,663	1,883	0.0071	0.9929	65.98
19.5	207,802	1,717	0.0083	0.9917	65.50
20.5	206,085	25,862	0.1255	0.8745	64.96
21.5	180,224		0.0000	1.0000	56.81
22.5	175,784	31,843	0.1811	0.8189	56.81
23.5	142,471	6,421	0.0451	0.9549	46.52
24.5	94,673	1,582	0.0167	0.9833	44.42
25.5	90,443	3,682	0.0407	0.9593	43.68
26.5	30,909	4,500	0.1456	0.8544	41.90
27.5	26,409	1,652	0.0626	0.9374	35.80
28.5	24,757	10,178	0.4111	0.5889	33.56
29.5	14,579		0.0000	1.0000	19.76
30.5	14,579		0.0000	1.0000	19.76
31.5	14,579		0.0000	1.0000	19.76
32.5	14,579		0.0000	1.0000	19.76
33.5	14,579		0.0000	1.0000	19.76
34.5	14,579	1,617	0.1109	0.8891	19.76
35.5	12,962	12,962	1.0000		17.57
36.5					
37.5					
38.5					

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 345 POWER OPERATED EQUIPMENT

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1941-2014 EXPERIENCE BAND 1995-2014

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5					
40.5					
41.5					
42.5					
43.5					
44.5					
45.5					
46.5					
47.5					
48.5					
49.5					
50.5					
51.5					
52.5					
53.5	5,387		0.0000		
54.5	5,387		0.0000		
55.5	5,387		0.0000		
56.5	5,387		0.0000		
57.5	5,387		0.0000		
58.5	5,387		0.0000		
59.5	5,387		0.0000		
60.5	5,387		0.0000		
61.5	5,387		0.0000		
62.5	5,387		0.0000		
63.5	5,387		0.0000		
64.5	5,387		0.0000		
65.5	5,387		0.0000		
66.5	5,387		0.0000		
67.5	5,387		0.0000		
68.5	5,387		0.0000		
69.5	5,387		0.0000		
70.5	5,387		0.0000		
71.5	5,387		0.0000		
72.5	5,387	5,387	1.0000		
73.5					

PART VIII. NET SALVAGE STATISTICS

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 304.10 STRUCTURES AND IMPROVEMENTS - SOURCE OF SUPPLY

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	COST OF REMOVAL PCT	GROSS SALVAGE AMOUNT	GROSS SALVAGE PCT	NET SALVAGE AMOUNT	NET SALVAGE PCT
1987	450	9,215			0	9,215-	
1988	450	9,215			0	9,215-	
1989							
1990							
1991	5,311		0		0		0
1992							
1993	3,050		0		0		0
1994							
1995							
1996							
1997							
1998							
1999							
2000							
2001							
2002							
2003	24,347	87,305	359		0	87,305-	359-
2004	38,923	115,482	297		0	115,482-	297-
2005							
2006	1,100		0		0		0
2007							
2008	11,676		0		0		0
2009	6,621		0		0		0
2010							
2011							
2012	6,593	595	9		0	595-	9-
2013	6,377	86,112			0	86,112-	
2014	168,547	32,857	19		0	32,857-	19-
TOTAL	273,445	340,781	125		0	340,781-	125-

THREE-YEAR MOVING AVERAGES

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	COST OF REMOVAL PCT	GROSS SALVAGE AMOUNT	GROSS SALVAGE PCT	NET SALVAGE AMOUNT	NET SALVAGE PCT
87-89	300	6,143			0	6,143-	
88-90	150	3,072			0	3,072-	
89-91	1,770		0		0		0
90-92	1,770		0		0		0
91-93	2,787		0		0		0
92-94	1,017		0		0		0
93-95	1,017		0		0		0
94-96							
95-97							

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 304.10 STRUCTURES AND IMPROVEMENTS - SOURCE OF SUPPLY

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	COST OF REMOVAL PCT	GROSS SALVAGE AMOUNT	GROSS SALVAGE PCT	NET SALVAGE AMOUNT	NET SALVAGE PCT
THREE-YEAR MOVING AVERAGES							
96-98							
97-99							
98-00							
99-01							
00-02							
01-03	8,116	29,102	359		0	29,102-	359-
02-04	21,090	67,596	321		0	67,596-	321-
03-05	21,090	67,596	321		0	67,596-	321-
04-06	13,341	38,494	289		0	38,494-	289-
05-07	367		0		0		0
06-08	4,259		0		0		0
07-09	6,099		0		0		0
08-10	6,099		0		0		0
09-11	2,207		0		0		0
10-12	2,198	198	9		0	198-	9-
11-13	4,323	28,902	669		0	28,902-	669-
12-14	60,506	39,855	66		0	39,855-	66-
FIVE-YEAR AVERAGE							
10-14	36,303	23,913	66		0	23,913-	66-

KENTUCKY AMERICAN WATER COMPANY

ACCOUNTS 304.20 AND 304.30 STRUCTURES AND IMPROVEMENTS

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	PCT	GROSS SALVAGE AMOUNT	PCT	NET SALVAGE AMOUNT	PCT
1982	119		0		0		0
1983	3,903	1,034	26		0	1,034-	26-
1984	4,200		0		0		0
1985	4,215		0		0		0
1986	13,945		0		0		0
1987	9,195	1,628	18		0	1,628-	18-
1988	45,747	13,140	29		0	13,140-	29-
1989							
1990	27,910	3,615	13		0	3,615-	13-
1991	79,308	19,652	25		0	19,652-	25-
1992	28,738	8,163	28	2,436	8	5,727-	20-
1993	4,601	825	18		0	825-	18-
1994	500		0		0		0
1995							
1996							
1997							
1998							
1999	17,195	7,900	46		0	7,900-	46-
2000	92,575	38,325	41		0	38,325-	41-
2001	35,834	5,500	15		0	5,500-	15-
2002	17,127	70,552	412		0	70,552-	412-
2003	105	1,378			0	1,378-	
2004	200		0		0		0
2005	5,347	5,943	111		0	5,943-	111-
2006	24,500	25-	0		0	25	0
2007	5,991		0		0		0
2008	391,632		0		0		0
2009	91,226	347	0	1	0	346-	0
2010	8,373	73	1		0	73-	1-
2011	92,732	7,321	8		0	7,321-	8-
2012	164,608	24,151	15		0	24,151-	15-
2013	59,921	9,912	17		0	9,912-	17-
2014	1,493,901	11,574	1		0	11,574-	1-
TOTAL	2,723,647	231,009	8	2,437	0	228,572-	8-

THREE-YEAR MOVING AVERAGES

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	PCT	GROSS SALVAGE AMOUNT	PCT	NET SALVAGE AMOUNT	PCT
82-84	2,741	345	13		0	345-	13-
83-85	4,106	345	8		0	345-	8-
84-86	7,453		0		0		0
85-87	9,118	543	6		0	543-	6-

KENTUCKY AMERICAN WATER COMPANY

ACCOUNTS 304.20 AND 304.30 STRUCTURES AND IMPROVEMENTS

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	PCT	GROSS SALVAGE AMOUNT	PCT	NET SALVAGE AMOUNT	PCT
THREE-YEAR MOVING AVERAGES							
86-88	22,962	4,923	21		0	4,923-	21-
87-89	18,314	4,923	27		0	4,923-	27-
88-90	24,552	5,585	23		0	5,585-	23-
89-91	35,739	7,756	22		0	7,756-	22-
90-92	45,319	10,477	23	812	2	9,665-	21-
91-93	37,549	9,547	25	812	2	8,735-	23-
92-94	11,280	2,996	27	812	7	2,184-	19-
93-95	1,700	275	16		0	275-	16-
94-96	167		0		0		0
95-97							
96-98							
97-99	5,732	2,633	46		0	2,633-	46-
98-00	36,590	15,408	42		0	15,408-	42-
99-01	48,534	17,242	36		0	17,242-	36-
00-02	48,512	38,126	79		0	38,126-	79-
01-03	17,689	25,810	146		0	25,810-	146-
02-04	5,811	23,977	413		0	23,977-	413-
03-05	1,884	2,441	130		0	2,441-	130-
04-06	10,016	1,973	20		0	1,973-	20-
05-07	11,946	1,973	17		0	1,973-	17-
06-08	140,708	8-	0		0	8	0
07-09	162,950	116	0		0	115-	0
08-10	163,744	140	0		0	140-	0
09-11	64,110	2,580	4		0	2,580-	4-
10-12	88,571	10,515	12		0	10,515-	12-
11-13	105,753	13,795	13		0	13,795-	13-
12-14	572,810	15,212	3		0	15,212-	3-
FIVE-YEAR AVERAGE							
10-14	363,907	10,606	3		0	10,606-	3-

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 304.40 STRUCTURES AND IMPROVEMENTS - TRANSMISSION AND DISTRIBUTION

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	COST OF REMOVAL PCT	GROSS SALVAGE AMOUNT	GROSS SALVAGE PCT	NET SALVAGE AMOUNT	NET SALVAGE PCT
2006	2,300		0		0		0
2007							
2008	39,028		0		0		0
2009	708	1,556	220		0	1,556-	220-
2010							
2011							
2012							
2013	53		0		0		0
2014	22,657	110	0		0	110-	0
TOTAL	64,746	1,666	3		0	1,666-	3-
THREE-YEAR MOVING AVERAGES							
06-08	13,776		0		0		0
07-09	13,245	519	4		0	519-	4-
08-10	13,245	519	4		0	519-	4-
09-11	236	519	220		0	519-	220-
10-12							
11-13	18		0		0		0
12-14	7,570	37	0		0	37-	0
FIVE-YEAR AVERAGE							
10-14	4,542	22	0		0	22-	0

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 304.60 STRUCTURES AND IMPROVEMENTS - OFFICE BUILDINGS

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	PCT	GROSS SALVAGE AMOUNT	PCT	NET SALVAGE AMOUNT	PCT
1980	5,388	2,244	42	9,131	169	6,887	128
1981							
1982	46,850	9,646	21	50	0	9,596-	20-
1983	385		0		0		0
1984							
1985	660		0		0		0
1986							
1987	16,089	2,000	12		0	2,000-	12-
1988	34,846	2,675	8	3,500	10	825	2
1989							
1990	17,631	7,406	42		0	7,406-	42-
1991	28,515-		0		0		0
1992	5,155	300	6	4,196	81	3,896	76
1993	2,903	361	12	50	2	311-	11-
1994	6,294	502	8		0	502-	8-
1995							
1996							
1997							
1998							
1999	46,016		0		0		0
2000	1,901	551	29		0	551-	29-
2001							
2002							
2003	33,675		0		0		0
2004							
2005							
2006							
2007	6,099		0		0		0
2008	40,837		0		0		0
2009	13,217	2,605	20		0	2,605-	20-
2010	2,337		0	417	18	417	18
2011	969	1,019	105		0	1,019-	105-
2012	4,057	2,618	65		0	2,618-	65-
2013	79,682	27,982	35		0	27,982-	35-
2014	72,299	21,600	30		0	21,600-	30-
TOTAL	408,773	81,509	20	17,344	4	64,165-	16-

THREE-YEAR MOVING AVERAGES

80-82	17,413	3,963	23	3,060	18	903-	5-
81-83	15,745	3,215	20	17	0	3,199-	20-

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 304.60 STRUCTURES AND IMPROVEMENTS - OFFICE BUILDINGS

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	PCT	GROSS SALVAGE AMOUNT	PCT	NET SALVAGE AMOUNT	PCT
THREE-YEAR MOVING AVERAGES							
82-84	15,745	3,215	20	17	0	3,199-	20-
83-85	348		0		0		0
84-86	220		0		0		0
85-87	5,583	667	12		0	667-	12-
86-88	16,978	1,558	9	1,167	7	392-	2-
87-89	16,978	1,558	9	1,167	7	392-	2-
88-90	17,492	3,360	19	1,167	7	2,194-	13-
89-91	3,628-	2,469	68-		0	2,469-	68
90-92	1,910-	2,569	135-	1,399	73-	1,170-	61
91-93	6,819-	220	3-	1,415	21-	1,195	18-
92-94	4,784	388	8	1,415	30	1,028	21
93-95	3,066	288	9	17	1	271-	9-
94-96	2,098	167	8		0	167-	8-
95-97							
96-98							
97-99	15,339		0		0		0
98-00	15,972	184	1		0	184-	1-
99-01	15,972	184	1		0	184-	1-
00-02	634	184	29		0	184-	29-
01-03	11,225		0		0		0
02-04	11,225		0		0		0
03-05	11,225		0		0		0
04-06							
05-07	2,033		0		0		0
06-08	15,645		0		0		0
07-09	20,051	868	4		0	868-	4-
08-10	18,797	868	5	139	1	729-	4-
09-11	5,507	1,208	22	139	3	1,069-	19-
10-12	2,454	1,212	49	139	6	1,073-	44-
11-13	28,236	10,539	37		0	10,539-	37-
12-14	52,013	17,400	33		0	17,400-	33-
FIVE-YEAR AVERAGE							
10-14	31,869	10,644	33	83	0	10,560-	33-

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 304.70 STRUCTURES AND IMPROVEMENTS - STORE, SHOP AND GARAGE

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	COST OF REMOVAL PCT	GROSS SALVAGE AMOUNT	GROSS SALVAGE PCT	NET SALVAGE AMOUNT	NET SALVAGE PCT
2008	29,115		0		0		0
2009							
2010	7,226		0		0		0
2011							
2012							
2013							
2014	35,269	174	0		0	174-	0
TOTAL	71,611	174	0		0	174-	0
THREE-YEAR MOVING AVERAGES							
08-10	12,114		0		0		0
09-11	2,409		0		0		0
10-12	2,409		0		0		0
11-13							
12-14	11,756	58	0		0	58-	0
FIVE-YEAR AVERAGE							
10-14	8,499	35	0		0	35-	0

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 304.80 STRUCTURES AND IMPROVEMENTS - MISCELLANEOUS

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	COST OF REMOVAL PCT	GROSS SALVAGE AMOUNT	GROSS SALVAGE PCT	NET SALVAGE AMOUNT	NET SALVAGE PCT
2001	721		0		0		0
2002	7,539	17,616	234		0	17,616-	234-
2003	5,250		0		0		0
2004	109,674	239	0		0	239-	0
2005	6,000		0		0		0
2006							
2007							
2008	20,629		0		0		0
2009	5,551		0		0		0
2010	2,300		0		0		0
2011	161,507		0		0		0
2012	7,457	1,532	21		0	1,532-	21-
2013	43,417		0		0		0
2014	468,317	501	0		0	501-	0
TOTAL	838,361	19,889	2		0	19,889-	2-
THREE-YEAR MOVING AVERAGES							
01-03	4,503	5,872	130		0	5,872-	130-
02-04	40,821	5,952	15		0	5,952-	15-
03-05	40,308	80	0		0	80-	0
04-06	38,558	80	0		0	80-	0
05-07	2,000		0		0		0
06-08	6,876		0		0		0
07-09	8,726		0		0		0
08-10	9,493		0		0		0
09-11	56,453		0		0		0
10-12	57,088	511	1		0	511-	1-
11-13	70,794	511	1		0	511-	1-
12-14	173,064	678	0		0	678-	0
FIVE-YEAR AVERAGE							
10-14	136,600	407	0		0	407-	0

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 305.00 COLLECTING AND IMPOUNDING RESERVOIRS

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	COST OF REMOVAL PCT	GROSS SALVAGE AMOUNT	GROSS SALVAGE PCT	NET SALVAGE AMOUNT	NET SALVAGE PCT
2008	11,467		0		0		0
2009							
2010							
2011	9,156	763	8		0	763-	8-
2012	3,536		0		0		0
2013							
2014	137,748		0		0		0
TOTAL	161,907	763	0		0	763-	0
THREE-YEAR MOVING AVERAGES							
08-10	3,822		0		0		0
09-11	3,052	254	8		0	254-	8-
10-12	4,231	254	6		0	254-	6-
11-13	4,231	254	6		0	254-	6-
12-14	47,094		0		0		0
FIVE-YEAR AVERAGE							
10-14	30,088	153	1		0	153-	1-

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 306.00 LAKE, RIVER AND OTHER INTAKES

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	PCT	GROSS SALVAGE AMOUNT	PCT	NET SALVAGE AMOUNT	PCT
2002	5,189	99,254			0	99,254-	
2003							
2004							
2005							
2006	20,500	72,600	354		0	72,600-	354-
2007	3,666		0		0		0
2008							
2009							
2010							
2011	7,977	35,837	449		0	35,837-	449-
2012							
2013		1,065				1,065-	
2014	25,154	347	1		0	347-	1-
TOTAL	62,486	209,103	335		0	209,103-	335-
THREE-YEAR MOVING AVERAGES							
02-04	1,730	33,085			0	33,085-	
03-05							
04-06	6,833	24,200	354		0	24,200-	354-
05-07	8,055	24,200	300		0	24,200-	300-
06-08	8,055	24,200	300		0	24,200-	300-
07-09	1,222		0		0		0
08-10							
09-11	2,659	11,946	449		0	11,946-	449-
10-12	2,659	11,946	449		0	11,946-	449-
11-13	2,659	12,301	463		0	12,301-	463-
12-14	8,385	471	6		0	471-	6-
FIVE-YEAR AVERAGE							
10-14	6,626	7,450	112		0	7,450-	112-

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 309.00 SUPPLY MAINS

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	PCT	GROSS SALVAGE AMOUNT	PCT	NET SALVAGE AMOUNT	PCT
1980	2,299	3,756	163		0	3,756-	163-
1981	1,428	5,618	393		0	5,618-	393-
1982	4,924	727	15	5,449	111	4,722	96
1983	763	2,069	271		0	2,069-	271-
1984	4,660	2,519	54	315	7	2,204-	47-
1985	351	1,205	343		0	1,205-	343-
1986	4,522	3,166	70		0	3,166-	70-
1987	2,692	4,189	156	137	5	4,052-	151-
1988	1,277	2,686	210		0	2,686-	210-
1989	275,533	191,017	69	203,342	74	12,325	4
1990	2,425-		0		0		0
1991	45	747			0	747-	
1992	366	1,486	406		0	1,486-	406-
1993							
1994	5,485	15,413	281	4,879	89	10,534-	192-
1995							
1996							
1997							
1998							
1999							
2000	49	3,000			0	3,000-	
2001							
2002							
2003							
2004							
2005							
2006							
2007							
2008	412		0		0		0
2009		32		62		29	
2010	1		0		0		0
2011	391	1,177	301		0	1,177-	301-
2012	21		0		0		0
2013	305	879	288		0	879-	288-
2014	15,497	1	0		0	1-	0
TOTAL	318,596	239,687	75	214,184	67	25,503-	8-

THREE-YEAR MOVING AVERAGES

80-82	2,884	3,367	117	1,816	63	1,551-	54-
81-83	2,372	2,805	118	1,816	77	988-	42-

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 309.00 SUPPLY MAINS

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	COST OF REMOVAL PCT	GROSS SALVAGE AMOUNT	GROSS SALVAGE PCT	NET SALVAGE AMOUNT	NET SALVAGE PCT
THREE-YEAR MOVING AVERAGES							
82-84	3,449	1,772	51	1,921	56	150	4
83-85	1,925	1,931	100	105	5	1,826-	95-
84-86	3,178	2,297	72	105	3	2,192-	69-
85-87	2,522	2,853	113	46	2	2,808-	111-
86-88	2,830	3,347	118	46	2	3,301-	117-
87-89	93,167	65,964	71	67,826	73	1,862	2
88-90	91,462	64,568	71	67,781	74	3,213	4
89-91	91,051	63,921	70	67,781	74	3,859	4
90-92	671-	744	111-		0	744-	111
91-93	137	744	543		0	744-	543-
92-94	1,950	5,633	289	1,626	83	4,007-	205-
93-95	1,828	5,138	281	1,626	89	3,511-	192-
94-96	1,828	5,138	281	1,626	89	3,511-	192-
95-97							
96-98							
97-99							
98-00	16	1,000			0	1,000-	
99-01	16	1,000			0	1,000-	
00-02	16	1,000			0	1,000-	
01-03							
02-04							
03-05							
04-06							
05-07							
06-08	137		0		0		0
07-09	137	11	8	21	15	10	7
08-10	138	11	8	21	15	10	7
09-11	131	403	308	21	16	382-	293-
10-12	138	392	285		0	392-	285-
11-13	239	685	287		0	685-	287-
12-14	5,274	293	6		0	293-	6-
FIVE-YEAR AVERAGE							
10-14	3,243	411	13		0	411-	13-

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 310.10 OTHER POWER GENERATION EQUIPMENT

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	COST OF REMOVAL PCT	GROSS SALVAGE AMOUNT	GROSS SALVAGE PCT	NET SALVAGE AMOUNT	NET SALVAGE PCT
2002	9,442	29	0		0	29-	0
2003	27		0		0		0
2004							
2005							
2006							
2007							
2008		53,899				53,899-	
2009	14,501		0		0		0
2010	16,447		0		0		0
2011	14,473		0		0		0
2012	7,941	633	8		0	633-	8-
2013		693				693-	
2014	79,936	24,119	30		0	24,119-	30-
TOTAL	142,766	79,373	56		0	79,373-	56-
THREE-YEAR MOVING AVERAGES							
02-04	3,156	10	0		0	10-	0
03-05	9		0		0		0
04-06							
05-07							
06-08		17,966				17,966-	
07-09	4,834	17,966	372		0	17,966-	372-
08-10	10,316	17,966	174		0	17,966-	174-
09-11	15,140		0		0		0
10-12	12,954	211	2		0	211-	2-
11-13	7,471	442	6		0	442-	6-
12-14	29,292	8,481	29		0	8,481-	29-
FIVE-YEAR AVERAGE							
10-14	23,759	5,089	21		0	5,089-	21-

KENTUCKY AMERICAN WATER COMPANY

ACCOUNTS 311.20 THRU 311.54 PUMPING EQUIPMENT

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	PCT	GROSS SALVAGE AMOUNT	PCT	NET SALVAGE AMOUNT	PCT
1980	6,846	581	8		0	581-	8-
1981	111,666	6,609	6		0	6,609-	6-
1982	20,804		0		0		0
1983	8,641	7,893	91		0	7,893-	91-
1984	15,402	28,100	182		0	28,100-	182-
1985	25,509		0		0		0
1986	35,582	1,265	4		0	1,265-	4-
1987	65,960		0		0		0
1988	117,243	37,346	32		0	37,346-	32-
1989							
1990	53,741	19,720	37		0	19,720-	37-
1991	142,027	1,100	1		0	1,100-	1-
1992	1,502,228	87,842	6	2,000	0	85,842-	6-
1993	83,349	7,243	9		0	7,243-	9-
1994	54,193	6,368	12		0	6,368-	12-
1995							
1996							
1997							
1998							
1999	51,242	18,591	36		0	18,591-	36-
2000	6,563	265	4		0	265-	4-
2001	47,961		0		0		0
2002	17,353	5,905	34	3,459	20	2,446-	14-
2003	65,459	11,758	18	133	0	11,626-	18-
2004				1,829		1,829	
2005				5,191		5,191	
2006	10,400	21,530	207	12,361-	119-	33,891-	326-
2007	111,566		0		0		0
2008	124,691	168,362	135		0	168,362-	135-
2009	4,190		0		0		0
2010	20,504	1,045	5		0	1,045-	5-
2011	280,818	107,712	38		0	107,712-	38-
2012	160,429	8,365	5		0	8,365-	5-
2013	80,256	17,956	22		0	17,956-	22-
2014	3,925,971	74,635	2		0	74,635-	2-
TOTAL	7,150,594	640,191	9	250	0	639,941-	9-

THREE-YEAR MOVING AVERAGES

80-82	46,439	2,397	5		0	2,397-	5-
81-83	47,037	4,834	10		0	4,834-	10-

KENTUCKY AMERICAN WATER COMPANY

ACCOUNTS 311.20 THRU 311.54 PUMPING EQUIPMENT

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	PCT	GROSS SALVAGE AMOUNT	PCT	NET SALVAGE AMOUNT	PCT
THREE-YEAR MOVING AVERAGES							
82-84	14,949	11,998	80		0	11,998-	80-
83-85	16,517	11,998	73		0	11,998-	73-
84-86	25,498	9,788	38		0	9,788-	38-
85-87	42,350	422	1		0	422-	1-
86-88	72,928	12,870	18		0	12,870-	18-
87-89	61,068	12,449	20		0	12,449-	20-
88-90	56,995	19,022	33		0	19,022-	33-
89-91	65,256	6,940	11		0	6,940-	11-
90-92	565,999	36,221	6	667	0	35,554-	6-
91-93	575,868	32,062	6	667	0	31,395-	5-
92-94	546,590	33,818	6	667	0	33,151-	6-
93-95	45,847	4,537	10		0	4,537-	10-
94-96	18,064	2,123	12		0	2,123-	12-
95-97							
96-98							
97-99	17,081	6,197	36		0	6,197-	36-
98-00	19,268	6,285	33		0	6,285-	33-
99-01	35,255	6,285	18		0	6,285-	18-
00-02	23,959	2,057	9	1,153	5	904-	4-
01-03	43,591	5,888	14	1,197	3	4,691-	11-
02-04	27,604	5,888	21	1,807	7	4,081-	15-
03-05	21,820	3,919	18	2,384	11	1,535-	7-
04-06	3,467	7,177	207	1,780-	51-	8,957-	258-
05-07	40,655	7,177	18	2,390-	6-	9,567-	24-
06-08	82,219	63,297	77	4,120-	5-	67,418-	82-
07-09	80,149	56,121	70		0	56,121-	70-
08-10	49,795	56,469	113		0	56,469-	113-
09-11	101,838	36,252	36		0	36,252-	36-
10-12	153,917	39,041	25		0	39,041-	25-
11-13	173,834	44,678	26		0	44,678-	26-
12-14	1,388,885	33,652	2		0	33,652-	2-
FIVE-YEAR AVERAGE							
10-14	893,596	41,943	5		0	41,943-	5-

KENTUCKY AMERICAN WATER COMPANY

ACCOUNTS 320.10 AND 320.11 PURIFICATION SYSTEM

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	PCT	GROSS SALVAGE AMOUNT	PCT	NET SALVAGE AMOUNT	PCT
1980		7,727				7,727-	
1981	26,783	29,727	111		0	29,727-	111-
1982	42,186	23,427	56		0	23,427-	56-
1983	22,018		0		0		0
1984	1,400		0		0		0
1985	69,458	7,000	10		0	7,000-	10-
1986	147,206		0		0		0
1987	22,470	3,622	16	226	1	3,396-	15-
1988	245,366	175,800	72		0	175,800-	72-
1989	132,745	16,258	12		0	16,258-	12-
1990	201,156	30,074	15	175	0	29,899-	15-
1991	317,893	32,773	10	820	0	31,953-	10-
1992	131,590	83,640	64		0	83,640-	64-
1993	253,125	19,185	8	1,068	0	18,117-	7-
1994	359,656	3,997	1		0	3,997-	1-
1995							
1996							
1997							
1998							
1999	84,970	2,423	3		0	2,423-	3-
2000	298,470	25,131	8		0	25,131-	8-
2001	26,267	3,765	14		0	3,765-	14-
2002	15,797	2,234	14		0	2,234-	14-
2003	36,944	10,965	30		0	10,965-	30-
2004							
2005	22,500		0		0		0
2006	122,300	4,797	4		0	4,797-	4-
2007	231,024	4,933	2		0	4,933-	2-
2008	174,737	110,000	63		0	110,000-	63-
2009	61,811		0		0		0
2010	44,346	1,032	2		0	1,032-	2-
2011	168,236	5,507	3		0	5,507-	3-
2012	842,303	36,360	4		0	36,360-	4-
2013	52,913	37,195	70		0	37,195-	70-
2014	8,586,141	185,731	2		0	185,731-	2-
TOTAL	12,741,812	863,303	7	2,289	0	861,014-	7-

THREE-YEAR MOVING AVERAGES

80-82	22,990	20,294	88		0	20,294-	88-
81-83	30,329	17,718	58		0	17,718-	58-

KENTUCKY AMERICAN WATER COMPANY

ACCOUNTS 320.10 AND 320.11 PURIFICATION SYSTEM

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	PCT	GROSS SALVAGE AMOUNT	PCT	NET SALVAGE AMOUNT	PCT
THREE-YEAR MOVING AVERAGES							
82-84	21,868	7,809	36		0	7,809-	36-
83-85	30,959	2,333	8		0	2,333-	8-
84-86	72,688	2,333	3		0	2,333-	3-
85-87	79,711	3,541	4	75	0	3,465-	4-
86-88	138,347	59,807	43	75	0	59,732-	43-
87-89	133,527	65,227	49	75	0	65,151-	49-
88-90	193,089	74,044	38	58	0	73,986-	38-
89-91	217,265	26,368	12	332	0	26,037-	12-
90-92	216,880	48,829	23	332	0	48,497-	22-
91-93	234,203	45,199	19	629	0	44,570-	19-
92-94	248,124	35,607	14	356	0	35,251-	14-
93-95	204,260	7,727	4	356	0	7,371-	4-
94-96	119,885	1,332	1		0	1,332-	1-
95-97							
96-98							
97-99	28,323	808	3		0	808-	3-
98-00	127,813	9,185	7		0	9,185-	7-
99-01	136,569	10,440	8		0	10,440-	8-
00-02	113,511	10,377	9		0	10,377-	9-
01-03	26,336	5,655	21		0	5,655-	21-
02-04	17,580	4,400	25		0	4,400-	25-
03-05	19,815	3,655	18		0	3,655-	18-
04-06	48,267	1,599	3		0	1,599-	3-
05-07	125,275	3,243	3		0	3,243-	3-
06-08	176,020	39,910	23		0	39,910-	23-
07-09	155,857	38,311	25		0	38,311-	25-
08-10	93,631	37,011	40		0	37,011-	40-
09-11	91,465	2,180	2		0	2,180-	2-
10-12	351,628	14,300	4		0	14,300-	4-
11-13	354,484	26,354	7		0	26,354-	7-
12-14	3,160,452	86,429	3		0	86,429-	3-
FIVE-YEAR AVERAGE							
10-14	1,938,788	53,165	3		0	53,165-	3-

KENTUCKY AMERICAN WATER COMPANY

ACCOUNTS 330.00 AND 330.10 DISTRIBUTION RESERVOIRS,TANKS AND STANDPIPES

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	PCT	GROSS SALVAGE AMOUNT	PCT	NET SALVAGE AMOUNT	PCT
1980	68,079		0		0		0
1981							
1982	1,509		0		0		0
1983							
1984							
1985							
1986	18,937	8,012	42		0	8,012-	42-
1987	2,755		0		0		0
1988	200	200	100		0	200-	100-
1989	48,379	21,509	44		0	21,509-	44-
1990	11,850	1,100	9		0	1,100-	9-
1991	2,000	490	24		0	490-	24-
1992	7,676	249	3		0	249-	3-
1993	1,060		0		0		0
1994	1,890	285	15		0	285-	15-
1995							
1996							
1997							
1998							
1999							
2000	4,223	712	17		0	712-	17-
2001	5,938		0		0		0
2002		3,550				3,550-	
2003	29,652	16,831	57		0	16,831-	57-
2004	200	67	34		0	67-	34-
2005	2,000		0		0		0
2006							
2007							
2008	10,495	99-	1-		0	99	1
2009	9,520		0		0		0
2010	433		0		0		0
2011	24,996	6,582	26		0	6,582-	26-
2012	20,762	4,706	23		0	4,706-	23-
2013							
2014	334,469		0		0		0
TOTAL	607,024	64,195	11		0	64,195-	11-

THREE-YEAR MOVING AVERAGES

80-82	23,196		0		0		0
81-83	503		0		0		0

KENTUCKY AMERICAN WATER COMPANY

ACCOUNTS 330.00 AND 330.10 DISTRIBUTION RESERVOIRS,TANKS AND STANDPIPES

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	PCT	GROSS SALVAGE AMOUNT	PCT	NET SALVAGE AMOUNT	PCT
THREE-YEAR MOVING AVERAGES							
82-84	503		0		0		0
83-85							
84-86	6,312	2,671	42		0	2,671-	42-
85-87	7,231	2,671	37		0	2,671-	37-
86-88	7,297	2,737	38		0	2,737-	38-
87-89	17,111	7,236	42		0	7,236-	42-
88-90	20,143	7,603	38		0	7,603-	38-
89-91	20,743	7,700	37		0	7,700-	37-
90-92	7,175	613	9		0	613-	9-
91-93	3,579	246	7		0	246-	7-
92-94	3,542	178	5		0	178-	5-
93-95	983	95	10		0	95-	10-
94-96	630	95	15		0	95-	15-
95-97							
96-98							
97-99							
98-00	1,408	237	17		0	237-	17-
99-01	3,387	237	7		0	237-	7-
00-02	3,387	1,421	42		0	1,421-	42-
01-03	11,864	6,794	57		0	6,794-	57-
02-04	9,951	6,816	69		0	6,816-	69-
03-05	10,617	5,633	53		0	5,633-	53-
04-06	733	22	3		0	22-	3-
05-07	667		0		0		0
06-08	3,498	33-	1-		0	33	1
07-09	6,672	33-	0		0	33	0
08-10	6,816	33-	0		0	33	0
09-11	11,650	2,194	19		0	2,194-	19-
10-12	15,397	3,763	24		0	3,763-	24-
11-13	15,253	3,763	25		0	3,763-	25-
12-14	118,410	1,569	1		0	1,569-	1-
FIVE-YEAR AVERAGE							
10-14	76,132	2,258	3		0	2,258-	3-

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 331.00 MAINS AND ACCESSORIES

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	PCT	GROSS SALVAGE AMOUNT	PCT	NET SALVAGE AMOUNT	PCT
1980	84,507	15,771	19	68,320	81	52,549	62
1981	15,654	13,716	88	57,659	368	43,943	281
1982	20,015	16,490	82	4,618	23	11,872-	59-
1983	15,360	12,703	83	23,029	150	10,326	67
1984	118,063	30,644	26	42,588	36	11,944	10
1985	12,019	8,970	75	73,631	613	64,661	538
1986	128,162	15,362	12	17,937	14	2,575	2
1987	214,318	30,172	14	36,610	17	6,438	3
1988	416,905	24,229	6	26,404	6	2,175	1
1989	124,956	35,816	29	7,693	6	28,123-	23-
1990	211,528	58,518	28	5,989	3	52,529-	25-
1991	97,857	51,823	53	15,268	16	36,555-	37-
1992	84,395	57,593	68	2,024	2	55,569-	66-
1993	117,879	80,718	68	14,735	13	65,983-	56-
1994	77,563	45,039	58	28,778	37	16,261-	21-
1995							
1996							
1997							
1998							
1999	235,231	60,239	26	3,289	1	56,950-	24-
2000	294,500	55,808	19	500	0	55,308-	19-
2001	74,947	22,269	30		0	22,269-	30-
2002	426,067	75,242	18		0	75,242-	18-
2003	48,141	57,712	120		0	57,712-	120-
2004	123,602	43,334	35		0	43,334-	35-
2005	254,241	58,110	23		0	58,110-	23-
2006	31,765	426	1	6,217	20	5,791	18
2007	189,780-	1,414	1-		0	1,414-	1
2008	837,135	26,733	3		0	26,733-	3-
2009	73,678	24,456	33	3,376	5	21,079-	29-
2010	97,670	69,246	71	306	0	68,940-	71-
2011	154,083	53,430	35		0	53,430-	35-
2012	174,408	77,094	44		0	77,094-	44-
2013	41,835	142,137	340	1,422	3	140,716-	336-
2014	87,202	170,711	196	4,031	5	166,680-	191-
TOTAL	4,503,905	1,435,926	32	444,424	10	991,502-	22-

THREE-YEAR MOVING AVERAGES

80-82	40,059	15,326	38	43,532	109	28,207	70
81-83	17,010	14,303	84	28,435	167	14,132	83

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 331.00 MAINS AND ACCESSORIES

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	PCT	GROSS SALVAGE AMOUNT	PCT	NET SALVAGE AMOUNT	PCT
THREE-YEAR MOVING AVERAGES							
82-84	51,146	19,946	39	23,412	46	3,466	7
83-85	48,481	17,439	36	46,416	96	28,977	60
84-86	86,081	18,325	21	44,719	52	26,393	31
85-87	118,166	18,168	15	42,726	36	24,558	21
86-88	253,128	23,254	9	26,984	11	3,729	1
87-89	252,060	30,072	12	23,569	9	6,503-	3-
88-90	251,130	39,521	16	13,362	5	26,159-	10-
89-91	144,780	48,719	34	9,650	7	39,069-	27-
90-92	131,260	55,978	43	7,760	6	48,218-	37-
91-93	100,044	63,378	63	10,676	11	52,702-	53-
92-94	93,279	61,117	66	15,179	16	45,938-	49-
93-95	65,147	41,919	64	14,504	22	27,415-	42-
94-96	25,854	15,013	58	9,593	37	5,420-	21-
95-97							
96-98							
97-99	78,410	20,080	26	1,096	1	18,983-	24-
98-00	176,577	38,682	22	1,263	1	37,419-	21-
99-01	201,560	46,105	23	1,263	1	44,842-	22-
00-02	265,171	51,106	19	167	0	50,940-	19-
01-03	183,052	51,741	28		0	51,741-	28-
02-04	199,270	58,763	29		0	58,763-	29-
03-05	141,994	53,052	37		0	53,052-	37-
04-06	136,536	33,957	25	2,072	2	31,885-	23-
05-07	32,075	19,983	62	2,072	6	17,911-	56-
06-08	226,373	9,524	4	2,072	1	7,452-	3-
07-09	240,344	17,534	7	1,125	0	16,409-	7-
08-10	336,161	40,145	12	1,227	0	38,917-	12-
09-11	108,477	49,044	45	1,227	1	47,817-	44-
10-12	142,054	66,590	47	102	0	66,488-	47-
11-13	123,442	90,887	74	474	0	90,413-	73-
12-14	101,148	129,981	129	1,818	2	128,163-	127-
FIVE-YEAR AVERAGE							
10-14	111,040	102,524	92	1,152	1	101,372-	91-

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 333.00 SERVICES

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	PCT	GROSS SALVAGE AMOUNT	PCT	NET SALVAGE AMOUNT	PCT
1980	18,002	24,241	135	3,804	21	20,437-	114-
1981	8,304	25,338	305	197	2	25,141-	303-
1982	11,710	41,944	358	383	3	41,561-	355-
1983	8,341	37,319	447	676	8	36,643-	439-
1984	13,132	25,225	192	5,302	40	19,923-	152-
1985	7,559	21,068	279		0	21,068-	279-
1986	10,241	20,391	199	449	4	19,942-	195-
1987	8,957	14,043	157	312	3	13,731-	153-
1988	19,616	25,011	128	913	5	24,098-	123-
1989	32,954	25,566	78		0	25,566-	78-
1990	29,542	64,239	217		0	64,239-	217-
1991	46,660	75,225	161		0	75,225-	161-
1992	50,131	54,400	109		0	54,400-	109-
1993	43,228	44,497	103		0	44,497-	103-
1994	2,454	8,259	337		0	8,259-	337-
1995							
1996							
1997							
1998							
1999	62,418	54,393	87		0	54,393-	87-
2000	67,606	97,070	144		0	97,070-	144-
2001	34,642	232,835	672		0	232,835-	672-
2002	79,096	178,730	226		0	178,730-	226-
2003	40,216	116,666	290		0	116,666-	290-
2004	2,817	122,957			0	122,957-	
2005	15,153	74,724	493		0	74,724-	493-
2006	3,882	42,824			0	42,824-	
2007	295,572	12,130	4		0	12,130-	4-
2008	570,463	94,867	17		0	94,867-	17-
2009	6,555	63,971	976	7,267	111	56,704-	865-
2010	92,478	73,276	79	8,284	9	64,993-	70-
2011	298,419	72,559	24	6,652	2	65,907-	22-
2012	303,411	183,802	61	7,277	2	176,525-	58-
2013	262,026	14,364	5	4,393	2	9,971-	4-
2014	222,876	81,713	37	238	0	81,475-	37-
TOTAL	2,668,464	2,023,649	76	46,147	2	1,977,502-	74-

THREE-YEAR MOVING AVERAGES

80-82	12,672	30,508	241	1,461	12	29,046-	229-
81-83	9,452	34,867	369	419	4	34,448-	364-

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 333.00 SERVICES

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	PCT	GROSS SALVAGE AMOUNT	PCT	NET SALVAGE AMOUNT	PCT
THREE-YEAR MOVING AVERAGES							
82-84	11,061	34,829	315	2,120	19	32,709-	296-
83-85	9,677	27,871	288	1,993	21	25,878-	267-
84-86	10,311	22,228	216	1,917	19	20,311-	197-
85-87	8,919	18,501	207	254	3	18,247-	205-
86-88	12,938	19,815	153	558	4	19,257-	149-
87-89	20,509	21,540	105	408	2	21,132-	103-
88-90	27,371	38,272	140	304	1	37,968-	139-
89-91	36,385	55,010	151		0	55,010-	151-
90-92	42,111	64,621	153		0	64,621-	153-
91-93	46,673	58,041	124		0	58,041-	124-
92-94	31,938	35,719	112		0	35,719-	112-
93-95	15,227	17,585	115		0	17,585-	115-
94-96	818	2,753	337		0	2,753-	337-
95-97							
96-98							
97-99	20,806	18,131	87		0	18,131-	87-
98-00	43,341	50,488	116		0	50,488-	116-
99-01	54,889	128,099	233		0	128,099-	233-
00-02	60,448	169,545	280		0	169,545-	280-
01-03	51,318	176,077	343		0	176,077-	343-
02-04	40,710	139,451	343		0	139,451-	343-
03-05	19,396	104,782	540		0	104,782-	540-
04-06	7,284	80,168			0	80,168-	
05-07	104,869	43,226	41		0	43,226-	41-
06-08	289,972	49,940	17		0	49,940-	17-
07-09	290,863	56,989	20	2,422	1	54,567-	19-
08-10	223,166	77,371	35	5,183	2	72,188-	32-
09-11	132,484	69,936	53	7,401	6	62,535-	47-
10-12	231,436	109,879	47	7,404	3	102,475-	44-
11-13	287,952	90,242	31	6,107	2	84,134-	29-
12-14	262,771	93,293	36	3,969	2	89,324-	34-
FIVE-YEAR AVERAGE							
10-14	235,842	85,143	36	5,369	2	79,774-	34-

KENTUCKY AMERICAN WATER COMPANY

ACCOUNTS 334.10 THRU 334.30 METERS AND METER INSTALLATIONS

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	COST OF REMOVAL PCT	GROSS SALVAGE AMOUNT	GROSS SALVAGE PCT	NET SALVAGE AMOUNT	NET SALVAGE PCT
1980	79,366	1,639	2	11,758	15	10,119	13
1981	107,531	3,502	3	22,687	21	19,185	18
1982	187,562	7,768	4	37,747	20	29,979	16
1983	99,321	11,131	11	13,400	13	2,269	2
1984	87,166	8,975	10	11,775	14	2,800	3
1985	92,668	5,544	6	12,228	13	6,684	7
1986	74,228	7,556	10	2,477	3	5,079-	7-
1987	123,691	2,332	2	8,519	7	6,187	5
1988	136,124	4,017	3	13,175	10	9,158	7
1989	122,229	3,724	3	16,085	13	12,361	10
1990	133,683	9,475	7	10,960	8	1,485	1
1991	152,174	10,199	7	5,989	4	4,210-	3-
1992	153,973	6,203	4	13,473	9	7,270	5
1993	120,966	9,754	8	93,364	77	83,610	69
1994	1,227	2,796	228		0	2,796-	228-
1995							
1996							
1997							
1998							
1999	90,023	46,996	52	804	1	46,192-	51-
2000	84,881	66,757	79	3,265	4	63,492-	75-
2001	59,466	52,230	88	173	0	52,057-	88-
2002	108,243	54,749	51		0	54,749-	51-
2003	578,028	40,090	7		0	40,090-	7-
2004	84,261	72,000	85		0	72,000-	85-
2005	116,511	58,223	50	460-	0	58,682-	50-
2006	184,704	60,264	33	22,491	12	37,773-	20-
2007	496,453	26,955	5	1,869	0	25,086-	5-
2008	610,344	3,486-	1-		0	3,486	1
2009	345,842	63,612	18	115,168	33	51,556	15
2010	208,579	31,553	15	42,139	20	10,587	5
2011	2,110,264	485,561	23	85,679	4	399,882-	19-
2012	108,231	369,217	341	76,004	70	293,213-	271-
2013	92,675	478,586	516	170,405	184	308,181-	333-
2014	40,425	32,429	80	28,906	72	3,522-	9-
TOTAL	6,990,839	2,030,349	29	820,081	12	1,210,268-	17-

THREE-YEAR MOVING AVERAGES

80-82	124,820	4,303	3	24,064	19	19,761	16
81-83	131,471	7,467	6	24,611	19	17,144	13

KENTUCKY AMERICAN WATER COMPANY

ACCOUNTS 334.10 THRU 334.30 METERS AND METER INSTALLATIONS

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	PCT	GROSS SALVAGE AMOUNT	PCT	NET SALVAGE AMOUNT	PCT
THREE-YEAR MOVING AVERAGES							
82-84	124,683	9,291	7	20,974	17	11,683	9
83-85	93,052	8,550	9	12,468	13	3,918	4
84-86	84,687	7,358	9	8,827	10	1,468	2
85-87	96,862	5,144	5	7,741	8	2,597	3
86-88	111,348	4,635	4	8,057	7	3,422	3
87-89	127,348	3,358	3	12,593	10	9,235	7
88-90	130,679	5,739	4	13,407	10	7,668	6
89-91	136,029	7,799	6	11,011	8	3,212	2
90-92	146,610	8,626	6	10,141	7	1,515	1
91-93	142,371	8,719	6	37,609	26	28,890	20
92-94	92,055	6,251	7	35,612	39	29,361	32
93-95	40,731	4,183	10	31,121	76	26,938	66
94-96	409	932	228		0	932-	228-
95-97							
96-98							
97-99	30,008	15,665	52	268	1	15,397-	51-
98-00	58,302	37,918	65	1,356	2	36,561-	63-
99-01	78,124	55,328	71	1,414	2	53,914-	69-
00-02	84,197	57,912	69	1,146	1	56,766-	67-
01-03	248,579	49,023	20	58	0	48,965-	20-
02-04	256,844	55,613	22		0	55,613-	22-
03-05	259,600	56,771	22	153-	0	56,924-	22-
04-06	128,492	63,496	49	7,344	6	56,152-	44-
05-07	265,889	48,481	18	7,967	3	40,514-	15-
06-08	430,500	27,911	6	8,120	2	19,791-	5-
07-09	484,213	29,027	6	39,012	8	9,985	2
08-10	388,255	30,559	8	52,436	14	21,876	6
09-11	888,228	193,575	22	80,995	9	112,580-	13-
10-12	809,025	295,443	37	67,941	8	227,503-	28-
11-13	770,390	444,454	58	110,696	14	333,758-	43-
12-14	80,444	293,410	365	91,772	114	201,639-	251-
FIVE-YEAR AVERAGE							
10-14	512,035	279,469	55	80,627	16	198,842-	39-

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 335.00 FIRE HYDRANTS

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	PCT	GROSS SALVAGE AMOUNT	PCT	NET SALVAGE AMOUNT	PCT
1980	12,294	2,498	20	9,619	78	7,121	58
1981	7,347	4,205	57	6,633	90	2,428	33
1982	8,316	4,213	51	7,109	85	2,896	35
1983	5,859	5,083	87	5,315	91	232	4
1984	9,155	15,650	171	8,870	97	6,780-	74-
1985	5,260	4,828	92	5,692	108	864	16
1986	4,060	6,489	160	6,416	158	73-	2-
1987	5,248	16,989	324	14,128	269	2,861-	55-
1988	15,368	7,826	51	1,174	8	6,652-	43-
1989	14,725	13,734	93	5,723	39	8,011-	54-
1990	15,761	20,197	128	3,281	21	16,916-	107-
1991	15,953	11,036	69	5,221	33	5,815-	36-
1992	60,190	28,345	47	1,943	3	26,402-	44-
1993	12,448	10,199	82	2,098	17	8,101-	65-
1994	5,440	5,777	106	2,610	48	3,167-	58-
1995							
1996							
1997							
1998							
1999	6,437	1,831	28	685	11	1,147-	18-
2000	8,303	2,385	29	263	3	2,122-	26-
2001	11,529	5,833	51		0	5,833-	51-
2002	19,766	846	4		0	846-	4-
2003	4,262		0		0		0
2004	10,660		0		0		0
2005	13,469	2,091	16		0	2,091-	16-
2006	17,275	898	5		0	898-	5-
2007	1,716	16	1		0	16-	1-
2008	35,914	1,770	5		0	1,770-	5-
2009	12,061	7,453	62		0	7,453-	62-
2010	5,633	25,354	450		0	25,354-	450-
2011	9,422	38,057	404		0	38,057-	404-
2012	11,285	37,368	331		0	37,368-	331-
2013	5,864	11,977	204	28	0	11,949-	204-
2014	23,546	43,146	183	1,499	6	41,646-	177-
TOTAL	394,566	336,095	85	88,308	22	247,788-	63-

THREE-YEAR MOVING AVERAGES

80-82	9,319	3,639	39	7,787	84	4,148	45
81-83	7,174	4,500	63	6,352	89	1,852	26

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 335.00 FIRE HYDRANTS

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	PCT	GROSS SALVAGE AMOUNT	PCT	NET SALVAGE AMOUNT	PCT
THREE-YEAR MOVING AVERAGES							
82-84	7,777	8,315	107	7,098	91	1,217-	16-
83-85	6,758	8,520	126	6,626	98	1,895-	28-
84-86	6,158	8,989	146	6,993	114	1,996-	32-
85-87	4,856	9,435	194	8,745	180	690-	14-
86-88	8,225	10,435	127	7,239	88	3,195-	39-
87-89	11,780	12,850	109	7,008	59	5,841-	50-
88-90	15,285	13,919	91	3,393	22	10,526-	69-
89-91	15,480	14,989	97	4,742	31	10,247-	66-
90-92	30,635	19,859	65	3,482	11	16,378-	53-
91-93	29,530	16,527	56	3,087	10	13,439-	46-
92-94	26,026	14,774	57	2,217	9	12,557-	48-
93-95	5,963	5,325	89	1,569	26	3,756-	63-
94-96	1,813	1,926	106	870	48	1,056-	58-
95-97							
96-98							
97-99	2,146	610	28	228	11	382-	18-
98-00	4,913	1,405	29	316	6	1,089-	22-
99-01	8,756	3,350	38	316	4	3,034-	35-
00-02	13,199	3,021	23	88	1	2,933-	22-
01-03	11,852	2,226	19		0	2,226-	19-
02-04	11,562	282	2		0	282-	2-
03-05	9,464	697	7		0	697-	7-
04-06	13,802	996	7		0	996-	7-
05-07	10,820	1,002	9		0	1,002-	9-
06-08	18,302	895	5		0	895-	5-
07-09	16,564	3,080	19		0	3,080-	19-
08-10	17,869	11,526	65		0	11,526-	65-
09-11	9,039	23,622	261		0	23,622-	261-
10-12	8,780	33,593	383		0	33,593-	383-
11-13	8,857	29,134	329	9	0	29,125-	329-
12-14	13,565	30,830	227	509	4	30,321-	224-
FIVE-YEAR AVERAGE							
10-14	11,150	31,181	280	306	3	30,875-	277-

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 341.10 TRANSPORTATION EQUIPMENT - LIGHT DUTY TRUCKS

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	PCT	GROSS SALVAGE AMOUNT	PCT	NET SALVAGE AMOUNT	PCT
1982		140		12,200		12,060	
1983	32,127	100	0	8,100	25	8,000	25
1984	9,205		0	7,500	81	7,500	81
1985	87,029	315	0	17,700	20	17,385	20
1986	33,598		0	6,444	19	6,444	19
1987	53,418	11	0	10,875	20	10,864	20
1988	46,179	60	0	8,550	19	8,490	18
1989	50,554		0	22,509	45	22,509	45
1990	96,067	1,393	1	27,637	29	26,244	27
1991	118,677		0	36,945	31	36,945	31
1992	96,153		0	32,236	34	32,236	34
1993	72,282		0	23,220	32	23,220	32
1994	60,343	1,498	2	17,716	29	16,218	27
1995							
1996							
1997							
1998							
1999	44,574	2,850	6	11,675	26	8,825	20
2000	94,444	5,440	6	16,729	18	11,289	12
2001	90,536		0		0		0
2002		7,629		30,000		22,371	
2003	52,861	1,010	2	13,321	25	12,311	23
2004	27,211		0		0		0
2005	18,273		0		0		0
2006	197,839	11,832-	6-		0	11,832	6
2007	54,895		0		0		0
2008	130,678		0	26,576	20	26,576	20
2009	75,134		0	10,582	14	10,582	14
2010	65,599		0	7,123	11	7,123	11
2011							
2012	854,991		0	127,917	15	127,917	15
2013	44,078	156-	0	49,340	112	49,496	112
2014	799,297		0	33,914	4	33,914	4
TOTAL	3,306,042	8,458	0	558,809	17	550,351	17

THREE-YEAR MOVING AVERAGES

82-84	13,777	80	1	9,267	67	9,187	67
83-85	42,787	138	0	11,100	26	10,962	26
84-86	43,277	105	0	10,548	24	10,443	24
85-87	58,015	109	0	11,673	20	11,564	20

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 341.10 TRANSPORTATION EQUIPMENT - LIGHT DUTY TRUCKS

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	PCT	GROSS SALVAGE AMOUNT	PCT	NET SALVAGE AMOUNT	PCT
THREE-YEAR MOVING AVERAGES							
86-88	44,398	24	0	8,623	19	8,599	19
87-89	50,050	24	0	13,978	28	13,954	28
88-90	64,267	484	1	19,565	30	19,081	30
89-91	88,433	464	1	29,030	33	28,566	32
90-92	103,632	464	0	32,273	31	31,808	31
91-93	95,704		0	30,800	32	30,800	32
92-94	76,259	499	1	24,391	32	23,891	31
93-95	44,208	499	1	13,645	31	13,146	30
94-96	20,114	499	2	5,905	29	5,406	27
95-97							
96-98							
97-99	14,858	950	6	3,892	26	2,942	20
98-00	46,340	2,763	6	9,468	20	6,705	14
99-01	76,518	2,763	4	9,468	12	6,705	9
00-02	61,660	4,356	7	15,576	25	11,220	18
01-03	47,799	2,880	6	14,440	30	11,561	24
02-04	26,691	2,880	11	14,440	54	11,561	43
03-05	32,782	337	1	4,440	14	4,104	13
04-06	81,108	3,944-	5-		0	3,944	5
05-07	90,335	3,944-	4-		0	3,944	4
06-08	127,804	3,944-	3-	8,859	7	12,803	10
07-09	86,902		0	12,386	14	12,386	14
08-10	90,470		0	14,760	16	14,760	16
09-11	46,911		0	5,901	13	5,901	13
10-12	306,863		0	45,013	15	45,013	15
11-13	299,690	52-	0	59,086	20	59,138	20
12-14	566,122	52-	0	70,390	12	70,442	12
FIVE-YEAR AVERAGE							
10-14	352,793	31-	0	43,659	12	43,690	12

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 341.20 TRANSPORTATION EQUIPMENT - HEAVY DUTY TRUCKS

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	PCT	GROSS SALVAGE AMOUNT	PCT	NET SALVAGE AMOUNT	PCT
1986	13,756		0	1,900	14	1,900	14
1987	41,200		0	7,300	18	7,300	18
1988	9,955		0	3,200	32	3,200	32
1989	41,315		0	19,767	48	19,767	48
1990							
1991	58,941		0	11,440	19	11,440	19
1992	79,570		0	17,458	22	17,458	22
1993	13,415		0	2,000	15	2,000	15
1994	25,100		0	5,500	22	5,500	22
1995							
1996							
1997							
1998							
1999							
2000	89,605	5,830	7	19,045	21	13,215	15
2001	18,235		0		0		0
2002		3,340		6,102		2,762	
2003							
2004							
2005							
2006	47,659	1,060-	2-		0	1,060	2
2007	65,892		0		0		0
2008				8,613		8,613	
2009	62,521		0	3,870	6	3,870	6
2010				4,275		4,275	
2011	33,692		0	1,799	5	1,799	5
2012	108,574		0	9,111	8	9,111	8
2013	105,115		0	40,334	38	40,334	38
2014	635,200		0	78,640	12	78,640	12
TOTAL	1,449,746	8,110	1	240,355	17	232,245	16

THREE-YEAR MOVING AVERAGES

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	PCT	GROSS SALVAGE AMOUNT	PCT	NET SALVAGE AMOUNT	PCT
86-88	21,637		0	4,133	19	4,133	19
87-89	30,823		0	10,089	33	10,089	33
88-90	17,090		0	7,656	45	7,656	45
89-91	33,419		0	10,402	31	10,402	31
90-92	46,170		0	9,633	21	9,633	21
91-93	50,642		0	10,299	20	10,299	20
92-94	39,362		0	8,319	21	8,319	21
93-95	12,838		0	2,500	19	2,500	19

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 341.20 TRANSPORTATION EQUIPMENT - HEAVY DUTY TRUCKS

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	PCT	GROSS SALVAGE AMOUNT	PCT	NET SALVAGE AMOUNT	PCT
THREE-YEAR MOVING AVERAGES							
94-96	8,367		0	1,833	22	1,833	22
95-97							
96-98							
97-99							
98-00	29,868	1,943	7	6,348	21	4,405	15
99-01	35,947	1,943	5	6,348	18	4,405	12
00-02	35,947	3,057	9	8,382	23	5,326	15
01-03	6,078	1,113	18	2,034	33	921	15
02-04		1,113		2,034		921	
03-05							
04-06	15,886	353-	2-		0	353	2
05-07	37,850	353-	1-		0	353	1
06-08	37,850	353-	1-	2,871	8	3,224	9
07-09	42,804		0	4,161	10	4,161	10
08-10	20,840		0	5,586	27	5,586	27
09-11	32,071		0	3,315	10	3,315	10
10-12	47,422		0	5,062	11	5,062	11
11-13	82,460		0	17,082	21	17,082	21
12-14	282,963		0	42,695	15	42,695	15
FIVE-YEAR AVERAGE							
10-14	176,516		0	26,832	15	26,832	15

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 341.30 TRANSPORTATION EQUIPMENT - AUTOS

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	PCT	GROSS SALVAGE AMOUNT	PCT	NET SALVAGE AMOUNT	PCT
1982	34,922	120	0	4,400	13	4,280	12
1983	33,905	125	0	7,900	23	7,775	23
1984							
1985	39,613	175	0	7,600	19	7,425	19
1986	38,712		0	1,416	4	1,416	4
1987	49,853		0	16,125	32	16,125	32
1988	46,956		0	10,900	23	10,900	23
1989	57,313	50	0	23,047	40	22,997	40
1990	30,101		0	13,824	46	13,824	46
1991	9,700		0	1,000	10	1,000	10
1992	11,500		0	4,893	43	4,893	43
1993	12,323		0		0		0
1994	36,024	241	1		0	241-	1-
1995							
1996	42,288		0		0		0
1997	84,116		0		0		0
1998							
1999	32,082		0	5,300	17	5,300	17
2000							
2001							
2002	12,116	700	6		0	700-	6-
2003	2,900		0		0		0
2004							
2005							
2006							
2007	15,016-		0		0		0
2008	61,308		0	7,589	12	7,589	12
2009	15,899		0	125	1	125	1
2010							
2011	16,926		0	10,107	60	10,107	60
2012	91,285		0	2,070	2	2,070	2
2013	39,466	310-	1-	26,608	67	26,919	68
2014	27,206		0	8,900	33	8,900	33
TOTAL	811,498	1,101	0	151,804	19	150,704	19
THREE-YEAR MOVING AVERAGES							
82-84	22,942	82	0	4,100	18	4,018	18
83-85	24,506	100	0	5,167	21	5,067	21
84-86	26,108	58	0	3,005	12	2,947	11
85-87	42,726	58	0	8,380	20	8,322	19

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 341.30 TRANSPORTATION EQUIPMENT - AUTOS

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	PCT	GROSS SALVAGE AMOUNT	PCT	NET SALVAGE AMOUNT	PCT
THREE-YEAR MOVING AVERAGES							
86-88	45,174		0	9,480	21	9,480	21
87-89	51,374	17	0	16,691	32	16,674	32
88-90	44,790	17	0	15,924	36	15,907	36
89-91	32,371	17	0	12,624	39	12,607	39
90-92	17,100		0	6,572	38	6,572	38
91-93	11,174		0	1,964	18	1,964	18
92-94	19,949	80	0	1,631	8	1,551	8
93-95	16,116	80	0		0	80-	0
94-96	26,104	80	0		0	80-	0
95-97	42,135		0		0		0
96-98	42,135		0		0		0
97-99	38,733		0	1,767	5	1,767	5
98-00	10,694		0	1,767	17	1,767	17
99-01	10,694		0	1,767	17	1,767	17
00-02	4,039	233	6		0	233-	6-
01-03	5,005	233	5		0	233-	5-
02-04	5,005	233	5		0	233-	5-
03-05	967		0		0		0
04-06							
05-07	5,005-		0		0		0
06-08	15,431		0	2,530	16	2,530	16
07-09	20,730		0	2,571	12	2,571	12
08-10	25,736		0	2,571	10	2,571	10
09-11	10,942		0	3,411	31	3,411	31
10-12	36,070		0	4,059	11	4,059	11
11-13	49,226	103-	0	12,928	26	13,032	26
12-14	52,652	103-	0	12,526	24	12,630	24
FIVE-YEAR AVERAGE							
10-14	34,977	62-	0	9,537	27	9,599	27

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 341.40 TRANSPORTATION EQUIPMENT - OTHER

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	COST OF REMOVAL PCT	GROSS SALVAGE AMOUNT	GROSS SALVAGE PCT	NET SALVAGE AMOUNT	NET SALVAGE PCT
1996	220		0		0		0
1997	2,993		0		0		0
1998							
1999							
2000							
2001							
2002							
2003							
2004							
2005							
2006							
2007	972		0		0		0
2008				82		82	
2009				25		25	
2010	588		0	8,055		8,055	
2011							
2012	48,421		0	7,800	16	7,800	16
2013	132,669	1,648	1	56,050	42	54,402	41
2014	58,959		0	32,264	55	32,264	55
TOTAL	244,822	1,648	1	104,275	43	102,628	42

THREE-YEAR MOVING AVERAGES

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	COST OF REMOVAL PCT	GROSS SALVAGE AMOUNT	GROSS SALVAGE PCT	NET SALVAGE AMOUNT	NET SALVAGE PCT
96-98	1,071		0		0		0
97-99	998		0		0		0
98-00							
99-01							
00-02							
01-03							
02-04							
03-05							
04-06							
05-07	324		0		0		0
06-08	324		0	27	8	27	8
07-09	324		0	36	11	36	11
08-10	196		0	2,721		2,721	
09-11	196		0	2,693		2,693	
10-12	16,336		0	5,285	32	5,285	32

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 341.40 TRANSPORTATION EQUIPMENT - OTHER

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	PCT	GROSS SALVAGE AMOUNT	PCT	NET SALVAGE AMOUNT	PCT
THREE-YEAR MOVING AVERAGES							
11-13	60,363	549	1	21,283	35	20,734	34
12-14	80,016	549	1	32,038	40	31,489	39
FIVE-YEAR AVERAGE							
10-14	48,127	330	1	20,834	43	20,504	43

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 345 POWER OPERATED EQUIPMENT

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	PCT	GROSS SALVAGE AMOUNT	PCT	NET SALVAGE AMOUNT	PCT
1980	13,957	20	0	10,100	72	10,080	72
1981							
1982	4,745		0		0		0
1983	369-		0		0		0
1984							
1985	34,721	35	0	18,612	54	18,577	54
1986	3,106		0		0		0
1987							
1988	7,922		0		0		0
1989							
1990	479-		0		0		0
1991	65,103		0	8,554	13	8,554	13
1992	10,550		0		0		0
1993	4,132		0	152	4	152	4
1994	22,762		0	2,000	9	2,000	9
1995							
1996							
1997							
1998							
1999							
2000							
2001							
2002							
2003							
2004							
2005							
2006							
2007							
2008							
2009	99,826		0	8,510	9	8,510	9
2010	23,436		0		0		0
2011	27,605		0		0		0
2012	2,620	525	20		0	525-	20-
2013							
2014	153,356	632	0		0	632-	0
TOTAL	472,993	1,212	0	47,928	10	46,716	10

THREE-YEAR MOVING AVERAGES

80-82	6,234	7	0	3,367	54	3,360	54
81-83	1,459		0		0		0

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 345 POWER OPERATED EQUIPMENT

SUMMARY OF BOOK SALVAGE

YEAR	REGULAR RETIREMENTS	COST OF REMOVAL AMOUNT	PCT	GROSS SALVAGE AMOUNT	PCT	NET SALVAGE AMOUNT	PCT
THREE-YEAR MOVING AVERAGES							
82-84	1,459		0		0		0
83-85	11,451	12	0	6,204	54	6,192	54
84-86	12,609	12	0	6,204	49	6,192	49
85-87	12,609	12	0	6,204	49	6,192	49
86-88	3,676		0		0		0
87-89	2,641		0		0		0
88-90	2,481		0		0		0
89-91	21,541		0	2,851	13	2,851	13
90-92	25,058		0	2,851	11	2,851	11
91-93	26,595		0	2,902	11	2,902	11
92-94	12,481		0	717	6	717	6
93-95	8,965		0	717	8	717	8
94-96	7,587		0	667	9	667	9
95-97							
96-98							
97-99							
98-00							
99-01							
00-02							
01-03							
02-04							
03-05							
04-06							
05-07							
06-08							
07-09	33,275		0	2,837	9	2,837	9
08-10	41,087		0	2,837	7	2,837	7
09-11	50,289		0	2,837	6	2,837	6
10-12	17,887	175	1		0	175-	1-
11-13	10,075	175	2		0	175-	2-
12-14	51,992	386	1		0	386-	1-
FIVE-YEAR AVERAGE							
10-14	41,403	231	1		0	231-	1-

PART IX. DETAILED DEPRECIATION CALCULATIONS

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 304.10 STRUCTURES AND IMPROVEMENTS - SOURCE OF SUPPLY

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 50-S0.5						
NET SALVAGE PERCENT.. -10						
1984	3,200.00	1,592	1,301	2,219	27.38	81
1988	2,533.00	1,132	925	1,861	29.68	63
1991	23,528.92	9,571	7,821	18,061	31.51	573
2002	234,817.17	56,206	45,927	212,372	39.12	5,429
2003	452,890.41	100,732	82,310	415,869	39.89	10,425
2004	57,970.66	11,886	9,712	54,056	40.68	1,329
2006	1,656,129.06	280,184	228,943	1,592,799	42.31	37,646
2007	1,775.08	268	219	1,734	43.14	40
2008	58,979.41	7,785	6,361	58,516	44.00	1,330
2010	14,675,018.78	1,368,886	1,118,539	15,023,982	45.76	328,321
2012	821,586.09	43,560	35,594	868,151	47.59	18,242
2013	169,453.48	5,443	4,448	181,951	48.54	3,748
2014	1,545,048.61	16,656	13,609	1,685,944	49.51	34,053
	19,702,930.67	1,903,901	1,555,709	20,117,515		441,280

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 45.6 2.24

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 304.20 STRUCTURES AND IMPROVEMENTS - POWER AND PUMPING

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
KENTUCKY RIVER STATION						
INTERIM SURVIVOR CURVE.. IOWA 60-R1.5						
PROBABLE RETIREMENT YEAR.. 6-2042						
NET SALVAGE PERCENT.. -15						
1951	8,622.60	7,250	6,780	3,136	15.90	197
1957	92,039.85	73,994	69,201	36,645	17.55	2,088
1958	26,944.94	21,491	20,099	10,888	17.82	611
1959	51,381.05	40,646	38,013	21,075	18.09	1,165
1966	2,125.00	1,581	1,479	965	19.86	49
1967	73,300.89	54,035	50,535	33,762	20.10	1,680
1970	73,708.15	52,745	49,328	35,436	20.78	1,705
1971	17,572.79	12,443	11,637	8,572	21.00	408
1972	12,864.02	9,013	8,429	6,365	21.21	300
1973	3,602.44	2,496	2,334	1,809	21.42	84
1974	3,168.00	2,170	2,029	1,614	21.62	75
1978	6,162.43	4,020	3,760	3,327	22.38	149
1985	743.96	437	409	447	23.50	19
1988	16,973.46	9,426	8,815	10,704	23.90	448
1989	6,581.48	3,580	3,348	4,221	24.03	176
1991	30,518.44	15,881	14,852	20,244	24.26	834
1992	1,957,414.33	994,278	929,867	1,321,159	24.37	54,213
1993	21,577.08	10,677	9,985	14,828	24.48	606
1995	1,752.80	819	766	1,250	24.68	51
1996	5,317.98	2,408	2,252	3,864	24.78	156
2006	326,778.28	86,591	80,981	294,814	25.55	11,539
2007	3,208.80	772	722	2,968	25.61	116
2008	89,918.76	19,299	18,049	85,358	25.67	3,325
2009	8,182.42	1,531	1,432	7,978	25.73	310
2011	23,845.98	3,022	2,826	24,597	25.84	952
	2,864,305.93	1,430,605	1,337,928	1,956,024		81,256
FRANKLIN COUNTY TANK AND BOOSTER STATION						
INTERIM SURVIVOR CURVE.. IOWA 60-R1.5						
PROBABLE RETIREMENT YEAR.. 6-2065						
NET SALVAGE PERCENT.. -15						
2010	4,573,023.70	434,497	406,349	4,852,628	42.97	112,931
2014	147,803.17	1,688	1,579	168,395	43.87	3,839
	4,720,826.87	436,185	407,928	5,021,023		116,770

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 304.20 STRUCTURES AND IMPROVEMENTS - POWER AND PUMPING

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
OTHER STRUCTURES						
SURVIVOR CURVE.. IOWA 60-R1.5						
NET SALVAGE PERCENT.. -15						
1934	13,004.84	12,126	11,340	3,615	11.35	319
1948	2,166.09	1,809	1,692	799	16.42	49
1949	456.97	378	354	172	16.84	10
1951	77.93	63	59	31	17.70	2
1955	6,204.43	4,814	4,502	2,633	19.52	135
1962	4,217.13	2,986	2,793	2,057	23.06	89
1966	7,073.51	4,710	4,405	3,730	25.26	148
1971	5,977.84	3,643	3,407	3,468	28.20	123
1972	43,203.93	25,828	24,155	25,530	28.81	886
1974	1,039.00	596	557	637	30.06	21
1975	12,499.78	7,022	6,567	7,808	30.69	254
1987	266,561.62	108,312	101,295	205,250	38.80	5,290
1988	14,556.05	5,717	5,347	11,393	39.51	288
1989	447,765.79	169,670	158,679	356,252	40.23	8,855
1997	852.20	226	211	769	46.15	17
1998	21,873.51	5,488	5,132	20,022	46.91	427
1999	778,890.09	184,071	172,147	723,577	47.67	15,179
2006	110,585.37	14,583	13,638	113,535	53.12	2,137
2007	168,433.96	19,628	18,356	175,343	53.92	3,252
2008	11,071.71	1,120	1,047	11,685	54.72	214
2013	52,732.79	1,243	1,162	59,480	58.77	1,012
2014	1,655.70	13	12	1,892	59.59	32
	1,970,900.24	574,046	536,859	1,729,676		38,739
	9,556,033.04	2,440,836	2,282,715	8,706,723		236,765

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 36.8 2.48

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 304.30 STRUCTURES AND IMPROVEMENTS - WATER TREATMENT

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
KENTUCKY RIVER STATION						
INTERIM SURVIVOR CURVE.. IOWA 60-R1.5						
PROBABLE RETIREMENT YEAR.. 6-2042						
NET SALVAGE PERCENT.. -15						
1925	7,032.20	6,921	4,695	3,392	8.65	392
1959	6,925.11	5,478	3,716	4,248	18.09	235
1960	3,833.51	3,008	2,041	2,368	18.35	129
1970	13,665.34	9,779	6,634	9,081	20.78	437
1971	67,314.31	47,665	32,334	45,077	21.00	2,147
1973	526.00	364	247	358	21.42	17
1975	723.00	490	332	499	21.82	23
1976	1,114.00	745	505	776	22.01	35
1977	1,434.51	948	643	1,007	22.20	45
1982	152,885.57	94,260	63,943	111,875	23.05	4,854
1984	11,400.01	6,810	4,620	8,490	23.35	364
1987	33,510.51	18,981	12,876	25,661	23.77	1,080
1988	53,593.29	29,763	20,190	41,442	23.90	1,734
1989	19,188.56	10,438	7,081	14,986	24.03	624
1990	112,467.18	59,865	40,611	88,727	24.15	3,674
1991	17,225.55	8,964	6,081	13,728	24.26	566
1992	8,000.00	4,064	2,757	6,443	24.37	264
1993	805,593.09	398,644	270,428	656,004	24.48	26,798
1995	47,316.34	22,116	15,003	39,411	24.68	1,597
1996	1,390,343.32	629,469	427,012	1,171,882	24.78	47,291
1997	6,903.44	3,021	2,049	5,890	24.87	237
1999	128,640.45	52,168	35,389	112,547	25.04	4,495
2000	168,478.81	65,401	44,366	149,385	25.12	5,947
2001	153,164.99	56,691	38,457	137,682	25.20	5,464
2002	11,650.51	4,094	2,777	10,621	25.27	420
2003	11,333.94	3,756	2,548	10,486	25.34	414
2005	228,821.20	65,999	44,772	218,373	25.48	8,570
2006	223,795.95	59,302	40,229	217,137	25.55	8,499
2008	21,152.39	4,540	3,080	21,245	25.67	828
2009	7,399.10	1,384	939	7,570	25.73	294
2011	18,479.46	2,342	1,589	19,663	25.84	761
2013	1,983.30	115	78	2,203	25.94	85
2014	2,169.63	43	29	2,466	25.99	95
	3,738,064.57	1,677,628	1,138,051	3,160,723		128,415

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 304.30 STRUCTURES AND IMPROVEMENTS - WATER TREATMENT

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
KENTUCKY RIVER STATION II						
INTERIM SURVIVOR CURVE.. IOWA 60-R1.5						
PROBABLE RETIREMENT YEAR.. 6-2065						
NET SALVAGE PERCENT.. -15						
2010	23,152,774.13	2,199,815	1,492,287	25,133,403	42.97	584,906
2014	4,960,399.43	56,645	38,426	5,666,033	43.87	129,155
	28,113,173.56	2,256,460	1,530,713	30,799,436		714,061
RICHMOND ROAD STATION TREATMENT PLANT						
INTERIM SURVIVOR CURVE.. IOWA 60-R1.5						
PROBABLE RETIREMENT YEAR.. 6-2038						
NET SALVAGE PERCENT.. -15						
1925	5,156.56	5,083	3,448	2,482	8.57	290
1926	1,939.94	1,903	1,291	940	8.83	106
1929	563.61	544	369	279	9.59	29
1938	8,725.21	8,049	5,460	4,574	11.82	387
1941	369.39	335	227	198	12.54	16
1947	1,334.65	1,173	796	739	13.95	53
1971	2,328.84	1,726	1,171	1,507	18.86	80
1972	27,672.99	20,323	13,786	18,037	19.02	948
1973	221.99	161	109	146	19.18	8
1974	4,654.28	3,352	2,274	3,079	19.33	159
1977	50,913.14	35,524	24,098	34,452	19.75	1,744
1983	1,276.58	826	560	908	20.48	44
1988	1,452,526.37	867,542	588,514	1,081,892	20.98	51,568
1989	7,833.76	4,591	3,114	5,894	21.07	280
1991	69,390.06	39,055	26,494	53,305	21.23	2,511
1994	10,388.09	5,443	3,692	8,254	21.46	385
1997	580,691.83	278,551	188,960	478,835	21.66	22,107
1999	10,008.73	4,468	3,031	8,479	21.78	389
2001	222,917.06	91,357	61,974	194,381	21.89	8,880
2005	6,719.98	2,173	1,474	6,254	22.09	283
2006	24,821.65	7,411	5,027	23,518	22.13	1,063
2007	330,949.59	89,907	60,990	319,602	22.18	14,409
2008	51,557.01	12,557	8,518	50,772	22.22	2,285
2009	18,757.16	3,995	2,710	18,861	22.26	847
2010	8,048.90	1,452	985	8,271	22.30	371
2011	38,975.77	5,677	3,851	40,971	22.34	1,834
2012	24,932.42	2,705	1,835	26,837	22.37	1,200
2014	47,237.49	1,091	740	53,583	22.45	2,387
	3,010,913.05	1,496,974	1,015,501	2,447,049		114,663

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 304.30 STRUCTURES AND IMPROVEMENTS - WATER TREATMENT

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
OTHER STRUCTURES						
SURVIVOR CURVE.. IOWA 60-R1.5						
NET SALVAGE PERCENT.. -15						
1974	1,607.00	922	625	1,223	30.06	41
1996	1,043,366.07	291,965	198,060	1,001,811	45.40	22,066
1997	12,571.95	3,337	2,264	12,194	46.15	264
2006	246,960.18	32,567	22,092	261,912	53.12	4,931
2007	628,598.19	73,250	49,691	673,197	53.92	12,485
2009	14,357.26	1,233	836	15,674	55.52	282
	1,947,460.65	403,274	273,569	1,966,011		40,069
	36,809,611.83	5,834,336	3,957,834	38,373,219		997,208

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 38.5 2.71

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 304.40 STRUCTURES AND IMPROVEMENTS - TRANSMISSION AND DISTRIBUTION

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 40-R2.5						
NET SALVAGE PERCENT.. -5						
1991	39,397.96	20,953	35,882	5,486	19.74	278
1992	412,979.52	211,502	362,192	71,436	20.49	3,486
1996	7,226.03	3,107	5,321	2,266	23.62	96
1997	26.54	11	19	9	24.43	
1998	139,105.41	53,860	92,234	53,827	25.25	2,132
1999	51,796.46	18,926	32,410	21,976	26.08	843
2000	8,279.36	2,843	4,869	3,824	26.92	142
2002	21,163.70	6,317	10,818	11,404	28.63	398
2005	11,570.17	2,654	4,545	7,604	31.26	243
2006	78,517.51	16,180	27,707	54,736	32.15	1,703
2008	25,387.15	4,025	6,893	19,764	33.96	582
2009	92,187.89	12,414	21,258	75,539	34.87	2,166
2010	25,516.58	2,820	4,829	21,963	35.79	614
2011	4,504.67	388	665	4,065	36.72	111
	917,658.95	356,000	609,642	353,900		12,794

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 27.7 1.39

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 304.60 STRUCTURES AND IMPROVEMENTS - OFFICE BUILDING

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
MAIN OFFICE						
INTERIM SURVIVOR CURVE.. IOWA 60-R2						
PROBABLE RETIREMENT YEAR.. 6-2043						
NET SALVAGE PERCENT.. -15						
1965	7,142.07	5,501	4,198	4,015	19.11	210
1970	647,194.01	472,755	360,787	383,486	20.63	18,589
1971	2,640.16	1,907	1,455	1,581	20.91	76
1972	19,896.38	14,207	10,842	12,039	21.19	568
1973	5,009.31	3,535	2,698	3,063	21.46	143
1977	4,946.00	3,318	2,532	3,156	22.48	140
1979	5,098.00	3,326	2,538	3,324	22.95	145
1982	72,896.87	45,476	34,705	49,126	23.59	2,082
1984	1,886.00	1,138	868	1,300	23.99	54
1985	1,151.52	683	521	803	24.17	33
1986	27,739.44	16,157	12,330	19,570	24.35	804
1987	136,970.34	78,241	59,710	97,806	24.53	3,987
1988	82,908.88	46,425	35,430	59,916	24.69	2,427
1989	44,800.88	24,556	18,740	32,781	24.86	1,319
1990	32,653.68	17,505	13,359	24,193	25.01	967
1991	3,265.27	1,710	1,305	2,450	25.16	97
1992	16,608.13	8,484	6,475	12,625	25.30	499
1994	27,097.92	13,099	9,997	21,166	25.58	827
1995	26,056.54	12,229	9,333	20,632	25.70	803
2008	1,806,812.15	384,690	293,580	1,784,254	26.98	66,132
2009	7,271.02	1,348	1,029	7,333	27.05	271
2010	2,703,957.36	422,992	322,810	2,786,741	27.12	102,756
2011	499,236.09	62,660	47,820	526,302	27.18	19,364
2013	71,595.70	4,097	3,127	79,208	27.31	2,900
2014	325,425.91	6,452	4,924	369,316	27.37	13,493
	6,580,259.63	1,652,491	1,261,113	6,306,185		238,686
OTHER STRUCTURES						
SURVIVOR CURVE.. IOWA 60-R2						
NET SALVAGE PERCENT.. -15						
1988	780.00	333	254	643	37.70	17
1989	6,617.35	2,731	2,084	5,526	38.47	144
1996	11,220.54	3,437	2,623	10,281	44.02	234
1997	2,091,767.73	607,806	463,852	1,941,681	44.84	43,302
1998	226,122.80	62,106	47,397	212,645	45.67	4,656
1999	167,972.15	43,496	33,194	159,974	46.49	3,441
2000	1,733.16	421	321	1,672	47.33	35
2001	23,770.83	5,390	4,113	23,223	48.17	482

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 304.60 STRUCTURES AND IMPROVEMENTS - OFFICE BUILDING

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
OTHER STRUCTURES						
SURVIVOR CURVE.. IOWA 60-R2						
NET SALVAGE PERCENT.. -15						
2003	50,555.36	9,816	7,491	50,648	49.87	1,016
2004	14,508.35	2,581	1,970	14,715	50.72	290
2005	60,598.88	9,779	7,463	62,226	51.58	1,206
2006	59,714.97	8,641	6,594	62,078	52.45	1,184
2007	93,718.41	11,999	9,157	98,619	53.32	1,850
2008	279,837.73	31,110	23,742	298,072	54.20	5,499
2009	14,136.07	1,333	1,017	15,239	55.08	277
2010	88,564.00	6,857	5,233	96,616	55.96	1,727
2011	156,716.02	9,462	7,221	173,002	56.85	3,043
2012	57,151.00	2,465	1,881	63,842	57.75	1,105
2013	106,501.31	2,777	2,119	120,357	58.64	2,052
	3,511,986.66	822,540	627,728	3,411,057		71,560
	10,092,246.29	2,475,031	1,888,841	9,717,242		310,246

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 31.3 3.07

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 304.70 STRUCTURES AND IMPROVEMENTS - STORE, SHOP AND GARAGE

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 55-R2						
NET SALVAGE PERCENT.. 0						
1957	13,694.36	10,194	11,176	2,518	14.06	179
1972	749.00	449	492	257	22.00	12
1977	5,650.00	3,065	3,360	2,290	25.16	91
1987	44,400.17	18,446	20,224	24,176	32.15	752
1988	42,525.48	17,095	18,742	23,783	32.89	723
1990	17,912.83	6,709	7,356	10,557	34.40	307
1993	546,102.20	181,503	198,994	347,108	36.72	9,453
1996	147,253.93	42,543	46,643	100,611	39.11	2,573
1999	70,632.43	17,273	18,937	51,695	41.55	1,244
2001	11,660.81	2,500	2,741	8,920	43.21	206
2002	43,961.08	8,752	9,595	34,366	44.05	780
2005	2,618.00	400	439	2,179	46.60	47
2009	799,355.85	71,502	78,392	720,964	50.08	14,396
2011	7,549.73	432	474	7,076	51.85	136
2014	3,312.34	27	29	3,283	54.55	60
	1,757,378.21	380,890	417,594	1,339,784		30,959

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 43.3 1.76

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 304.80 STRUCTURES AND IMPROVEMENTS - MISCELLANEOUS

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 25-S0.5						
NET SALVAGE PERCENT.. 0						
1934	291.39	280	37	254	1.00	254
1985	23,000.00	16,404	2,174	20,826	7.17	2,905
1987	25,030.07	17,071	2,263	22,767	7.95	2,864
1989	67,361.16	43,731	5,796	61,565	8.77	7,020
1990	13,875.00	8,769	1,162	12,713	9.20	1,382
1991	6,522.00	4,010	531	5,991	9.63	622
1992	5,113.58	3,052	405	4,709	10.08	467
1993	4,040.72	2,339	310	3,731	10.53	354
1994	3,145.91	1,762	234	2,912	11.00	265
1997	23,223.35	11,621	1,540	21,683	12.49	1,736
1998	34,995.42	16,784	2,224	32,771	13.01	2,519
2000	9,043.98	3,940	522	8,522	14.11	604
2001	19,040.39	7,852	1,041	17,999	14.69	1,225
2002	34,048.07	13,224	1,753	32,295	15.29	2,112
2003	320,932.31	116,691	15,466	305,466	15.91	19,200
2004	7,875.70	2,662	353	7,523	16.55	455
2005	364,463.48	113,421	15,032	349,431	17.22	20,292
2006	220,090.06	62,418	8,273	211,817	17.91	11,827
2007	78,551.61	20,046	2,657	75,895	18.62	4,076
2011	1,875.00	242	32	1,843	21.78	85
2012	124,046.63	11,611	1,538	122,508	22.66	5,406
	1,386,565.83	477,930	63,343	1,323,222		85,670

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 15.4 6.18

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 305.00 COLLECTING AND IMPOUNDING RESERVOIRS

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 70-R3						
NET SALVAGE PERCENT.. 0						
1934	24,854.61	21,336	18,246	6,609	9.91	667
1972	5,066.11	2,776	2,374	2,692	31.64	85
1988	760,225.13	272,054	232,650	527,575	44.95	11,737
1989	2,284.00	788	674	1,610	45.84	35
1991	14,013.00	4,478	3,829	10,184	47.63	214
1992	9,151.62	2,806	2,400	6,752	48.54	139
1993	3,586.34	1,053	900	2,686	49.45	54
1994	30,591.30	8,583	7,340	23,251	50.36	462
1996	1,591.87	405	346	1,246	52.21	24
2005	3,282.30	435	372	2,910	60.73	48
	854,646.28	314,714	269,131	585,515		13,465

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 43.5 1.58

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 306.00 LAKE, RIVER AND OTHER INTAKES

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 50-S1						
NET SALVAGE PERCENT.. -10						
1961	449.15	350	458	36	14.63	2
1966	19,532.24	14,314	18,727	2,758	16.69	165
1970	31,574.52	21,923	28,683	6,049	18.44	328
1971	23,098.06	15,804	20,677	4,731	18.90	250
1991	165,120.57	72,689	95,101	86,532	29.99	2,885
1992	6,000.00	2,552	3,339	3,261	30.67	106
1993	6,985.00	2,864	3,747	3,936	31.36	126
1994	169.67	67	88	99	32.07	3
1997	3,365.94	1,164	1,523	2,180	34.28	64
2002	245,293.78	63,193	82,677	187,146	38.29	4,888
2007	2,378.59	381	498	2,118	42.71	50
2010	820,061.67	80,104	104,803	797,265	45.56	17,499
2012	257,591.23	14,111	18,462	264,888	47.51	5,575
2013	49,161.46	1,622	2,122	51,956	48.50	1,071
	1,630,781.88	291,138	380,905	1,412,955		33,012

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 42.8 2.02

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 309.00 SUPPLY MAINS

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 70-R3						
NET SALVAGE PERCENT.. -10						
1934	223,521.48	211,065	227,802	18,072	9.91	1,824
1940	503.19	457	493	61	12.15	5
1941	433.53	391	422	55	12.56	4
1944	41.85	37	40	6	13.89	
1951	218.11	180	194	46	17.46	3
1953	1,629.41	1,316	1,420	372	18.60	20
1956	59,882.73	46,665	50,365	15,506	20.41	760
1959	109,730.59	82,216	88,736	31,968	22.32	1,432
1964	16,403.53	11,414	12,319	5,725	25.72	223
1965	440,490.69	301,592	325,508	159,032	26.43	6,017
1967	2,875.37	1,904	2,055	1,108	27.87	40
1968	5,722.03	3,722	4,017	2,277	28.61	80
1970	3,226.09	2,022	2,182	1,367	30.11	45
1972	10,673.26	6,434	6,944	4,797	31.64	152
1976	127,784.70	70,703	76,310	64,253	34.79	1,847
1980	3,498.25	1,755	1,894	1,954	38.07	51
1981	2,370.70	1,158	1,250	1,358	38.91	35
1982	53,151.82	25,266	27,270	31,197	39.75	785
1983	358.65	166	179	216	40.60	5
1984	14,163.31	6,352	6,856	8,724	41.46	210
1987	96,069.30	39,146	42,250	63,426	44.07	1,439
1988	100,191.76	39,440	42,567	67,644	44.95	1,505
1989	1,976,228.33	750,283	809,779	1,364,072	45.84	29,757
1991	9,330.23	3,280	3,540	6,723	47.63	141
1992	1,765,551.22	595,392	642,605	1,299,501	48.54	26,772
1993	5,475.01	1,768	1,908	4,115	49.45	83
1994	29,331.77	9,053	9,771	22,494	50.36	447
2000	25,261.98	5,573	6,015	21,773	55.96	389
2007	52,178.70	6,010	6,487	50,910	62.67	812
2008	5,454.04	545	588	5,411	63.64	85
2010	13,377,790.18	927,081	1,000,596	13,714,973	65.59	209,102
2012	2,585.07	100	108	2,736	67.54	41
2013	49,211.71	1,144	1,234	52,899	68.52	772
	18,571,338.59	3,153,630	3,403,704	17,024,768		284,883

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 59.8 1.53

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 310.10 OTHER POWER GENERATION EQUIPMENT

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 35-R3						
NET SALVAGE PERCENT.. -5						
1981	38,609.55	31,505	28,192	12,348	7.80	1,583
1988	162,035.27	111,853	100,089	70,048	11.99	5,842
1989	55,199.86	36,962	33,075	24,885	12.68	1,963
1996	209,151.84	106,666	95,447	124,162	18.00	6,898
2003	12,785.70	4,204	3,762	9,663	24.04	402
2007	196,041.20	42,698	38,207	167,636	27.74	6,043
2008	133,198.85	25,215	22,563	117,296	28.69	4,088
2009	32,060.10	5,146	4,605	29,058	29.65	980
2010	1,769,672.64	233,069	208,556	1,649,600	30.61	53,891
2011	45,464.46	4,664	4,174	43,564	31.58	1,379
2012	20,101.38	1,477	1,322	19,784	32.55	608
2013	69,396.79	3,060	2,738	70,129	33.53	2,092
2014	53,786.18	791	707	55,768	34.51	1,616
	2,797,503.82	607,310	543,437	2,393,942		87,385

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 27.4 3.12

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 311.20 ELECTRIC PUMPING EQUIPMENT

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 43-S0.5						
NET SALVAGE PERCENT.. -15						
1934	5,904.01	6,483	4,273	2,517	1.94	1,297
1940	2,338.33	2,441	1,609	1,080	3.96	273
1947	282.63	277	183	142	6.31	23
1949	15,991.09	15,400	10,151	8,239	6.99	1,179
1950	465.46	444	293	242	7.34	33
1953	694.17	643	424	374	8.38	45
1954	212.25	195	129	115	8.73	13
1955	113,041.92	102,548	67,597	62,401	9.08	6,872
1956	1,094.13	982	647	611	9.44	65
1958	29,118.81	25,574	16,858	16,629	10.16	1,637
1959	50,458.90	43,818	28,884	29,144	10.53	2,768
1962	5,393.17	4,522	2,981	3,221	11.65	276
1965	3,283.85	2,651	1,747	2,029	12.81	158
1966	55,698.85	44,390	29,261	34,793	13.20	2,636
1967	13,481.70	10,600	6,987	8,517	13.60	626
1970	108,625.30	81,866	53,964	70,955	14.82	4,788
1971	2,476.72	1,839	1,212	1,636	15.24	107
1973	565.00	407	268	382	16.09	24
1974	9,556.37	6,765	4,459	6,531	16.53	395
1976	153,438.04	104,969	69,193	107,261	17.42	6,157
1977	659.56	443	292	466	17.87	26
1979	1,256.95	813	536	909	18.81	48
1981	169,137.91	105,079	69,265	125,244	19.77	6,335
1982	13,658.17	8,306	5,475	10,232	20.26	505
1983	38,571.60	22,942	15,123	29,234	20.76	1,408
1984	14,571.77	8,468	5,582	11,176	21.27	525
1985	68,086.72	38,622	25,459	52,841	21.79	2,425
1986	20,663.26	11,428	7,533	16,230	22.32	727
1987	385,566.74	207,778	136,961	306,441	22.85	13,411
1988	612,070.60	320,836	211,486	492,395	23.40	21,043
1989	397,193.83	202,254	133,320	323,453	23.96	13,500
1990	76,255.20	37,667	24,829	62,864	24.53	2,563
1991	8,221.11	3,933	2,593	6,861	25.11	273
1992	2,249,164.63	1,040,642	685,960	1,900,579	25.70	73,952
1993	28,748.56	12,840	8,464	24,597	26.30	935
1998	350,170.72	126,427	83,337	319,359	29.50	10,826
1999	267,460.25	91,631	60,400	247,179	30.19	8,187
2000	152,404.16	49,360	32,537	142,728	30.89	4,621
2001	122,352.46	37,304	24,590	116,115	31.60	3,675
2002	22,474.75	6,413	4,227	21,619	32.33	669
2003	82,705.48	21,964	14,478	80,633	33.07	2,438
2004	3,145.15	771	508	3,109	33.83	92

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 311.20 ELECTRIC PUMPING EQUIPMENT

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 43-S0.5						
NET SALVAGE PERCENT.. -15						
2005	72,535.83	16,276	10,729	72,687	34.61	2,100
2006	15,944.04	3,236	2,133	16,203	35.41	458
2008	5,842.76	928	612	6,107	37.06	165
2010	6,058,225.77	682,135	449,643	6,517,317	38.79	168,015
2011	129,080.17	11,427	7,532	140,910	39.69	3,550
2012	82,373.44	5,287	3,485	91,244	40.60	2,247
2013	2,342,652.28	91,463	60,290	2,633,760	41.54	63,403
2014	827,346.27	10,847	7,150	944,298	42.51	22,214
	15,190,660.84	3,634,334	2,395,649	15,073,611		459,708

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 32.8 3.03

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 311.30 DIESEL PUMPING EQUIPMENT

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 43-S0.5						
NET SALVAGE PERCENT.. -15						
1965	22,657.13	18,293	13,389	12,667	12.81	989
1972	1,003.12	733	537	617	15.66	39
1981	95,017.92	59,031	43,207	66,064	19.77	3,342
1987	101,246.21	54,561	39,935	76,498	22.85	3,348
1988	1,109.18	581	425	851	23.40	36
1991	1,881.25	900	659	1,504	25.11	60
1993	80,611.31	36,003	26,351	66,352	26.30	2,523
2006	129,930.05	26,374	19,304	130,116	35.41	3,675
	433,456.17	196,476	143,807	354,668		14,012

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 25.3 3.23

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 311.40 HYDRAULIC PUMPING EQUIPMENT

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 43-S0.5						
NET SALVAGE PERCENT.. -15						
1947	20,674.66	20,287	1,707	22,069	6.31	3,497
1995	35,434.40	14,651	1,233	39,517	27.54	1,435
2004	6,712.72	1,646	138	7,582	33.83	224
2005	318,909.77	71,560	6,022	360,724	34.61	10,423
2006	1,015.16	206	17	1,151	35.41	33
	382,746.71	108,350	9,117	431,042		15,612

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 27.6 4.08

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 311.52 SOURCE OF SUPPLY PUMPING EQUIPMENT

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 43-S0.5						
NET SALVAGE PERCENT.. -15						
2007	696,220.72	126,055	102,884	697,770	36.23	19,259
2008	3,849,977.61	611,611	499,188	3,928,286	37.06	105,998
2009	3,661,277.60	497,425	405,991	3,804,478	37.92	100,329
2010	740,502.91	83,378	68,052	783,526	38.79	20,199
2011	266,599.30	23,601	19,263	287,326	39.69	7,239
2012	191,866.24	12,314	10,050	210,596	40.60	5,187
2013	1,090,605.48	42,580	34,754	1,219,442	41.54	29,356
2014	1,350,113.57	17,700	14,446	1,538,184	42.51	36,184
	11,847,163.43	1,414,664	1,154,628	12,469,610		323,751

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 38.5 2.73

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 311.54 TRANSMISSION AND DISTRIBUTION PUMPING EQUIPMENT

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 43-S0.5						
NET SALVAGE PERCENT.. -15						
2007	77,063.51	13,953	2,813	85,810	36.23	2,368
2012	17,283.69	1,109	223	19,653	40.60	484
	94,347.20	15,062	3,036	105,463		2,852

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 37.0 3.02

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 320.10 PURIFICATION SYSTEM - STRUCTURES

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

KENTUCKY RIVER STATION
INTERIM SURVIVOR CURVE.. IOWA 55-R3
PROBABLE RETIREMENT YEAR.. 6-2042
NET SALVAGE PERCENT.. -15

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
1958	76,113.80	71,022	57,440	30,091	10.37	2,902
1959	544,917.94	503,424	407,150	219,506	10.81	20,306
1962	4,219.69	3,776	3,054	1,799	12.18	148
1966	1,143,481.59	975,496	788,943	526,061	14.13	37,230
1970	451,865.93	365,389	295,512	224,134	16.14	13,887
1976	1,013.11	749	606	559	19.04	29
1977	448,939.18	326,532	264,086	252,194	19.49	12,940
1978	747.80	535	433	427	19.93	21
1979	6,198.57	4,362	3,528	3,601	20.35	177
1981	103,631.74	70,442	56,971	62,206	21.15	2,941
1982	85,103.93	56,830	45,962	51,908	21.52	2,412
1984	1,818.96	1,170	946	1,146	22.22	52
1986	20,519.97	12,691	10,264	13,334	22.86	583
1987	219,990.46	133,242	107,761	145,228	23.16	6,271
1988	759,416.61	450,114	364,035	509,295	23.44	21,728
1989	33,996.31	19,703	15,935	23,161	23.70	977
1990	7,568.73	4,285	3,466	5,238	23.95	219
1991	509.01	281	227	358	24.19	15
1992	40,905.39	22,013	17,803	29,238	24.41	1,198
1993	19,390.91	10,153	8,211	14,088	24.62	572
1994	6,318.28	3,213	2,599	4,667	24.82	188
1996	204,724.75	97,641	78,968	156,465	25.19	6,211
1997	108,441.59	49,954	40,401	84,307	25.35	3,326
1999	9,193.35	3,912	3,164	7,408	25.66	289
2002	56,860.87	20,891	16,896	48,494	26.05	1,862
2003	3,474.74	1,203	973	3,023	26.17	116
2007	15,505.81	3,881	3,139	14,693	26.56	553
2008	265,157.05	59,214	47,890	257,041	26.64	9,649
2013	3,684.58	222	180	4,058	26.97	150
	4,643,710.65	3,272,340	2,646,540	2,693,727		146,952

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 320.10 PURIFICATION SYSTEM - STRUCTURES

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
KENTUCKY RIVER STATION II						
INTERIM SURVIVOR CURVE.. IOWA 55-R3						
PROBABLE RETIREMENT YEAR.. 6-2065						
NET SALVAGE PERCENT.. -15						
2010	14,582,554.25	1,514,828	1,225,133	15,544,804	44.51	349,243
2014	61,462.93	759	614	70,069	46.04	1,522
	14,644,017.18	1,515,587	1,225,747	15,614,873		350,765
RICHMOND ROAD STATION TREATMENT PLANT						
INTERIM SURVIVOR CURVE.. IOWA 55-R3						
PROBABLE RETIREMENT YEAR.. 6-2038						
NET SALVAGE PERCENT.. -15						
1900	9,352.92	10,560	8,541	2,215	1.00	2,215
1929	26.49	29	23	7	1.77	4
1934	1,506.01	1,637	1,324	408	3.03	135
1936	342.12	368	298	96	3.55	27
1938	138.71	148	120	40	4.06	10
1948	4,331.32	4,370	3,534	1,447	6.75	214
1950	27,527.47	27,415	22,173	9,483	7.37	1,287
1953	22,789.91	22,219	17,971	8,238	8.37	984
1960	7,813.41	7,175	5,803	3,182	11.05	288
1964	2,277.79	2,008	1,624	995	12.74	78
1966	1,473.00	1,270	1,027	667	13.61	49
1968	4,540.05	3,824	3,093	2,128	14.47	147
1971	6,312.96	5,126	4,146	3,114	15.73	198
1972	11,330.58	9,084	7,347	5,683	16.14	352
1973	58,045.91	45,945	37,161	29,592	16.53	1,790
1974	39,714.75	31,028	25,096	20,576	16.91	1,217
1988	3,355,917.25	2,107,991	1,704,956	2,154,349	20.82	103,475
1989	9,929.28	6,114	4,945	6,474	21.00	308
1991	1,190.30	702	568	801	21.33	38
1992	18,079.30	10,415	8,424	12,367	21.48	576
1994	8,864.67	4,852	3,924	6,270	21.76	288
1995	3,224.21	1,715	1,387	2,321	21.89	106
1997	664,505.78	331,976	268,504	495,677	22.12	22,409
1999	2,588.14	1,202	972	2,004	22.32	90
2002	981,756.84	397,291	321,331	807,689	22.58	35,770
2003	3,517.11	1,345	1,088	2,957	22.66	130
2007	624,519.59	175,283	141,770	576,428	22.92	25,150

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 320.10 PURIFICATION SYSTEM - STRUCTURES

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
RICHMOND ROAD STATION TREATMENT PLANT INTERIM SURVIVOR CURVE.. IOWA 55-R3 PROBABLE RETIREMENT YEAR.. 6-2038 NET SALVAGE PERCENT.. -15						
2008	1,068,184.71	268,666	217,299	1,011,114	22.97	44,019
2012	7,395.45	823	666	7,839	23.15	339
2014	5,228.25	124	100	5,912	23.22	255
	6,952,424.28	3,480,705	2,815,216	5,180,072		241,948
OTHER STRUCTURES SURVIVOR CURVE.. IOWA 55-R3 NET SALVAGE PERCENT.. -15						
1996	2,250,651.76	828,706	670,225	1,918,024	37.39	51,298
2005	13,258.66	2,559	2,070	13,178	45.77	288
2006	10,736.70	1,859	1,503	10,844	46.72	232
2009	153,749.22	17,296	13,988	162,823	49.62	3,281
2010	7,017.03	647	523	7,546	50.59	149
	2,435,413.37	851,067	688,310	2,112,415		55,248
	28,675,565.48	9,119,699	7,375,813	25,601,087		794,913

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 32.2   2.77

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 320.11 PURIFICATION SYSTEM - EQUIPMENT

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 27-L2						
NET SALVAGE PERCENT.. -15						
1970	244,452.52	216,359	174,983	106,137	6.22	17,064
1974	108.00	91	74	50	7.17	7
1981	970,333.34	746,816	603,995	511,888	8.93	57,322
1984	2,181.04	1,610	1,302	1,206	9.67	125
1987	142,933.99	101,121	81,783	82,591	10.39	7,949
1988	257,733.44	179,703	145,337	151,056	10.63	14,210
1989	17,766.81	12,206	9,872	10,560	10.87	971
1990	60,992.04	41,253	33,364	36,777	11.12	3,307
1991	348,062.80	231,714	187,401	212,871	11.37	18,722
1992	8,821.95	5,772	4,668	5,477	11.64	471
1993	634,476.96	407,253	329,370	400,279	11.93	33,552
1994	12,064.62	7,590	6,138	7,736	12.23	633
1996	310,024.29	185,790	150,260	206,268	12.93	15,953
1997	20,551.70	11,975	9,685	13,949	13.32	1,047
1998	94,740.35	53,426	43,209	65,742	13.76	4,778
1999	964,589.66	523,823	423,647	685,631	14.25	48,114
2000	474,781.73	247,114	199,856	346,143	14.78	23,420
2001	18,551.32	9,189	7,432	13,902	15.37	904
2002	288,988.50	135,151	109,305	223,032	16.02	13,922
2003	28,240.90	12,365	10,000	22,477	16.72	1,344
2004	26,691.92	10,834	8,762	21,934	17.47	1,256
2005	8,054.76	2,998	2,425	6,838	18.26	374
2006	31,966.04	10,783	8,721	28,040	19.08	1,470
2007	1,485,261.31	447,253	361,720	1,346,331	19.93	67,553
2008	256,529.79	67,743	54,788	240,221	20.80	11,549
2009	158,710.46	35,896	29,031	153,486	21.69	7,076
2010	363,575.82	67,981	54,980	363,132	22.61	16,061
2011	544,992.50	79,853	64,582	562,159	23.56	23,861
2012	109,068.59	11,521	9,318	116,111	24.52	4,735
2013	1,411,565.59	89,590	72,457	1,550,843	25.51	60,794
2014	868,004.06	18,487	14,951	983,254	26.50	37,104
	10,164,816.80	3,973,260	3,213,416	8,476,123		495,648

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 17.1   4.88

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 320.20 PURIFICATION SYSTEM - FILTER MEDIA

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 10-S3						
NET SALVAGE PERCENT.. 0						
2007	27,968.19	18,990	27,968			
2009	140,600.74	74,940	140,601			
2010	405,450.33	180,020	343,897	61,553	5.56	11,071
2011	168,320.47	58,744	112,220	56,101	6.51	8,618
	742,339.73	332,694	624,686	117,654		19,689

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 6.0 2.65

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 330.00 DISTRIBUTION RESERVOIRS AND STANDPIPES

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 55-R4						
NET SALVAGE PERCENT.. -10						
2004	1,656,899.71	346,948	331,825	1,490,765	44.53	33,478
2008	11,716.56	1,521	1,455	11,433	48.51	236
2010	102,741.97	9,227	8,825	104,191	50.51	2,063
	1,771,358.24	357,696	342,105	1,606,389		35,777

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 44.9   2.02

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 330.10 ELEVATED TANKS AND STANDPIPES

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 55-R4						
NET SALVAGE PERCENT.. -10						
1949	29,865.15	30,248	32,623	229	4.36	53
1953	31.05	31	33	1	5.55	
1954	86,170.71	84,654	91,300	3,488	5.88	593
1965	367,671.17	323,183	348,557	55,881	11.05	5,057
1966	723.36	627	676	120	11.68	10
1968	174,702.28	146,751	158,273	33,900	13.00	2,608
1970	582.65	473	510	131	14.38	9
1973	1,249.84	962	1,038	337	16.53	20
1974	22,918.00	17,289	18,646	6,564	17.28	380
1975	116,046.57	85,782	92,517	35,134	18.04	1,948
1976	9,768.97	7,071	7,626	3,120	18.81	166
1977	5,027.00	3,559	3,838	1,692	19.60	86
1980	2,486.15	1,639	1,768	967	22.04	44
1985	18,779.50	10,757	11,602	9,055	26.36	344
1987	767,762.54	412,135	444,493	400,046	28.16	14,206
1988	11,180.11	5,796	6,251	6,047	29.08	208
1989	1,070,509.38	535,260	577,284	600,276	30.00	20,009
1990	664,161.54	319,730	344,833	385,745	30.93	12,472
1991	21,644.73	10,013	10,799	13,010	31.87	408
1992	3,704.09	1,643	1,772	2,302	32.82	70
1994	26,620.29	10,792	11,639	17,643	34.73	508
1996	1,021,559.19	374,501	403,904	719,811	36.67	19,629
1998	119,414.51	39,120	42,191	89,165	38.62	2,309
1999	785,425.59	241,911	260,904	603,064	39.60	15,229
2000	32,901.84	9,489	10,234	25,958	40.58	640
2001	908,985.58	244,332	263,515	736,369	41.56	17,718
2002	38,174.00	9,505	10,251	31,740	42.55	746
2005	3,333,636.69	631,384	680,956	2,986,044	45.53	65,584
2006	169,043.00	28,669	30,920	155,027	46.52	3,332
2009	85,427.55	9,380	10,117	83,853	49.51	1,694
2014	1,034,179.58	10,341	11,153	1,126,445	54.50	20,669
	10,930,352.61	3,607,027	3,890,223	8,133,165		206,749

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 39.3 1.89

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 330.20 GROUND LEVEL FACILITIES

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 55-R4						
NET SALVAGE PERCENT.. 0						
2007	108,616.26	14,772	13,255	95,361	47.52	2,007
2009	8,939.49	892	800	8,139	49.51	164
2010	2,079,601.48	169,779	152,344	1,927,257	50.51	38,156
2012	141,581.45	6,435	5,774	135,807	52.50	2,587
2013	573,874.81	15,650	14,043	559,832	53.50	10,464
	2,912,613.49	207,528	186,216	2,726,398		53,378

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 51.1 1.83

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 330.40 CLEARWELLS

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 55-R4						
NET SALVAGE PERCENT.. 0						
2007	581.91	79	117	465	47.52	10
2010	1,095,733.70	89,456	132,684	963,049	50.51	19,067
	1,096,315.61	89,535	132,801	963,514		19,077

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 50.5 1.74

ACCOUNT 331.00 MAINS AND ACCESSORIES

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 85-R3						
NET SALVAGE PERCENT.. -25						
1906	30.00	34	28	10	8.81	1
1933	50,678.07	49,292	40,637	22,711	18.86	1,204
1934	391,494.70	377,792	311,453	177,915	19.38	9,180
1935	43,013.58	41,179	33,948	19,819	19.90	996
1936	33,176.74	31,498	25,967	15,504	20.44	759
1937	115,464.56	108,690	89,605	54,726	20.99	2,607
1938	16,677.11	15,564	12,831	8,015	21.54	372
1939	20,212.62	18,694	15,411	9,855	22.11	446
1940	15,915.43	14,584	12,023	7,871	22.69	347
1941	14,359.35	13,033	10,744	7,205	23.28	309
1942	1,840.39	1,654	1,364	936	23.88	39
1943	2,346.40	2,088	1,721	1,212	24.49	49
1944	671.23	591	487	352	25.11	14
1945	9,664.23	8,422	6,943	5,137	25.74	200
1946	14,456.57	12,462	10,274	7,797	26.38	296
1947	23,868.66	20,348	16,775	13,061	27.03	483
1948	120,090.47	101,212	83,440	66,673	27.69	2,408
1949	86,935.84	72,425	59,708	48,962	28.35	1,727
1950	127,031.53	104,558	86,198	72,591	29.03	2,501
1951	35,565.16	28,918	23,840	20,616	29.71	694
1952	151,709.08	121,813	100,423	89,213	30.40	2,935
1953	331,177.99	262,508	216,413	197,559	31.10	6,352
1954	148,706.38	116,318	95,893	89,990	31.81	2,829
1955	573,529.57	442,629	364,905	352,007	32.52	10,824
1956	1,043,958.49	794,635	655,101	649,847	33.24	19,550
1957	441,418.41	331,257	273,090	278,683	33.97	8,204
1958	649,836.25	480,595	396,205	416,090	34.71	11,988
1959	470,214.73	342,563	282,411	305,357	35.46	8,611
1960	433,562.62	311,081	256,457	285,496	36.21	7,884
1961	242,799.20	171,532	141,412	162,087	36.96	4,385
1962	324,893.70	225,850	186,192	219,925	37.73	5,829
1963	322,774.88	220,722	181,964	221,505	38.50	5,753
1964	405,983.82	272,963	225,032	282,448	39.28	7,191
1965	487,722.86	322,330	265,730	343,924	40.06	8,585
1966	4,339,804.83	2,817,673	2,322,902	3,101,854	40.85	75,933
1967	726,807.01	463,339	381,979	526,530	41.65	12,642
1968	588,319.57	368,134	303,491	431,908	42.45	10,175
1969	772,089.47	473,928	390,708	574,404	43.26	13,278
1970	439,680.56	264,583	218,123	331,478	44.08	7,520
1971	585,446.80	345,238	284,616	447,192	44.90	9,960
1972	1,631,005.79	942,150	776,713	1,262,044	45.72	27,604
1973	853,817.29	482,663	397,910	669,362	46.56	14,376

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 331.00 MAINS AND ACCESSORIES

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 85-R3						
NET SALVAGE PERCENT.. -25						
1974	3,092,294.92	1,710,310	1,409,987	2,455,382	47.39	51,812
1975	665,091.81	359,540	296,406	534,959	48.24	11,090
1976	772,093.84	407,733	336,137	628,980	49.09	12,813
1977	1,325,776.99	683,554	563,525	1,093,696	49.94	21,900
1978	1,194,275.07	600,646	495,175	997,669	50.80	19,639
1979	1,459,648.73	715,447	589,818	1,234,743	51.67	23,897
1980	1,009,787.19	482,022	397,381	864,853	52.54	16,461
1981	498,699.75	231,602	190,934	432,441	53.42	8,095
1982	413,597.15	186,729	153,940	363,056	54.30	6,686
1983	551,044.43	241,647	199,215	489,591	55.18	8,873
1984	1,822,100.31	774,939	638,863	1,638,762	56.08	29,222
1985	5,125,964.44	2,112,923	1,741,903	4,665,553	56.97	81,895
1986	1,767,492.20	705,185	581,358	1,628,007	57.87	28,132
1987	8,225,224.84	3,171,544	2,614,635	7,666,896	58.78	130,434
1988	5,354,039.12	1,992,773	1,642,851	5,049,698	59.69	84,599
1989	3,446,442.81	1,236,670	1,019,516	3,288,538	60.60	54,266
1990	3,083,431.64	1,064,709	877,751	2,976,539	61.52	48,383
1991	1,924,313.94	638,415	526,312	1,879,080	62.44	30,094
1992	3,749,244.68	1,192,588	983,175	3,703,381	63.37	58,441
1993	3,234,565.32	984,642	811,743	3,231,464	64.30	50,256
1994	6,719,303.51	1,953,554	1,610,519	6,788,610	65.23	104,072
1995	3,740,617.76	1,035,824	853,938	3,821,834	66.17	57,758
1996	5,488,592.75	1,443,980	1,190,424	5,670,317	67.11	84,493
1997	6,256,369.10	1,559,478	1,285,641	6,534,820	68.05	96,030
1998	5,537,344.17	1,302,937	1,074,147	5,847,533	69.00	84,747
1999	6,902,624.47	1,527,723	1,259,462	7,368,819	69.95	105,344
2000	6,519,375.97	1,351,793	1,114,424	7,034,796	70.90	99,221
2001	6,933,108.02	1,339,736	1,104,485	7,561,900	71.86	105,231
2002	3,170,345.93	567,849	468,137	3,494,795	72.82	47,992
2003	2,774,701.87	457,826	377,434	3,090,943	73.78	41,894
2004	1,523,587.80	229,662	189,334	1,715,151	74.75	22,945
2005	1,201,747.25	164,174	135,346	1,366,838	75.71	18,054
2006	4,912,172.29	601,004	495,471	5,644,744	76.68	73,614
2007	32,533,247.08	3,511,557	2,894,944	37,771,615	77.66	486,372
2008	9,353,141.11	876,155	722,306	10,969,120	78.63	139,503
2009	3,594,309.22	285,433	235,312	4,257,575	79.60	53,487
2010	75,429,968.25	4,902,948	4,042,014	90,245,446	80.58	1,119,948
2011	3,974,038.64	201,037	165,736	4,801,812	81.56	58,875
2012	3,837,418.37	138,819	114,443	4,682,330	82.54	56,728

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 331.00 MAINS AND ACCESSORIES

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 85-R3						
NET SALVAGE PERCENT.. -25						
2013	4,729,498.54	102,926	84,853	5,827,020	83.52	69,768
2014	21,993,102.40	158,350	130,544	27,360,834	84.51	323,759
9999	51,928,355.58-	10,058,646-	8,292,393-	56,618,051-		795,432-
	231,000,140.04	44,745,279	36,888,213	251,861,962		3,538,431

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 71.2 1.53

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 333.00 SERVICES

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)

SURVIVOR CURVE.. IOWA 52-R3
NET SALVAGE PERCENT.. -75

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
1934	4,399.71	7,439	7,699			
1937	366.80	611	642			
1939	180.50	298	316			
1940	159.49	262	279			
1941	70.77	115	124			
1942	804.00	1,304	1,407			
1946	281.15	446	481	11	4.83	2
1950	1,784.82	2,768	2,988	135	5.91	23
1953	490.46	746	805	53	6.81	8
1954	385.91	583	629	46	7.13	6
1955	1,484.57	2,225	2,402	196	7.46	26
1956	3,391.42	5,044	5,444	491	7.81	63
1957	5,359.47	7,904	8,531	848	8.18	104
1958	15,331.26	22,413	24,191	2,639	8.56	308
1959	37,959.48	54,983	59,346	7,083	8.96	791
1960	37,875.33	54,339	58,651	7,631	9.37	814
1961	25,236.50	35,832	38,675	5,489	9.81	560
1962	88,652.11	124,530	134,411	20,730	10.26	2,020
1963	70,128.00	97,400	105,128	17,596	10.73	1,640
1964	31,927.22	43,817	47,294	8,579	11.22	765
1965	82,512.30	111,852	120,727	23,670	11.72	2,020
1966	106,810.76	142,884	154,222	32,697	12.25	2,669
1967	101,989.63	134,582	145,261	33,221	12.79	2,597
1968	121,583.96	158,147	170,696	42,076	13.35	3,152
1969	129,018.59	165,300	178,416	47,367	13.93	3,400
1970	106,245.32	134,012	144,646	41,283	14.52	2,843
1971	117,635.96	145,965	157,547	48,316	15.13	3,193
1972	163,315.85	199,182	214,987	70,816	15.76	4,493
1973	93,338.31	111,827	120,700	42,642	16.40	2,600
1974	226,185.27	265,962	287,066	108,758	17.06	6,375
1975	137,023.50	158,032	170,571	69,220	17.73	3,904
1976	204,665.37	231,360	249,718	108,446	18.41	5,891
1977	296,703.20	328,413	354,472	164,759	19.11	8,622
1978	311,918.15	337,803	364,607	181,250	19.82	9,145
1979	334,327.27	353,858	381,936	203,137	20.55	9,885
1980	296,023.56	306,043	330,327	187,714	21.28	8,821
1981	173,127.35	174,618	188,474	114,499	22.03	5,197
1982	272,261.84	267,641	288,878	187,580	22.79	8,231
1983	245,011.96	234,503	253,110	175,661	23.56	7,456
1984	334,763.97	311,618	336,344	249,493	24.34	10,250
1985	459,948.33	415,921	448,923	355,987	25.13	14,166
1986	558,052.12	489,614	528,464	448,127	25.93	17,282

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 333.00 SERVICES

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 52-R3						
NET SALVAGE PERCENT.. -75						
1987	720,904.31	612,839	661,466	600,117	26.74	22,443
1988	739,939.73	608,600	656,891	638,004	27.56	23,150
1989	796,887.93	633,183	683,425	711,129	28.39	25,049
1990	755,929.19	579,261	625,224	697,652	29.23	23,868
1991	756,785.63	558,277	602,575	721,800	30.08	23,996
1992	929,879.08	659,361	711,680	915,608	30.93	29,603
1993	772,840.35	525,381	567,069	785,402	31.80	24,698
1994	860,174.12	559,567	603,967	901,338	32.67	27,589
1995	974,948.93	605,039	653,048	1,053,113	33.56	31,380
1996	1,063,878.96	628,354	678,213	1,183,575	34.45	34,356
1997	976,065.47	546,921	590,318	1,117,797	35.35	31,621
1998	1,440,186.26	763,356	823,927	1,696,399	36.25	46,797
1999	1,665,976.47	832,014	898,032	2,017,427	37.16	54,290
2000	1,932,004.17	905,062	976,877	2,404,130	38.08	63,134
2001	10,218,579.85	4,467,231	4,821,696	13,060,819	39.01	334,807
2002	735,830.12	298,644	322,341	965,362	39.94	24,170
2003	704,374.60	263,603	284,519	948,137	40.88	23,193
2004	602,367.00	206,169	222,528	831,614	41.83	19,881
2005	802,649.81	249,056	268,818	1,135,819	42.78	26,550
2006	1,211,550.63	337,199	363,955	1,756,259	43.73	40,161
2007	1,160,212.42	285,430	308,078	1,722,294	44.69	38,539
2008	2,533,674.04	541,471	584,435	3,849,495	45.65	84,326
2009	3,860,521.35	698,967	754,429	6,001,483	46.62	128,732
2010	1,917,174.87	284,542	307,120	3,047,936	47.59	64,046
2011	1,702,115.57	196,475	212,065	2,766,637	48.57	56,962
2012	2,351,249.84	194,666	210,112	3,904,575	49.54	78,817
2013	1,093,891.33	54,481	58,804	1,855,506	50.52	36,728
2014	717,788.42	11,833	12,772	1,243,358	51.51	24,138
9999	15,659,736.81-	7,241,200-	7,815,660-	19,588,879-		506,853-
	33,537,375.18	15,507,978	16,738,259	41,952,148		1,085,493

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 38.6 3.24

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 334.10 METERS

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 40-R0.5						
NET SALVAGE PERCENT.. -20						
1986	1,458.98	737	1,375-	3,126	23.17	135
1988	2,096.80	990	1,847-	4,363	24.26	180
2002	56,623.00	12,927	24,117-	92,065	32.39	2,842
2003	30,783.47	6,474	12,078-	49,018	32.99	1,486
2006	14,513.75	2,268	4,231-	21,648	34.79	622
2008	1,293,262.80	155,192	289,532-	1,841,447	36.00	51,151
2009	556,641.53	56,610	105,614-	773,584	36.61	21,130
2010	2,288,208.76	190,837	356,032-	3,101,883	37.22	83,339
2011	5,311,507.27	344,186	642,126-	7,015,935	37.84	185,411
2012	2,483,086.64	115,464	215,414-	3,195,118	38.45	83,098
2013	1,933,046.10	53,932	100,617-	2,420,272	39.07	61,947
2014	462,443.21	4,301	8,024-	562,956	39.69	14,184
9999	4,243,349.96-	277,502-	517,717	5,609,737-		148,619-
	10,190,322.35	666,416	1,243,290-	13,471,677		356,906

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 37.7 3.50

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 334.11 METERS - BRONZE CASE

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 40-R0.5						
NET SALVAGE PERCENT.. -20						
2006	37,862.01	5,918	7,574	37,860	34.79	1,088
2007	485,316.25	66,974	85,721	496,658	35.40	14,030
2008	1,482,113.08	177,854	227,636	1,550,900	36.00	43,081
2009	263,744.72	26,823	34,331	282,163	36.61	7,707
9999	667,073.07-	81,602-	104,443-	696,045-		19,376-
	1,601,962.99	195,967	250,819	1,671,536		46,530

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 35.9 2.90

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 334.12 METERS - PLASTIC CASE

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 40-R0.5						
NET SALVAGE PERCENT.. -20						
1976	303.88	201	119-	484	18.00	27
1977	296.96	192	113-	469	18.49	25
1979	106.98	66	39-	167	19.49	9
1981	465.52	272	160-	719	20.51	35
1983	108.98	60	35-	166	21.56	8
1984	38.00	20	12-	58	22.09	3
1985	3,175.62	1,656	977-	4,788	22.62	212
1986	1,053.79	532	314-	1,579	23.17	68
1987	937.01	458	270-	1,394	23.71	59
1988	1,711.33	808	477-	2,531	24.26	104
1989	3,157.67	1,438	848-	4,637	24.82	187
1990	195.67	86	51-	286	25.38	11
1992	1,940.06	785	463-	2,791	26.52	105
1993	8,037.18	3,113	1,836-	11,481	27.09	424
1994	45,303.92	16,758	9,883-	64,248	27.67	2,322
1995	11,934.36	4,207	2,481-	16,802	28.25	595
1997	9,263.92	2,940	1,734-	12,851	29.42	437
2001	282,382.96	69,551	41,015-	379,875	31.79	11,950
2007	5,884.53	812	479-	7,540	35.40	213
2013	5,815.36	162	96-	7,074	39.07	181
2014	16,242.44	151	89-	19,580	39.69	493
9999	117,112.57-	30,654-	18,078	158,613-		5,135-
	281,243.57	73,614	43,413-	380,905		12,333

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 30.9 4.39

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 334.13 METERS - OTHER

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 40-R0.5						
NET SALVAGE PERCENT.. -20						
1934	221.37	259	11-	277	1.00	277
1935	77.55	91	4-	97	1.00	97
1936	184.20	216	9-	230	1.00	230
1937	237.68	276	12-	297	1.23	241
1939	69.91	79	3-	87	2.18	40
1940	50.72	57	2-	63	2.64	24
1941	274.11	303	13-	342	3.10	110
1944	126.81	135	6-	158	4.42	36
1946	166.54	174	7-	207	5.26	39
1949	21.51	22	1-	27	6.47	4
1950	63.27	63	3-	79	6.87	11
1951	616.69	606	26-	766	7.27	105
1952	56.86	55	2-	70	7.67	9
1953	888.22	851	36-	1,102	8.06	137
1954	628.72	595	25-	779	8.46	92
1956	986.40	910	39-	1,223	9.25	132
1957	566.29	516	22-	702	9.65	73
1958	94.99	85	4-	118	10.06	12
1959	828.81	734	31-	1,026	10.46	98
1960	1,132.35	990	42-	1,401	10.87	129
1961	782.01	674	29-	967	11.28	86
1962	333.51	283	12-	412	11.69	35
1963	1,615.14	1,351	57-	1,995	12.11	165
1964	554.45	457	19-	684	12.53	55
1965	2,628.95	2,133	91-	3,246	12.96	250
1966	3,086.88	2,464	105-	3,809	13.39	284
1967	3,381.70	2,655	113-	4,171	13.83	302
1971	1,120.46	819	35-	1,380	15.63	88
1974	429.43	296	13-	528	17.03	31
1977	594.85	384	16-	730	18.49	39
1978	1,487.77	938	40-	1,825	18.98	96
1980	1,729.52	1,038	44-	2,119	20.00	106
1981	560.70	328	14-	687	20.51	33
1983	376.27	208	9-	461	21.56	21
1985	6,562.14	3,421	145-	8,020	22.62	355
1986	6,691.30	3,378	143-	8,173	23.17	353
1987	157.20	77	3-	192	23.71	8
1988	2,180.02	1,029	44-	2,660	24.26	110
1989	4,247.33	1,934	82-	5,179	24.82	209
1990	2,580.38	1,132	48-	3,144	25.38	124
1992	9,519.28	3,850	163-	11,586	26.52	437
1993	8,582.94	3,324	141-	10,441	27.09	385

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 334.13 METERS - OTHER

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 40-R0.5						
NET SALVAGE PERCENT.. -20						
1994	10,008.78	3,702	157-	12,168	27.67	440
1995	9,026.06	3,182	135-	10,966	28.25	388
1996	91,710.15	30,732	1,305-	111,357	28.83	3,863
1997	126,486.24	40,147	1,705-	153,488	29.42	5,217
1998	172,258.15	51,626	2,192-	208,902	30.01	6,961
1999	102,800.26	28,990	1,231-	124,591	30.60	4,072
2000	298,668.92	78,938	3,352-	361,755	31.19	11,598
2001	857,934.50	211,309	8,973-	1,038,494	31.79	32,667
2002	832,583.35	190,079	8,072-	1,007,172	32.39	31,095
2003	1,015,497.69	213,559	9,069-	1,227,666	32.99	37,213
2004	1,180,860.80	227,080	9,643-	1,426,676	33.59	42,473
2005	451,622.80	78,718	3,343-	545,290	34.19	15,949
2006	1,336,848.87	208,949	8,872-	1,613,091	34.79	46,367
2007	62,174.79	8,580	364-	74,974	35.40	2,118
2008	25,585.96	3,070	130-	30,833	36.00	856
2009	147,426.61	14,993	638-	177,550	36.61	4,850
2011	17,183.36	1,113	47-	20,667	37.84	546
2012	30,826.98	1,433	61-	37,053	38.45	964
2013	688.47	19	1-	827	39.07	21
2014	3,555.04	33	1-	4,267	39.69	108
9999	2,010,960.50-	422,005-	17,920	2,431,073-		74,448-
	4,829,282.51	1,013,437	43,035-	5,838,174		178,786

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 32.7 3.70

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 334.20 METER INSTALLATIONS

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 40-R0.5						
NET SALVAGE PERCENT.. -20						
1934	27,150.30	31,766	32,580			
1935	2,467.85	2,887	2,961			
1936	369.80	433	444			
1938	809.36	930	971			
1939	1,959.54	2,223	2,351			
1940	825.42	925	991			
1941	3,204.62	3,548	3,846			
1942	1,000.38	1,094	1,188	12	3.55	3
1943	39.59	43	47	1	3.99	
1945	280.47	296	321	16	4.84	3
1946	448.62	468	508	30	5.26	6
1947	6,623.74	6,822	7,409	539	5.67	95
1948	19,712.77	20,066	21,793	1,862	6.07	307
1949	20,132.24	20,251	21,994	2,165	6.47	335
1950	2,159.26	2,146	2,331	260	6.87	38
1951	8,985.34	8,823	9,582	1,200	7.27	165
1952	17,950.65	17,410	18,908	2,633	7.67	343
1953	19,638.24	18,817	20,437	3,129	8.06	388
1954	20,592.16	19,484	21,161	3,550	8.46	420
1955	24,310.70	22,718	24,673	4,500	8.85	508
1956	22,829.18	21,060	22,873	4,522	9.25	489
1957	33,189.72	30,219	32,820	7,008	9.65	726
1958	23,694.07	21,282	23,114	5,319	10.06	529
1959	16,235.19	14,388	15,626	3,856	10.46	369
1960	36,024.13	31,481	34,191	9,038	10.87	831
1961	33,938.17	29,241	31,758	8,968	11.28	795
1962	31,149.88	26,456	28,733	8,647	11.69	740
1963	51,370.76	42,982	46,681	14,964	12.11	1,236
1964	58,659.21	48,341	52,502	17,889	12.53	1,428
1965	73,709.31	59,793	64,939	23,512	12.96	1,814
1966	71,241.50	56,872	61,767	23,723	13.39	1,772
1967	65,483.40	51,411	55,836	22,744	13.83	1,645
1968	57,662.65	44,510	48,341	20,854	14.27	1,461
1969	45,769.46	34,712	37,700	17,223	14.72	1,170
1970	49,970.02	37,223	40,427	19,537	15.17	1,288
1971	56,379.19	41,219	44,767	22,888	15.63	1,464
1972	94,556.12	67,825	73,663	39,804	16.09	2,474
1973	70,105.49	49,298	53,541	30,586	16.56	1,847
1974	149,361.38	102,925	111,784	67,450	17.03	3,961
1975	88,307.84	59,581	64,709	41,260	17.51	2,356
1976	102,881.88	67,902	73,746	49,712	18.00	2,762
1977	151,100.37	97,505	105,897	75,423	18.49	4,079

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 334.20 METER INSTALLATIONS

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 40-R0.5						
NET SALVAGE PERCENT.. -20						
1978	201,142.65	126,841	137,758	103,613	18.98	5,459
1979	208,758.91	128,449	139,505	111,006	19.49	5,696
1980	212,120.85	127,273	138,227	116,318	20.00	5,816
1981	169,998.49	99,398	107,953	96,045	20.51	4,683
1982	200,656.99	114,194	124,023	116,765	21.03	5,552
1983	183,597.83	101,566	110,308	110,009	21.56	5,102
1984	272,822.77	146,588	159,205	168,182	22.09	7,613
1985	384,431.99	200,443	217,695	243,623	22.62	10,770
1986	366,628.21	185,111	201,044	238,910	23.17	10,311
1987	452,906.59	221,335	240,385	303,103	23.71	12,784
1988	386,524.89	182,517	198,226	265,604	24.26	10,948
1989	512,183.54	233,248	253,324	361,296	24.82	14,557
1990	353,665.90	155,118	168,469	255,930	25.38	10,084
1991	408,485.45	172,177	186,996	303,187	25.95	11,684
1992	519,005.06	209,886	227,951	394,855	26.52	14,889
1993	490,162.24	189,840	206,180	382,015	27.09	14,102
1994	429,065.08	158,711	172,371	342,507	27.67	12,378
1995	347,971.51	122,660	133,217	284,349	28.25	10,065
1996	490,664.56	164,422	178,574	410,223	28.83	14,229
1997	697,615.57	221,423	240,481	596,658	29.42	20,281
1998	519,293.39	155,632	169,027	454,125	30.01	15,132
1999	756,093.39	213,218	231,570	675,742	30.60	22,083
2000	541,983.78	143,246	155,575	494,806	31.19	15,864
2001	243,153.56	59,889	65,044	226,740	31.79	7,132
2002	541,068.58	123,526	134,158	515,124	32.39	15,904
2003	781,916.62	164,437	178,590	759,710	32.99	23,028
2004	691,031.06	132,885	144,323	684,914	33.59	20,390
2005	818,293.89	142,629	154,905	827,048	34.19	24,190
2006	1,228,221.19	191,971	208,495	1,265,370	34.79	36,372
2007	164,054.71	22,640	24,589	172,277	35.40	4,867
2008	129,715.27	15,566	16,906	138,752	36.00	3,854
2009	1,163,569.27	118,335	128,520	1,267,763	36.61	34,629
2010	883,141.36	73,654	79,993	979,777	37.22	26,324
2011	469,292.02	30,410	33,028	530,122	37.84	14,010
2012	656,990.84	30,550	33,179	755,210	38.45	19,641
2013	3,307,954.63	92,292	100,236	3,869,310	39.07	99,035
2014	1,109,073.71	10,314	11,202	1,319,686	39.69	33,250
9999	6,719,290.63-	1,822,668-	1,978,886-	6,084,262-		194,196-
	16,136,245.69	4,377,102	4,752,257	14,611,238		466,359

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 31.3 2.89

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 334.30 METER VAULTS

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 40-R0.5						
NET SALVAGE PERCENT.. -20						
2008	39,000.11	4,680	5,365-	52,165	36.00	1,449
2009	64,535.39	6,563	7,524-	84,966	36.61	2,321
2010	6,433.62	537	616-	8,336	37.22	224
2011	236,167.17	15,304	17,544-	300,945	37.84	7,953
2012	205,872.72	9,573	10,974-	258,021	38.45	6,711
2013	123,440.77	3,444	3,948-	152,077	39.07	3,892
2014	76,029.81	707	811-	92,047	39.69	2,319
	751,479.59	40,808	46,782-	948,557		24,869

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 38.1 3.31

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 335.00 FIRE HYDRANTS

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 70-R4						
NET SALVAGE PERCENT.. -40						
1934	513.25	653	510	209	6.37	33
1937	15.89	20	16	6	7.31	1
1938	30.93	39	30	13	7.65	2
1939	85.34	106	83	36	8.00	4
1940	31.32	39	30	14	8.36	2
1941	88.25	108	84	40	8.75	5
1942	11.99	15	12	5	9.15	1
1946	37.36	44	34	18	10.97	2
1947	34.35	40	31	17	11.48	1
1948	315.37	366	286	156	12.01	13
1949	548.60	630	492	276	12.57	22
1950	236.61	269	210	121	13.15	9
1951	645.80	726	567	337	13.76	24
1952	3,419.06	3,803	2,973	1,814	14.38	126
1953	7,288.81	8,015	6,265	3,939	15.02	262
1954	3,617.08	3,930	3,072	1,992	15.67	127
1955	17,235.66	18,501	14,461	9,669	16.33	592
1956	15,756.16	16,698	13,052	9,007	17.01	530
1957	19,316.05	20,205	15,793	11,249	17.70	636
1958	14,733.45	15,208	11,887	8,740	18.39	475
1959	37,425.48	38,099	29,779	22,617	19.10	1,184
1960	23,616.85	23,707	18,530	14,534	19.81	734
1961	28,414.04	28,107	21,969	17,811	20.54	867
1962	44,317.03	43,183	33,753	28,291	21.28	1,329
1963	27,627.54	26,506	20,718	17,961	22.03	815
1964	43,126.21	40,728	31,834	28,543	22.78	1,253
1965	57,106.20	53,052	41,467	38,482	23.55	1,634
1966	106,204.59	97,007	75,823	72,863	24.33	2,995
1967	61,960.91	55,616	43,471	43,274	25.12	1,723
1968	66,002.96	58,175	45,471	46,933	25.93	1,810
1969	57,006.09	49,322	38,551	41,258	26.74	1,543
1970	67,094.06	56,950	44,514	49,418	27.56	1,793
1971	56,253.73	46,814	36,591	42,164	28.39	1,485
1972	76,621.82	62,478	48,835	58,436	29.23	1,999
1973	135,559.50	108,203	84,575	105,208	30.09	3,496
1974	363,848.55	284,167	222,113	287,275	30.95	9,282
1975	100,785.47	76,960	60,154	80,946	31.82	2,544
1976	71,870.25	53,615	41,907	58,711	32.70	1,795
1977	124,269.05	90,492	70,731	103,246	33.59	3,074
1978	138,945.41	98,707	77,152	117,372	34.48	3,404
1979	149,596.66	103,551	80,938	128,497	35.39	3,631
1980	128,549.58	86,643	67,723	112,246	36.30	3,092

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 335.00 FIRE HYDRANTS

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 70-R4						
NET SALVAGE PERCENT.. -40						
1981	75,026.94	49,188	38,447	66,591	37.22	1,789
1982	77,534.51	49,405	38,616	69,932	38.14	1,834
1983	60,248.76	37,270	29,131	55,217	39.07	1,413
1984	160,419.29	96,220	75,208	149,379	40.01	3,734
1985	163,595.48	95,049	74,293	154,741	40.95	3,779
1986	111,297.79	62,550	48,891	106,926	41.90	2,552
1987	221,376.05	120,162	93,922	216,004	42.86	5,040
1988	230,761.84	120,872	94,477	228,590	43.81	5,218
1989	222,642.15	112,302	87,778	223,921	44.78	5,000
1990	341,145.16	165,523	129,377	348,226	45.74	7,613
1991	201,918.67	94,053	73,515	209,171	46.71	4,478
1992	330,976.58	147,749	115,485	347,882	47.68	7,296
1993	227,258.94	96,995	75,814	242,349	48.66	4,980
1994	275,820.75	112,315	87,789	298,360	49.64	6,010
1995	216,035.95	83,736	65,450	237,000	50.62	4,682
1996	319,106.99	117,433	91,789	354,961	51.60	6,879
1997	263,368.18	91,703	71,678	297,037	52.59	5,648
1998	270,789.51	88,980	69,549	309,556	53.57	5,779
1999	366,272.06	113,104	88,405	424,376	54.56	7,778
2000	255,768.76	73,918	57,776	300,300	55.55	5,406
2001	392,469.84	105,655	82,583	466,875	56.54	8,257
2002	474,071.87	118,139	92,341	571,360	57.54	9,930
2003	558,845.23	128,201	100,206	682,177	58.53	11,655
2004	555,936.45	116,521	91,076	687,235	59.52	11,546
2005	751,818.46	142,546	111,418	941,128	60.52	15,551
2006	990,260.69	167,944	131,270	1,255,095	61.52	20,401
2007	689,102.62	103,228	80,686	884,058	62.51	14,143
2008	507,685.18	65,894	51,504	659,255	63.51	10,380
2009	528,706.82	58,053	45,376	694,814	64.51	10,771
2010	724,166.50	65,027	50,827	963,006	65.51	14,700
2011	490,724.04	34,351	26,850	660,164	66.50	9,927
2012	638,439.05	31,918	24,948	868,867	67.50	12,872
2013	1,166,604.28	35,000	27,357	1,605,889	68.50	23,444
2014	2,374,812.59	23,739	18,555	3,306,183	69.50	47,571
9999	2,442,807.20-	677,823-	529,806-	2,890,125-		52,630-
	14,842,364.09	4,118,417	3,219,068	17,560,241		319,775

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 54.9 2.15

KENTUCKY AMERICAN WATER COMPANY

ACCOUTN 339.60 OTHER P/E COMPANY PLANNING STUDY

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. 10-SQUARE						
NET SALVAGE PERCENT.. 0						
2007	63,554.70	47,666	47,666	15,889	2.50	6,356
2008	31,736.46	20,629	20,629	11,107	3.50	3,173
2009	144,403.79	79,422	79,422	64,982	4.50	14,440
2012	78,472.72	19,618	19,618	58,855	7.50	7,847
2013	297,442.08	44,616	44,616	252,826	8.50	29,744
	615,609.75	211,951	211,951	403,659		61,560

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 6.6 10.00

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 340.10 OFFICE FURNITURE AND EQUIPMENT - FURNITURE

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. 20-SQUARE						
NET SALVAGE PERCENT.. 0						
1995	19,715.35	18,730	18,730	985	1.00	985
1996	16,689.34	15,438	15,438	1,251	1.50	834
1997	3,242.18	2,837	2,837	405	2.50	162
1998	188,662.31	155,646	155,646	33,016	3.50	9,433
1999	22,561.83	17,485	17,485	5,077	4.50	1,128
2001	7,882.90	5,321	5,321	2,562	6.50	394
2004	4,361.47	2,290	2,290	2,071	9.50	218
2005	14,130.29	6,712	6,712	7,418	10.50	706
2006	20,545.69	8,732	8,732	11,814	11.50	1,027
2007	57,968.53	21,738	21,738	36,231	12.50	2,898
2008	16,838.09	5,472	5,472	11,366	13.50	842
2010	79,677.74	17,927	17,927	61,751	15.50	3,984
2011	14,392.26	2,519	2,519	11,873	16.50	720
2012	160,805.49	20,101	20,101	140,704	17.50	8,040
	627,473.47	300,948	300,948	326,525		31,371

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 10.4 5.00

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 340.15 OFFICE FURNITURE AND EQUIPMENT - COMPUTER SOFTWARE SPECIAL RATE

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. 10-SQUARE						
NET SALVAGE PERCENT.. 0						
2010	238,251.50	107,213	107,213	131,038	5.50	23,825
2012	5,028,519.11	1,257,130	1,257,130	3,771,389	7.50	502,852
2013	6,596,154.86	989,423	989,423	5,606,732	8.50	659,616
2014	81,058.45	4,053	4,053	77,005	9.50	8,106
	11,943,983.92	2,357,819	2,357,819	9,586,165		1,194,399

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 8.0 10.00

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 340.21 OFFICE FURNITURE AND EQUIPMENT - MAINFRAME

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. 5-SQUARE						
NET SALVAGE PERCENT.. 0						
2010	38,363.10	30,690	30,690	7,673	1.00	7,673
2011	173.94	122	122	52	1.50	35
2014	28,694.20	2,869	2,869	25,825	4.50	5,739
	67,231.24	33,681	33,681	33,550		13,447

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 2.5   20.00

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 340.22 OFFICE FURNITURE AND EQUIPMENT - PERSONAL

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. 5-SQUARE						
NET SALVAGE PERCENT.. 0						
2010	100,797.76	80,638	80,638	20,160	1.00	20,160
2011	191,210.41	133,847	133,847	57,363	1.50	38,242
2012	170,098.86	85,049	85,049	85,050	2.50	34,020
2013	7,204.52	2,161	2,161	5,044	3.50	1,441
2014	25,411.32	2,541	2,541	22,870	4.50	5,082
	494,722.87	304,236	304,236	190,487		98,945

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 1.9 20.00

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 340.23 OFFICE FURNITURE AND EQUIPMENT - PERIPHERAL OTHER

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. 5-SQUARE						
NET SALVAGE PERCENT.. 0						
2010	61,338.82	49,071	49,071	12,268	1.00	12,268
2011	14,538.42	10,177	10,177	4,361	1.50	2,907
2012	406,818.52	203,409	203,409	203,410	2.50	81,364
2013	294,713.22	88,414	88,414	206,299	3.50	58,943
2014	532,143.80	53,214	53,214	478,930	4.50	106,429
	1,309,552.78	404,285	404,285	905,268		261,911

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 3.5 20.00

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 340.30 OFFICE FURNITURE AND EQUIPMENT - COMPUTER SOFTWARE

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. 5-SQUARE						
NET SALVAGE PERCENT.. 0						
2010	43,651.13	34,921	34,921	8,730	1.00	8,730
2012	291,889.15	145,945	145,945	145,944	2.50	58,378
2013	23,586.10	7,076	7,076	16,510	3.50	4,717
2014	672,904.99	67,290	67,290	605,615	4.50	134,581
	1,032,031.37	255,232	255,232	776,799		206,406

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 3.8   20.00

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 340.32 OFFICE FURNITURE AND EQUIPMENT - COMPUTER SOFTWARE PERSONAL

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. 5-SQUARE						
NET SALVAGE PERCENT.. 0						
2010	3,388.42	2,711	2,711	677	1.00	677
2014	294,449.84	29,445	29,445	265,005	4.50	58,890
	297,838.26	32,156	32,156	265,682		59,567

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 4.5 20.00

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 340.50 OFFICE FURNITURE AND EQUIPMENT - OTHER

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. 15-SQUARE						
NET SALVAGE PERCENT.. 0						
2000	1,008.57	941	941	68	1.00	68
2001	5,166.10	4,649	4,649	517	1.50	345
2005	3,965.82	2,512	2,512	1,454	5.50	264
2006	6,544.92	3,709	3,709	2,836	6.50	436
	16,685.41	11,811	11,811	4,874		1,113

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 4.4 6.67

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 341.10 TRANSPORTATION EQUIPMENT - LIGHT DUTY TRUCKS

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 10-L2.5						
NET SALVAGE PERCENT.. +15						
2001	1,752.14	1,087	1,028	461	2.70	171
2007	73,458.86	36,964	34,960	27,480	4.08	6,735
2008	50,892.87	23,663	22,380	20,879	4.53	4,609
2009	139,960.44	58,056	54,909	64,057	5.12	12,511
2010	734,111.37	258,958	244,923	379,072	5.85	64,799
2011	120,499.89	34,107	32,258	70,167	6.67	10,520
2012	558,164.86	115,289	109,041	365,399	7.57	48,269
2014	223,355.41	9,493	8,978	180,874	9.50	19,039
	1,902,195.84	537,617	508,477	1,108,389		166,653

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 6.7 8.76

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 341.20 TRANSPORTATION EQUIPMENT - HEAVY DUTY TRUCKS

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 11-L2						
NET SALVAGE PERCENT.. +15						
1979	12,423.75	9,600	8,410	2,150	1.00	2,150
2007	67,512.47	29,841	26,141	31,245	5.28	5,918
2008	198,420.14	81,109	71,051	97,606	5.71	17,094
2010	303,280.50	94,913	83,143	174,645	6.95	25,129
2011	213,147.21	53,693	47,035	134,140	7.74	17,331
2012	377,120.66	69,938	61,265	259,288	8.60	30,150
2013	455,959.49	51,794	45,371	342,195	9.53	35,907
2014	421,996.73	16,303	14,281	344,416	10.50	32,802
	2,049,860.95	407,191	356,697	1,385,685		166,481

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 8.3 8.12

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 341.30 TRANSPORTATION EQUIPMENT - AUTOS

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 10-S2.5						
NET SALVAGE PERCENT.. +20						
1981	2,269.65	1,634	1,322	494	1.00	494
2007	16,571.50	8,683	7,025	6,232	3.45	1,806
2008	13,152.34	6,229	5,039	5,483	4.08	1,344
2011	31,569.25	8,713	7,049	18,206	6.55	2,780
	63,562.74	25,259	20,435	30,415		6,424

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 4.7 10.11

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 341.40 TRANSPORTATION EQUIPMENT - OTHER

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 9-L2.5						
NET SALVAGE PERCENT.. +20						
2001	1,836.18	1,125	896	573	2.11	272
2007	92,750.78	45,922	36,560	37,641	3.43	10,974
2008	97,618.80	45,382	36,130	41,965	3.77	11,131
2009	14,207.52	5,974	4,756	6,610	4.27	1,548
2010	111,246.36	40,345	32,120	56,877	4.92	11,560
2011	38,104.29	11,144	8,872	21,611	5.71	3,785
2012	287,567.62	61,859	49,248	180,806	6.58	27,478
2013	152,233.28	20,027	15,944	105,843	7.52	14,075
2014	72,826.69	3,237	2,577	55,685	8.50	6,551
	868,391.52	235,015	187,103	507,611		87,374

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 5.8 10.06

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 342 STORES EQUIPMENT

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. 25-SQUARE						
NET SALVAGE PERCENT.. 0						
1997	2,570.59	1,799	1,799	772	7.50	103
2010	23,374.96	4,207	4,207	19,168	20.50	935
2012	4,296.10	430	430	3,866	22.50	172
	30,241.65	6,436	6,436	23,806		1,210

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 19.7 4.00

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 343 TOOLS, SHOP AND GARAGE EQUIPMENT

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. 20-SQUARE						
NET SALVAGE PERCENT.. 0						
1995	55,829.32	53,038	53,038	2,791	1.00	2,791
1996	35,091.84	32,460	32,460	2,632	1.50	1,755
1997	79,116.83	69,227	69,227	9,890	2.50	3,956
1998	28,123.68	23,202	23,202	4,922	3.50	1,406
1999	79,394.16	61,530	61,530	17,864	4.50	3,970
2000	87,133.88	63,172	63,172	23,962	5.50	4,357
2001	32,137.66	21,693	21,693	10,445	6.50	1,607
2002	4,442.66	2,777	2,777	1,666	7.50	222
2004	3,052.00	1,602	1,602	1,450	9.50	153
2005	125,610.02	59,665	59,665	65,945	10.50	6,280
2006	585,639.50	248,897	248,897	336,742	11.50	29,282
2007	238,682.81	89,506	89,506	149,177	12.50	11,934
2008	115,398.90	37,505	37,505	77,894	13.50	5,770
2009	36,220.47	9,961	9,961	26,259	14.50	1,811
2010	133,295.37	29,991	29,991	103,304	15.50	6,665
2011	93,034.37	16,281	16,281	76,753	16.50	4,652
2012	193,346.90	24,168	24,168	169,179	17.50	9,667
2013	221,459.18	16,609	16,609	204,850	18.50	11,073
2014	63,002.85	1,575	1,575	61,428	19.50	3,150
	2,210,012.40	862,859	862,859	1,347,153		110,501

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 12.2   5.00

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 344 LABORATORY EQUIPMENT

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. 15-SQUARE						
NET SALVAGE PERCENT.. 0						
2003	2,000.00	1,533	1,533	467	3.50	133
2005	5,800.00	3,673	3,673	2,127	5.50	387
2007	20,166.18	10,083	10,083	10,083	7.50	1,344
2008	15,465.63	6,702	6,702	8,764	8.50	1,031
2009	6,594.63	2,418	2,418	4,177	9.50	440
2010	672,507.35	201,752	201,752	470,755	10.50	44,834
2011	508,655.91	118,685	118,685	389,971	11.50	33,911
2012	9,309.72	1,552	1,552	7,758	12.50	621
2013	15,686.06	1,569	1,569	14,117	13.50	1,046
2014	17,910.62	597	597	17,314	14.50	1,194
	1,274,096.10	348,564	348,564	925,532		84,941

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 10.9 6.67

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 345 POWER OPERATED EQUIPMENT

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. IOWA 23-S1.5						
NET SALVAGE PERCENT.. +10						
1988	55,852.00	38,640	50,267			
1989	2,648.67	1,796	2,384			
1990	41,376.70	27,476	37,127	112	6.03	19
1991	1,470.02	954	1,289	34	6.41	5
1992	4,439.80	2,813	3,801	195	6.81	29
1995	53,978.20	31,430	42,470	6,110	8.12	752
1997	66,151.11	35,929	48,549	10,987	9.12	1,205
1999	28,034.41	14,020	18,945	6,286	10.22	615
2001	3,403.44	1,538	2,078	985	11.45	86
2003	14,878.92	5,939	8,025	5,366	12.80	419
2005	992,362.64	337,834	456,500	436,626	14.30	30,533
2008	31,893.02	7,750	10,472	18,232	16.79	1,086
2011	15,441.00	2,079	2,809	11,088	19.56	567
2012	8,380.95	813	1,099	6,444	20.52	314
2014	39,460.19	772	1,043	34,471	22.50	1,532
	1,359,771.07	509,783	686,858	536,936		37,162

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 14.4   2.73

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 346.10 COMMUNICATION EQUIPMENT - NON-TELEPHONE

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. 15-SQUARE						
NET SALVAGE PERCENT.. 0						
2002	9,939.54	8,283	8,283	1,657	2.50	663
2003	45,153.44	34,618	34,618	10,535	3.50	3,010
2005	1,062.69	673	673	390	5.50	71
2008	599.38	260	260	339	8.50	40
2009	16,934.02	6,209	6,209	10,725	9.50	1,129
2010	6,865.25	2,060	2,060	4,805	10.50	458
2012	125,355.92	20,893	20,893	104,463	12.50	8,357
2013	100,676.34	10,068	10,068	90,608	13.50	6,712
2014	3,933.85	131	131	3,803	14.50	262
	310,520.43	83,195	83,195	227,325		20,702

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 11.0 6.67

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 346.19 REMOTE CONTROL AND INSTRUMENTATION

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. 15-SQUARE						
NET SALVAGE PERCENT.. 0						
2008	22,310.63	9,668	9,668	12,643	8.50	1,487
2010	824,655.96	247,397	247,397	577,259	10.50	54,977
2011	1,026,839.21	239,592	239,592	787,247	11.50	68,456
2012	1,012,043.36	168,677	168,677	843,366	12.50	67,469
2013	2.09			2	13.50	
	2,885,851.25	665,334	665,334	2,220,517		192,389

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 11.5 6.67

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 346.20 COMMUNICATION EQUIPMENT - TELEPHONE

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. 15-SQUARE						
NET SALVAGE PERCENT.. 0						
2008	20,843.96	9,032	9,032	11,812	8.50	1,390
2010	27,048.52	8,115	8,115	18,934	10.50	1,803
2012	44,802.17	7,467	7,467	37,335	12.50	2,987
	92,694.65	24,614	24,614	68,081		6,180

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 11.0   6.67

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 347.00 MISCELLANEOUS EQUIPMENT

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. 20-SQUARE						
NET SALVAGE PERCENT.. 0						
1995	4,370.33	4,152	4,152	218	1.00	218
1996	6,137.24	5,677	5,677	460	1.50	307
1997	16,853.26	14,747	14,747	2,106	2.50	842
1998	42,103.37	34,735	34,735	7,368	3.50	2,105
1999	71,190.82	55,173	55,173	16,018	4.50	3,560
2001	21,004.47	14,178	14,178	6,826	6.50	1,050
2002	55,127.04	34,454	34,454	20,673	7.50	2,756
2003	65,342.21	37,572	37,572	27,770	8.50	3,267
2004	9,148.98	4,803	4,803	4,346	9.50	457
2005	624,412.10	296,596	296,596	327,816	10.50	31,221
2006	5,015.01	2,131	2,131	2,884	11.50	251
2007	12,596.30	4,724	4,724	7,872	12.50	630
2008	3,044.87	990	990	2,055	13.50	152
2009	7,783.88	2,141	2,141	5,643	14.50	389
2010	173,491.53	39,036	39,036	134,456	15.50	8,675
2011	7,240.21	1,267	1,267	5,973	16.50	362
2012	49,094.10	6,137	6,137	42,957	17.50	2,455
2013	506,012.36	37,951	37,951	468,061	18.50	25,301
2014	7,616.62	190	190	7,427	19.50	381
	1,687,584.70	596,654	596,654	1,090,931		84,379

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 12.9   5.00

KENTUCKY AMERICAN WATER COMPANY

ACCOUNT 348.00 OTHER TANGIBLE PROPERTY

CALCULATED REMAINING LIFE DEPRECIATION ACCRUAL
RELATED TO ORIGINAL COST AS OF DECEMBER 31, 2014

YEAR (1)	ORIGINAL COST (2)	CALCULATED ACCRUED (3)	ALLOC. BOOK RESERVE (4)	FUTURE BOOK ACCRUALS (5)	REM. LIFE (6)	ANNUAL ACCRUAL (7)
SURVIVOR CURVE.. 20-SQUARE						
NET SALVAGE PERCENT.. 0						
1998	107,321.46	88,540	88,540	18,781	3.50	5,366
2003	5,603.90	3,222	3,222	2,382	8.50	280
2005	4,702.50	2,234	2,234	2,468	10.50	235
	117,627.86	93,996	93,996	23,632		5,881

COMPOSITE REMAINING LIFE AND ANNUAL ACCRUAL RATE, PERCENT .. 4.0 5.00

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. 2015-00418**

DIRECT TESTIMONY OF EDWARD L. SPITZNAGEL, JR.

JANUARY 29, 2016

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1. Q. Please state your name, business address, and employer.

A. My name is Edward L. Spitznagel, Jr., and my business address is Campus Box 1146, One Brookings Drive, St Louis, Missouri 63130. I am employed by Washington University.

2. Q. What is your present position?

A. I am Professor of Mathematics in the College of Arts and Sciences at Washington University. I also hold a joint appointment in the Division of Biostatistics of the Washington University School of Medicine.

3. Q. Please review your educational background and work experience.

A. I hold a Bachelor of Science, summa cum laude, in mathematics, awarded in 1962 by Xavier University, Cincinnati, Ohio. I hold a Master of Science (1963) and Ph.D. (1965) in mathematics awarded by the University of Chicago. I have served on the Faculty of Arts and Sciences of Washington University since 1969. I have held a joint appointment in the Division of Biostatistics since 1978. From 1965 to 1969 I was on the faculty of Northwestern University.

Attached to my testimony is Appendix A, which provides a more detailed listing of my education and qualifications in the area of mathematics and statistics.

4. Q. What is the purpose of your testimony in this case?

A. I have been employed by Kentucky-American Water Company (KAW) to make weather-normalized predictions of water utilization by residential and commercial customers for the forecasted test year period September 2016 through August 2017. The predictions are based on ten years of monthly consumption data spanning May 2005 to April 2015.

5. Q. Please describe the consumption data.

A. The data were extracted from the national system in the form of total monthly consumption and bill days, from which gallons per customer day were computed separately for residential and commercial customer classes.

6. Q. What is weather normalization?

A. From one year to the next, variations in temperature and precipitation lead to changes in water consumption. More water will generally be used during hotter, drier periods. The regulatory question is how to reflect those weather-related differences when setting rates.

For ratemaking purposes, revenues need to be set to as "normal" a level as possible, factoring out the potential or actual results of unusual weather conditions. This can be accomplished by building statistical models that predict water utilization from meteorological data and other possible predictors. An estimate of future utilization can then be made by using a long-term average of meteorological data (since there is no better way to forecast next year's weather than as an average) and known values of the other predictors.

7. Q. What are examples of these other, non-meteorological predictors?

A. One is the year itself. Since 1993, the Environmental Protection Agency has required all new toilets manufactured in the United States to use at most 1.6 gallons per flush, which is a reduction of over 50% from the previous 3.5 gallons per flush. In addition, new faucets, showerheads, clothes washing machines, and dishwashers have all been redesigned to use less water. It appears that the introduction of these toilets, other plumbing fixtures, and appliances in new construction and replacement in old construction has led to a gradual decline in water consumption over time for both residential and commercial customer classes.

Another is the month of the year. While water utilization increases during the warmer summer months, analysis of variance shows that month as a categorical variable is a powerful predictor even after temperature and moisture have been included in the model.

8. Q. What model for water utilization did you employ?

A. In a case before this Commission in 1997, I screened a large number of candidate predictors by examining data from sixteen different operating companies in five states: Kentucky, Missouri, Ohio, Tennessee, and Virginia.

I used as candidate predictors only those variables that correlated consistently with utilization for most or all of these operating companies.

I then fitted the surviving candidates in a multivariate model to predict utilization for KAW. I found that calendar month was a strong predictor even in the presence of heat and moisture variables. Therefore I included month as a categorical variable. With month included, I added drought severity index, temperature, and calendar year as potential numeric predictors. In that investigation I found that temperature was not a useful additional predictor in the presence of the drought index, the calendar month, and calendar year.

In 2008, I re-screened for KAW the original list of candidate variables. I found drought severity index, month, and year still to be useful predictors, each one adding to the predictive value of the others. In addition, I found a measurement of temperature called cooling degree days to be a useful predictor in the presence of the other three.

These four variables are useful predictors in the present case as well. The evidence for the usefulness of these four variables, drought severity index, month, year, and cooling degree days can be found in the multivariate analyses in Appendix B.

9. Q. What are cooling degree days?

A. Cooling degrees are a daily measure of the amount by which the average daily temperature exceeds 65 degrees Fahrenheit. For example, if the average temperature on a summer day is 84 degrees, the cooling degrees for that day are 84

− 65 = 19. If the average temperature on a winter day is 54 degrees, the cooling degrees for that day are 0. The primary use of cooling degrees is to aid in estimating the amount of electricity that will be used for air conditioning on a given day. Cooling degree days are the sum of cooling degrees over a given time period, such as a month, which is the form in which NOAA reports them. For water consumption, cooling degrees can act as an additional factor explaining outside water usage.

10. Q. What is the drought severity index?

A. There are a total of four drought severity indices provided by NOAA. They are reported on a monthly basis from 1895 to the present. They are: the Palmer Drought Severity Index (PDSI), the Modified Palmer Drought Severity Index (PMDI), the Palmer Hydrological Drought Index (PHDI), and the Palmer "Z" Index (ZNDX). The PDSI and PMDI are very similar to each other, differing only when the weather transitions between wet and dry spells. In my original investigations, both PDSI and PMDI turned out to be excellent predictors, much better than PHDI or ZNDX. Because PDSI worked slightly better than PMDI, I used PDSI in all weather normalizations prior to 2008. In the previous and present cases, however, PMDI gave predictive models that fitted the data slightly better, so I have shifted over to using PMDI rather than PDSI.

11. Q. Although PMDI is referred to as a drought severity index, low values of PMDI are associated with higher water consumption. Why is that?

A. PMDI and the other three variants are actually measures of available moisture, so high positive values indicate relative abundance of moisture rather than absence of moisture. Thus, people will be induced to use more outside water when PMDI is low, and particularly when it is negative.

12. Q. To summarize, in your weather normalization, what variables were found to predict utilization?

A. The calendar year, the month of the year (as a categorical variable), the Modified Palmer Drought Severity Index (PMDI), and cooling degree days (CDD). For commercial customers, the month of the year was found to interact with PMDI, meaning that the effect of PMDI on consumption varies by month. I therefore accounted for this interaction by running separate models for each month. In these separate models I omitted PMDI for the months of January through April, due to there being no weather-driven consumption during these months. I omitted CDD for the months of November through April because its value is essentially zero during those six months. These separate models are found in Appendix C.

13. Q. Once you had estimated the coefficients in these monthly models, how did you project weather-normalized utilization for September 2016 through August 2017?

A. I put the coefficients from the monthly regressions into Excel spreadsheets, one for each of the two customer classes. I then calculated the monthly mean PMDI and CDD over the 30 year period from May 1985 to April 2015. These spreadsheets are given in Appendix D.

14. Q. Having inserted the mean drought severity indices in the spreadsheets, how did you proceed?

A. I then projected an average daily utilization for each month under average weather. For the forecasted test year, I computed a weighted average of the 12 projected daily utilizations from September 2016 through August 2017, using as weights the number of days from the preceding month. Using the days from the preceding month allows for the fact that bills in September, for example, include utilization from the latter part of August.

15. Q. What are your projections of daily utilization under average weather for the two customer classes?

A. For the forecasted test year:

For residential customers: 130.34 gallons / customer / day

For commercial customers: 1,059.20 gallons / customer / day

16. Q. Does this conclude your testimony?

A. Yes, it does.

VERIFICATION

STATE OF MISSOURI	)	
	)	**SS:**
COUNTY OF ST. LOUIS	)	

The undersigned, **Edward L. Spitznagel, Jr.**, being duly sworn, deposes and says he is a Professor of Mathematics in the College of Arts and Sciences at Washington University and holds a joint appointment in the Division of Biostatistics of the Washington University School of Medicine, 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.

Edward L. Spitznagel, Jr.
EDWARD L. SPITZNAGEL, JR.

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 13 day of January, 2016.

Cynthia Fields (SEAL)
Notary Public

My Commission Expires:
March 5, 2018

CYNTHIA FIELDS
Notary Public, Notary Seal
State of Missouri
St. Louis County
Commission # 14589356
My Commission Expires March 05, 2018

Edward L. Spitznagel, Jr.

Born: Cincinnati, Ohio, 1941.

Education:
- Xavier University, 1959-1962
- Awarded Bachelor of Science Degree (Summa cum Laude), 1962
- University of Chicago, 1962-1965
- Awarded Master of Science Degree, 1963
- Awarded Ph.D. in Mathematics, 1965

Scholarships and Fellowships:
- Xavier University, 1959-1962
- Honorary Woodrow Wilson Fellow, 1962-1963
- National Science Foundation Fellow, 1962-1965

Positions:
- Assistant Professor of Mathematics
- Northwestern University, 1965-1969
- Associate Professor of Mathematics
- Washington University, 1969-1980
- Professor of Mathematics
- Washington University, 1980-present
- Joint appointment, Division of Biostatistics,
- Washington University School of Medicine, 1978-present

Consulting Experience:
- Litton Industries (USACDCEC, Fort Ord, CA)
- Price Waterhouse (Advanced Auditing Methods, NY)
- Mallinckrodt, Inc.
- St. Louis County Juvenile Court
- Monsanto Company
- American Red Cross
- Carboline Corporation
- Regional Justice Information Service
- Harris-Stowe State College
- Equal Employment Opportunity Commission
- American Optometric Association
- Petrolite Corporation
- U.S. Army Atmospheric Sciences Laboratory (White Sands, NM)
- St. Louis County Water Company
- Gateway Medical Research, Inc.
- MasterCard
- Simmons Market Research Bureau
- Transactional Data Solutions
- Missouri-American Water Company
- Capital City Water Company
- Kentucky-American Water Company
- Tennessee-American Water Company
- Iowa-American Water Company
- New Jersey-American Water Company
- Anheuser-Busch, Inc.
- Partek, Inc.
- Santa Clara County Mental Health Administration (San Jose, CA)
- and many law firms

Publications:

1. New impedance method for determining viscoelastic constants. *Rev. Sci. Inst.* **35**, 582-586 (1964). (With Potzick and Catanese).
2. Hall subgroups of certain families of finite groups. *Math. Z.* **97**, 259-290 (1967).
3. A new look at the fifteen puzzle. *Math. Mag.* **40**, 171-174 (1967).
4. Terminality of the maximal unipotent subgroups of Chevalley groups. *Math. Z.* **103**, 112-116 (1968).
5. Note on the alternating group. *Amer. Math. Monthly* **75**, 68-69 (1968).
6. A computer study of the orders of finite simple groups. *Math. Comp.* **22**, 669-671 (1968). (With Szygenda)
7. Density of finite simple group orders. *Math. Z.* **106**, 175-177 (1968). (With Dornhoff)
8. An experimental approach in the teaching of probability. *The Mathematics Teacher* **61**, 565-568 (1968).
9. Structure and terminality of the maximal unipotent subgroups of Steinberg groups. *Illinois J. Math.* **13**, 400-405 (1969).
10. Poisson integrals: rigor or mortis? *Amer. J. Phys.* **38**, 266-267 (1970). (With Hart)
11. An elementary proof that primes are scarce. *Amer. Math. Monthly* **77**, 396-397 (1970).
12. *Selected topics in mathematics.* Holt, Rinehart and Winston (1971).
13. Lognormal model for ascorbic acid requirements in man. *Bioscience* **21**, 981-984 (1971).
14. The uses of computing in a modernized probability and statistics course. *Proceedings of the Second Annual Conference on Computers in the Undergraduate Curricula,* 217-222 (1971).
15. Properties of a game based on Euclid's algorithm. *Math. Mag.* **46**, 87-92 (1973).
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17. An inexpensive computer assist in teaching large enrollment mathematics courses. *Proceedings of Symposia in Applied Mathematics (American Mathematical Society)* **20**, 175-179 (1974).
18. Use of SAS in teaching a first course in statistics. *Proceedings of the First Annual Conference of SAS Users Group International,* 85-89 (1976).
19. Maintenance and analysis of anesthesia/surgery data with SAS. *Proceedings of the Third Annual Conference of SAS Users Group International,* 74-76 (1978). (With Owens)
20. K.W.I.C. indexes with SAS. *Proceedings of the Third Annual Conference of SAS Users Group International,* 267-270 (1978).
21. The use of loglinear and multivariate logistic models to assess the associations between HLA antigen responses and disease. *Proceedings of the 1978 American Statistical Association Section on Statistical Computing,* 271-275 (1978). (With Miller and Kass)
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Check for main effects and interactions between Weather Variables and Consumption

The GLM Procedure

Class Level Information

Class	Levels	Values
month	12	1 2 3 4 5 6 7 8 9 10 11 12

Number of Observations Read	120
Number of Observations Used	120

Check for main effects and interactions between Weather Variables and Consumption

The GLM Procedure

Dependent Variable: residential

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	36	0.07521978	0.00208944	33.79	<.0001
Error	83	0.00513253	0.00006184		
Corrected Total	119	0.08035231			

R-Square	Coeff Var	Root MSE	residential Mean
0.936125	5.127444	0.007864	0.153365

Source	DF	Type I SS	Mean Square	F Value	Pr > F
pmdi	1	0.01400807	0.01400807	226.53	<.0001
cdd	1	0.03434335	0.03434335	555.38	<.0001
year	1	0.01044749	0.01044749	168.95	<.0001
month	11	0.01075101	0.00097736	15.81	<.0001
pmdi*month	11	0.00415683	0.00037789	6.11	<.0001
year*month	11	0.00151303	0.00013755	2.22	0.0203

Source	DF	Type III SS	Mean Square	F Value	Pr > F
pmdi	1	0.00259295	0.00259295	41.93	<.0001
cdd	1	0.00027114	0.00027114	4.38	0.0393
year	1	0.00794419	0.00794419	128.47	<.0001
month	11	0.00392369	0.00035670	5.77	<.0001
pmdi*month	11	0.00227747	0.00020704	3.35	0.0007
year*month	11	0.00151303	0.00013755	2.22	0.0203

Check for main effects and interactions between Weather Variables and Consumption

The GLM Procedure

Dependent Variable: commercial

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	36	4.31136362	0.11976010	29.47	<.0001
Error	83	0.33724540	0.00406320		
Corrected Total	119	4.64860902			

R-Square	Coeff Var	Root MSE	commercial Mean
0.927452	5.235864	0.063743	1.217435

Source	DF	Type I SS	Mean Square	F Value	Pr > F
pmdi	1	0.70415685	0.70415685	173.30	<.0001
cdd	1	1.75040487	1.75040487	430.79	<.0001
year	1	0.46485311	0.46485311	114.41	<.0001
month	11	1.19442132	0.10858376	26.72	<.0001
pmdi*month	11	0.16381225	0.01489202	3.67	0.0003
year*month	11	0.03371522	0.00306502	0.75	0.6836

Source	DF	Type III SS	Mean Square	F Value	Pr > F
pmdi	1	0.12188939	0.12188939	30.00	<.0001
cdd	1	0.01831051	0.01831051	4.51	0.0367
year	1	0.33727839	0.33727839	83.01	<.0001
month	11	0.18287896	0.01662536	4.09	<.0001
pmdi*month	11	0.10905135	0.00991376	2.44	0.0109
year*month	11	0.03371522	0.00306502	0.75	0.6836

Run regressions by month: Lexington, MAY2005-APR2015
Residential Model, JANUARY

The REG Procedure
Model: MODEL1
Dependent Variable: residential

Number of Observations Read	10
Number of Observations Used	10

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	420.77976	420.77976	34.90	0.0004
Error	8	96.46579	12.05822		
Corrected Total	9	517.24554			

Root MSE	3.47250	R-Square	0.8135
Dependent Mean	135.84034	Adj R-Sq	0.7902
Coeff Var	2.55631		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	159.55351	4.16173	38.34	<.0001
since_2000	1	-2.25840	0.38231	-5.91	0.0004

Run regressions by month: Lexington, MAY2005-APR2015
Residential Model, FEBRUARY

The REG Procedure
Model: MODEL1
Dependent Variable: residential

Number of Observations Read	10
Number of Observations Used	10

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	280.72451	280.72451	7.97	0.0224
Error	8	281.65220	35.20652		
Corrected Total	9	562.37671			

Root MSE	5.93351	R-Square	0.4992
Dependent Mean	135.32502	Adj R-Sq	0.4366
Coeff Var	4.38464		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	154.69381	7.11121	21.75	<.0001
since_2000	1	-1.84465	0.65326	-2.82	0.0224

Run regressions by month: Lexington, MAY2005-APR2015
Residential Model, MARCH

The REG Procedure
Model: MODEL1
Dependent Variable: residential

Number of Observations Read	10
Number of Observations Used	10

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	284.10325	284.10325	5.00	0.0558
Error	8	454.65243	56.83155		
Corrected Total	9	738.75568			

Root MSE	7.53867	R-Square	0.3846
Dependent Mean	133.71703	Adj R-Sq	0.3076
Coeff Var	5.63778		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	153.20203	9.03498	16.96	<.0001
since_2000	1	-1.85571	0.82998	-2.24	0.0558

Run regressions by month: Lexington, MAY2005-APR2015
Residential Model, APRIL

The REG Procedure
Model: MODEL1
Dependent Variable: residential

Number of Observations Read 10
Number of Observations Used 10

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	352.30811	352.30811	28.22	0.0007
Error	8	99.88548	12.48568		
Corrected Total	9	452.19359			

Root MSE	3.53351	R-Square	0.7791
Dependent Mean	131.92960	Adj R-Sq	0.7515
Coeff Var	2.67833		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	153.62780	4.23485	36.28	<.0001
since_2000	1	-2.06649	0.38903	-5.31	0.0007

Run regressions by month: Lexington, MAY2005-APR2015
Residential Model, MAY

The REG Procedure
Model: MODEL1
Dependent Variable: residential

Number of Observations Read	10
Number of Observations Used	10

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	973.90825	324.63608	39.53	0.0002
Error	6	49.27608	8.21268		
Corrected Total	9	1023.18433			

Root MSE	2.86578	R-Square	0.9518
Dependent Mean	143.51537	Adj R-Sq	0.9278
Coeff Var	1.99684		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	172.62295	3.31130	52.13	<.0001
pmdi	1	-0.67183	0.60696	-1.11	0.3107
cdd	1	0.04533	0.03291	1.38	0.2175
since_2000	1	-3.46397	0.46768	-7.41	0.0003

Run regressions by month: Lexington, MAY2005-APR2015
Residential Model, JUNE

The REG Procedure
Model: MODEL1
Dependent Variable: residential

Number of Observations Read	10
Number of Observations Used	10

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	2820.27305	940.09102	6.67	0.0244
Error	6	846.08622	141.01437		
Corrected Total	9	3666.35928			

Root MSE	11.87495	R-Square	0.7692
Dependent Mean	168.36851	Adj R-Sq	0.6538
Coeff Var	7.05295		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	175.48005	30.42289	5.77	0.0012
pmdi	1	-4.58189	2.25949	-2.03	0.0889
cdd	1	0.12670	0.10527	1.20	0.2741
since_2000	1	-3.81246	1.48857	-2.56	0.0428

Run regressions by month: Lexington, MAY2005-APR2015
Residential Model, JULY

The REG Procedure
Model: MODEL1
Dependent Variable: residential

Number of Observations Read	10
Number of Observations Used	10

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	5239.60814	1746.53605	8.18	0.0153
Error	6	1281.41194	213.56866		
Corrected Total	9	6521.02009			

Root MSE	14.61399	R-Square	0.8035
Dependent Mean	184.48208	Adj R-Sq	0.7052
Coeff Var	7.92163		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	190.62519	24.76542	7.70	0.0003
pmdi	1	-7.76461	3.02563	-2.57	0.0425
cdd	1	0.07022	0.05581	1.26	0.2550
since_2000	1	-2.76360	1.97669	-1.40	0.2116

Run regressions by month: Lexington, MAY2005-APR2015
Residential Model, AUGUST

The REG Procedure
Model: MODEL1
Dependent Variable: residential

Number of Observations Read	10
Number of Observations Used	10

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	5907.67896	1969.22632	15.92	0.0029
Error	6	742.09928	123.68321		
Corrected Total	9	6649.77824			

Root MSE	11.12130	R-Square	0.8884
Dependent Mean	180.69562	Adj R-Sq	0.8326
Coeff Var	6.15471		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	255.19918	32.41370	7.87	0.0002
pmdi	1	-4.99788	2.76778	-1.81	0.1210
cdd	1	-0.02884	0.07439	-0.39	0.7117
since_2000	1	-6.90949	1.53547	-4.50	0.0041

Run regressions by month: Lexington, MAY2005-APR2015
Residential Model, SEPTEMBER

The REG Procedure
Model: MODEL1
Dependent Variable: residential

Number of Observations Read	10
Number of Observations Used	10

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	5188.05457	1729.35152	32.95	0.0004
Error	6	314.91534	52.48589		
Corrected Total	9	5502.96991			

Root MSE	7.24471	R-Square	0.9428
Dependent Mean	178.36337	Adj R-Sq	0.9142
Coeff Var	4.06177		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	230.77125	16.08853	14.34	<.0001
pmdi	1	-5.17977	1.82395	-2.84	0.0296
cdd	1	-0.00750	0.09241	-0.08	0.9380
since_2000	1	-5.26340	0.87939	-5.99	0.0010

Run regressions by month: Lexington, MAY2005-APR2015
Residential Model, OCTOBER

The REG Procedure
Model: MODEL1
Dependent Variable: residential

Number of Observations Read	10
Number of Observations Used	10

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	4623.70863	1541.23621	20.16	0.0016
Error	6	458.68615	76.44769		
Corrected Total	9	5082.39478			

Root MSE	8.74344	R-Square	0.9097
Dependent Mean	164.07801	Adj R-Sq	0.8646
Coeff Var	5.32883		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	205.33296	10.99486	18.68	<.0001
pmdi	1	-4.98099	1.20332	-4.14	0.0061
cdd	1	0.10226	0.21748	0.47	0.6548
since_2000	1	-4.07558	1.03861	-3.92	0.0078

Run regressions by month: Lexington, MAY2005-APR2015
Residential Model, NOVEMBER

The REG Procedure
Model: MODEL1
Dependent Variable: residential

Number of Observations Read	10
Number of Observations Used	10

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	1661.38611	830.69305	31.12	0.0003
Error	7	186.87537	26.69648		
Corrected Total	9	1848.26147			

Root MSE	5.16686	R-Square	0.8989
Dependent Mean	144.93657	Adj R-Sq	0.8700
Coeff Var	3.56491		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	173.25686	6.01384	28.81	<.0001
pmdi	1	-2.49357	0.61935	-4.03	0.0050
since_2000	1	-2.84354	0.62227	-4.57	0.0026

Run regressions by month: Lexington, MAY2005-APR2015
Residential Model, DECEMBER

The REG Procedure
Model: MODEL1
Dependent Variable: residential

Number of Observations Read	10
Number of Observations Used	10

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	731.28395	365.64197	69.12	<.0001
Error	7	37.03176	5.29025		
Corrected Total	9	768.31571			

Root MSE	2.30005	R-Square	0.9518
Dependent Mean	135.39891	Adj R-Sq	0.9380
Coeff Var	1.69872		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	159.99412	2.72655	58.68	<.0001
pmdi	1	-0.82780	0.30125	-2.75	0.0286
since_2000	1	-2.51586	0.28834	-8.73	<.0001

Run regressions by month: Lexington, MAY2005-APR2015
Commercial Model, JANUARY

The REG Procedure
Model: MODEL1
Dependent Variable: commercial

Number of Observations Read	10
Number of Observations Used	10

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	25451	25451	8.28	0.0206
Error	8	24598	3074.79162		
Corrected Total	9	50049			

Root MSE	55.45080	R-Square	0.5085
Dependent Mean	1004.61445	Adj R-Sq	0.4471
Coeff Var	5.51961		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	1189.03626	66.45689	17.89	<.0001
since_2000	1	-17.56398	6.10493	-2.88	0.0206

Run regressions by month: Lexington, MAY2005-APR2015
Commercial Model, FEBRUARY

The REG Procedure
Model: MODEL1
Dependent Variable: commercial

Number of Observations Read	10
Number of Observations Used	10

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	17583	17583	4.67	0.0628
Error	8	30148	3768.55774		
Corrected Total	9	47731			

Root MSE	61.38858	R-Square	0.3684
Dependent Mean	1068.34087	Adj R-Sq	0.2894
Coeff Var	5.74616		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	1221.62912	73.57322	16.60	<.0001
since_2000	1	-14.59888	6.75866	-2.16	0.0628

Run regressions by month: Lexington, MAY2005-APR2015
Commercial Model, MARCH

The REG Procedure
Model: MODEL1
Dependent Variable: commercial

Number of Observations Read	10
Number of Observations Used	10

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	35240	35240	12.40	0.0078
Error	8	22730	2841.25258		
Corrected Total	9	57970			

Root MSE	53.30340	R-Square	0.6079
Dependent Mean	1067.84307	Adj R-Sq	0.5589
Coeff Var	4.99169		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	1284.85345	63.88327	20.11	<.0001
since_2000	1	-20.66765	5.86851	-3.52	0.0078

Run regressions by month: Lexington, MAY2005-APR2015
Commercial Model, APRIL

The REG Procedure
Model: MODEL1
Dependent Variable: commercial

Number of Observations Read	10
Number of Observations Used	10

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	8888.40117	8888.40117	2.62	0.1441
Error	8	27128	3391.01359		
Corrected Total	9	36017			

Root MSE	58.23241	R-Square	0.2468
Dependent Mean	1079.82445	Adj R-Sq	0.1526
Coeff Var	5.39277		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	1188.81132	69.79061	17.03	<.0001
since_2000	1	-10.37970	6.41118	-1.62	0.1441

Run regressions by month: Lexington, MAY2005-APR2015
Commercial Model, MAY

The REG Procedure
Model: MODEL1
Dependent Variable: commercial

Number of Observations Read	10
Number of Observations Used	10

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	89846	29949	16.71	0.0026
Error	6	10754	1792.28344		
Corrected Total	9	100600			

Root MSE	42.33537	R-Square	0.8931
Dependent Mean	1138.89610	Adj R-Sq	0.8397
Coeff Var	3.71723		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	1420.62353	48.91701	29.04	<.0001
pmdi	1	6.63802	8.96641	0.74	0.4871
cdd	1	1.06006	0.48611	2.18	0.0720
since_2000	1	-40.41734	6.90892	-5.85	0.0011

Run regressions by month: Lexington, MAY2005-APR2015
Commercial Model, JUNE

The REG Procedure
Model: MODEL1
Dependent Variable: commercial

Number of Observations Read	10
Number of Observations Used	10

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	96518	32173	22.59	0.0011
Error	6	8544.63022	1424.10504		
Corrected Total	9	105063			

Root MSE	37.73732	R-Square	0.9187
Dependent Mean	1279.80467	Adj R-Sq	0.8780
Coeff Var	2.94868		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	1258.72115	96.68072	13.02	<.0001
pmdi	1	-31.54989	7.18043	-4.39	0.0046
cdd	1	0.88623	0.33454	2.65	0.0381
since_2000	1	-19.23251	4.73050	-4.07	0.0066

Run regressions by month: Lexington, MAY2005-APR2015
Commercial Model, JULY

The REG Procedure
Model: MODEL1
Dependent Variable: commercial

Number of Observations Read	10
Number of Observations Used	10

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	146880	48960	8.53	0.0139
Error	6	34427	5737.84498		
Corrected Total	9	181307			

Root MSE	75.74856	R-Square	0.8101
Dependent Mean	1399.34373	Adj R-Sq	0.7152
Coeff Var	5.41315		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	1400.10665	128.36637	10.91	<.0001
pmdi	1	-31.28693	15.68272	-1.99	0.0931
cdd	1	0.56910	0.28926	1.97	0.0967
since_2000	1	-18.49624	10.24578	-1.81	0.1211

Run regressions by month: Lexington, MAY2005-APR2015
Commercial Model, AUGUST

The REG Procedure
Model: MODEL1
Dependent Variable: commercial

Number of Observations Read	10
Number of Observations Used	10

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	207932	69311	14.12	0.0040
Error	6	29452	4908.67546		
Corrected Total	9	237384			

Root MSE	70.06194	R-Square	0.8759
Dependent Mean	1444.79272	Adj R-Sq	0.8139
Coeff Var	4.84927		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	1780.81766	204.19986	8.72	0.0001
pmdi	1	-35.10740	17.43643	-2.01	0.0907
cdd	1	-0.00489	0.46865	-0.01	0.9920
since_2000	1	-35.58796	9.67317	-3.68	0.0103

Run regressions by month: Lexington, MAY2005-APR2015
Commercial Model, SEPTEMBER

The REG Procedure
Model: MODEL1
Dependent Variable: commercial

Number of Observations Read	10
Number of Observations Used	10

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	238452	79484	9.00	0.0122
Error	6	53005	8834.15322		
Corrected Total	9	291457			

Root MSE	93.99018	R-Square	0.8181
Dependent Mean	1444.40016	Adj R-Sq	0.7272
Coeff Var	6.50721		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	1970.35390	208.72644	9.44	<.0001
pmdi	1	-70.64868	23.66318	-2.99	0.0245
cdd	1	-1.78487	1.19889	-1.49	0.1871
since_2000	1	-26.28079	11.40891	-2.30	0.0608

Run regressions by month: Lexington, MAY2005-APR2015
Commercial Model, OCTOBER

The REG Procedure
Model: MODEL1
Dependent Variable: commercial

Number of Observations Read	10
Number of Observations Used	10

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	241318	80439	26.75	0.0007
Error	6	18044	3007.26474		
Corrected Total	9	259362			

Root MSE	54.83853	R-Square	0.9304
Dependent Mean	1340.41193	Adj R-Sq	0.8956
Coeff Var	4.09117		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	1578.53225	68.95940	22.89	<.0001
pmdi	1	-39.13793	7.54717	-5.19	0.0020
cdd	1	1.36144	1.36404	1.00	0.3568
since_2000	1	-23.93023	6.51413	-3.67	0.0104

Run regressions by month: Lexington, MAY2005-APR2015
Commercial Model, NOVEMBER

The REG Procedure
Model: MODEL1
Dependent Variable: commercial

Number of Observations Read	10
Number of Observations Used	10

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	101621	50811	11.47	0.0062
Error	7	31010	4429.93515		
Corrected Total	9	132631			

Root MSE	66.55776	R-Square	0.7662
Dependent Mean	1207.03775	Adj R-Sq	0.6994
Coeff Var	5.51414		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	1395.85866	77.46821	18.02	<.0001
pmdi	1	-23.05030	7.97826	-2.89	0.0233
since_2000	1	-18.60448	8.01588	-2.32	0.0533

Run regressions by month: Lexington, MAY2005-APR2015
Commercial Model, DECEMBER

The REG Procedure
Model: MODEL1
Dependent Variable: commercial

Number of Observations Read	10
Number of Observations Used	10

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	53410	26705	27.49	0.0005
Error	7	6800.22859	971.46123		
Corrected Total	9	60211			

Root MSE	31.16827	R-Square	0.8871
Dependent Mean	1031.79530	Adj R-Sq	0.8548
Coeff Var	3.02078		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	1232.50806	36.94777	33.36	<.0001
pmdi	1	-8.74590	4.08221	-2.14	0.0694
since_2000	1	-20.35526	3.90732	-5.21	0.0012

		Projections of Residential Water Utilization, Gallons per Day, Kentucky-American										
	Slope of	Slope of	Slope of		30-yr Avg	30-yr Avg	Days	2014	2015	2016	2017	2018
Month	PMDI	CDD	SINCE_2000	Intercept	PMDI	CDD		Gal/Day	Gal/Day	Gal/Day	Gal/Day	Gal/Day
Jan	0	0	-2.25840	159.55351	0.35133	0.867	31	127.94	125.68	123.42	121.16	118.90
Feb	0	0	-1.84465	154.69381	0.28333	0.000	31	128.87	127.02	125.18	123.33	121.49
Mar	0	0	-1.85571	153.20203	-0.03833	5.967	28	127.22	125.37	123.51	121.65	119.80
Apr	0	0	-2.06649	153.62780	0.04667	6.500	31	124.70	122.63	120.56	118.50	116.43
May	-0.67183	0.04533	-3.46397	172.62295	0.27167	89.733	30	128.01	124.55	121.08	117.62	114.16
Jun	-4.58189	0.12670	-3.81246	175.48005	0.31267	219.933	31	148.54	144.73	140.91	137.10	133.29
Jul	-7.76461	0.07022	-2.76360	190.62519	0.22600	330.800	30	173.41	170.65	167.88	165.12	162.35
Aug	-4.99788	-0.02884	-6.90949	255.19918	-0.02433	298.067	31	149.99	143.08	136.17	129.26	122.35
Sep	-5.17977	-0.00750	-5.26340	230.77125	0.09167	129.567	31	155.64	150.37	145.11	139.85	134.58
Oct	-4.98099	0.10226	-4.07558	205.33296	0.48100	14.767	30	147.39	143.31	139.24	135.16	131.09
Nov	-2.49357	0	-2.84354	173.25686	0.48100	0.000	31	132.25	129.40	126.56	123.72	120.87
Dec	-0.82780	0	-2.51586	159.99412	0.58567	0.000	30	124.29	121.77	119.26	116.74	114.22
				Annual projections:				139.07	135.75	132.41	129.11	125.79
KAWC2015.XLS			**Projection: Sep 2016 to Aug 2017**						130.34			

		Projections of Commercial Water Utilization, Gallons per Day, Kentucky-American										
	Slope of	Slope of	Slope of		30-yr Avg	30-yr Avg	Days	2014	2015	2016	2017	2018
Month	PMDI	CDD	SINCE_2000	Intercept	PMDI	CDD		Gal/Day	Gal/Day	Gal/Day	Gal/Day	Gal/Day
Jan	0	0	-17.56398	1189.0363	0.35133	0.867	31	943.14	925.58	908.01	890.45	872.88
Feb	0	0	-14.59888	1221.6291	0.28333	0.000	31	1,017.24	1,002.65	988.05	973.45	958.85
Mar	0	0	-20.66765	1284.8535	-0.03833	5.967	28	995.51	974.84	954.17	933.50	912.84
Apr	0	0	-10.37970	1188.8113	0.04667	6.500	31	1,043.50	1,033.12	1,022.74	1,012.36	1,001.98
May	6.63802	1.06006	-40.41734	1420.6235	0.27167	89.733	30	951.71	911.29	870.87	830.45	790.04
Jun	-31.54989	0.88623	-19.23251	1258.7212	0.31267	219.933	31	1,174.51	1,155.28	1,136.05	1,116.81	1,097.58
Jul	-31.28693	0.56910	-18.49624	1400.1067	0.22600	330.800	30	1,322.35	1,303.85	1,285.35	1,266.86	1,248.36
Aug	-35.10740	-0.00489	-35.58796	1780.8177	-0.02433	298.067	31	1,281.98	1,246.39	1,210.81	1,175.22	1,139.63
Sep	-70.64868	-1.78487	-26.28079	1970.3539	0.09167	129.567	31	1,364.69	1,338.41	1,312.12	1,285.84	1,259.56
Oct	-39.13793	1.36144	-23.93023	1578.5323	0.48100	14.767	30	1,244.79	1,220.86	1,196.93	1,173.00	1,149.07
Nov	-23.05030	0	-18.60448	1395.8587	0.48100	0.000	31	1,124.31	1,105.70	1,087.10	1,068.50	1,049.89
Dec	-8.74590	0	-20.35526	1232.5081	0.58567	0.000	30	942.41	922.06	901.70	881.35	860.99
				Annual projections:				1,118.20	1,096.05	1,073.57	1,051.75	1,029.60
KAWC2015.XLS			**Projection: Sep 2016 to Aug 2017**						1,059.20			

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. 2015-00418**
	)	
	)	

DIRECT TESTIMONY
OF
DR. JAMES H. VANDER WEIDE
ON BEHALF OF

KENTUCKY-AMERICAN WATER COMPANY

JANUARY 29, 2016

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I. WITNESS IDENTIFICATION

Q. 1 What is your name and business address?

A. 1 My name is James H. Vander Weide. I am Research Professor of Finance and Economics at Duke University, the Fuqua School of Business. I am also President of Financial Strategy Associates, a firm that provides strategic and financial consulting services to business clients. My business address is 3606 Stoneybrook Drive, Durham, North Carolina 27705.

Q. 2 Would you please describe your educational background and prior academic experience?

A. 2 I graduated from Cornell University with a Bachelor's Degree in Economics and from Northwestern University with a Ph.D. in Finance. After joining the faculty of the School of Business at Duke University, I was named Assistant Professor, Associate Professor, and then Professor. I have published research in the areas of finance and economics and taught courses in corporate finance, investment management, and management of financial institutions at Duke for more than thirty-five years. My research publications and teaching experience are described in Appendix 1. I am now retired from my teaching duties at Duke.

Q. 3 Have you previously testified on financial or economic issues?

A. 3 As an expert on financial and economic theory and practice, I have participated in more than 400 regulatory and legal proceedings before the public service commissions of forty-three states and four Canadian provinces, the Federal Energy Regulatory Commission, the National Energy Board (Canada), the Federal Communications Commission, the Canadian Radio-Television and Telecommunications Commission, the U.S. Congress, the National Telecommunications and Information Administration, the insurance commissions of five states, the Iowa State Board of Tax Review, and the North Carolina Property Tax Commission. In addition, I have prepared expert testimony in proceedings before the U.S. District Court for the District of Nebraska; the U.S. District Court for the District of New Hampshire; the U.S. District Court for the District of Northern Illinois; the U.S. District Court for the Eastern District of North Carolina; the Montana Second Judicial District Court, Silver Bow County; the U.S. District Court for the Northern District of California; the Superior Court, North Carolina; the U.S. Bankruptcy Court for the Southern District of West Virginia; and the U. S. District Court for the Eastern District of Michigan.

II. PURPOSE OF TESTIMONY

Q. 4 What is the purpose of your testimony?

A. 4 I have been asked by Kentucky American Water Company (KAW) to prepare an independent appraisal of its cost of equity capital and to recommend a rate of return on equity that is fair, that allows KAW to attract capital on reasonable terms, and that allows KAW to maintain its financial integrity. In addition, KAW has asked me to assess the reasonableness of its recommended 47.352 percent equity ratio and to assess the reasonableness of its recommendation to be released from the restriction that its equity capital structure be maintained in the range 35 percent to 45 percent, a restriction which was determined in Case No. 2006-00197, the proceeding in which the Commission approved Thames Water Aqua Holdings GmbH's sale of AWW common stock to the public. In this proceeding, KAWC is requesting that the Commission approve an equity ratio equal to 46.607 percent.

Q. 5 How do you estimate KAW's cost of equity?

A. 5 I estimate KAW's cost of equity by applying several standard cost of equity estimation techniques, including the discounted cash flow (DCF) model, the risk premium method, and the Capital Asset Pricing Model (CAPM) to groups of comparable risk companies.

Q. 6 What cost of equity do you find for your comparable companies in this proceeding?

A. 6 I find that the cost of equity for my comparable companies is in the range 9.5 percent to 11.2 percent. Because the average beta of my proxy companies is significantly less than 1.0, my conclusion is based on the results of my DCF and risk premium studies.

Q. 7 What is your recommendation regarding KAW's cost of equity?

A. 7 I recommend that KAW be allowed a fair rate of return on common equity in the range 9.5 percent to 11.2 percent.

Q. 8 What is your opinion regarding the Company's request to be released from the restriction that its equity capital structure ratio be maintained in the range 35 percent to 45 percent?

A. 8 Based on my examination of the equity ratios maintained and allowed for regulated utilities, I conclude that the Commission should eliminate its current 35 percent to 45 percent equity ratio restriction and accept the Company's requested equity ratio of 46.607 percent.

Q. 9 Do you have an exhibit to accompany your testimony?

A. 9 Yes. I have an Exhibit___(JVW-1), consisting of nine schedules and five appendices that were prepared by me or under my direction and supervision.

III. ECONOMIC AND LEGAL PRINCIPLES

Q. 10 How do economists define the required rate of return, or cost of capital, associated with particular investment decisions such as the decision to invest in water treatment, storage, and distribution facilities?

A. 10 Economists define the cost of capital as the return investors expect to receive on alternative investments of comparable risk.

Q. 11 How does the cost of capital affect a firm's investment decisions?

A. 11 The goal of a firm is to maximize the value of the firm. This goal can be accomplished by accepting all investments in plant and equipment with an expected rate of return greater than or equal to the cost of capital. Thus, a firm should continue to invest in plant and equipment only so long as the return on its investment is greater than or equal to its cost of capital.

Q. 12 How does the cost of capital affect investors' willingness to invest in a company?

A. 12 The cost of capital measures the return investors can expect on investments of comparable risk. The cost of capital also measures the investor's required rate of return on investment because rational investors will not invest in a particular investment opportunity if the expected return on that opportunity is less than the cost of capital. Thus, the cost of capital is a hurdle rate for both investors and the firm.

Q. 13 Do all investors have the same position in the firm?

A. 13 No. Debt investors have a fixed claim on a firm's assets and income that must be paid prior to any payment to the firm's equity investors. Since the firm's equity investors have a residual claim on the firm's assets and income, equity investments are riskier than debt investments. Thus, the cost of equity exceeds the cost of debt.

Q. 14 What is the economic definition of the cost of equity?

A. 14 As I noted above, the cost of equity is the return investors expect to receive on alternative equity investments of comparable risk. Since the return on an equity investment of comparable risk is not a contractual return, the cost of equity is more difficult to measure than the cost of debt. However, as I have already noted, the cost of equity is greater than the cost of debt. The cost of equity, like the cost of debt, is both forward looking and market based.

Q. 15 How do economists measure the percentages of debt and equity in a firm's capital structure?

A. 15 Economists measure the percentages of debt and equity in a firm's capital structure by first calculating the market value of the firm's debt and the market value of its equity. Economists then calculate the percentage of debt by the ratio of the market value of debt to the combined market value of debt and equity, and the percentage of equity by the ratio of the market value of equity to the combined market values of debt and equity. For example, if a firm's debt has a market value of $25 million and its equity has a market value of $75 million, then its total market capitalization is $100 million, and its capital structure contains 25 percent debt and 75 percent equity.

Q. 16 Why do economists measure a firm's capital structure in terms of the market values of its debt and equity?

A. 16 Economists measure a firm's capital structure in terms of the market values of its debt and equity because: (1) the weighted average cost of capital is defined as the return investors expect to earn on a portfolio of the company's debt and equity securities; (2) investors measure the expected return and risk on their portfolios using market value weights, not book value weights; and (3) market values are the best measure of the amounts of debt and equity investors have invested in the company on a going forward basis.

Q. 17 Why do investors measure the expected return and risk on their investment portfolios using market value weights rather than book value weights?

A. 17 Investors measure the expected return and risk on their investment portfolios using market value weights because market values are the best measure of the amounts the investors currently have invested in each security in the portfolio. From the point of view of investors, the historical cost or book value of their investment is irrelevant for the purpose of assessing the current risk and required return on their portfolios because if they were to sell their investments, they would receive market value, not historical cost. Thus, the return can only be measured in terms of market values.

Q. 18 Is the economic definition of the weighted average cost of capital consistent with regulators' traditional definition of the average cost of capital?

A. 18 No. The economic definition of the weighted average cost of capital is based on the market costs of debt and equity, the market value percentages of debt and equity in a company's capital structure, and the future expected risk of investing in the company. In contrast, regulators have traditionally defined the weighted average cost of capital using the embedded cost of debt and the book values of debt and equity in a company's capital structure.

Q. 19 Are these economic principles regarding the fair return for capital recognized in any Supreme Court cases?

A. 19 Yes. These economic principles, relating to the supply of and demand for capital, are recognized in two United States Supreme Court cases: (1) *Bluefield Water Works and Improvement Co. v. Public Service Comm'n.*; and (2) *Federal Power Comm'n v. Hope Natural Gas Co*. In the *Bluefield Water Works* case, the Court states:

> A public utility is entitled to such rates as will permit it to earn a return upon the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties, but it has no constitutional right to profits such as are realized or anticipated in highly profitable enterprises or speculative ventures. The return…should be reasonably sufficient to assure confidence in the financial soundness of the utility, and should be adequate, under efficient and economical management, to maintain and support its credit, and enable it to raise the money necessary for the proper discharge of its public duties. [*Bluefield Water Works and Improvement Co. v. Public Service Comm'n.* 262 U.S. 679, 692 (1923)].

The Court clearly recognizes here that: (1) a regulated firm cannot remain financially sound unless the return it is allowed an opportunity to earn on the value of its property is at least equal to the cost of capital (the principle relating to the demand for capital); and (2) a regulated firm will not be able to attract capital if it does not offer investors an opportunity to earn a return on their investment equal to the return they expect to earn on other investments of the same risk (the principle relating to the supply of capital).

In the *Hope Natural Gas* case, the Court reiterates the financial soundness and capital attraction principles of the *Bluefield* case:

> From the investor or company point of view it is important that there be enough revenue not only for operating expenses but also for the capital costs of the business. These include service on the debt and dividends on the stock... By that standard the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital. [*Federal Power Comm'n v. Hope Natural Gas Co*., 320 U.S. 591, 603 (1944)]

IV. BUSINESS AND FINANCIAL RISKS IN THE WATER UTILITY INDUSTRY

Q. 20 Are the returns on investment opportunities, such as an investment in KAW, known with certainty at the time an investment is made?

A. 20 No. The return on an investment in a company depends on the company's expected future cash flows over the life of the investment. Since the company's expected future cash flows are uncertain at the time the investment is made, the return on the investment is also uncertain.

Q. 21 As you discuss above, investors require a return on investment that is equal to the return they expect to receive on other investments of similar risk. Does the required return on an investment depend on the risk of that investment?

A. 21 Yes. Since investors are averse to risk, they require a higher rate of return on investments with greater risk.

Q. 22 What fundamental risk do investors face when they invest in a company such as KAW?

A. 22 Investors face the fundamental risk that their realized, or actual, return on investment will be less than their required return on investment.

Q. 23 How do investors measure investment risk?

A. 23 Investors generally measure investment risk by estimating the probability, or likelihood, of earning less than the required return on investment. For investments or projects with potential returns distributed symmetrically about the expected, or mean, return, investors can also measure investment risk by estimating the variance, or volatility, of the potential return on investment.

Q. 24 Do investors distinguish between business and financial risk?

A. 24 Yes. Business risk is the underlying risk that investors will earn less than their required return on investment when the investment is financed entirely with equity. Financial risk is the additional risk of earning less than the required return when the investment is financed with both fixed-cost debt and equity.

Q. 25 What are the primary determinants of a water utility's business risk?

A. 25 The business risk of investing in water utilities such as KAW is caused by: (1) demand uncertainty; (2) operating expense uncertainty;

(3) investment cost uncertainty; (4) high operating leverage; and (5) regulatory uncertainty.

Q. 26 How does demand uncertainty affect a water utility's business risk?

A. 26 Demand uncertainty affects a water utility's business risk through its impact on the variability of the company's revenues and its return on investment. The greater the uncertainty in demand, the greater is the uncertainty in the company's revenues and its return on investment.

Q. 27 What causes the demand for water services to be uncertain?

A. 27 Demand uncertainty is caused by the sensitivity of demand to (1) the state of the economy and population growth; (2) changes in rates; (3) customer efforts to conserve water usage; (4) customer use of more efficient appliances; (5) fluctuations in average temperatures and rainfall from year to year; and (6) potential service restrictions due to severe weather conditions and/or lack of water supply.

Q. 28 Why are a water utility's operating expenses uncertain?

A. 28 Operating expense uncertainty arises as a result of variability in (1) production costs such as fuel and power costs, chemical costs, purchased water and waste disposal costs; (2) employee-related costs such as salaries and wages, pensions, and insurance; (3) operating supply and service costs such as contracted services, office supplies and services, transportation and rent; (4) maintenance and materials costs; and (5) customer billing and accounting expenses.

Q. 29 Why are a water utility's investment costs uncertain?

A. 29 The water utility business requires large investments in the reservoirs and dams, water treatment plants, trunk mains, pumping stations, and distribution facilities required to deliver water service to customers. The future amounts of required investment in water plant and equipment are uncertain due to: (1) long-run demand uncertainty; (2) uncertainty of the investment costs required to comply with environmental, water quality, and health and safety laws and regulations; (3) uncertainty of the investment costs required to improve the Company's business operations; (4) uncertainty of the investment costs required to maintain and replace aging plant and equipment; and (5) uncertainty in the investment costs required to assure sufficient water supply to meet forecasted demand for water services.

Q. 30 You note above that high operating leverage contributes to the business risk of utilities. What is operating leverage?

A. 30 Operating leverage is the increased sensitivity of a company's earnings to sales variability that arises when some of the company's costs are fixed.

Q. 31 How do economists measure operating leverage?

A. 31 Economists typically measure operating leverage by the ratio of a company's fixed expenses to its operating margin (revenues minus variable expenses).

Q. 32 What is the difference between fixed and variable expenses?

A. 32 Fixed expenses are expenses that do not vary with output, and variable expenses are expenses that vary directly with output. For water utilities, fixed expenses include the fixed component of operating and maintenance costs, depreciation and amortization, and taxes.

Q. 33 Do water utilities typically experience high operating leverage?

A. 33 Yes. As noted above, operating leverage increases when a firm's commitment to fixed costs rises in relation to its operating margin on sales. The relatively high degree of fixed costs in the water utility business arises primarily from: (1) the average water utility's large investment in fixed plant and equipment; and (2) the relative "fixity" of a water utility's operating and maintenance costs. High operating leverage causes the average water utility's operating income to be highly sensitive to demand and revenue fluctuations.

Q. 34 How does operating leverage affect a company's business risk?

A. 34 Operating leverage affects a company's business risk through its impact on the variability of the company's profits or income. Generally speaking, the higher a company's operating leverage, the higher is the variability of the company's operating profits.

Q. 35 How does the typical water utility's operating leverage compare to the operating leverage of electric and natural gas utilities?

A. 35 Operating leverage is sometimes measured by the ratio of fixed plant and equipment to revenues. The typical water utility's ratio of fixed plant and equipment to revenues is generally higher than that of a typical electric or natural gas distribution utility.

Q. 36 Is there any way to reduce the higher business risk associated with high operating leverage?

A. 36 Yes. The higher business risk associated with high operating leverage can be mitigated through regulatory mechanisms such as forward-looking test periods, fixed/variable rate designs, and inclusion of construction work in progress in rate base.

Q. 37 Does regulation create uncertainty for water utilities?

A. 37 Yes. Investors' perceptions of the business and financial risks of water utilities are strongly influenced by their views of the quality of regulation. Investors are aware that regulators in some jurisdictions may be unwilling at times to set rates that allow companies an opportunity to recover their cost of service in a timely manner and earn a fair and reasonable return on investment. If investors perceive that regulators may not provide an opportunity to earn a fair rate of return on investment, investors may demand a higher rate of return for water utilities operating in such jurisdictions. On the other hand, if investors perceive that regulators will provide a reasonable opportunity for the company to maintain its financial integrity and earn a fair rate of return on its investment, investors will view regulatory risk as minimal.

Q. 38 You note that financial leverage increases the risk of investing in water utilities such as KAW. How do economists measure financial leverage?

A. 38 Economists generally measure financial leverage by the percentages of debt and equity in a company's market value capital structure. Companies with a high percentage of debt compared to equity are considered to have high financial leverage.

Q. 39 Why does high financial leverage affect the risk of investing in a water utility's stock?

A. 39 High financial leverage is a source of additional risk to utility stock investors because it increases the percentage of the firm's total costs (that is, operating and capital costs) that are fixed, and the presence of higher fixed costs increases the variability of the equity investors' return on investment.

Q. 40 Can the risk of investing in KAW be distinguished from the risks of investing in companies in other industries?

A. 40 Yes. The risks of investing in water utilities such as KAW can be distinguished from the risks of investing in companies in many other industries in several ways. First, the risks of investing in water utilities are increased because of the greater capital intensity of the water utility business and the fact that most investments in water facilities are largely irreversible once they are made. Second, unlike returns in competitive industries, the returns from investment in water utilities are largely asymmetric. That is, there is little opportunity for water utilities to earn more than the required return, and a significant chance that the utilities will earn less than the required return.

V. COST OF EQUITY ESTIMATION METHODS

Q. 41 What methods do you use to estimate the cost of common equity capital for KAW?

A. 41 I use three generally accepted methods for estimating the cost of common equity. These are the Discounted Cash Flow (DCF), the risk premium method, and the Capital Asset Pricing Model (CAPM). The DCF method assumes that the current market price of a firm's stock is equal to the discounted value of all expected future cash flows. The risk premium method assumes that the investor's required return on an equity investment is equal to the interest rate on a long-term bond plus an additional equity risk premium to compensate the investor for the risks of investing in equities compared to bonds. The CAPM assumes that the investor's required rate of return on equity is equal to a risk-free rate of interest plus the product of a company-specific risk factor, beta, and the expected risk premium on the market portfolio.

VI. DISCOUNTED CASH FLOW (DCF) APPROACH

Q. 42 Please describe the DCF model.

A. 42 The DCF model is derived from the assumption that investors value an asset on the basis of the future cash flows they expect to receive from owning the asset. Thus, investors value an investment in a bond because they expect to receive a sequence of semi-annual coupon payments over the life of the bond and a terminal payment equal to the bond's face value at the time the bond matures. Likewise, investors value an investment in a firm's stock because they expect to receive a sequence of dividend payments and, perhaps, expect to sell the stock at a higher price sometime in the future.

A second fundamental principle of the DCF approach is that investors value a dollar received in the future less than a dollar received today. A future dollar is valued less than a current dollar because investors could invest a current dollar in an interest earning account and increase their wealth. This principle is called the time value of money.

Applying the two fundamental DCF principles noted above to an investment in a bond leads to the conclusion that investors value their investment in the bond on the basis of the present value of the bond's future cash flows. Thus, the price of the bond should reflect the timing, magnitude, and relative risk of the expected cash flows. Algebraically this can be expressed as:

EQUATION 1

$$P_B = \frac{C}{(1+i)} + \frac{C}{(1+i)^2} + \cdots + \frac{C+F}{(1+i)^n}$$

where:

P_B = Bond price;

C = Cash value of the constant coupon payment (assumed for notational convenience to occur annually rather than semi-annually);

F = Face value of the bond;

i = The rate of interest investors could earn by investing their money in an alternative bond of equal risk; and

n = The number of periods before the bond matures.

Applying these same principles to an investment in a firm's stock suggests that the price of the stock should be equal to:

EQUATION 2

$$P_s = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \cdots + \frac{D_n + P_n}{(1+k)^n}$$

where:

P_S = Current price of the firm's stock;

$D_1, D_2 ... D_n$ = Expected annual dividend per share on the firm's stock;

P_n = Price per share of stock at the time the investor expects to sell the stock; and

k = Return the investor expects to earn on alternative investments of the same risk, i.e., the investor's required rate of return.

Equation (2) is frequently called the annual discounted cash flow model of stock valuation. Assuming that dividends grow at a constant annual rate, *g*, this equation can be solved for *k*, the cost of equity. The resulting cost of equity equation is $k = D_1/P_s + g$, where *k* is the cost of equity, D_1 is the expected next period annual dividend, P_s is the current price of the stock, and *g* is the constant annual growth rate in earnings, dividends, and book value per share. The term D_1/P_s is called the dividend yield component of the annual DCF model, and the term *g* is called the growth component of the annual DCF model. As in the case of the price of a bond, the price of a stock is related to the timing, magnitude, and relative risk of the expected cash flows.

Q. 43 Are you recommending that the annual DCF model be used to estimate KAW's cost of equity?

A. 43 No. The DCF model assumes that a company's stock price is equal to the present discounted value of all expected future dividends. The annual DCF model is only a correct expression for the present discounted value of future dividends if dividends are paid annually at the end of each year. Since the companies in my proxy group all pay dividends quarterly, the current market price that investors are willing to pay reflects the expected quarterly receipt of dividends. Therefore, a quarterly DCF model must be used to estimate the cost of equity for these firms. The quarterly DCF model differs from the annual DCF model in that it expresses a company's stock price as the present discounted value of a quarterly stream of dividend payments. A complete analysis of the implications of the quarterly payment of dividends on the DCF model is provided in Exhibit__(JVW-1), Appendix 2. For the reasons cited there, I employ the quarterly DCF model throughout my calculations.

Q. 44 Please describe the quarterly DCF model you used.

A. 44 The quarterly DCF model I used is described on Exhibit___(JVW-1) Schedule 1 and in Appendix 2. The quarterly DCF equation shows that the cost of equity is: the sum of the future expected dividend yield and the growth rate, where the dividend in the dividend yield is the equivalent future value of the four quarterly dividends at the end of the year, and the growth rate is the expected growth in dividends or earnings per share.

Q. 45 In Appendix 2, you demonstrate that the quarterly DCF model provides the theoretically correct valuation of stocks when dividends are paid quarterly. Do investors, in practice, recognize the actual timing and magnitude of cash flows when they value stocks and other securities?

A. 45 Yes. In valuing long-term government or corporate bonds, investors recognize that interest is paid semi-annually. Thus, the price of a long-term government or corporate bond is simply the present value of the semi-annual interest and principal payments on these bonds. Likewise, in valuing mortgages, investors recognize that interest is paid monthly. Thus, the value of a mortgage loan is simply the present value of the monthly interest and principal payments on the loan. In valuing stock investments, stock investors correctly recognize that dividends are paid quarterly. Thus, a firm’s stock price is the present value of the stream of quarterly dividends expected from owning the stock.

Q. 46 When valuing bonds, mortgages, or stocks, would investors assume that cash flows are received only at the end of the year, when, in fact, the cash flows are received semi-annually, quarterly, or monthly?

A 46 No. Assuming that cash flows are received at the end of the year when they are received semi-annually, quarterly, or monthly would lead investors to make serious mistakes in valuing investment opportunities. No rational investor would make the mistake of assuming that dividends or other cash flows are paid annually when, in fact, they are paid more frequently.

Q. 47 How do you estimate the growth component of the quarterly DCF model?

A. 47 I use both the average analysts' estimates of future earnings per share (EPS) growth reported by I/B/E/S Thomson Reuters (I/B/E/S) and the estimate of future earnings per share growth reported by Value Line.

Q. 48 Do you generally rely on EPS growth estimates from both I/B/E/S and Value Line?

A. 48 In applying the DCF model, I generally rely on the analysts' estimates reported by I/B/E/S. However, as I discuss in this testimony, the water companies have such small market capitalization that there are generally only one or two I/B/E/S analysts' long-term growth forecasts available. To supplement the available I/B/E/S growth forecasts, I therefore also rely on the earnings growth forecasts reported by Value Line.

Q. 49 What are the analysts' estimates of future EPS growth?

A. 49 As part of their research, financial analysts working at Wall Street firms periodically estimate EPS growth for each firm they follow. The EPS forecasts for each firm are then published. Investors who are contemplating purchasing or selling shares in individual companies review the forecasts. These estimates represent five-year forecasts of EPS growth.

Q. 50 What is I/B/E/S?

A. 50 I/B/E/S is a division of Thomson Reuters that reports analysts' EPS growth forecasts for a broad group of companies. The forecasts are expressed in terms of a mean forecast and a standard deviation of forecast for each firm. Investors use the mean forecast as an estimate of future firm performance.

Q. 51 Why do you use the I/B/E/S growth estimates?

A. 51 The I/B/E/S growth rates: (1) are widely circulated in the financial community, (2) include the projections of reputable financial analysts who develop estimates of future EPS growth, (3) are reported on a timely basis to investors, and (4) are widely used by institutional and other investors.

Q. 52 Why do you rely on analysts' projections of future EPS growth in estimating the investors' expected growth rate rather than looking at historical growth rates?

A. 52 I rely on analysts' projections of future EPS growth because there is considerable empirical evidence that investors use analysts' forecasts to estimate future earnings growth.

Q. 53 Have you performed any studies concerning the use of analysts' forecasts as an estimate of investors' expected growth rate, g?

A. 53 Yes, I prepared a study in conjunction with Willard T. Carleton, Professor Emeritus of Finance at the University of Arizona, on why analysts' forecasts are the best estimate of investors' expectation of future long-term growth. This study is described in a paper entitled "Investor Growth Expectations and Stock Prices: the Analysts versus History," published in the Spring 1988 edition of *The Journal of Portfolio Management*.

Q. 54 Please summarize the results of your study.

A. 54 First, we performed a correlation analysis to identify the historically oriented growth rates which best described a firm's stock price. Then we did a regression study comparing the historical growth rates with the average analysts' forecasts. In every case, the regression equations containing the average of analysts' forecasts statistically outperformed the regression equations containing the historical growth estimates. These results are consistent with those found by Cragg and Malkiel, the early major research in this area (John G. Cragg and Burton G. Malkiel, *Expectations and the Structure of Share Prices*, University of Chicago Press, 1982). These results are also consistent with the hypothesis that investors use analysts' forecasts, rather than historically oriented growth calculations, in making stock buy and sell decisions. They provide overwhelming evidence that the analysts' forecasts of future growth are superior to historically oriented growth measures in predicting a firm's stock price.

Q. 55 Has your study been updated?

A. 55 Yes. Researchers at State Street Financial Advisors updated my study using data through year-end 2003. Their results continue to confirm that analysts' growth forecasts are superior to historically-oriented growth measures in predicting a firm's stock price.

Q. 56 What price do you use in your DCF model?

A. 56 I use a simple average of the monthly high and low stock prices for each firm for the three-month period ending November 2015. These high and low stock prices were obtained from Thomson Reuters.

Q. 57 Why do you use the three-month average stock price in applying the DCF method?

A. 57 I use the three-month average stock price in applying the DCF method because stock prices fluctuate daily, while financial analysts' forecasts for a given company are generally changed less frequently, often on a quarterly basis. Thus, to match the stock price with an earnings forecast, it is appropriate to average stock prices over a three-month period.

Q. 58 Do you include an allowance for flotation costs in your DCF analysis?

A. 58 Yes. I include a five percent allowance for flotation costs in my DCF calculations.

Q. 59 Please explain your inclusion of flotation costs.

A. 59 All firms that have sold securities in the capital markets have incurred some level of flotation costs, including underwriters' commissions, legal fees, printing expense, etc. These costs are withheld from the proceeds of the stock sale or are paid separately, and must be recovered over the life of the equity issue. Costs vary depending upon the size of the issue, the type of registration method used and other factors, but in general these costs range between three and five percent of the proceeds from the issue [see Lee, Inmoo, Scott Lochhead, Jay Ritter, and Quanshui Zhao, "The Costs of Raising Capital," *The Journal of Financial Research*, Vol. XIX No 1 (Spring 1996), 59-74, and Clifford W. Smith, "Alternative Methods for Raising Capital," *Journal of Financial Economics* 5 (1977) 273-307]. In addition to these costs, for large equity issues (in relation to outstanding equity shares), there is likely to be a decline in price associated with the sale of shares to the public. On average, the decline in price associated with new stock issuances has been estimated at two to three percent [see

Richard H. Pettway, "The Effects of New Equity Sales Upon Utility Share Prices," *Public Utilities Fortnightly*, May 10, 1984, 35—39]. Thus, the total flotation cost, including both issuance expense and stock price decline, generally ranges from five to eight percent of the proceeds of an equity issue. I believe a combined five percent allowance for flotation costs is a conservative estimate that should be used in applying the DCF model in this proceeding.

Q. 60 Does KAW issue equity in the capital markets?

A. 60 No. Although KAW does not issue equity in the capital markets, its parent must issue equity to provide KAW the necessary financing to make investments in its water supply operations. If the parent is not able to recover its flotation costs through KAW's rates, it will have no incentive to invest in KAW.

Q. 61 Is a flotation cost adjustment only appropriate if a company issues stock during the test year?

A. 61 No. As described in Exhibit__(JVW-1), Appendix 3, a flotation cost adjustment is required whether or not a company issued new stock during the test year. Previously incurred flotation costs have not been recovered in previous rate cases; rather, they are a permanent cost associated with past issues of common stock. Just as an adjustment is made to the embedded cost of debt to reflect previously incurred debt issuance costs (regardless of whether additional bond issuances were made in the test year), so should an adjustment be made to the cost of equity regardless of whether additional stock was issued during the test year.

Q. 62 How do you apply the DCF approach to obtain the cost of equity capital for KAW?

A. 62 I apply the DCF approach to the publicly-traded water companies shown on Exhibit___(JVW-1) Schedule 1 and the publicly-traded natural gas distribution companies (LDCs) shown on Exhibit___(JVW-1) Schedule 2.

Q. 63 How do you select your group of publicly-traded water companies?

A. 63 I select all the water companies included in the Value Line Investment Survey that: (1) pay dividends; (2) did not decrease dividends during any quarter of the past two years; (3) have an analyst's long-term growth forecast; and (4) are not the subject of a merger that has not been completed. In addition, all of the companies included in my group have a Value Line Safety Rank of 2 or 3, where 3 is the average Safety Rank of the Value Line universe of companies.

Q. 64 Why do you eliminate companies that have either decreased or eliminated their dividend in the past two years?

A. 64 The DCF model requires the assumption that dividends will grow at a constant rate into the indefinite future. If a company has either decreased or eliminated its dividend in recent years, an assumption that the company's dividend will grow at the same rate into the indefinite future is questionable.

Q. 65 Why do you eliminate companies that do not have any analyst's long-term growth forecasts?

A. 65 As noted above, my studies indicate that the analysts' growth forecasts best approximate the growth forecasts used by investors in making stock buy and sell decisions; and thus, the average of the analysts' growth forecasts is the best available estimate of the growth term in the DCF Model. In my opinion, it is difficult to apply the DCF model to companies that do not have any analysts' long-term growth estimates.

Q. 66 Why do you eliminate companies that are being acquired in transactions that are not yet completed?

A. 66 A merger announcement generally increases the target company's stock price, but not the acquiring company's stock price. Analysts' growth forecasts for the target company, on the other hand, are necessarily related to the company as it currently exists. The use of a stock price that includes the growth-enhancing prospects of potential mergers in conjunction with growth forecasts that do not include the growth-enhancing prospects of potential mergers produces DCF results that tend to distort a company's cost of equity.

Q. 67 Are the Value Line water companies widely followed by analysts in the investment community?

A. 67 As a result of their small market capitalization, the water companies are generally followed by few analysts.

Q. 68 Recognizing the greater uncertainty associated with DCF results based on fewer analysts' forecasts, do you supplement your DCF results for the water companies with a DCF analysis of an additional proxy group?

A. 68 Yes. Given the uncertainty in applying the DCF model to companies with fewer analysts' growth forecasts, I also apply the DCF model to an additional proxy group consisting of natural gas distribution companies ("LDCs").

Q. 69 Please summarize the result of your application of the DCF model to your water company proxy group.

A. 69 As shown in Exhibit__(JVW-1), Schedule 1, my application of the DCF model to the Value Line water companies produces a market-weighted average DCF result of 9.6 percent and a simple average DCF result of 9.3 percent. The average of the market-weighted and simple average results is 9.5 percent.

Q. 70 You note above that you also apply your DCF method to a proxy group of LDCs. Why do you apply your DCF model to a proxy group of LDCs?

A. 70 I apply my DCF model to a proxy group of LDCs because: (1) the sample of publicly-traded water companies with sufficient information to estimate the cost of equity is relatively small; (2) the LDCs are a conservative proxy for the risk of investing in water companies, and (3) it is useful to examine the cost of equity results for a group of companies of similar risk in order to test the reasonableness of the results obtained by applying cost of equity methods to the group of publicly-traded water companies. Financial theory does not require that companies be in exactly the same industry to be comparable in risk.

Q. 71 How do you select your proxy group of LDCs?

A. 71 I select all the companies in Value Line's natural gas industry groups that: (1) are in the business of natural gas distribution; (2) paid dividends during every quarter of the last two years; (3) did not decrease dividends during any quarter of the past two years; (4) have an available I/B/E/S long-term growth estimate; and (5) are not the subject of a merger offer that has not been completed. In addition, all of the LDCs included in my group have an investment grade bond rating and a Value Line Safety Rank of 1, 2, or 3. The LDCs in my DCF proxy group and the average DCF result are shown on Exhibit___(JVW-1) Schedule 2.

Q. 72 How are the LDCs similar to KAW?

A. 72 Like KAW, the LDCs invest primarily in a capital-intensive physical network that connects the customer to the source of supply, and sell their products and services at regulated rates to customers whose demand is primarily dependent on weather and the state of the economy.

Q. 73 Does your LDC proxy group meet the standards of the *Hope* and *Bluefield* cases you cite above?

A. 73 Yes. The *Hope* and *Bluefield* standard states that a public utility should be allowed to earn a return on its investment that is commensurate with the returns investors are able to earn on investments having similar risk. The LDCs are a group of companies that meet the standards of the *Hope* and *Bluefield* cases because they are a conservative proxy for the risk of investing in KAW.

Q. 74 Do you have any empirical evidence that the LDCs in your proxy group are a conservative proxy for KAW?

A. 74 Yes. The average Value Line Safety Rank for my proxy group of LDCs is approximately 1, on a scale where 1 is the most safe and 5 is the least safe, whereas the water companies have an average Value Line Safety Rank of approximately 3.

Q. 75 Please summarize the results of your application of the DCF method to the LDC proxy group.

A. 75 My application of the DCF method to the LDC proxy group produces a market-weighted average result of 10.1 percent, as shown on Exhibit___(JVW-1) Schedule 2.

VII. RISK PREMIUM APPROACH

Q. 76 Please describe the risk premium approach to estimating KAW's cost of equity.

A. 76 The risk premium approach is based on the principle that investors expect to earn a return on an equity investment in KAW that reflects a "premium" over and above the return they expect to earn on an investment in a portfolio of long-term bonds. This equity risk premium compensates equity investors for the additional risk they bear in making equity investments versus bond investments.

Q. 77 Does the risk premium approach specify what debt instrument should be used to estimate the interest rate component in the methodology?

A. 77 No. The risk premium approach can be implemented using virtually any debt instrument. However, the risk premium approach does require that the debt instrument used to estimate the risk premium be the same as the debt instrument used to calculate the interest rate component of the risk premium approach. For example, if the risk premium on equity is calculated by comparing the returns on stocks and the returns on A-rated utility bonds, then the interest rate on A-rated utility bonds must be used to estimate the interest rate component of the risk premium approach.

Q. 78 How do you measure the required risk premium on an equity investment in KAW?

A. 78 I use two methods to estimate the required risk premium on an equity investment in KAW. The first is called the ex ante risk premium method, and the second is called the ex post risk premium method.

A. Ex Ante Risk Premium Approach

Q. 79 Please describe your ex ante risk premium approach for measuring the required risk premium on an equity investment in KAW.

A. 79 My ex ante risk premium method is based on studies of the DCF expected return on a comparable group of natural gas distribution companies, which I compared to the interest rate on Moody's A-rated utility bonds. Specifically, for each month in my study period, I calculate the risk premium using the equation,

$$RP_{PROXY} = DCF_{PROXY} - I_A$$

where:

RP_{PROXY}	=	the required risk premium on an equity investment in the proxy group of companies;
DCF_{PROXY}	=	average DCF estimated cost of equity on a portfolio of proxy companies; and
I_A	=	the yield to maturity on an investment in A-rated utility bonds.

I then perform a regression analysis to determine if there is a relationship between the calculated risk premium and interest rates. Finally, I use the results of the regression analysis to estimate the investors' required risk premium. To estimate the cost of equity, I then add the required risk premium to the interest rate on A-rated utility bonds. A detailed description of my ex ante risk premium studies is contained in Appendix 4, and the underlying DCF results and interest rates are displayed in Exhibit___(JVW-1) Schedule 3.

Q. 80 Why do you apply your ex ante risk premium study to LDCs rather than to water companies?

A. 80 I apply my ex ante risk premium approach to LDCs rather than to water companies because the LDCs are similar in risk to the water companies and there is sufficient data to apply the DCF method to the sample companies over a relatively long period of time. In contrast, there are few water utilities with consistent data extending back for a reasonably long study period.

Q. 81 What estimated risk premium do you obtain from your ex ante risk premium method?

A. 81 As described in Appendix 4, my analyses produce an estimated risk premium over the yield on A-rated utility bonds equal to 4.9 percent.

Q. 82 What cost of equity result do you obtain from your ex ante risk premium study?

A. 82 To estimate the cost of equity using the ex ante risk premium method, one may add the estimated risk premium over the yield on A-rated utility bonds to the forecasted yield to maturity on A-rated utility bonds. In my studies, I choose to use the yield on A-rated utility bonds because it is a frequently-used benchmark for utility bond yields. I obtain the forecasted yield to maturity on A-rated utility bonds, 6.3 percent, by averaging forecast data from Value Line and the U.S. Energy Information Administration ("EIA"). My analyses produce an estimated risk premium over the yield on A-rated utility bonds equal to

4.9 percent. Adding an estimated risk premium of 4.9 percent to the 6.3 percent forecasted yield to maturity on A-rated utility bonds produces a cost of equity estimate of 11.2 percent using the ex ante risk premium method (see Appendix 4).

Q. 83 How do you obtain the expected yield on A-rated utility bonds?

A. 83 As noted above, I obtain the expected yield to maturity on A-rated utility bonds, 6.27 percent, by averaging forecast data from Value Line and the EIA. Value Line Selection & Opinion (December 4, 2015) projects a AAA-rated Corporate bond yield equal to 5.8 percent. The November 2015 average spread between A-rated utility bonds and Aaa-rated Corporate bonds is 34 basis points (A-rated utility, 4.40 percent, less Aaa-rated Corporate, 4.06 percent, equals 34 basis points). Adding 34 basis points to the 5.8 percent Value Line Aaa Corporate bond forecast equals a forecast yield of 6.14 percent for the A-rated utility bonds. The EIA forecasts an AA-rated utility bond yield equal to 6.21 percent. The average spread between AA-rated utility and A-rated utility bonds at November 2015 is 18 basis points (4.40 percent less 4.22 percent). Adding 18 basis points to EIA's 6.21 percent AA-utility bond yield forecast equals a forecast yield for A-rated utility bonds equal to 6.39 percent. The average of the forecasts (6.14 percent using Value Line data and 6.39 percent using EIA data) is 6.27 percent.

Q. 84 Why do you use a forecasted yield to maturity on A-rated utility bonds rather than a current yield to maturity?

A. 84 I use a forecasted yield to maturity on A-rated utility bonds rather than a current yield to maturity because the fair rate of return standard requires that a company have an opportunity to earn its required return on its investment during the forward-looking period during which rates will be in effect. Because current interest rates are depressed as a result of the Federal Reserve's extraordinary efforts to keep interest rates low in an effort to stimulate the economy, current interest rates at this time are likely a poor indicator of future interest rates. Economists project that future interest rates will be higher than current interest rates as the Federal Reserve allows interest rates to rise in order to prevent inflation. I note that the Federal Reserve has taken the first step to increase interest rates in December 2015. Thus, the use of forecasted interest rates is consistent with the fair rate of return standard, whereas the use of current interest rates at this time is not.

B. Ex Post Risk Premium Approach

Q. 85 Please describe your ex post risk premium approach for measuring the required risk premium on an equity investment in KAW.

A. 85 I first perform a study of the comparable returns received by bond and stock investors over the seventy-eight years of my study. I estimate the returns on stock and bond portfolios, using stock price and dividend yield data on the S&P 500 and bond yield data on Moody's A-rated Utility Bonds. My study consists of making an investment of one dollar in the S&P 500 and Moody's A-rated utility bonds at the beginning of 1937, and reinvesting the principal plus return each year to 2015. The return associated with each stock portfolio is the sum of the annual dividend yield and capital gain (or loss) which accrued to this portfolio during the year(s) in which it was held. The return associated with the bond portfolio, on the other hand, is the sum of the annual coupon yield and capital gain (or loss) which accrued to the bond portfolio during the year(s) in which it was held. The resulting annual returns on the stock and bond portfolios purchased in each year from 1937 to 2015 are shown on Exhibit___(JVW-1) Schedule 4. The average annual return on an investment in the S&P 500 stock portfolio is 11.3 percent, while the average annual return on an investment in the Moody's A-rated utility bond portfolio is 6.8 percent. The risk premium on the S&P 500 stock portfolio is, therefore, 4.5 percent.

I also conduct a second study using stock data on the S&P Utilities rather than the S&P 500. As shown on Exhibit___(JVW-1) Schedule 5, the S&P Utility stock portfolio shows an average annual return of 10.7 percent per year. Thus, the return on the S&P Utility stock portfolio exceeds the return on the Moody's A–rated utility bond portfolio by 3.9 percent.

Q. 86 Why is it appropriate to perform your ex post risk premium analysis using both the S&P 500 and the S&P Utility Stock indices?

A. 86 I perform my ex post risk premium analysis on both the S&P 500 and the S&P Utilities because I believe utilities today face risks that are somewhere in between the average risk of the S&P Utilities and the S&P 500 over the years 1937 to 2015. Thus, I use the average of the two historically-based risk premiums as my estimate of the required risk premium in my ex post risk premium method.

Q. 87 Would your study provide a different ex post risk premium if you started with a different time period?

A. 87 Yes, the ex post risk premium results vary somewhat depending on the historical time period chosen. My policy is to go back as far in history as I can get reliable data. I believe it is most meaningful to begin after the passage and implementation of the Public Utility Holding Company Act of 1935. This Act significantly changed the structure of the public utility industry. Since the Public Utility Holding Company Act of 1935 was not implemented until the beginning of 1937, I feel that numbers taken from before this date are not comparable to those taken after. (The repeal of the 1935 Act does not have a material impact on the structure of the public utility industry; thus, the Act's repeal does not have any impact on my choice of time period.)

Q. 88 Why is it necessary to examine the yield from debt investments in order to determine the investors' required rate of return on equity capital?

A. 88 As previously explained, investors expect to earn a return on their equity investment that exceeds currently available bond yields because the return on equity, as a residual return, is less certain than the yield on bonds; and investors must be compensated for this uncertainty. Second, investors' current expectations concerning the amount by which the return on equity will exceed the bond yield could be influenced by historical differences in returns to bond and stock investors. For these reasons, we can estimate investors' current expected returns on equity investments from knowledge of current bond yields and past differences between returns on stocks and bonds.

Q. 89 What conclusions do you draw from your ex post risk premium analyses about the required return on an equity investment in KAW?

A. 89 My studies provide evidence that investors today require an equity return of at least 3.9 to 4.5 percentage points above the expected yield on A-rated utility bonds. Adding a 3.9 to 4.5 percentage point risk premium to the forecasted yield of 6.3 percent on A-rated utility bonds, I obtain an expected return on equity in the range 10.2 percent to 10.8 percent, with a midpoint of 10.5 percent. Adding a 15-basis-point allowance for flotation costs, I obtain an estimate of 10.6 percent as the ex post risk premium cost of equity for KAW. (I determine the flotation cost allowance by calculating the difference in my DCF results with and without a flotation cost allowance.)

VIII. CAPITAL ASSET PRICING MODEL

Q. 90 What is the CAPM?

A. 90 The CAPM is an equilibrium model of the security markets in which the expected or required return on a given security is equal to the risk-free rate of interest, plus the company equity "beta," times the market risk premium:

Cost of equity = Risk-free rate + Equity beta x Market risk premium

The risk-free rate in this equation is the expected rate of return on a risk-free government security, the equity beta is a measure of the company's risk relative to the market as a whole, and the market risk premium is the premium investors require to invest in the market basket of all securities compared to the risk-free security.

Q. 91 How do you use the CAPM to estimate the cost of equity for your proxy companies?

A. 91 The CAPM requires an estimate of the risk-free rate, the company-specific risk factor or beta, and the expected return on the market portfolio. For my estimate of the risk-free rate, I use the forecasted yield to maturity on 20-year Treasury bonds of 4.24 percent, using forecast data from Value Line and EIA. I use the 20-year Treasury bond to estimate the risk-free rate because SBBI® estimates the risk premium using 20-year Treasury bonds, and one should use the same maturity to estimate the risk-free rate as is used to estimate the risk premium on the market portfolio.

For my estimate of the company-specific risk, or beta, I use the average 0.73 Value Line beta for my proxy water companies. For my estimate of the expected risk premium on the market portfolio, I use two approaches. First, I estimate the risk premium on the market portfolio using historical risk premium data reported by SBBI®. Second, I estimate the risk premium on the market portfolio from the difference between the DCF cost of equity for the S&P 500 and the forecasted yield to maturity on 20-year Treasury bonds.

Q. 92 How do you obtain the forecasted yield to maturity on 20-year Treasury bonds?

A. 92 As noted above, I use data from Value Line and EIA to obtain a forecasted yield to maturity on 20-year Treasury bonds. Value Line forecasts a yield on 10-year Treasury notes equal to 3.5 percent. The current spread between the average November 2015 yield on 10-year Treasury notes (2.26 percent) and 20-year Treasury bonds (2.69 percent) is 43 basis points. Adding 43 basis points to Value Line's 3.5 percent forecasted yield on 10-year Treasury notes produces a forecasted yield of 3.93 percent for 20-year Treasury bonds (see Value Line Investment Survey, Selection & Opinion, December 4, 2015). EIA forecasts a yield of 4.11 percent on 10-year Treasury notes. Adding the 43 basis point spread between 10-year Treasury notes and 20-year Treasury bonds to the EIA forecast of 4.11 percent for 10-year Treasury notes produces an EIA forecast for 20-year Treasury bonds equal to

4.54 percent. The average of the forecasts is 4.24 percent (3.93 percent using Value Line data and 4.54 percent using EIA data).

Q. 93 How do you estimate the expected risk premium on the market portfolio using historical risk premium data reported by SBBI®?

A. 93 I estimate the expected risk premium on the market portfolio by calculating the difference between the arithmetic mean total return on the S&P 500 from 1926 to 2015 (12.1 percent) and the average income return on 20-year U.S. Treasury bonds over the same period (5.1 percent)) (see Ibbotson® SBBI® 2015 Yearbook, published by Morningstar®). Thus, my historical risk premium method produces a risk premium of 7.0 percent (12.1 – 5.1 = 7.0).

Q. 94 Why do you recommend that the risk premium on the market portfolio be estimated using the arithmetic mean return on the S&P 500?

A. 94 As explained in SBBI®, the arithmetic mean return is the best approach for calculating the return investors expect to receive in the future:

> The equity risk premium data presented in this book are arithmetic average risk premia as opposed to geometric average risk premia. The arithmetic average equity risk premium can be demonstrated to be most appropriate when discounting future cash flows. For use as the expected equity risk premium in either the CAPM or the building block approach, the arithmetic mean or the simple difference of the arithmetic means of stock market returns and riskless rates is the relevant number. This is because both the CAPM and the building block approach are additive models, in which the cost of capital is the sum of its parts. The geometric average is more appropriate for reporting past performance, since it represents the

compound average return. [SBBI, 2014 Valuation Yearbook at 56.]

A discussion of the importance of using arithmetic mean returns in the context of CAPM or risk premium studies is contained in Exhibit___(JVW-1) Schedule 6.

Q. 95 Why do you recommend that the risk premium on the market portfolio be estimated using the income return on 20-year Treasury bonds rather than the total return on these bonds?

A. 95 As discussed above, the CAPM requires an estimate of the risk-free rate of interest. When Treasury bonds are issued, the income return on the bond is risk free, but the total return, which includes both income and capital gains or losses, is not. Thus, the income return should be used in the CAPM because it is only the income return that is risk free.

Q. 96 What CAPM result do you obtain when you estimate the expected return on the market portfolio from the arithmetic mean difference between the return on the market and the yield on 20-year Treasury bonds?

A. 96 Using a risk-free rate equal to 4.24 percent, a water utility beta equal to 0.73, a risk premium on the market portfolio equal to 7 percent, and a flotation cost allowance equal to 15 basis points, I obtain an historical CAPM estimate of the cost of equity equal to 9.5 percent for my water utility group (4.24 + 0.73 x 7 + 0.15 = 9.5).

Q. 97 Can a reasonable application of the CAPM produce higher cost of equity results than you have just reported?

A. 97 Yes. The CAPM tends to underestimate the cost of equity for small market capitalization companies such as my water companies.

Q. 98 Does the finance literature support an adjustment to the CAPM equation to account for a company's size as measured by market capitalization supported in the finance literature?

A. 98 Yes. For example, Duff & Phelps, (who have purchased the Ibbotson® size premia data), support such an adjustment. Their estimates of the size premium required to be added to the basic CAPM cost of equity are shown below in TABLE 1.

TABLE 1
ESTIMATES OF PREMIUMS FOR COMPANY SIZE
2015 VALUATION YEARBOOK

Decile	Smallest Mkt. Cap. ($Millions)	Largest Mkt. Cap. ($Millions)	Premium
Large-Cap (No Adjustment)	>10,105.622		0
Mid-Cap (3-5)	2,552.441	10,105.622	1.07%
Low-Cap (6-8)	549.056	2,542.913	1.80%
Micro-Cap (9-10)	3.037	548.839	3.74%

Q. 99 Do you make an adjustment to reflect the small market capitalization of your water utilities?

A. 99 Yes. My size-adjusted CAPM result is 11.9 percent. As my estimate of the cost of equity from my application of the historical CAPM, I use the 10.7 percent average of the base historical CAPM result and the size-adjusted CAPM result (see Exhibit___(JVW-1) Schedule 7).

Q. 100 How does your DCF-based CAPM differ from your historical CAPM?

A. 100 As described above, my DCF-based CAPM differs from my historical CAPM in the method I use to estimate the risk premium on the market portfolio. In the historical CAPM, I use historical risk premium data to estimate the risk premium on the market portfolio. In the DCF-based CAPM, I estimate the risk premium on the market portfolio from the difference between the DCF cost of equity for the S&P 500 and the forecasted yield to maturity on 20-year Treasury bonds.

Q. 101 What risk premium do you obtain when you calculate the difference between the DCF-return on the S&P 500 and the risk-free rate?

A. 101 Using this method, I obtain a risk premium on the market portfolio equal to 7.6 percent (see Exhibit JVW-1 Schedule 8).

Q. 102 What CAPM result do you obtain when you estimate the risk premium on the market portfolio by applying the DCF model to the S&P 500?

A. 102 Using a risk-free rate of 4.24 percent, a water utility beta of 0.73, a risk premium on the market portfolio of 7.76 percent, and a flotation cost allowance of 15 basis points, I obtain a CAPM result of 10.1 percent (see Exhibit___(JVW-1) Schedule 8).

Q. 103 Are there other reasons to believe that the CAPM may produce cost of equity estimates at this time that are unreasonably low?

A. 103 Yes. There is considerable evidence in the finance literature that the CAPM tends to underestimate the cost of equity for companies whose equity beta is less than 1.0 and to overestimate the cost of equity for companies whose equity beta is greater than 1.0.[1]

Q. 104 Can you briefly summarize the evidence that the CAPM underestimates the required returns for securities or portfolios with betas less than 1.0 and overestimates required returns for securities or portfolios with betas greater than 1.0?

A. 104 Yes. The CAPM conjectures that security returns increase with increases in security betas in line with the equation

$$ER_i = R_f + \beta_i \left[ER_m - R_f\right],$$

where ER_i is the expected return on security or portfolio *i,* R_f is the risk-free rate, $ER_m - R_f$ is the expected risk premium on the market portfolio, and β_i is a measure of the risk of investing in security or portfolio *i*. If the CAPM correctly predicts the relationship between risk and return in the marketplace, then the realized returns on portfolios of securities and the corresponding portfolio betas should lie on the solid straight line with intercept R_f and slope $[R_m - R_f]$ shown below.

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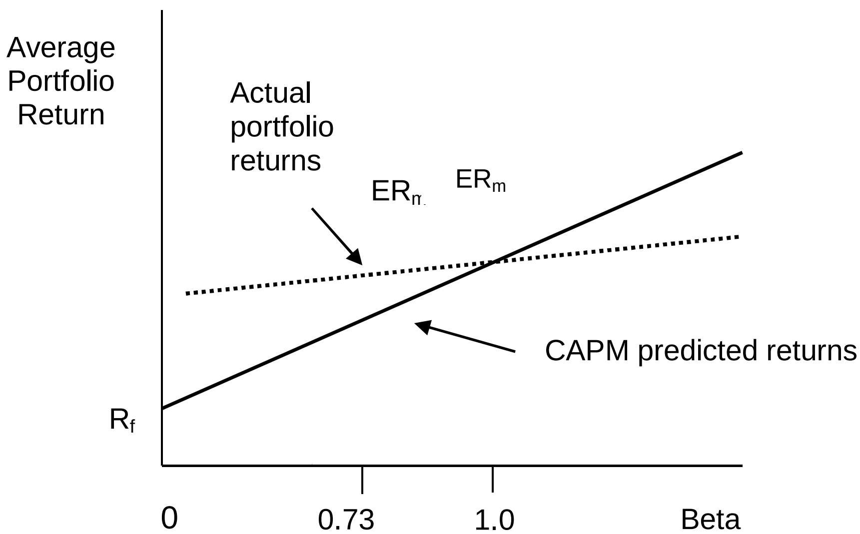
1 *See*, for example, Fischer Black, Michael C. Jensen, and Myron Scholes, "The Capital Asset Pricing Model: Some Empirical Tests," in *Studies in the Theory of Capital Markets*, M. Jensen, ed. New York: Praeger, 1972; Eugene Fama and James MacBeth, "Risk, Return, and Equilibrium: Empirical Tests," *Journal of Political Economy* 81 (1973), pp. 607-36; Robert Litzenberger and Krishna Ramaswamy, "The Effect of Personal Taxes and Dividends on Capital Asset Prices: Theory and Empirical Evidence," *Journal of Financial Economics* 7 (1979), pp. 163-95.; Rolf Banz, "The Relationship between Return and Market Value of Common Stocks," *Journal of Financial Economics* (March 1981), pp. 3-18; and Eugene Fama and Kenneth French, "The Cross-Section of Expected Returns," *Journal of Finance* (June 1992), pp. 427-465.

FIGURE 1
AVERAGE RETURNS COMPARED TO BETA
FOR PORTFOLIOS FORMED ON PRIOR BETA



Financial scholars have found that the relationship between realized returns and betas is inconsistent with the relationship posited by the CAPM. As described in Fama and French (1992) and Fama and French (2004), the actual relationship between portfolio betas and returns is shown by the dotted line in the figure above. Although financial scholars disagree on the reasons why the return/beta relationship looks more like the dotted line in the figure than the solid line, they generally agree that the dotted line lies above the solid line for portfolios with betas less than 1.0 and below the solid line for portfolios with betas greater than 1.0. Thus, in practice, scholars generally agree that the CAPM underestimates portfolio returns for companies with betas less than 1.0, and overestimates portfolio returns for portfolios with betas greater than 1.0.

Q. 105 Do you have additional evidence that the CAPM tends to underestimate the cost of equity for utilities with average betas less than 1.0?

A. 105 Yes. As shown in Schedule 9, over the period 1937 to 2015, investors in the S&P Utilities Stock Index have earned a risk premium over the yield on long-term Treasury bonds equal to 5.49 percent, while investors in the S&P 500 have earned a risk premium over the yield on long-term Treasury bonds equal to 6.06 percent. According to the CAPM, investors in utility stocks should expect to earn a risk premium over the yield on long-term Treasury securities equal to the average utility beta times the expected risk premium on an investment in the S&P 500. Thus, the ratio of the risk premium on the utility portfolio to the risk premium on the S&P 500 should equal the utility beta. However, the average water utility beta at the time of my studies is approximately 0.73, whereas the historical ratio of the utility risk premium to the S&P 500 risk premium is 0.90 ($5.49 \div 6.06 = 0.90$). Thus, the use of the current 0.73 measured beta may produce an underestimate of the cost of equity for utilities.

Q. 106 What conclusions do you reach from your review of the literature on the CAPM to predict the relationship between risk and return in the marketplace?

A. 106 I conclude that the financial literature supports the proposition that the CAPM underestimates the cost of equity for companies such as public utilities with betas less than 1.0.

IX. FAIR RATE OF RETURN ON EQUITY

Q. 107 Please summarize your findings concerning KAW's cost of equity.

A. 107 Based on my application of several cost of equity methods to my comparable companies, I conclude that my comparable companies' cost of equity is in the range 9.5 percent to 11.2 percent.

TABLE 2
COST OF EQUITY MODEL RESULTS

Method	Model Result
DCF—Water Utilities	9.5%
DCF—Natural Gas Utilities	10.1%
Ex Ante Risk Premium	11.2%
Ex Post Risk Premium	10.6%
CAPM – Historical	10.7%
CAPM – DCF-based	10.1%
Range of Results	9.5% - 11.2%

Q. 108 What is your recommendation as to a fair rate of return on common equity for KAW?

A. 108 I recommend that KAW be allowed a fair rate of return on common equity in the range 9.5 percent to 11.2 percent.

X. ALLOWED EQUITY RATIO IN CAPITAL STRUCTURE

Q. 109 What capital structure is the Company requesting in this proceeding?

A. 109 KAW is requesting a capital structure containing 1.500 percent short-term debt, 50.585 percent long-term debt, 0.563 percent preferred stock, and 47.352 percent common equity (see testimony of Mr. Rungren).

Q. 110 Has the Company requested that you evaluate whether its requested capital structure is fair and reasonable?

A. 110 Yes.

Q. 111 How do you evaluate whether the Company's requested capital structure is fair and reasonable?

A. 111 I evaluate whether the Company's requested capital structure is fair and reasonable by comparing the Company's requested equity percentage to: (1) the equity percentage in the combined capitalization of American Water subsidiaries; (2) the recent allowed equity ratios for utilities operating in Kentucky; and (3) the average allowed equity ratios for regulated natural gas and electric utilities.

Q. 112 How does the equity percentage in KAW's requested capital structure compare to the equity percentage in the combined capitalization of American Water's subsidiaries at August 31, 2015?

A. 112 Although KAW's requested capital structure, with 47.352 percent common equity, contains more equity than the 45 percent equity permitted by the current regulatory restriction, KAW's requested capital structure contains significantly less equity than the 51.51 percent common equity in the combined capitalization of American Water's operating subsidiaries at August 31, 2015 (see Table 3).

TABLE 3
COMPARISON OF THE COMBINED CAPITAL STRUCTURE RATIOS OF AMERICAN WATER'S OPERATING SUBSIDIARIES AT AUGUST 31, 2015 TO KAW'S REQUESTED CAPITAL STRUCTURE

CAPITAL COMPONENT	AMERICAN WATER SUBSIDIARIES' COMBINED CAPITAL STRUCTURE	KAW REQUESTED CAPITAL STRUCTURE
Short-Term Debt	0.40%	1.500%
Long-Term Debt	47.93%	50.585%
Preferred Stock	0.16%	0.563%
Common Equity	51.51%	47.352%
Total	100.00%	100.00%

Q. 113 How does the Company's requested 47.352 percent equity ratio compare to the most recent allowed equity ratios for regulated utilities operating in Kentucky?

A. 113 The Company's requested 47.352 percent equity ratio is lower than any year-end equity ratio for other regulated utilities operating in Kentucky (see KAW filing, *In the Matter of the Motion of American Water Works Company, Inc. and Kentucky-American Water Company for Release of Conditions Ordered in Case No. 2006 – 00197*, October 9, 2014, at 7 – 9).

TABLE 4
YEAR-END EQUITY RATIOS FOR UTILITIES OPERATING IN KENTUCKY
COMPARED TO KAW'S REQUESTED EQUITY RATIO

	COMPANY	2007	2008	2009	2010	2011	2012
1	Atmos Energy Corporation		49.50%	51.00%	51.30%	50.70%	55.30%
2	Columbia Gas of Kentucky		52.12%	55.16%	52.14%	52.40%	52.82%
3	Kentucky Utilities Company	52.73%	52.97%	53.06%	52.86%	53.62%	
4	Louisville Gas and Electric Company	52.22%	52.47%	54.01%	58.34%	55.46%	
5	Water Service Corporation of Kentucky		46.70%	47.71%	49.69%	49.75%	47.56%
6	**Average**	**52.48%**	**50.75%**	**52.19%**	**52.87%**	**52.39%**	**51.89%**

Q. 114 How does the Company's requested 47.352 percent equity ratio compare to the average of allowed equity ratios for regulated electric and natural gas utilities?

A. 114 The Company's requested 47.352 percent equity ratio is less than the average of allowed equity ratios for electric and natural gas utilities, which is approximately 50 percent.

Q. 115 Based on your review of the combined capitalization of American Water's operating subsidiaries and the allowed equity ratios for regulated utilities operating in Kentucky and the average allowed equity ratios for regulated electric and natural gas utilities nationally, what do you conclude regarding the reasonableness of KAW's requested equity ratio in this proceeding?

A. 115 I conclude that KAW's requested equity ratio is fair and reasonable because the Company's requested equity ratio: (1) represents KAW's actual equity ratio; (2) is less than the equity ratio in American Water's combined operating subsidiaries; (3) is less than the equity ratios for other Kentucky utilities; and (4) is less than the average allowed equity ratios for regulated electric and natural gas utilities nationwide.

Q. 116 Have you also evaluated the reasonableness of the Company's proposal to remove the regulatory restriction that KAW maintain an equity ratio in the range 35 percent to 45 percent?

A. 116 Yes.

Q. 117 What do you conclude about the reasonableness of the Company's proposal to remove the regulatory restriction on KAW's equity ratio?

A. 117 I conclude that the Commission should release KAW from the regulatory restriction on KAW's equity ratio because the restriction requires the Company to maintain an equity ratio that is less than the Company's actual equity ratio, less than equity ratios for other Kentucky utilities, and less than the allowed equity ratios for natural gas and electric utilities nationwide. Furthermore, the restriction prevents KAW from choosing a capital structure that minimizes its long-run cost of capital. (Company Witness Mr. Rungren discusses additional benefits of removing the current regulatory restriction on KAW's equity ratio.)

Q. 118 Does this conclude your testimony?

A. 118 Yes, it does.

VERIFICATION

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

The undersigned, **James H. Vander Weide, Ph.D.**, being duly sworn, deposes and says he is President of Financial Strategy Associates, 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 H. Vander Weide
JAMES H. VANDER WEIDE, PH.D.

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 7th day of January, 2016.

Sandra W. Bumpass (SEAL)
Notary Public

My Commission Expires:

05 · 30 · 2018

SANDRA W. BUMPASS
NOTARY
PUBLIC
DURHAM COUNTY, NC

LIST OF SCHEDULES AND APPENDICES

KENTUCKY AMERICAN WATER COMPANY
EXHIBIT__(JVW-1)
SCHEDULE 1
SUMMARY OF DISCOUNTED CASH FLOW ANALYSIS
FOR PROXY WATER UTILITIES

	COMPANY	MOST RECENT QUARTERLY DIVIDEND (d_0)	STOCK PRICE (P_0)	VALUE LINE EPS GROWTH	I/B/E/S FORECAST OF FUTURE EARNINGS GROWTH	AVERAGE FORECAST OF FUTURE EARNINGS GROWTH	MARKET CAP $ (MIL)	DCF MODEL RESULT
1	Amer. States Water	0.224	40.558	6.00%	4.00%	5.00%	1,523	7.4%
2	Amer. Water Works	0.340	55.619	7.00%	7.59%	7.30%	10,278	10.1%
3	Aqua America	0.178	27.305	7.50%	5.55%	6.53%	5,122	9.4%
4	California Water	0.168	21.948	6.50%	5.00%	5.75%	1,043	9.3%
5	Conn. Water Services	0.268	36.112	4.50%	5.00%	4.75%	396	8.1%
6	Consolidated Water	0.075	11.503	12.50%	7.00%	9.75%	172	12.9%
7	Middlesex Water	0.199	24.530	5.00%	2.70%	3.85%	401	7.4%
8	SJW Corp.	0.195	30.491	1.50%	14.00%	7.75%	610	10.8%
9	York Water Co. (The)	0.150	22.322	6.50%	4.90%	5.70%	295	8.7%
10	Average							9.3%
11	Market-weighted Average							9.6%
12	Average simple, market-weighted							9.5%

Notes:

d_0	=	Most recent quarterly dividend.
d_1, d_2, d_3, d_4	=	Next four quarterly dividends, calculated by multiplying the last four quarterly dividends per *Value Line* and Yahoo Finance, by the factor (1 + g).
P_0	=	Average of the monthly high and low stock prices during the three months ending November 2015 per Thomson Reuters.
FC	=	Flotation costs expressed as a percent of gross proceeds.
g	=	Average of I/B/E/S and Value Line forecasts of future earnings growth November 2015.
k	=	Cost of equity using the quarterly version of the DCF model shown by the formula below:

$$k = \frac{d_1(1+k)^{.75} + d_2(1+k)^{.50} + d_3(1+k)^{.25} + d_4}{P_0(1-FC)} + g$$

KENTUCKY AMERICAN WATER COMPANY
EXHIBIT__(JVW-1)
SCHEDULE 2
SUMMARY OF DISCOUNTED CASH FLOW ANALYSIS
FOR NATURAL GAS DISTRIBUTION UTILITIES

	COMPANY	MOST RECENT QUARTERLY DIVIDEND (D_0)	STOCK PRICE (P_0)	I/B/E/S FORECAST OF FUTURE EARNINGS GROWTH	MARKET CAP $ (MIL)	DCF MODEL RESULT
1	Atmos Energy	0.420	59.094	7.00%	6,334	10.1%
2	Laclede Group	0.460	55.159	4.44%	2,492	8.2%
3	New Jersey Resources	0.240	29.978	6.00%	2,628	9.5%
4	Northwest Nat. Gas	0.468	46.028	4.00%	1,307	8.6%
5	South Jersey Inds.	0.251	25.005	6.00%	1,651	10.7%
6	UGI Corp.	0.228	35.000	8.00%	6,032	11.0%
7	WGL Holdings Inc.	0.463	58.232	7.00%	2,978	10.7%
8	Market-weighted Average					10.1%

Notes:

d_0 = Most recent quarterly dividend.
d_1, d_2, d_3, d_4 = Next four quarterly dividends, calculated by multiplying the last four quarterly dividends per *Value Line* and Yahoo Finance by the factor (1 + g).
P_0 = Average of the monthly high and low stock prices during the three months ending November 2015 from Thomson Reuters.
FC = Flotation costs expressed as a percent of gross proceeds.
g = I/B/E/S forecast of future earnings growth November 2015.
k = Cost of equity using the quarterly version of the DCF model shown by the formula below:

$$k = \frac{d_1(1+k)^{.75} + d_2(1+k)^{.50} + d_3(1+k)^{.25} + d_4}{P_0(1-FC)} + g$$

KENTUCKY AMERICAN WATER COMPANY
EXHIBIT__(JVW-1)
SCHEDULE 3
COMPARISON OF DCF EXPECTED RETURN
ON AN EQUITY INVESTMENT IN NATURAL GAS DISTRIBUTION UTILITIES
TO THE INTEREST RATE ON A-RATED UTILITY BONDS

In this analysis, I compute an electric utility equity risk premium by comparing the DCF estimated cost of equity for a natural gas utility proxy group to the interest rate on A-rated utility bonds. For each month in my June 1998 through November 2015 study period:

DCF	=	Average DCF-estimated cost of equity on a portfolio of proxy companies;
Bond Yield	=	Yield to maturity on an investment in A-rated utility bonds; and
Risk Premium	=	DCF – Bond yield.

A more detailed description of my ex ante risk premium method is contained in Appendix 4.

LINE	DATE	DCF	BOND YIELD	RISK PREMIUM
1	Jun-98	0.1154	0.0703	0.0451
2	Jul-98	0.1186	0.0703	0.0483
3	Aug-98	0.1234	0.0700	0.0534
4	Sep-98	0.1273	0.0693	0.0580
5	Oct-98	0.1260	0.0696	0.0564
6	Nov-98	0.1211	0.0703	0.0508
7	Dec-98	0.1185	0.0691	0.0494
8	Jan-99	0.1195	0.0697	0.0498
9	Feb-99	0.1243	0.0709	0.0534
10	Mar-99	0.1257	0.0726	0.0531
11	Apr-99	0.1260	0.0722	0.0538
12	May-99	0.1221	0.0747	0.0474
13	Jun-99	0.1208	0.0774	0.0434
14	Jul-99	0.1222	0.0771	0.0451
15	Aug-99	0.1220	0.0791	0.0429
16	Sep-99	0.1226	0.0793	0.0433
17	Oct-99	0.1233	0.0806	0.0427
18	Nov-99	0.1240	0.0794	0.0446
19	Dec-99	0.1280	0.0814	0.0466
20	Jan-00	0.1301	0.0835	0.0466
21	Feb-00	0.1344	0.0825	0.0519
22	Mar-00	0.1344	0.0828	0.0516
23	Apr-00	0.1316	0.0829	0.0487
24	May-00	0.1292	0.0870	0.0422
25	Jun-00	0.1295	0.0836	0.0459
26	Jul-00	0.1317	0.0825	0.0492
27	Aug-00	0.1290	0.0813	0.0477
28	Sep-00	0.1257	0.0823	0.0434
29	Oct-00	0.1260	0.0814	0.0446
30	Nov-00	0.1251	0.0811	0.0440
31	Dec-00	0.1239	0.0784	0.0455
32	Jan-01	0.1261	0.0780	0.0481
33	Feb-01	0.1261	0.0774	0.0487

LINE	DATE	DCF	BOND YIELD	RISK PREMIUM
34	Mar-01	0.1275	0.0768	0.0507
35	Apr-01	0.1227	0.0794	0.0433
36	May-01	0.1302	0.0799	0.0503
37	Jun-01	0.1304	0.0785	0.0519
38	Jul-01	0.1338	0.0778	0.0560
39	Aug-01	0.1327	0.0759	0.0568
40	Sep-01	0.1268	0.0775	0.0493
41	Oct-01	0.1268	0.0763	0.0505
42	Nov-01	0.1268	0.0757	0.0511
43	Dec-01	0.1254	0.0783	0.0471
44	Jan-02	0.1236	0.0766	0.0470
45	Feb-02	0.1241	0.0754	0.0487
46	Mar-02	0.1189	0.0776	0.0413
47	Apr-02	0.1159	0.0757	0.0402
48	May-02	0.1162	0.0752	0.0410
49	Jun-02	0.1170	0.0741	0.0429
50	Jul-02	0.1242	0.0731	0.0511
51	Aug-02	0.1234	0.0717	0.0517
52	Sep-02	0.1260	0.0708	0.0552
53	Oct-02	0.1250	0.0723	0.0527
54	Nov-02	0.1221	0.0714	0.0507
55	Dec-02	0.1216	0.0707	0.0509
56	Jan-03	0.1219	0.0706	0.0513
57	Feb-03	0.1232	0.0693	0.0539
58	Mar-03	0.1195	0.0679	0.0516
59	Apr-03	0.1162	0.0664	0.0498
60	May-03	0.1126	0.0636	0.0490
61	Jun-03	0.1114	0.0621	0.0493
62	Jul-03	0.1127	0.0657	0.0470
63	Aug-03	0.1139	0.0678	0.0461
64	Sep-03	0.1127	0.0656	0.0471
65	Oct-03	0.1123	0.0643	0.0480
66	Nov-03	0.1089	0.0637	0.0452
67	Dec-03	0.1071	0.0627	0.0444
68	Jan-04	0.1059	0.0615	0.0444
69	Feb-04	0.1039	0.0615	0.0424
70	Mar-04	0.1037	0.0597	0.0440
71	Apr-04	0.1041	0.0635	0.0406
72	May-04	0.1045	0.0662	0.0383
73	Jun-04	0.1036	0.0646	0.0390
74	Jul-04	0.1011	0.0627	0.0384
75	Aug-04	0.1008	0.0614	0.0394
76	Sep-04	0.0976	0.0598	0.0378
77	Oct-04	0.0974	0.0594	0.0380
78	Nov-04	0.0962	0.0597	0.0365
79	Dec-04	0.0970	0.0592	0.0378
80	Jan-05	0.0990	0.0578	0.0412
81	Feb-05	0.0979	0.0561	0.0418
82	Mar-05	0.0979	0.0583	0.0396
83	Apr-05	0.0988	0.0564	0.0424

LINE	DATE	DCF	BOND YIELD	RISK PREMIUM
84	May-05	0.0981	0.0553	0.0427
85	Jun-05	0.0976	0.0540	0.0436
86	Jul-05	0.0966	0.0551	0.0415
87	Aug-05	0.0969	0.0550	0.0419
88	Sep-05	0.0980	0.0552	0.0428
89	Oct-05	0.0990	0.0579	0.0411
90	Nov-05	0.1049	0.0588	0.0461
91	Dec-05	0.1045	0.0580	0.0465
92	Jan-06	0.0982	0.0575	0.0407
93	Feb-06	0.1124	0.0582	0.0542
94	Mar-06	0.1127	0.0598	0.0529
95	Apr-06	0.1100	0.0629	0.0471
96	May-06	0.1056	0.0642	0.0414
97	Jun-06	0.1049	0.0640	0.0409
98	Jul-06	0.1087	0.0637	0.0450
99	Aug-06	0.1041	0.0620	0.0421
100	Sep-06	0.1053	0.0600	0.0453
101	Oct-06	0.1030	0.0598	0.0432
102	Nov-06	0.1033	0.0580	0.0453
103	Dec-06	0.1035	0.0581	0.0454
104	Jan-07	0.1013	0.0596	0.0417
105	Feb-07	0.1018	0.0590	0.0428
106	Mar-07	0.1018	0.0585	0.0433
107	Apr-07	0.1007	0.0597	0.0410
108	May-07	0.0967	0.0599	0.0368
109	Jun-07	0.0970	0.0630	0.0340
110	Jul-07	0.1006	0.0625	0.0381
111	Aug-07	0.1021	0.0624	0.0397
112	Sep-07	0.1014	0.0618	0.0396
113	Oct-07	0.1080	0.0611	0.0469
114	Nov-07	0.1083	0.0597	0.0486
115	Dec-07	0.1084	0.0616	0.0468
116	Jan-08	0.1113	0.0602	0.0511
117	Feb-08	0.1139	0.0621	0.0518
118	Mar-08	0.1147	0.0621	0.0526
119	Apr-08	0.1167	0.0629	0.0538
120	May-08	0.1069	0.0627	0.0442
121	Jun-08	0.1062	0.0638	0.0424
122	Jul-08	0.1086	0.0640	0.0446
123	Aug-08	0.1123	0.0637	0.0486
124	Sep-08	0.1130	0.0649	0.0481
125	Oct-08	0.1213	0.0756	0.0457
126	Nov-08	0.1221	0.0760	0.0461
127	Dec-08	0.1162	0.0654	0.0508
128	Jan-09	0.1131	0.0639	0.0492
129	Feb-09	0.1155	0.0630	0.0524
130	Mar-09	0.1198	0.0642	0.0556
131	Apr-09	0.1146	0.0648	0.0498
132	May-09	0.1225	0.0649	0.0576
133	Jun-09	0.1208	0.0620	0.0588

LINE	DATE	DCF	BOND YIELD	RISK PREMIUM
134	Jul-09	0.1145	0.0597	0.0548
135	Aug-09	0.1109	0.0571	0.0538
136	Sep-09	0.1109	0.0553	0.0556
137	Oct-09	0.1146	0.0555	0.0592
138	Nov-09	0.1148	0.0564	0.0584
139	Dec-09	0.1123	0.0579	0.0544
140	Jan-10	0.1198	0.0577	0.0621
141	Feb-10	0.1167	0.0587	0.0580
142	Mar-10	0.1074	0.0584	0.0490
143	Apr-10	0.0934	0.0582	0.0352
144	May-10	0.0970	0.0552	0.0418
145	Jun-10	0.0953	0.0546	0.0407
146	Jul-10	0.1050	0.0526	0.0524
147	Aug-10	0.1038	0.0501	0.0537
148	Sep-10	0.1034	0.0501	0.0533
149	Oct-10	0.1050	0.0510	0.0540
150	Nov-10	0.1041	0.0536	0.0505
151	Dec-10	0.1029	0.0557	0.0472
152	Jan-11	0.1019	0.0557	0.0462
153	Feb-11	0.1004	0.0568	0.0436
154	Mar-11	0.1014	0.0556	0.0458
155	Apr-11	0.1031	0.0555	0.0476
156	May-11	0.1018	0.0532	0.0486
157	Jun-11	0.1020	0.0526	0.0494
158	Jul-11	0.1035	0.0527	0.0508
159	Aug-11	0.1179	0.0469	0.0710
160	Sep-11	0.1155	0.0448	0.0707
161	Oct-11	0.1150	0.0452	0.0698
162	Nov-11	0.1120	0.0425	0.0695
163	Dec-11	0.1092	0.0435	0.0657
164	Jan-12	0.1078	0.0434	0.0644
165	Feb-12	0.1081	0.0436	0.0645
166	Mar-12	0.1081	0.0448	0.0633
167	Apr-12	0.1131	0.0440	0.0691
168	May-12	0.1201	0.0420	0.0781
169	Jun-12	0.1011	0.0408	0.0603
170	Jul-12	0.0977	0.0393	0.0584
171	Aug-12	0.1023	0.0400	0.0623
172	Sep-12	0.1038	0.0402	0.0636
173	Oct-12	0.1011	0.0391	0.0620
174	Nov-12	0.1032	0.0384	0.0648
175	Dec-12	0.1023	0.0400	0.0623
176	Jan-13	0.1013	0.0415	0.0598
177	Feb-13	0.0982	0.0418	0.0564
178	Mar-13	0.1018	0.0420	0.0598
179	Apr-13	0.1001	0.0400	0.0601
180	May-13	0.1000	0.0417	0.0583
181	Jun-13	0.1000	0.0453	0.0547
182	Jul-13	0.0983	0.0468	0.0515
183	Aug-13	0.0982	0.0473	0.0509

LINE	DATE	DCF	BOND YIELD	RISK PREMIUM
184	Sep-13	0.0991	0.0480	0.0511
185	Oct-13	0.0998	0.0470	0.0528
186	Nov-13	0.0964	0.0477	0.0487
187	Dec-13	0.0966	0.0481	0.0485
188	Jan-14	0.0948	0.0463	0.0485
189	Feb-14	0.1019	0.0453	0.0566
190	Mar-14	0.1027	0.0451	0.0576
191	Apr-14	0.1081	0.0441	0.0640
192	May-14	0.1069	0.0426	0.0643
193	Jun-14	0.1059	0.0429	0.0630
194	Jul-14	0.1075	0.0423	0.0652
195	Aug-14	0.1069	0.0413	0.0656
196	Sep-14	0.1058	0.0424	0.0634
197	Oct-14	0.1131	0.0406	0.0725
198	Nov-14	0.1113	0.0409	0.0704
199	Dec-14	0.1105	0.0395	0.0710
200	Jan-15	0.1043	0.0358	0.0685
201	Feb-15	0.1043	0.0367	0.0676
202	Mar-15	0.1062	0.0374	0.0688
203	Apr-15	0.1072	0.0375	0.0697
204	May-15	0.1067	0.0417	0.0650
205	Jun-15	0.1020	0.0439	0.0581
206	Jul-15	0.0974	0.0440	0.0534
207	Aug-15	0.0949	0.0425	0.0524
208	Sep-15	0.0975	0.0439	0.0536
209	Oct-15	0.0961	0.0429	0.0532
210	Nov-15	0.1007	0.0440	0.0567

Notes: A-rated utility bond yield information from the Mergent Bond Record. DCF results are calculated using a quarterly DCF model as follows:

D_0 = Latest quarterly dividend per *Value Line* and Yahoo Finance.
P_0 = Average of the monthly high and low stock prices for each month from Thomson Reuters.
FC = Flotation costs expressed as a percent of gross proceeds.
g = I/B/E/S forecast of future earnings growth for each month.
k = Cost of equity using the quarterly version of the DCF model shown by the formula below:

$$k = \left[\frac{d_0 (1+g)^{\frac{1}{4}}}{P_0 (1-FC)} + (1+g)^{\frac{1}{4}} \right]^4 - 1$$

KENTUCKY AMERICAN WATER COMPANY
EXHIBIT__(JVW-1)
SCHEDULE 4
COMPARATIVE RETURNS ON S&P 500 STOCK INDEX
AND MOODY'S A-RATED BONDS 1937 – 2015

LINE	YEAR	S&P 500 STOCK PRICE	STOCK DIVIDEND YIELD	STOCK RETURN	A-RATED BOND PRICE	BOND RETURN	RISK PREMIUM
1	2015	2,028.18	0.0208		$107.65		
2	2014	1,822.36	0.0210	13.39%	$89.89	24.20%	-10.81%
3	2013	1,481.11	0.0220	25.24%	$97.45	-3.65%	28.89%
4	2012	1,300.58	0.0214	16.02%	$94.36	7.52%	8.50%
5	2011	1,282.62	0.0185	3.25%	$77.36	27.14%	-23.89%
6	2010	1,123.58	0.0203	16.18%	$75.02	8.44%	7.74%
7	2009	865.58	0.0310	32.91%	$68.43	15.48%	17.43%
8	2008	1,378.76	0.0206	-35.16%	$72.25	0.24%	-35.40%
9	2007	1,424.16	0.0181	-1.38%	$72.91	4.59%	-5.97%
10	2006	1,278.72	0.0183	13.20%	$75.25	2.20%	11.01%
11	2005	1,181.41	0.0177	10.01%	$74.91	5.80%	4.21%
12	2004	1,132.52	0.0162	5.94%	$70.87	11.34%	-5.40%
13	2003	895.84	0.0180	28.22%	$62.26	20.27%	7.95%
14	2002	1,140.21	0.0138	-20.05%	$57.44	15.35%	-35.40%
15	2001	1,335.63	0.0116	-13.47%	$56.40	8.93%	-22.40%
16	2000	1,425.59	0.0118	-5.13%	$52.60	14.82%	-19.95%
17	1999	1,248.77	0.0130	15.46%	$63.03	-10.20%	25.66%
18	1998	963.35	0.0162	31.25%	$62.43	7.38%	23.87%
19	1997	766.22	0.0195	27.68%	$56.62	17.32%	10.36%
20	1996	614.42	0.0231	27.02%	$60.91	-0.48%	27.49%
21	1995	465.25	0.0287	34.93%	$50.22	29.26%	5.68%
22	1994	472.99	0.0269	1.05%	$60.01	-9.65%	10.71%
23	1993	435.23	0.0288	11.56%	$53.13	20.48%	-8.93%
24	1992	416.08	0.0290	7.50%	$49.56	15.27%	-7.77%
25	1991	325.49	0.0382	31.65%	$44.84	19.44%	12.21%
26	1990	339.97	0.0341	-0.85%	$45.60	7.11%	-7.96%
27	1989	285.41	0.0364	22.76%	$43.06	15.18%	7.58%
28	1988	250.48	0.0366	17.61%	$40.10	17.36%	0.25%
29	1987	264.51	0.0317	-2.13%	$48.92	-9.84%	7.71%
30	1986	208.19	0.0390	30.95%	$39.98	32.36%	-1.41%
31	1985	171.61	0.0451	25.83%	$32.57	35.05%	-9.22%
32	1984	166.39	0.0427	7.41%	$31.49	16.12%	-8.72%
33	1983	144.27	0.0479	20.12%	$29.41	20.65%	-0.53%
34	1982	117.28	0.0595	28.96%	$24.48	36.48%	-7.51%
35	1981	132.97	0.0480	-7.00%	$29.37	-3.01%	-3.99%
36	1980	110.87	0.0541	25.34%	$34.69	-3.81%	29.16%
37	1979	99.71	0.0533	16.52%	$43.91	-11.89%	28.41%
38	1978	90.25	0.0532	15.80%	$49.09	-2.40%	18.20%
39	1977	103.80	0.0399	-9.06%	$50.95	4.20%	-13.27%

LINE	YEAR	S&P 500 STOCK PRICE	STOCK DIVIDEND YIELD	STOCK RETURN	A-RATED BOND PRICE	BOND RETURN	RISK PREMIUM
40	1976	96.86	0.0380	10.96%	$43.91	25.13%	-14.17%
41	1975	72.56	0.0507	38.56%	$41.76	14.75%	23.81%
42	1974	96.11	0.0364	-20.86%	$52.54	-12.91%	-7.96%
43	1973	118.40	0.0269	-16.14%	$58.51	-3.37%	-12.77%
44	1972	103.30	0.0296	17.58%	$56.47	10.69%	6.89%
45	1971	93.49	0.0332	13.81%	$53.93	12.13%	1.69%
46	1970	90.31	0.0356	7.08%	$50.46	14.81%	-7.73%
47	1969	102.00	0.0306	-8.40%	$62.43	-12.76%	4.36%
48	1968	95.04	0.0313	10.45%	$66.97	-0.81%	11.26%
49	1967	84.45	0.0351	16.05%	$78.69	-9.81%	25.86%
50	1966	93.32	0.0302	-6.48%	$86.57	-4.48%	-2.00%
51	1965	86.12	0.0299	11.35%	$91.40	-0.91%	12.26%
52	1964	76.45	0.0305	15.70%	$92.01	3.68%	12.02%
53	1963	65.06	0.0331	20.82%	$93.56	2.61%	18.20%
54	1962	69.07	0.0297	-2.84%	$89.60	8.89%	-11.73%
55	1961	59.72	0.0328	18.94%	$89.74	4.29%	14.64%
56	1960	58.03	0.0327	6.18%	$84.36	11.13%	-4.95%
57	1959	55.62	0.0324	7.57%	$91.55	-3.49%	11.06%
58	1958	41.12	0.0448	39.74%	$101.22	-5.60%	45.35%
59	1957	45.43	0.0431	-5.18%	$100.70	4.49%	-9.67%
60	1956	44.15	0.0424	7.14%	$113.00	-7.35%	14.49%
61	1955	35.60	0.0438	28.40%	$116.77	0.20%	28.20%
62	1954	25.46	0.0569	45.52%	$112.79	7.07%	38.45%
63	1953	26.18	0.0545	2.70%	$114.24	2.24%	0.46%
64	1952	24.19	0.0582	14.05%	$113.41	4.26%	9.79%
65	1951	21.21	0.0634	20.39%	$123.44	-4.89%	25.28%
66	1950	16.88	0.0665	32.30%	$125.08	1.89%	30.41%
67	1949	15.36	0.0620	16.10%	$119.82	7.72%	8.37%
68	1948	14.83	0.0571	9.28%	$118.50	4.49%	4.79%
69	1947	15.21	0.0449	1.99%	$126.02	-2.79%	4.79%
70	1946	18.02	0.0356	-12.03%	$126.74	2.59%	-14.63%
71	1945	13.49	0.0460	38.18%	$119.82	9.11%	29.07%
72	1944	11.85	0.0495	18.79%	$119.82	3.34%	15.45%
73	1943	10.09	0.0554	22.98%	$118.50	4.49%	18.49%
74	1942	8.93	0.0788	20.87%	$117.63	4.14%	16.73%
75	1941	10.55	0.0638	-8.98%	$116.34	4.55%	-13.52%
76	1940	12.30	0.0458	-9.65%	$112.39	7.08%	-16.73%
77	1939	12.50	0.0349	1.89%	$105.75	10.05%	-8.16%
78	1938	11.31	0.0784	18.36%	$99.83	9.94%	8.42%
79	1937	17.59	0.0434	-31.36%	$103.18	0.63%	-31.99%
80	Average			11.3%		6.8%	4.5%

Note: See Appendix 5 for an explanation of how stock and bond returns are derived and the source of the data presented.

KENTUCKY AMERICAN WATER COMPANY
EXHIBIT__(JVW-1)
SCHEDULE 5
COMPARATIVE RETURNS ON S&P UTILITY STOCK INDEX
AND MOODY'S A-RATED BONDS 1937 – 2015

LINE	YEAR	S&P UTILITY STOCK PRICE	STOCK DIVIDEND YIELD	STOCK RETURN	A-RATED BOND PRICE	BOND RETURN	RISK PREMIUM
1	2015				$107.65		
2	2014			28.91%	$89.89	24.20%	4.71%
3	2013			13.01%	$97.45	-3.65%	16.66%
4	2012			2.09%	$94.36	7.52%	-5.43%
5	2011			19.99%	$77.36	27.14%	-7.15%
6	2010			7.04%	$75.02	8.44%	-1.40%
7	2009			10.71%	$68.43	15.48%	-4.77%
8	2008			-25.90%	$72.25	0.24%	-26.14%
9	2007			16.56%	$72.91	4.59%	11.96%
10	2006			20.76%	$75.25	2.20%	18.56%
11	2005			16.05%	$74.91	5.80%	10.25%
12	2004			22.84%	$70.87	11.34%	11.50%
13	2003			23.48%	$62.26	20.27%	3.21%
14	2002			-14.73%	$57.44	15.35%	-30.08%
15	2001	307.70	0.0287	-17.90%	$56.40	8.93%	-26.83%
16	2000	239.17	0.0413	32.78%	$52.60	14.82%	17.96%
17	1999	253.52	0.0394	-1.72%	$63.03	-10.20%	8.48%
18	1998	228.61	0.0457	15.47%	$62.43	7.38%	8.09%
19	1997	201.14	0.0492	18.58%	$56.62	17.32%	1.26%
20	1996	202.57	0.0454	3.83%	$60.91	-0.48%	4.31%
21	1995	153.87	0.0584	37.49%	$50.22	29.26%	8.23%
22	1994	168.70	0.0496	-3.83%	$60.01	-9.65%	5.82%
23	1993	159.79	0.0537	10.95%	$53.13	20.48%	-9.54%
24	1992	149.70	0.0572	12.46%	$49.56	15.27%	-2.81%
25	1991	138.38	0.0607	14.25%	$44.84	19.44%	-5.19%
26	1990	146.04	0.0558	0.33%	$45.60	7.11%	-6.78%
27	1989	114.37	0.0699	34.68%	$43.06	15.18%	19.51%
28	1988	106.13	0.0704	14.80%	$40.10	17.36%	-2.55%
29	1987	120.09	0.0588	-5.74%	$48.92	-9.84%	4.10%
30	1986	92.06	0.0742	37.87%	$39.98	32.36%	5.51%
31	1985	75.83	0.0860	30.00%	$32.57	35.05%	-5.04%
32	1984	68.50	0.0925	19.95%	$31.49	16.12%	3.83%
33	1983	61.89	0.0948	20.16%	$29.41	20.65%	-0.49%
34	1982	51.81	0.1074	30.20%	$24.48	36.48%	-6.28%
35	1981	52.01	0.0978	9.40%	$29.37	-3.01%	12.41%
36	1980	50.26	0.0953	13.01%	$34.69	-3.81%	16.83%
37	1979	50.33	0.0893	8.79%	$43.91	-11.89%	20.68%
38	1978	52.40	0.0791	3.96%	$49.09	-2.40%	6.36%
39	1977	54.01	0.0714	4.16%	$50.95	4.20%	-0.04%
40	1976	46.99	0.0776	22.70%	$43.91	25.13%	-2.43%
41	1975	38.19	0.0920	32.24%	$41.76	14.75%	17.49%
42	1974	48.60	0.0713	-14.29%	$52.54	-12.91%	-1.38%

LINE	YEAR	S&P UTILITY STOCK PRICE	STOCK DIVIDEND YIELD	STOCK RETURN	A-RATED BOND PRICE	BOND RETURN	RISK PREMIUM
43	1973	60.01	0.0556	-13.45%	$58.51	-3.37%	-10.08%
44	1972	60.19	0.0542	5.12%	$56.47	10.69%	-5.57%
45	1971	63.43	0.0504	-0.07%	$53.93	12.13%	-12.19%
46	1970	55.72	0.0561	19.45%	$50.46	14.81%	4.64%
47	1969	68.65	0.0445	-14.38%	$62.43	-12.76%	-1.62%
48	1968	68.02	0.0435	5.28%	$66.97	-0.81%	6.08%
49	1967	70.63	0.0392	0.22%	$78.69	-9.81%	10.03%
50	1966	74.50	0.0347	-1.72%	$86.57	-4.48%	2.76%
51	1965	75.87	0.0315	1.34%	$91.40	-0.91%	2.25%
52	1964	67.26	0.0331	16.11%	$92.01	3.68%	12.43%
53	1963	63.35	0.0330	9.47%	$93.56	2.61%	6.86%
54	1962	62.69	0.0320	4.25%	$89.60	8.89%	-4.64%
55	1961	52.73	0.0358	22.47%	$89.74	4.29%	18.18%
56	1960	44.50	0.0403	22.52%	$84.36	11.13%	11.39%
57	1959	43.96	0.0377	5.00%	$91.55	-3.49%	8.49%
58	1958	33.30	0.0487	36.88%	$101.22	-5.60%	42.48%
59	1957	32.32	0.0487	7.90%	$100.70	4.49%	3.41%
60	1956	31.55	0.0472	7.16%	$113.00	-7.35%	14.51%
61	1955	29.89	0.0461	10.16%	$116.77	0.20%	9.97%
62	1954	25.51	0.0520	22.37%	$112.79	7.07%	15.30%
63	1953	24.41	0.0511	9.62%	$114.24	2.24%	7.38%
64	1952	22.22	0.0550	15.36%	$113.41	4.26%	11.10%
65	1951	20.01	0.0606	17.10%	$123.44	-4.89%	21.99%
66	1950	20.20	0.0554	4.60%	$125.08	1.89%	2.71%
67	1949	16.54	0.0570	27.83%	$119.82	7.72%	20.10%
68	1948	16.53	0.0535	5.41%	$118.50	4.49%	0.92%
69	1947	19.21	0.0354	-10.41%	$126.02	-2.79%	-7.62%
70	1946	21.34	0.0298	-7.00%	$126.74	2.59%	-9.59%
71	1945	13.91	0.0448	57.89%	$119.82	9.11%	48.79%
72	1944	12.10	0.0569	20.65%	$119.82	3.34%	17.31%
73	1943	9.22	0.0621	37.45%	$118.50	4.49%	32.96%
74	1942	8.54	0.0940	17.36%	$117.63	4.14%	13.22%
75	1941	13.25	0.0717	-28.38%	$116.34	4.55%	-32.92%
76	1940	16.97	0.0540	-16.52%	$112.39	7.08%	-23.60%
77	1939	16.05	0.0553	11.26%	$105.75	10.05%	1.21%
78	1938	14.30	0.0730	19.54%	$99.83	9.94%	9.59%
79	1937	24.34	0.0432	-36.93%	$103.18	0.63%	-37.55%
80	Average			10.7%		6.8%	3.9%

See Appendix 5 for an explanation of how stock and bond returns are derived and the source of the data presented. Standard & Poor's discontinued its S&P Utilities Index in December 2001 and replaced its utilities stock index with separate indices for electric and natural gas utilities. In this study, the stock returns beginning in 2002 are based on the total returns for the EEI Index of U.S. shareholder-owned electric utilities, as reported by EEI on its website.
http://www.eei.org/whatwedo/DataAnalysis/IndusFinanAnalysis/Pages/QtrlyFinancialUpdates.aspx

KENTUCKY AMERICAN WATER COMPANY
EXHIBIT__(JVW-1)
SCHEDULE 6
USING THE ARITHMETIC MEAN TO ESTIMATE
THE COST OF EQUITY CAPITAL

Consider an investment that in a given year generates a return of 30 percent with probability equal to .5 and a return of -10 percent with a probability equal to .5. For each dollar invested, the possible outcomes of this investment at the end of year one are:

ENDING WEALTH	PROBABILITY
$1.30	0.50
$0.90	0.50

At the end of year two, the possible outcomes are:

ENDING WEALTH			PROBABILITY	VALUE X PROBABILITY
(1.30) (1.30)	=	$1.69	0.25	0.4225
(1.30) (.9)	=	$1.17	0.50	0.5850
(.9) (.9)	=	$0.81	0.25	0.2025
Expected Wealth	=			$1.21

The expected value of this investment at the end of year two is $1.21. In a competitive capital market, the cost of equity is equal to the expected rate of return on an investment. In the above example, the cost of equity is that rate of return which will make the initial investment of one dollar grow to the expected value of $1.21 at the end of two years. Thus, the cost of equity is the solution to the equation:

$$1(1+k)^2 = 1.21 \text{ or}$$

$$k = (1.21/1)^{.5} – 1 = 10\%.$$

The arithmetic mean of this investment is:

$$(30\%)\ (.5) + (-10\%)\ (.5) = 10\%.$$

Thus, the arithmetic mean is equal to the cost of equity capital.

The geometric mean of this investment is:

$$[(1.3)\ (.9)]^{.5} – 1 = .082 = 8.2\%.$$

Thus, the geometric mean is not equal to the cost of equity capital.

The lesson is obvious: for an investment with an uncertain outcome, the arithmetic mean is the best measure of the cost of equity capital.

KENTUCKY AMERICAN WATER COMPANY
EXHIBIT__(JVW-1)
SCHEDULE 7
CALCULATION OF CAPITAL ASSET PRICING MODEL COST OF EQUITY
USING THE IBBOTSON® SBBI® 7.0 PERCENT RISK PREMIUM

LINE	COMPANY	VALUE LINE BETA	RISK-FREE RATE	MARKET RISK PREMIUM	BETA X RISK PREMIUM	CAPM RESULT	MARKET CAP $ (MIL)	SIZE PREMIUM	SIZE-ADJUSTED CAPM
1	Amer. States Water	0.70	4.2%	7.0%	4.90%	9.3%	1,523	1.80%	11.1%
2	Amer. Water Works	0.70	4.2%	7.0%	4.90%	9.3%	10,278		9.3%
3	Aqua America	0.75	4.2%	7.0%	5.25%	9.6%	5,122	1.07%	10.7%
4	California Water	0.75	4.2%	7.0%	5.25%	9.6%	1,043	1.80%	11.4%
5	Conn. Water Services	0.65	4.2%	7.0%	4.55%	8.9%	396	3.74%	12.7%
6	Consolidated Water	0.85	4.2%	7.0%	5.95%	10.3%	172	3.74%	14.1%
7	Middlesex Water	0.70	4.2%	7.0%	4.90%	9.3%	401	3.74%	13.0%
8	SJW Corp.	0.75	4.2%	7.0%	5.25%	9.6%	610	1.80%	11.4%
9	York Water Co. (The)	0.75	4.2%	7.0%	5.25%	9.6%	295	3.74%	13.4%
10	Average	0.73	4.2%	7.0%	5.13%	9.5%			11.9%
11	Average Unadjusted, Adjusted					10.7%			

Notes:

ESTIMATES OF SIZE PREMIA			
Decile	Smallest Mkt. Cap. ($Millions)	Largest Mkt. Cap. ($Millions)	Premium
Large-Cap (No Adjustment)	10,105.622		0
Mid-Cap (3-5)	2,552.441	10,105.622	1.07%
Low-Cap (6-8)	549.056	2,542.913	1.80%
Micro-Cap (9-10)	3.037	548.839	3.74%

Estimates of size premia from *2015 Valuation Handbook, Guide to Cost of Capital, Market Results Through 2014*, Duff & Phelps, John Wiley & Sons, Inc., Appendix 3. Ibbotson SBBI® risk premium from 2015 Ibbotson® SBBI® Stocks, Bonds, Bills, and Inflation® Yearbook; Value Line beta for comparable companies from Value Line Investment Analyzer. Value Line forecasts a yield on 10-year Treasury notes equal to 3.5 percent. The spread between the average Nov. 2015 yield on 10-year Treasury notes (2.26 percent) and 20-year Treasury bonds (2.69 percent) is 43 basis points. Adding 43 basis points to Value Line's 3.5 percent forecasted yield on 10-year Treasury notes produces a forecasted yield of 3.93 percent for 20-year Treasury bonds (see Value Line Investment Survey, Selection & Opinion, Dec. 4, 2015). EIA forecasts a yield of 4.11 percent on 10-year Treasury notes. Adding the 43 basis point spread between 10-year Treasury notes and 20-year Treasury bonds to the EIA forecast of 4.11 percent for 10-year Treasury notes produces an EIA forecast for 20-year Treasury bonds equal to 4.54 percent. The average of the forecasts is 4.24 percent (3.93 percent using Value Line data and 4.54 percent using EIA data).

KENTUCKY AMERICAN WATER COMPANY
EXHIBIT__(JVW-1)
SCHEDULE 8
CALCULATION OF CAPITAL ASSET PRICING MODEL COST OF EQUITY
USING DCF ESTIMATE OF THE EXPECTED RATE OF RETURN
ON THE MARKET PORTFOLIO

LINE			
1	Risk-free Rate	4.2%	Long-term Treasury bond yield forecast
2	Beta	0.73	Average Beta Water Utilities
3	DCF S&P 500	12.0%	DCF Cost of Equity S&P 500 (see following)
4	Risk Premium	7.76%	
5	Beta * Risk Premium	5.66%	
6	Flotation cost	0.15%	
7	Model Result	10.1%	

Value Line beta for comparable companies from Value Line October 2015. Forecast 20-year Treasury bond yield using data from Value Line Selection & Opinion, December 4, 2015, and Energy Information Administration December 2015.

KENTUCKY AMERICAN WATER COMPANY
EXHIBIT__(JVW-1)
SCHEDULE 8 (CONTINUED)
CALCULATION OF CAPITAL ASSET PRICING MODEL COST OF EQUITY
USING DCF ESTIMATE OF THE EXPECTED RATE OF RETURN
ON THE MARKET PORTFOLIO
SUMMARY OF DISCOUNTED CASH FLOW ANALYSIS FOR S&P 500 COMPANIES

	COMPANY	STOCK PRICE (P_0)	D_0	FORECAST OF FUTURE EARNINGS GROWTH	MODEL RESULT	MARKET CAP $ (MILS)
1	3M	148.98	4.10	7.84%	10.8%	97,517
2	ABBOTT LABORATORIES	43.10	0.96	10.18%	12.7%	68,216
3	ACCENTURE CLASS A	101.54	2.20	9.88%	12.3%	67,265
4	ACE	108.07	2.68	9.60%	12.3%	37,466
5	ACTIVISION BLIZZARD	32.69	0.23	10.97%	11.8%	27,061
6	ADT	32.28	0.84	9.03%	11.9%	5,618
7	ADV.AUTO PARTS	184.56	0.24	13.03%	13.2%	11,891
8	AETNA	109.26	1.00	10.07%	11.1%	34,832
9	AGILENT TECHS.	36.69	0.46	10.78%	12.2%	12,759
10	AIRGAS	100.27	2.40	8.43%	11.0%	9,998
11	ALTERA	51.06	0.72	11.00%	12.6%	15,958
12	ALTRIA GROUP	56.65	2.26	8.57%	13.0%	112,661
13	AMERICAN INTL.GP.	59.65	1.12	9.88%	12.0%	76,670
14	AMETEK	53.87	0.36	10.40%	11.1%	13,271
15	AMGEN	150.08	3.16	10.32%	12.7%	120,308
16	ANTHEM	139.74	2.50	10.92%	12.9%	33,380
17	AON CLASS A	91.68	1.20	9.13%	10.6%	25,699
18	AUTOMATIC DATA PROC.	83.08	2.12	10.40%	13.2%	39,844
19	AVERY DENNISON	61.26	1.48	9.61%	12.3%	6,013
20	BEST BUY	35.27	0.92	10.03%	12.9%	10,568
21	BLACKROCK	326.47	8.72	8.92%	11.9%	58,888
22	BOEING	139.53	3.64	10.74%	13.7%	99,988
23	BORGWARNER	42.37	0.52	9.61%	11.0%	9,499
24	C R BARD	187.94	0.96	10.46%	11.0%	13,501
25	CF INDUSTRIES HDG.	49.60	1.20	9.47%	12.1%	10,854
26	CH ROBINSON WWD.	68.76	1.72	10.24%	13.0%	9,811
27	CIGNA	135.12	0.04	12.80%	12.8%	32,929
28	CINTAS	88.77	1.05	12.58%	13.9%	10,138
29	CISCO SYSTEMS	26.86	0.84	9.40%	12.9%	138,932
30	CLOROX	118.55	3.08	7.30%	10.1%	16,049
31	CMS ENERGY	34.86	1.16	6.72%	10.3%	9,848
32	COACH	30.06	1.35	7.07%	12.0%	8,231
33	CUMMINS	108.47	3.90	5.71%	9.6%	17,508
34	DISCOVER FINANCIAL SVS.	54.29	1.12	8.53%	10.8%	24,644
35	DOW CHEMICAL	47.18	1.84	8.10%	12.4%	61,777
36	DR PEPPER SNAPPLE GROUP	83.30	1.92	7.23%	9.7%	16,872
37	EASTMAN CHEMICAL	68.85	1.84	6.85%	9.7%	10,536
38	EATON	54.35	2.20	5.34%	9.7%	26,273
39	EMC	25.31	0.46	10.45%	12.5%	48,548
40	EMERSON ELECTRIC	46.59	1.90	6.33%	10.7%	32,819

	COMPANY	STOCK PRICE (P_0)	D_0	FORECAST OF FUTURE EARNINGS GROWTH	MODEL RESULT	MARKET CAP $ (MILS)
41	EVERSOURCE ENERGY	49.76	1.67	6.57%	10.2%	16,189
42	EXPEDITOR INTL.OF WASH.	48.76	0.72	11.80%	13.5%	9,181
43	GENERAL DYNAMICS	142.96	2.76	10.14%	12.3%	45,902
44	GENERAL ELECTRIC	27.37	0.92	7.70%	11.4%	306,007
45	HERSHEY	89.63	2.33	7.63%	10.5%	13,289
46	HONEYWELL INTL.	99.63	2.38	9.07%	11.7%	80,953
47	HUNTINGTON BCSH.	10.94	0.28	8.80%	11.6%	9,420
48	ILLINOIS TOOL WORKS	87.23	2.20	7.70%	10.4%	33,616
49	INGERSOLL-RAND	56.72	1.16	7.60%	9.8%	15,316
50	INTEL	31.62	0.96	8.25%	11.6%	161,862
51	INTERNATIONAL BUS.MCHS.	142.63	5.20	7.25%	11.2%	132,653
52	INVESCO	32.57	1.08	9.73%	13.4%	14,068
53	J M SMUCKER	115.53	2.68	8.08%	10.6%	14,514
54	JOHNSON CONTROLS	42.84	1.16	10.38%	13.4%	29,599
55	JP MORGAN CHASE & CO.	63.53	1.76	8.48%	11.5%	249,065
56	KEYCORP	13.16	0.30	9.24%	11.8%	10,927
57	KIMBERLY-CLARK	113.91	3.52	7.87%	11.2%	44,162
58	KOHL'S	46.71	1.80	8.62%	12.9%	8,787
59	KROGER	36.29	0.42	10.60%	11.9%	36,329
60	L BRANDS	92.24	2.00	10.26%	12.7%	26,753
61	LENNAR 'A'	49.95	0.16	11.60%	12.0%	8,799
62	LINCOLN NATIONAL	51.43	1.00	8.92%	11.1%	13,757
63	LOCKHEED MARTIN	212.37	6.60	7.02%	10.4%	68,834
64	LYONDELLBASELL INDS.CL.A	89.19	3.12	6.93%	10.7%	41,852
65	M&T BANK	119.84	2.80	8.79%	11.4%	22,300
66	MARATHON PETROLEUM	50.50	1.28	10.22%	13.0%	29,745
67	MCCORMICK & COMPANY NV.	82.21	1.72	7.30%	9.6%	9,852
68	MCDONALDS	104.54	3.56	8.22%	12.0%	104,035
69	MEAD JOHNSON NUTRITION	77.45	1.65	8.54%	10.9%	16,315
70	MICROSOFT	48.72	1.44	9.13%	12.4%	430,868
71	MONDELEZ INTERNATIONAL CL.A	43.91	0.68	9.52%	11.2%	70,845
72	MONSANTO	91.04	2.16	10.36%	13.0%	42,150
73	NASDAQ	55.16	1.00	9.02%	11.0%	9,749
74	NEWELL RUBBERMAID	42.19	0.76	9.53%	11.5%	11,734
75	NEWS 'A'	13.84	0.20	11.65%	13.3%	5,414
76	NEXTERA ENERGY	99.44	3.08	6.90%	10.2%	46,510
77	NIELSEN	46.42	1.12	10.70%	13.4%	17,355
78	NIKE 'B'	124.04	1.28	12.64%	13.8%	84,868
79	NORTHERN TRUST	70.24	1.44	11.50%	13.8%	17,434
80	PACCAR	53.32	0.96	7.94%	9.9%	18,047
81	PARKER-HANNIFIN	101.95	2.52	7.63%	10.3%	14,102
82	PATTERSON COMPANIES	45.51	0.88	9.95%	12.1%	4,985
83	PAYCHEX	49.28	1.68	9.50%	13.3%	19,487
84	PENTAIR	54.37	1.28	7.27%	9.8%	10,233
85	PERKINELMER	49.09	0.28	8.98%	9.6%	5,891
86	PG&E	52.14	1.82	5.94%	9.7%	26,087
87	PPG INDUSTRIES	95.95	1.44	11.86%	13.5%	27,834
88	PPL	32.81	1.51	4.87%	9.8%	22,951
89	PRINCIPAL FINL.GP.	48.99	1.52	9.88%	13.3%	14,848
90	PROCTER & GAMBLE	73.64	2.65	8.35%	12.3%	206,796

	COMPANY	STOCK PRICE (P_0)	D_0	FORECAST OF FUTURE EARNINGS GROWTH	MODEL RESULT	MARKET CAP $ (MILS)
91	PROGRESSIVE OHIO	31.44	0.69	8.06%	10.5%	18,355
92	PRUDENTIAL FINL.	80.82	2.80	9.00%	12.8%	39,417
93	QUEST DIAGNOSTICS	65.49	1.52	9.88%	12.5%	9,726
94	RAYTHEON 'B'	113.32	2.68	7.59%	10.2%	37,938
95	ROCKWELL COLLINS	85.76	1.32	9.30%	11.0%	12,127
96	ROPER TECHNOLOGIES	172.70	1.00	11.27%	11.9%	19,097
97	ROSS STORES	48.90	0.47	11.42%	12.5%	18,853
98	SCRIPPS NETWORKS INTACT. 'A'	54.65	0.92	11.07%	13.0%	5,343
99	SEAGATE TECH.	42.22	2.52	7.33%	13.9%	10,175
100	ST.JUDE MEDICAL	65.00	1.16	10.55%	12.5%	17,672
101	STANLEY BLACK & DECKER	102.87	2.20	11.03%	13.4%	16,072
102	STARWOOD H&R.WORLDWIDE	72.80	1.50	8.73%	11.0%	12,205
103	STRYKER	96.88	1.38	9.20%	10.8%	35,927
104	SYSCO	40.18	1.24	8.30%	11.7%	23,371
105	T ROWE PRICE GROUP	72.36	2.08	8.36%	11.5%	19,179
106	TARGET	75.79	2.24	10.47%	13.8%	43,462
107	TESORO	103.97	2.00	10.81%	13.0%	13,699
108	TEXAS INSTRUMENTS	52.71	1.52	10.00%	13.2%	58,785
109	THERMO FISHER SCIENTIFIC	128.64	0.60	9.38%	9.9%	54,836
110	TIFFANY & CO	78.81	1.60	8.33%	10.5%	9,518
111	TJX	70.68	0.84	10.83%	12.2%	45,327
112	TOTAL SYSTEM SERVICES	49.88	0.40	12.73%	13.6%	10,024
113	TYCO INTERNATIONAL	35.42	0.82	8.02%	10.5%	15,147
114	UNION PACIFIC	88.98	2.20	8.12%	10.8%	74,343
115	UNITED PARCEL SER.'B'	101.25	2.92	10.20%	13.4%	72,708
116	V F	67.81	1.48	10.82%	13.3%	27,066
117	VALERO ENERGY	64.18	2.00	10.21%	13.7%	34,254
118	VERIZON COMMUNICATIONS	45.05	2.26	7.58%	13.1%	186,192
119	VIACOM 'B'	46.04	1.60	9.39%	13.2%	18,126
120	WASTE MANAGEMENT	51.95	1.54	7.80%	11.0%	23,946
121	WEC ENERGY GROUP	50.84	1.98	7.55%	11.8%	15,866
122	WELLS FARGO & CO	53.21	1.50	8.75%	11.8%	285,884
123	WESTERN UNION	18.79	0.62	7.75%	11.3%	9,641
124	WESTROCK	53.46	1.50	8.70%	11.8%	12,902
125	XILINX	45.07	1.24	10.33%	13.4%	12,571
126	YUM! BRANDS	74.84	1.84	9.52%	12.2%	30,911
127	ZIMMER BIOMET HDG.	99.84	0.88	10.12%	11.1%	21,207
128	ZIONS BANCORP.	28.74	0.24	8.84%	9.8%	6,115
129	ZOETIS	43.34	0.33	12.35%	13.2%	23,400
130	Market-weighted Average				12.0%	

Notes: In applying the DCF model to the S&P 500, I included in the DCF analysis only those companies in the S&P 500 group which pay a dividend, have a positive growth rate, and have at least three analysts' long-term growth estimates. To be conservative, I also eliminated those 25% of companies with the highest and lowest DCF results.

D_0 = Current dividend per Thomson Reuters.

P_0 = Average of the monthly high and low stock prices during the three months ending November 2015 per Thomson Reuters.

g = I/B/E/S forecast of future earnings growth November 2015.

k = Cost of equity using the quarterly version of the DCF model shown below:

$$k = \left[\frac{d_0 (1+g)^{\frac{1}{4}}}{P_0} \right]^4 - 1$$

KENTUCKY AMERICAN WATER COMPANY
EXHIBIT__(JVW-1)
SCHEDULE 9
COMPARISON OF RISK PREMIA ON
S&P500 AND S&P UTILITIES 1937 – 2015

YEAR	S&P UTILITIES STOCK RETURN	SP500 STOCK RETURN	10-YR. TREASURY BOND YIELD	UTILITIES RISK PREMIUM	MARKET RISK PREMIUM
2014	0.2891	0.1339	0.0249	0.2642	0.1090
2013	0.1301	0.2524	0.0235	0.1066	0.2289
2012	0.0209	0.1602	0.0180	0.0029	0.1422
2011	0.1999	0.0325	0.0278	0.1721	0.0047
2010	0.0704	0.1618	0.0322	0.0382	0.1296
2009	0.1071	0.3291	0.0326	0.0745	0.2965
2008	-0.2590	-0.3516	0.0367	-0.2957	-0.3883
2007	0.1656	-0.0138	0.0463	0.1193	-0.0601
2006	0.2076	0.1320	0.0479	0.1597	0.0841
2005	0.1605	0.1001	0.0429	0.1176	0.0572
2004	0.2284	0.0594	0.0427	0.1857	0.0167
2003	0.2348	0.2822	0.0401	0.1947	0.2421
2002	-0.1473	-0.2005	0.0461	-0.1934	-0.2466
2001	-0.1790	-0.1347	0.0502	-0.2292	-0.1849
2000	0.3278	-0.0513	0.0603	0.2675	-0.1116
1999	-0.0172	0.1546	0.0564	-0.0736	0.0982
1998	0.1547	0.3125	0.0526	0.1021	0.2599
1997	0.1858	0.2768	0.0635	0.1223	0.2133
1996	0.0383	0.2702	0.0644	-0.0261	0.2058
1995	0.3749	0.3493	0.0658	0.3091	0.2835
1994	-0.0383	0.0105	0.0708	-0.1091	-0.0603
1993	0.1095	0.1156	0.0587	0.0508	0.0569
1992	0.1246	0.0750	0.0701	0.0545	0.0049
1991	0.1425	0.3165	0.0786	0.0639	0.2379
1990	0.0033	-0.0085	0.0855	-0.0822	-0.0940
1989	0.3468	0.2276	0.0850	0.2618	0.1426
1988	0.1480	0.1761	0.0884	0.0596	0.0877
1987	-0.0574	-0.0213	0.0838	-0.1412	-0.1051
1986	0.3787	0.3095	0.0768	0.3019	0.2327
1985	0.3000	0.2583	0.1062	0.1938	0.1521
1984	0.1995	0.0741	0.1244	0.0751	-0.0503
1983	0.2016	0.2012	0.1110	0.0906	0.0902
1982	0.3020	0.2896	0.1300	0.1720	0.1596
1981	0.0940	-0.0700	0.1391	-0.0451	-0.2091
1980	0.1301	0.2534	0.1146	0.0155	0.1388
1979	0.0879	0.1652	0.0944	-0.0065	0.0708
1978	0.0396	0.1580	0.0841	-0.0445	0.0739
1977	0.0416	-0.0906	0.0742	-0.0326	-0.1648

YEAR	S&P UTILITIES STOCK RETURN	SP500 STOCK RETURN	10-YR. TREASURY BOND YIELD	UTILITIES RISK PREMIUM	MARKET RISK PREMIUM
1976	0.2270	0.1096	0.0761	0.1509	0.0335
1975	0.3224	0.3856	0.0799	0.2425	0.3057
1974	-0.1429	-0.2086	0.0756	-0.2185	-0.2842
1973	-0.1345	-0.1614	0.0684	-0.2029	-0.2298
1972	0.0512	0.1758	0.0621	-0.0109	0.1137
1971	-0.0007	0.1381	0.0616	-0.0623	0.0765
1970	0.1945	0.0708	0.0735	0.1210	-0.0027
1969	-0.1438	-0.0840	0.0667	-0.2105	-0.1507
1968	0.0528	0.1045	0.0565	-0.0037	0.0480
1967	0.0022	0.1605	0.0507	-0.0485	0.1098
1966	-0.0172	-0.0648	0.0492	-0.0664	-0.1140
1965	0.0134	0.1135	0.0428	-0.0294	0.0707
1964	0.1611	0.1570	0.0419	0.1192	0.1151
1963	0.0947	0.2082	0.0400	0.0547	0.1682
1962	0.0425	-0.0284	0.0395	0.0030	-0.0679
1961	0.2247	0.1894	0.0388	0.1859	0.1506
1960	0.2252	0.0618	0.0412	0.1840	0.0206
1959	0.0500	0.0757	0.0433	0.0067	0.0324
1958	0.3688	0.3974	0.0332	0.3356	0.3642
1957	0.0790	-0.0518	0.0365	0.0425	-0.0883
1956	0.0716	0.0714	0.0318	0.0398	0.0396
1955	0.1016	0.2840	0.0282	0.0734	0.2558
1954	0.2237	0.4552	0.0240	0.1997	0.4312
1953	0.0962	0.0270	0.0281	0.0681	-0.0011
1952	0.1536	0.1405	0.0248	0.1288	0.1157
1951	0.1710	0.2039	0.0241	0.1469	0.1798
1950	0.0460	0.3230	0.0205	0.0255	0.3025
1949	0.2783	0.1610	0.0193	0.2590	0.1417
1948	0.0541	0.0928	0.0215	0.0326	0.0713
1947	-0.1041	0.0199	0.0185	-0.1226	0.0014
1946	-0.0700	-0.1203	0.0174	-0.0874	-0.1377
1945	0.5789	0.3818	0.0173	0.5616	0.3645
1944	0.2065	0.1879	0.0209	0.1856	0.1670
1943	0.3745	0.2298	0.0207	0.3538	0.2091
1942	0.1736	0.2087	0.0211	0.1525	0.1876
1941	-0.2838	-0.0898	0.0199	-0.3037	-0.1097
1940	-0.1652	-0.0965	0.0220	-0.1872	-0.1185
1939	0.1126	0.0189	0.0235	0.0891	-0.0046
1938	0.1954	0.1836	0.0255	0.1699	0.1581
1937	-0.3693	-0.3136	0.0269	-0.3962	-0.3405
Risk Premium 1937—2015				0.0549	0.0606
RP Utilities/RP SP500				0.90	

APPENDIX 1
QUALIFICATIONS OF JAMES H. VANDER WEIDE, PH.D.

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James H. Vander Weide is founder and President of Financial Strategy Associates, a consulting firm that provides strategic, financial, and economic consulting services to corporate clients, including cost of capital and valuation studies.

Educational Background and Academic Experience

Dr. Vander Weide holds a Ph.D. in Finance from Northwestern University and a Bachelor of Arts in Economics from Cornell University. He joined the faculty at Duke University and was named Assistant Professor, Associate Professor, Professor, and then Research Professor of Finance and Economics.

After joining the faculty at Duke, Dr. Vander Weide taught courses in corporate finance, investment management, and management of financial institutions. He also taught courses in statistics, economics, and operations research, and a Ph.D. seminar on the theory of public utility pricing. In addition, Dr. Vander Weide has been active in executive education at Duke and Duke Corporate Education, leading executive development seminars on topics including financial analysis, cost of capital, creating shareholder value, mergers and acquisitions, real options, capital budgeting, cash management, measuring corporate performance, valuation, short-run financial planning, depreciation policies, financial strategy, and competitive strategy. Dr. Vander Weide has designed and served as Program Director for several executive education programs, including the Advanced Management Program, Competitive Strategies in Telecommunications, and the Duke Program for Manager Development for managers from the former Soviet Union.

Publications

Dr. Vander Weide has written a book entitled *Managing Corporate Liquidity: An Introduction to Working Capital Management* published by John Wiley and Sons, Inc. He has also written a chapter titled, “Financial Management in the Short Run” for *The Handbook of Modern Finance*; a chapter titled “Principles for Lifetime Portfolio Selection: Lessons from Portfolio Theory” for *The Handbook of Portfolio Construction: Contemporary Applications of Markowitz Techniques;* and written research papers on such topics as portfolio management, capital budgeting, investments, the effect of regulation on the performance of public utilities, and cash management. His articles have been published in *American Economic Review, Financial Management, International Journal of Industrial Organization, Journal of Finance, Journal of Financial and Quantitative Analysis, Journal of Bank Research, Journal of Portfolio Management, Journal of Accounting Research, Journal of Cash Management, Management Science, Atlantic Economic Journal, Journal of Economics and Business,* and *Computers and Operations Research*.

Professional Consulting Experience

Dr. Vander Weide has provided financial and economic consulting services to firms in the telecommunications, electric, gas, insurance, and water industries for more than twenty-five years. He has testified on the cost of capital, competition, risk, incentive regulation, forward-looking economic cost, economic pricing guidelines, depreciation, accounting, valuation, and other financial and economic issues in more than four hundred regulatory and legal proceedings before the public service commissions of forty-three states and four Canadian provinces, the Federal Energy Regulatory Commission, the National Energy Board (Canada), the Federal Communications Commission, the Canadian Radio-Television and Telecommunications Commission, the U.S. Congress, the National Telecommunications and Information Administration, the insurance commissions of five states, the Iowa State Board of Tax Review, and the North Carolina Property Tax Commission. In addition, he has testified as an expert witness in telecommunications-related proceedings before the United States District Court for the District of New Hampshire, the Supreme Court for the State of New York, the United States District Court for the Northern District of California, the United States District Court for the Northern District of Illinois, the Montana Second Judicial District Court Silver Bow County, the United States Bankruptcy Court for the Southern District of West Virginia, and the United States District Court for the Eastern District of Michigan. He also testified as an expert before the United States Tax Court, United States District Court for the Eastern District of North Carolina; United States District Court for the District of Nebraska, and Superior Court of North Carolina. Dr. Vander Weide has testified in thirty states on issues relating to the pricing of unbundled network elements and universal service cost studies and has consulted with Bell Canada, Deutsche Telekom, and Telefónica on similar issues. He has also provided expert testimony on issues related to electric and natural gas restructuring. He has worked for Bell Canada/Nortel on a special task force to study the effects of vertical integration in the Canadian telephone industry and has worked for Bell Canada as an expert witness on the cost of capital. Dr. Vander Weide has provided consulting and expert witness testimony to the following companies:

ELECTRIC, GAS, PIPELINE, WATER COMPANIES	
Alcoa Power Generating, Inc.	Kinder Morgan Energy Partners
Alliant Energy and subsidiaries	Maritimes & Northeast Pipeline
AltaLink, L.P.	MidAmerican Energy and subsidiaries
Ameren	National Fuel Gas
American Water Works	Nevada Power Company
Atmos Energy and subsidiaries	NICOR
BP p.l.c.	North Carolina Natural Gas
Buckeye Partners, L.P.	North Shore Gas
Central Illinois Public Service	Northern Natural Gas Company
Citizens Utilities	NOVA Gas Transmission Ltd.
Consolidated Natural Gas and subsidiaries	PacifiCorp
Dominion Resources and subsidiaries	Peoples Energy and its subsidiaries
Duke Energy and subsidiaries	PG&E
Empire District Electric Company	Plains All American Pipeline, L.P.
EPCOR Distribution & Transmission Inc.	Progress Energy
EPCOR Energy Alberta Inc.	PSE&G
FortisAlberta Inc.	Public Service Company of North Carolina
FortisBC Utilities	Sempra Energy/San Diego Gas and Electric
Hope Natural Gas	South Carolina Electric and Gas
Interstate Power Company	Southern Company and subsidiaries
Iberdrola Renewables	Spectra Energy Corp
Iowa Southern	Tennessee-American Water Company
Iowa-American Water Company	The Peoples Gas, Light and Coke Co.
Iowa-Illinois Gas and Electric	TransCanada
Kentucky Power Company	Trans Québec & Maritimes Pipeline Inc.
Kentucky-American Water Company	Union Gas
Newfoundland Power Inc.	United Cities Gas Company
	Virginia-American Water Company
	Wisconsin Energy Corporation
	Xcel Energy

Telecommunications Companies	
ALLTEL and subsidiaries	Phillips County Cooperative Tel. Co.
Ameritech (now AT&T new)	Pine Drive Cooperative Telephone Co.
AT&T (old)	Roseville Telephone Company (SureWest)
Bell Canada/Nortel	SBC Communications (now AT&T new)
BellSouth and subsidiaries	Sherburne Telephone Company
Centel and subsidiaries	Siemens
Cincinnati Bell (Broadwing)	Southern New England Telephone
Cisco Systems	Sprint/United and subsidiaries
Citizens Telephone Company	Telefónica
Concord Telephone Company	Tellabs, Inc.
Contel and subsidiaries	The Stentor Companies
Deutsche Telekom	U S West (Qwest)
GTE and subsidiaries (now Verizon)	Union Telephone Company
Heins Telephone Company	United States Telephone Association
JDS Uniphase	Valor Telecommunications (Windstream)
Lucent Technologies	Verizon (Bell Atlantic) and subsidiaries
Minnesota Independent Equal Access Corp.	Woodbury Telephone Company
NYNEX and subsidiaries (Verizon)	
Pacific Telesis and subsidiaries	

Insurance Companies
Allstate
North Carolina Rate Bureau
United Services Automobile Association (USAA)
The Travelers Indemnity Company
Gulf Insurance Company

Other Professional Experience

Dr. Vander Weide conducts in-house seminars and training sessions on topics such as creating shareholder value, financial analysis, competitive strategy, cost of capital, real options, financial strategy, managing growth, mergers and acquisitions, valuation, measuring corporate performance, capital budgeting, cash management, and financial planning. Among the firms for whom he has designed and taught tailored programs and training sessions are ABB Asea Brown Boveri, Accenture, Allstate, Ameritech, AT&T, Bell Atlantic/Verizon, BellSouth, Progress Energy/Carolina Power & Light, Contel, Fisons, GlaxoSmithKline, GTE, Lafarge, MidAmerican Energy, New Century Energies, Norfolk Southern, Pacific Bell Telephone, The Rank Group, Siemens, Southern New England Telephone, TRW, and Wolseley Plc.Dr. Vander Weide has also hosted a nationally prominent conference/workshop on estimating the cost of capital.In 1989, at the request of Mr. Fuqua, Dr. Vander Weide designed the Duke Program for Manager Development for managers from the former Soviet Union, the first in the United States designed exclusively for managers from Russia and the former Soviet republics.

Early in his career, Dr. Vander Weide helped found University Analytics, Inc., which was one of the fastest growing small firms in the country. As an officer at University Analytics, he designed cash management models, databases, and software packages that are still used by most major U.S. banks in consulting with their corporate clients. Having sold his interest in University Analytics, Dr. Vander Weide now concentrates on strategic and financial consulting, academic research, and executive education.

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JAMES H. VANDER WEIDE

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APPENDIX 2
THE QUARTERLY DCF MODEL

The simple DCF Model assumes that a firm pays dividends only at the end of each year. Because firms in fact pay dividends quarterly and investors appreciate the time value of money, the annual version of the DCF Model generally underestimates the value investors are willing to place on the firm's expected future dividend stream. In this appendix, we review two alternative formulations of the DCF Model that allow for the quarterly payment of dividends.

When dividends are assumed to be paid annually, the DCF Model suggests that the current price of the firm's stock is given by the expression:

$$P_0 = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \ldots + \frac{D_n + P_n}{(1+k)^n} \quad \textbf{(1)}$$

where

P_0	=	current price per share of the firm's stock,
$D_1, D_2, \ldots, D_n$	=	expected annual dividends per share on the firm's stock,
P_n	=	price per share of stock at the time investors expect to sell the stock, and
k	=	return investors expect to earn on alternative investments of the same risk, i.e., the investors' required rate of return.

Unfortunately, expression (1) is rather difficult to analyze, especially for the purpose of estimating k. Thus, most analysts make a number of simplifying assumptions. First, they assume that dividends are expected to grow at the constant rate g into the indefinite future. Second, they assume that the stock price at time n is simply the present value of all dividends expected in periods subsequent to n. Third, they assume that the investors' required rate of return, k, exceeds the expected dividend growth rate g. Under the above simplifying assumptions, a firm's stock price may be written as the following sum:

$$P_0 = \frac{D_0(1+g)}{(1+k)} + \frac{D_0(1+g)^2}{(1+k)^2} + \frac{D_0(1+g)^3}{(1+k)^3} + \ldots , \qquad \textbf{(2)}$$

where the three dots indicate that the sum continues indefinitely.

As we shall demonstrate shortly, this sum may be simplified to:

$$P_0 = \frac{D_0(1+g)}{(k-g)}$$

First, however, we need to review the very useful concept of a geometric progression.

Geometric Progression

Consider the sequence of numbers 3, 6, 12, 24,…, where each number after the first is obtained by multiplying the preceding number by the factor 2. Obviously, this sequence of numbers may also be expressed as the sequence 3, 3 x 2, 3 x 2^2, 3 x 2^3, etc. This sequence is an example of a geometric progression.

Definition: A geometric progression is a sequence in which each term after the first is obtained by multiplying some fixed number, called the common ratio, by the preceding term.

A general notation for geometric progressions is: a, the first term, r, the common ratio, and n, the number of terms. Using this notation, any geometric progression may be represented by the sequence:

$$a, ar, ar^2, ar^3, \ldots, ar^{n-1}.$$

In studying the DCF Model, we will find it useful to have an expression for the sum of n terms of a geometric progression. Call this sum S_n. Then

$$S_n = a + ar + \ldots + ar^{n-1} . \qquad \textbf{(3)}$$

However, this expression can be simplified by multiplying both sides of equation (3) by r and then subtracting the new equation from the old. Thus,

$$rS_n = ar + ar^2 + ar^3 + \ldots + ar^n$$

and

$$S_n - rS_n = a - ar^n \quad ,$$

or

$$(1 - r) S_n = a (1 - r^n) \ .$$

Solving for S_n, we obtain:

$$S_n = \frac{a(1 - r^n)}{(1 - r)} \qquad \textbf{(4)}$$

as a simple expression for the sum of n terms of a geometric progression. Furthermore, if $|r| < 1$, then S_n is finite, and as n approaches infinity, S_n approaches $a \div (1-r)$. Thus, for a geometric progression with an infinite number of terms and $|r| < 1$, equation (4) becomes:

$$S = \frac{a}{1 - r} \qquad \textbf{(5)}$$

Application to DCF Model

Comparing equation (2) with equation (3), we see that the firm's stock price (under the DCF assumption) is the sum of an infinite geometric progression with the first term

$$a = \frac{D_0(1+g)}{(1+k)}$$

and common factor

$$r = \frac{(1+g)}{(1+k)}$$

Applying equation (5) for the sum of such a geometric progression, we obtain

$$S = a \bullet \frac{1}{(1 - r)} = \frac{D_0(1+g)}{(1+k)} \bullet \frac{1}{1 - \frac{1+g}{1+k}} = \frac{D_0(1+g)}{(1+k)} \bullet \frac{1+k}{k - g} = \frac{D_0(1+g)}{k - g}$$

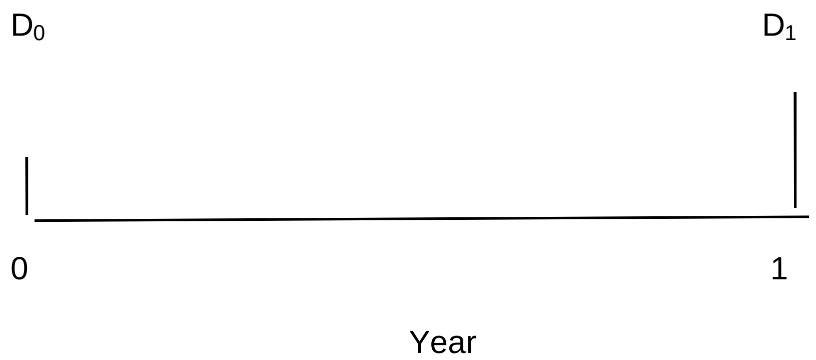
as we suggested earlier.

Quarterly DCF Model

The Annual DCF Model assumes that dividends grow at an annual rate of g% per year (see Figure 1).

Figure 1

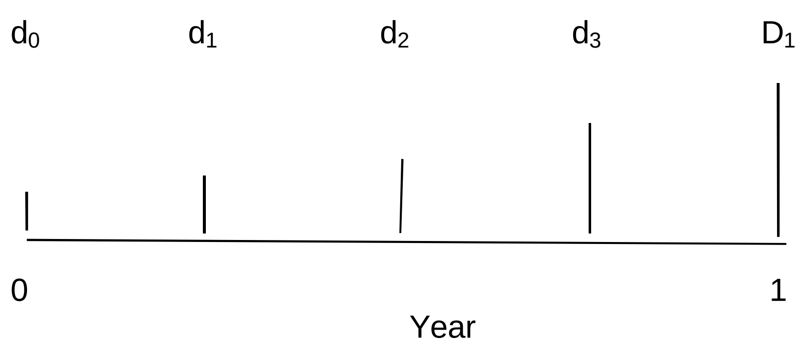
Annual DCF Model



$D_0 = 4d_0$ $\qquad$ $D_1 = D_0(1 + g)$

Figure 2

Quarterly DCF Model (Constant Growth Version)



$d_1 = d_0(1+g)^{.25}$ $\qquad$ $d_2 = d_0(1+g)^{.50}$

$d_3 = d_0(1+g)^{.75}$ $\qquad$ $d_4 = d_0(1+g)$

In the Quarterly DCF Model, it is natural to assume that quarterly dividend payments differ from the preceding quarterly dividend by the factor $(1 + g)^{.25}$, where g is expressed in terms of percent per year and the decimal .25 indicates that the growth has only occurred for one quarter of the year. (See Figure 2.) Using this assumption, along with the assumption of constant growth and ***k*** > ***g***, we obtain a new expression for the firm's stock price, which takes account of the quarterly payment of dividends. This expression is:

$$P_0 = \frac{d_0(1+g)^{\frac{1}{4}}}{(1+k)^{\frac{1}{4}}} + \frac{d_0(1+g)^{\frac{2}{4}}}{(1+k)^{\frac{2}{4}}} + \frac{d_0(1+g)^{\frac{3}{4}}}{(1+k)^{\frac{3}{4}}} + \dots \quad \textbf{(6)}$$

where d_0 is the last quarterly dividend payment, rather than the last annual dividend payment. (We use a lower case d to remind the reader that this is not the annual dividend.)

Although equation (6) looks formidable at first glance, it too can be greatly simplified using the formula [equation (4)] for the sum of an infinite geometric progression. As the reader can easily verify, equation (6) can be simplified to:

$$P_0 = \frac{d_0(1+g)^{\frac{1}{4}}}{(1+k)^{\frac{1}{4}} - (1+g)^{\frac{1}{4}}} \quad \textbf{(7)}$$

Solving equation (7) for *k*, we obtain a DCF formula for estimating the cost of equity under the quarterly dividend assumption:

$$k = \left[\frac{d_0(1+g)^{\frac{1}{4}}}{P_0} + (1+g)^{\frac{1}{4}} \right]^4 - 1 \quad \textbf{(8)}$$

An Alternative Quarterly DCF Model

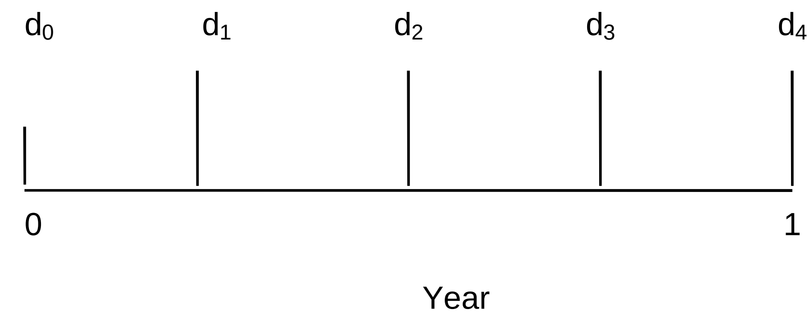
Although the constant growth Quarterly DCF Model [equation (8)] allows for the quarterly timing of dividend payments, it does require the assumption that the firm increases its dividend payments each quarter. Since this assumption is difficult for some analysts to accept, we now discuss a second Quarterly DCF Model that allows for constant quarterly dividend payments within each dividend year.

Assume then that the firm pays dividends quarterly and that each dividend payment is constant for four consecutive quarters. There are four cases to consider, with each case distinguished by varying assumptions about where we are evaluating the firm in relation to the time of its next dividend increase. (See Figure 3.)

Figure 3

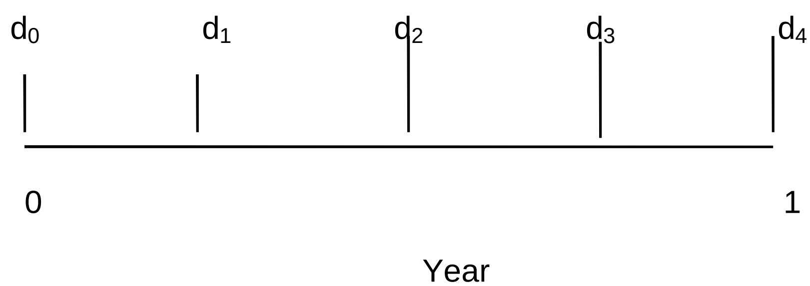
Quarterly DCF Model (Constant Dividend Version)

Case 1



$$d_1 = d_2 = d_3 = d_4 = d_0(1+g)$$

Case 2

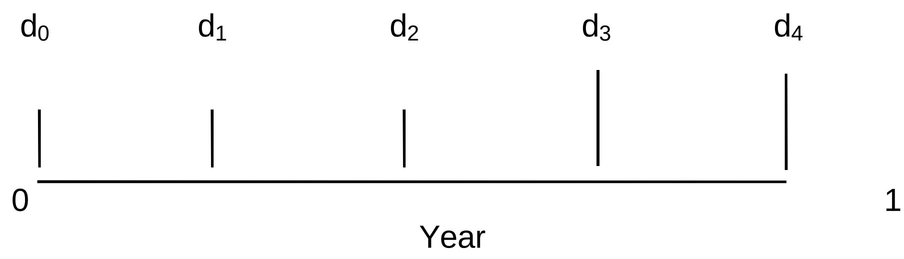


$$d_1 = d_0$$

$$d_2 = d_3 = d_4 = d_0(1+g)$$

<u>Figure 3</u> (continued)

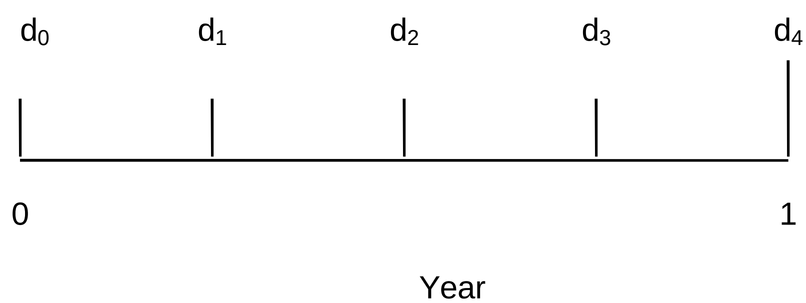
<u>Case 3</u>



$$d_1 = d_2 = d_0$$

$$d_3 = d_4 = d_0(1+g)$$

<u>Case 4</u>



$$d_1 = d_2 = d_3 = d_0$$

$$d_4 = d_0(1+g)$$

If we assume that the investor invests the quarterly dividend in an alternative investment of the same risk, then the amount accumulated by the end of the year will in all cases be given by

$$D_1^* = d_1 (1+k)^{3/4} + d_2 (1+k)^{1/2} + d_3 (1+k)^{1/4} + d_4$$

where d_1, d_2, d_3 and d_4 are the four quarterly dividends. Under these new assumptions, the firm's stock price may be expressed by an Annual DCF Model of the form (2), with the exception that

$$D_1^* = d_1 (1 + k)^{3/4} + d_2 (1 + k)^{1/2} + d_3 (1 + k)^{1/4} + d_4 \qquad \textbf{(9)}$$

is used in place of $D_0(1+g)$. But, we already know that the Annual DCF Model may be reduced to

$$P_0 = \frac{D_0 (1+g)}{k - g}$$

Thus, under the assumptions of the second Quarterly DCF Model, the firm's cost of equity is given by

$$k = \frac{D_1^*}{P_0} + g \quad \textbf{(10)}$$

with D_1^* given by (9).

Although equation (10) looks like the Annual DCF Model, there are at least two very important practical differences. First, since D_1^* is always greater than $D_0(1+g)$, the estimates of the cost of equity are always larger (and more accurate) in the Quarterly Model (10) than in the Annual Model. Second, since D_1^* depends on k through equation (9), the unknown “k” appears on both sides of (10), and an iterative procedure is required to solve for k.

APPENDIX 3
ADJUSTING FOR FLOTATION COSTS IN DETERMINING
A PUBLIC UTILITY'S
ALLOWED RATE OF RETURN ON EQUITY

I. Introduction

Regulation of public utilities is guided by the principle that utility revenues should be sufficient to allow recovery of all prudently incurred expenses, including the cost of capital. As set forth in the 1944 *Hope Natural Gas* Case [*Federal Power Comm'n v. Hope Natural Gas Co*. 320 U. S. 591 (1944) at 603], the U. S. Supreme Court states:

> From the investor or company point of view it is important that there be enough revenue not only for operating expenses but also for the capital costs of the business. These include service on the debt and dividends on the stock.…By that standard the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks.

Since the flotation costs arising from the issuance of debt and equity securities are an integral component of capital costs, this standard requires that the company's revenues be sufficient to fully recover flotation costs.

Despite the widespread agreement that flotation costs should be recovered in the regulatory process, several issues still need to be resolved. These include:

1. How is the term "flotation costs" defined? Does it include only the out-of-pocket costs associated with issuing securities (e. g., legal fees, printing costs, selling and underwriting expenses), or does it also include the reduction in a security's price that frequently accompanies flotation (i. e., market pressure)?
2. What should be the time pattern of cost recovery? Should a company be allowed to recover flotation costs immediately, or should flotation costs be recovered over the life of the issue?
3. For the purposes of regulatory accounting, should flotation costs be included as an expense? As an addition to rate base? Or as an additional element of a firm's allowed rate of return?
4. Do existing regulatory methods for flotation cost recovery allow a firm ***full*** recovery of flotation costs?

In this paper, I review the literature pertaining to the above issues and discuss my own views regarding how this literature applies to the cost of equity for a regulated firm.

II. Definition of Flotation Cost

The value of a firm is related to the future stream of net cash flows (revenues minus expenses measured on a cash basis) that can be derived from its assets. In the process of acquiring assets, a firm incurs certain expenses which reduce its value. Some of these expenses or costs are directly associated with revenue production in one period (*e. g.*, wages, cost of goods sold), while other costs are more properly associated with revenue production in many periods (*e. g.*, the acquisition cost of plant and equipment). In either case, the word "cost" refers to any item that reduces the value of a firm.

If this concept is applied to the act of issuing new securities to finance asset purchases, many items are properly included in issuance or flotation costs. These include: (1) compensation received by investment bankers for underwriting services, (2) legal fees, (3) accounting fees, (4) engineering fees, (5) trustee's fees, (6) listing fees, (7) printing and engraving expenses, (8) SEC registration fees, (9) Federal Revenue Stamps, (10) state taxes, (11) warrants granted to underwriters as extra compensation, (12) postage expenses, (13) employees' time, (14) market pressure, and (15) the offer discount. The finance literature generally divides these flotation cost items into three categories, namely, underwriting expenses, issuer expenses, and price effects.

III. Magnitude of Flotation Costs

The finance literature contains several studies of the magnitude of the flotation costs associated with new debt and equity issues. These studies differ primarily with regard to the time period studied, the sample of companies included, and the source of data. The flotation cost studies generally agree, however, that for large issues, underwriting expenses represent approximately one and one-half percent of the proceeds of debt issues and three to five percent of the proceeds of seasoned equity issues. They also agree that issuer expenses represent approximately five percent of both debt and equity issues, and that the announcement of an equity issue reduces the company's stock price by at least two to three percent of the proceeds from the stock issue. Thus, total flotation costs represent approximately two percent[2] of the proceeds from debt issues, and five and one-half to eight and one-half percent of the proceeds of equity issues.

Lee *et. al.* [14] is an excellent example of the type of flotation cost studies found in the finance literature. The Lee study is a comprehensive recent study of the underwriting and issuer costs associated with debt and equity issues for both utilities and non-utilities. The results of the Lee *et. al.* study are reproduced in Tables 1 and 2. Table 1 demonstrates that the total underwriting and issuer expenses for the 1,092 debt issues in their study averaged 2.24 percent of the proceeds of the issues, while the total underwriting and issuer costs for the 1,593 seasoned equity issues in their study averaged 7.11 percent of the proceeds of the new issue. Table 1 also demonstrates that the total underwriting and issuer costs of seasoned equity offerings, as a percent of proceeds, decline with the size of the issue. For issues above $60 million, total underwriting and issuer costs amount to from three to five percent of the amount of the proceeds.

Table 2 reports the total underwriting and issuer expenses for 135 utility debt issues and 136 seasoned utility equity issues. Total underwriting and issuer expenses for utility bond offerings averaged 1.47 percent of the amount of the proceeds and for seasoned utility equity offerings averaged 4.92 percent of the amount of the proceeds. Again, there are some economies of scale associated with larger equity offerings. Total underwriting and issuer expenses for equity offerings in excess of 40 million dollars generally range from three to four percent of the proceeds.

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[2] The two percent flotation cost on debt only recognizes the cost of newly-issued debt. When interest rates decline, many companies exercise the call provisions on higher cost debt and reissue debt at lower rates. This process involves reacquisition costs that are not included in the academic studies. If reacquisition costs were included in the academic studies, debt flotation costs could increase significantly.

The results of the Lee study for large equity issues are consistent with results of earlier studies by Bhagat and Frost [4], Mikkelson and Partch [17], and Smith [24]. Bhagat and Frost found that total underwriting and issuer expenses average approximately four and one-half percent of the amount of proceeds from negotiated utility offerings during the period 1973 to 1980, and approximately three and one-half percent of the amount of the proceeds from competitive utility offerings over the same period. Mikkelson and Partch found that total underwriting and issuer expenses average five and one-half percent of the proceeds from seasoned equity offerings over the 1972 to 1982 period. Smith found that total underwriting and issuer expenses for larger equity issues generally amount to four to five percent of the proceeds of the new issue.

The finance literature also contains numerous studies of the decline in price associated with sales of large blocks of stock to the public. These articles relate to the price impact of: (1) initial public offerings; (2) the sale of large blocks of stock from one investor to another; and (3) the issuance of seasoned equity issues to the general public. All of these studies generally support the notion that the announcement of the sale of large blocks of stock produces a decline in a company's share price. The decline in share price for initial public offerings is significantly larger than the decline in share price for seasoned equity offerings; and the decline in share price for public utilities is less than the decline in share price for non-public utilities. A comprehensive study of the magnitude of the decline in share price associated specifically with the sale of new equity by public utilities is reported in Pettway [19], who found the market pressure effect for a sample of 368 public utility equity sales to be in the range of two to three percent. This decline in price is a real cost to the utility, because the proceeds to the utility depend on the stock price on the day of issue.

In addition to the price decline associated with the announcement of a new equity issue, the finance literature recognizes that there is also a price decline associated with the actual issuance of equity securities. In particular, underwriters typically sell seasoned new equity securities to investors at a price lower than the closing market price on the day preceding the issue. The Rules of Fair Practice of the National Association of Securities Dealers require that underwriters not sell shares at a price above the offer price. Since the offer price represents a binding constraint to the underwriter, the underwriter tends to set the offer price slightly below the market price on the day of issue to compensate for the risk that the price received by the underwriter may go down, but can not increase. Smith provides evidence that the offer discount tends to be between 0.5 and 0.8 percent of the proceeds of an equity issue. I am not aware of any similar studies for debt issues.

In summary, the finance literature provides strong support for the conclusion that total underwriting and issuer expenses for public utility debt offerings represent approximately two percent of the amount of the proceeds, while total underwriting and issuer expenses for public utility equity offerings represent at least four to five percent of the amount of the proceeds. In addition, the finance literature supports the conclusion that the cost associated with the decline in stock price at the announcement date represents approximately two to three percent as a result of a large public utility equity issue.

IV. Time Pattern Of Flotation Cost Recovery

Although flotation costs are incurred only at the time a firm issues new securities, there is no reason why an issuing firm ought to recognize the expense only in the current period. In fact, if assets purchased with the proceeds of a security issue produce revenues over many years, a sound argument can be made in favor of recognizing flotation expenses over a reasonably lengthy period of time. Such recognition is certainly consistent with the generally accepted accounting principle that the time pattern of expenses match the time pattern of revenues, and it is also consistent with the normal treatment of debt flotation expenses in both regulated and unregulated industries.

In the context of a regulated firm, it should be noted that there are many possible time patterns for the recovery of flotation expenses. However, if it is felt that flotation expenses are most appropriately recovered over a period of years, then it should be recognized that investors must also be compensated for the passage of time. That is to say, the value of an investor's capital will be reduced if the expenses are merely distributed over time, without any allowance for the time value of money.

V. Accounting For Flotation Cost In A Regulatory Setting

In a regulatory setting, a firm's revenue requirements are determined by the equation:

Revenue Requirement = Total Expenses + Allowed Rate of Return x Rate Base

Thus, there are three ways in which an issuing firm can account for and recover its flotation expenses: (1) treat flotation expenses as a current expense and recover them immediately; (2) include flotation expenses in rate base and recover them over time; and (3) adjust the allowed rate of return upward and again recover flotation expenses over time. Before considering methods currently being used to recover flotation expenses in a regulatory setting, I shall briefly consider the advantages and disadvantages of these three basic recovery methods.

Expenses. Treating flotation costs as a current expense has several advantages. Because it allows for recovery at the time the expense occurs, it is not necessary to compute amortized balances over time and to debate which interest rate should be applied to these balances. A firm's stockholders are treated fairly, and so are the firm's customers, because they pay neither more nor less than the actual flotation expense. Since flotation costs are relatively small compared to the total revenue requirement, treatment as a current expense does not cause unusual rate hikes in the year of flotation, as would the introduction of a large generating plant in a state that does not allow Construction Work in Progress in rate base.

On the other hand, there are two major disadvantages of treating flotation costs as a current expense. First, since the asset purchased with the acquired funds will likely generate revenues for many years into the future, it seems unfair that current ratepayers should bear the full cost of issuing new securities, when future ratepayers share in the benefits. Second, this method requires an estimate of the underpricing effect on each security issue. Given the difficulties involved in measuring the extent of underpricing, it may be more accurate to estimate the average underpricing allowance for many securities than to estimate the exact figure for one security.

Rate Base. In an article in *Public Utilities Fortnightly*, Bierman and Hass [5] recommend that flotation costs be treated as an intangible asset that is included in a firm's rate base along with the assets acquired with the stock proceeds. This approach has many advantages. For ratepayers, it provides a better match between benefits and expenses: the future ratepayers who benefit from the financing costs contribute the revenues to recover these costs. For investors, if the allowed rate of return is equal to the investors' required rate of return, it is also theoretically fair since they are compensated for the opportunity cost of their investment (including both the time value of money and the investment risk).

Despite the compelling advantages of this method of cost recovery, there are several disadvantages that probably explain why it has not been used in practice. First, a firm will only recover the proper amount for flotation expenses if the rate base is multiplied by the appropriate cost of capital. To the extent that a commission under or over estimates the cost of capital, a firm will under or over recover its flotation expenses. Second, it is may be both legally and psychologically difficult for commissioners to include an intangible asset in a firm's rate base. According to established legal doctrine, assets are to be included in rate base only if they are "used and useful" in the public service. It is unclear whether intangible assets such as flotation expenses meet this criterion.

Rate of Return. The prevailing practice among state regulators is to treat flotation expenses as an additional element of a firm's cost of capital or allowed rate of return. This method is similar to the second method above (treatment in rate base) in that some part of the initial flotation cost is amortized over time. However, it has a disadvantage not shared by the rate base method. If flotation cost is included in rate base, it is fairly easy to keep track of the flotation cost on each new equity issue and see how it is recovered over time. Using the rate of return method, it is not possible to track the flotation cost for specific issues because the flotation cost for a specific issue is never recorded. Thus, it is not clear to participants whether a current allowance is meant to recover (1) flotation costs actually incurred in a test period, (2) expected future flotation costs, or (3) past flotation costs. This confusion never arises in the treatment of debt flotation costs. Because the exact costs are recorded and explicitly amortized over time, participants recognize that current allowances for debt flotation costs are meant to recover some fraction of the flotation costs on all past debt issues.

VI. Existing Regulatory Methods

Although most state commissions prefer to let a regulated firm recover flotation expenses through an adjustment to the allowed rate of return, there is considerable controversy about the magnitude of the required adjustment. The following are some of the most frequently asked questions: (1) Should an adjustment to the allowed return be made every year, or should the adjustment be made only in those years in which new equity is raised? (2) Should an adjusted rate of return be applied to the entire rate base, or should it be applied only to that portion of the rate base financed with paid-in capital (as opposed to retained earnings)? (3) What is the appropriate formula for adjusting the rate of return?

This section reviews several methods of allowing for flotation cost recovery. Since the regulatory methods of allowing for recovery of debt flotation costs is well known and widely accepted, I begin my discussion of flotation cost recovery procedures by describing the widely accepted procedure of allowing for debt flotation cost recovery.

Debt Flotation Costs

Regulators uniformly recognize that companies incur flotation costs when they issue debt securities. They typically allow recovery of debt flotation costs by making an adjustment to both the cost of debt and the rate base (see Brigham [6]). Assume that: (1) a regulated company issues $100 million in bonds that mature in ten years; (2) the interest rate on these bonds is seven percent; and (3) flotation costs represent four percent of the amount of the proceeds. Then the cost of debt for regulatory purposes will generally be calculated as follows:

$$\text{Cost of Debt} = \frac{\text{Interest expense} + \text{Amortization of flotation costs}}{\text{Principal value - Unamortized flotation costs}}$$

$$= \frac{\$7{,}000{,}000 + \$400{,}000}{\$100{,}000{,}000 - \$4{,}000{,}000}$$

$$= 7.71\%$$

Thus, in this example, regulatory practice requires that the cost of debt be adjusted upward by approximately 71 basis points to allow for the recovery of debt flotation costs. This example does not include losses on reacquisition of debt. The flotation cost allowance would increase if losses on reacquisition of debt were included.

The logic behind the traditional method of allowing for recovery of debt flotation costs is simple. Although the company has issued $100 million in bonds, it can only invest $96 million in rate base because flotation costs have reduced the amount of funds received by $4 million. If the company is not allowed to earn a 71 basis point higher rate of return on the $96 million invested in rate base, it will not generate sufficient cash flow to pay the seven percent interest on the $100 million in bonds it has issued. Thus, proper regulatory treatment is to increase the required rate of return on debt by 71 basis points.

Equity Flotation Costs

The finance literature discusses several methods of recovering equity flotation costs. Since each method stems from a specific model, (i. e., set of assumptions) of a firm and its cash flows, I will highlight the assumptions that distinguish one method from another.

Arzac and Marcus. Arzac and Marcus [2] study the proper flotation cost adjustment formula for a firm that makes continuous use of retained earnings and external equity financing and maintains a constant capital structure (debt/equity ratio). They assume at the outset that underwriting expenses and underpricing apply only to new equity obtained from external sources. They also assume that a firm has previously recovered all underwriting expenses, issuer expenses, and underpricing associated with previous issues of new equity.

To discuss and compare various equity flotation cost adjustment formulas, Arzac and Marcus make use of the following notation:

k	=	an investors' required return on equity
r	=	a utility's allowed return on equity base
S	=	value of equity in the absence of flotation costs
S_f	=	value of equity net of flotation costs
K_t	=	equity base at time t
E_t	=	total earnings in year t
D_t	=	total cash dividends at time t
b	=	$(E_t - D_t) \div E_t$ = retention rate, expressed as a fraction of earnings

h = new equity issues, expressed as a fraction of earnings

m = equity investment rate, expressed as a fraction of earnings,

$m = b + h < 1$

f = flotation costs, expressed as a fraction of the value of an issue.

Because of flotation costs, Arzac and Marcus assume that a firm must issue a greater amount of external equity each year than it actually needs. In terms of the above notation, a firm issues $hE_t \div (1\text{-}f)$ to obtain hE_t in external equity funding. Thus, each year a firm loses:

Equation 3

$$L = \frac{hE_t}{1-f} - hE_t = \frac{f}{1-f} \times hE_t$$

due to flotation expenses. The present value, V, of all future flotation expenses is:

Equation 4

$$V = \sum_{t=1}^{\infty} \frac{fhE_t}{(1-f)(1+k)^t} = \frac{fh}{1-f} \times \frac{rK_0}{k - mr}$$

To avoid diluting the value of the initial stockholder's equity, a regulatory authority needs to find the value of r, a firm's allowed return on equity base, that equates the value of equity net of flotation costs to the initial equity base ($S_f = K_0$). Since the value of equity net of flotation costs equals the value of equity in the absence of flotation costs minus the present value of flotation costs, a regulatory authority needs to find that value of *r* that solves the following equation:

$$S_f = S - L.$$

This value is:

Equation 5

$$r = \frac{k}{1 - \frac{fh}{1-f}}$$

To illustrate the Arzac-Marcus approach to adjusting the allowed return on equity for the effect of flotation costs, suppose that the cost of equity in the absence of flotation costs is 12 percent. Furthermore, assume that a firm obtains external equity financing each year equal to 10 percent of its earnings and that flotation expenses equal 5 percent of the value of each issue. Then, according to Arzac and Marcus, the allowed return on equity should be:

$$r = \frac{.12}{1 - \frac{(.05).(.1)}{.95}} = .1206 = 12.06\%$$

Summary. With respect to the three questions raised at the beginning of this section, it is evident that Arzac and Marcus believe the flotation cost adjustment should be applied each year, since continuous external equity financing is a fundamental assumption of their model. They also believe that the adjusted rate of return should be applied to the entire equity-financed portion of the rate base because their model is based on the assumption that the flotation cost adjustment mechanism will be applied to the entire equity financed portion of the rate base. Finally, Arzac and Marcus recommend a flotation cost adjustment formula, Equation (3), that implicitly excludes recovery of financing costs associated with financing in previous periods and includes only an allowance for the fraction of equity financing obtained from external sources.

Patterson. The Arzac-Marcus flotation cost adjustment formula is significantly different from the conventional approach (found in many introductory textbooks) which recommends the adjustment equation:

Equation 6

$$r = \frac{D_t}{P_{t-1}(1-f)} + g$$

where P_{t-1} is the stock price in the previous period and g is the expected dividend growth rate. Patterson [18] compares the Arzac-Marcus adjustment formula to the conventional approach and reaches the conclusion that the Arzac-Marcus formula effectively expenses issuance costs as they are incurred, while the conventional approach effectively amortizes them over an assumed infinite life of the equity issue. Thus, the conventional formula is similar to the formula for the recovery of debt flotation costs: it is not meant to compensate investors for the flotation costs of future issues, but instead is meant to compensate investors for the flotation costs of previous issues. Patterson argues that the conventional approach is more appropriate for rate making purposes because the plant purchased with external equity funds will yield benefits over many future periods.

Illustration. To illustrate the Patterson approach to flotation cost recovery, assume that a newly organized utility sells an initial issue of stock for $100 per share, and that the utility plans to finance all new investments with retained earnings. Assume also that: (1) the initial dividend per share is six dollars; (2) the expected long-run dividend growth rate is six percent; (3) the flotation cost is five percent of the amount of the proceeds; and (4) the payout ratio is 51.28 percent. Then, the investor's required rate of return on equity is [k = (D/P) + g = 6 percent + 6 percent = 12 percent]; and the flotation-cost-adjusted cost of equity is [6 percent (1/.95) + 6 percent = 12.316 percent].

The effects of the Patterson adjustment formula on the utility's rate base, dividends, earnings, and stock price are shown in Table 3. We see that the Patterson formula allows earnings and dividends to grow at the expected six percent rate. We also see that the present value of expected future dividends, $100, is just sufficient to induce investors to part with their money. If the present value of expected future dividends were less than $100, investors would not have been willing to invest $100 in the firm. Furthermore, the present value of future dividends will only equal $100 if the firm is allowed to earn the 12.316 percent flotation-cost-adjusted cost of equity on its entire rate base.

Summary. Patterson's opinions on the three issues raised in this section are in stark contrast to those of Arzac and Marcus. He believes that: (1) a flotation cost adjustment should be applied in every year, regardless of whether a firm issues any new equity in each year; (2) a flotation cost adjustment should be applied to the entire equity-financed portion of the rate base, including that portion financed by retained earnings; and (3) the rate of return adjustment formula should allow a firm to recover an appropriate fraction of all previous flotation expenses.

VII. Conclusion

Having reviewed the literature and analyzed flotation cost issues, I conclude that:

Definition of Flotation Cost: A regulated firm should be allowed to recover both the total underwriting and issuance expenses associated with issuing securities and the cost of market pressure.

Time Pattern of Flotation Cost Recovery. Shareholders are indifferent between the alternatives of immediate recovery of flotation costs and recovery over time, as long as they are fairly compensated for the opportunity cost of their money. This opportunity cost must include both the time value of money and a risk premium for equity investments of this nature.

Regulatory Recovery of Flotation Costs. The Patterson approach to recovering flotation costs is the only rate-of-return-adjustment approach that meets the *Hope* case criterion that a regulated company's revenues must be sufficient to allow the company an opportunity to recover all prudently incurred expenses, including the cost of capital. The Patterson approach is also the only rate-of-return-adjustment approach that provides an incentive for investors to invest in the regulated company.

Implementation of a Flotation Cost Adjustment. As noted earlier, prevailing regulatory practice typically allows the recovery of flotation costs through an adjustment to the required rate of return. My review of the literature on this subject indicates that there are at least two recommended methods of making this adjustment: the Patterson approach and the Arzac-Marcus approach. The Patterson approach assumes that a firm's flotation expenses on new equity issues are treated in the same manner as flotation expenses on new bond issues, *i. e.*, they are amortized over future time periods. If this assumption is true (and I believe it is), then the flotation cost adjustment should be applied to a firm's entire equity base, including retained earnings. In practical terms, the Patterson approach typically produces an increase in a firm's cost of equity of approximately thirty basis points. The Arzac-Marcus approach assumes that flotation costs on new equity issues are recovered entirely in the year in which the securities are sold. Under the Arzac-Marcus assumption, a firm should not be allowed any adjustments for flotation costs associated with previous flotations. Instead, a firm should be allowed only an adjustment on future security sales as they occur. Under reasonable assumptions about the rate of new equity sales, this method produces an increase in the cost of equity of approximately six basis points. Because the Arzac-Marcus approach does not allow the company to recover the entire amount of its flotation cost, I recommend that this approach be rejected and the Patterson approach be accepted.

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Table 1

Direct Costs as a Percentage of Gross Proceeds
for Equity (IPOs and SEOs) and Straight and Convertible Bonds
Offered by Domestic Operating Companies 1990—1994[3]

Equities

	IPOs				SEOs			
Proceeds ($ in millions)	No. of Issues	Gross Spreads	Other Direct Expenses	Total Direct Costs	No. of Issues	Gross Spreads	Other Direct Expenses	Total Direct Costs
2-9.99	337	9.05%	7.91%	16.96%	167	7.72%	5.56%	13.28%
10-19.99	389	7.24%	4.39%	11.63%	310	6.23%	2.49%	8.72%
20-39.99	533	7.01%	2.69%	9.70%	425	5.60%	1.33%	6.93%
40-59.99	215	6.96%	1.76%	8.72%	261	5.05%	0.82%	5.87%
60-79.99	79	6.74%	1.46%	8.20%	143	4.57%	0.61%	5.18%
80-99.99	51	6.47%	1.44%	7.91%	71	4.25%	0.48%	4.73%
100-199.99	106	6.03%	1.03%	7.06%	152	3.85%	0.37%	4.22%
200-499.99	47	5.67%	0.86%	6.53%	55	3.26%	0.21%	3.47%
500 and up	10	5.21%	0.51%	5.72%	9	3.03%	0.12%	3.15%
Total/Average	**1,767**	**7.31%**	**3.69%**	**11.00%**	**1,593**	**5.44%**	**1.67%**	**7.11%**

Bonds

	Convertible Bonds				Straight Bonds			
Proceeds ($ in millions)	No. of Issues	Gross Spreads	Other Direct Expenses	Total Direct Costs	No. of Issues	Gross Spreads	Other Direct Expenses	Total Direct Costs
2-9.99	4	6.07%	2.68%	8.75%	32	2.07%	2.32%	4.39%
10-19.99	14	5.48%	3.18%	8.66%	78	1.36%	1.40%	2.76%
20-39.99	18	4.16%	1.95%	6.11%	89	1.54%	0.88%	2.42%
40-59.99	28	3.26%	1.04%	4.30%	90	0.72%	0.60%	1.32%
60-79.99	47	2.64%	0.59%	3.23%	92	1.76%	0.58%	2.34%
80-99.99	13	2.43%	0.61%	3.04%	112	1.55%	0.61%	2.16%
100-199.99	57	2.34%	0.42%	2.76%	409	1.77%	0.54%	2.31%
200-499.99	27	1.99%	0.19%	2.18%	170	1.79%	0.40%	2.19%
500 and up	3	2.00%	0.09%	2.09%	20	1.39%	0.25%	1.64%
Total/Average	**211**	**2.92%**	**0.87%**	**3.79%**	**1,092**	**1.62%**	**0.62%**	**2.24%**

Notes:

Closed-end funds and unit offerings are excluded from the sample. Rights offerings for SEOs are also excluded. Bond offerings do not include securities backed by mortgages and issues by Federal agencies. Only firm commitment offerings and non-shelf-registered offerings are included.
Gross Spreads as a percentage of total proceeds, including management fee, underwriting fee, and selling concession.
Other Direct Expenses as a percentage of total proceeds, including management fee, underwriting fee, and selling concession.
Total Direct Costs as a percentage of total proceeds (total direct costs are the sum of gross spreads and other direct expenses).

[3] Inmoo Lee, Scott Lochhead, Jay Ritter, and Quanshui Zhao, “The Costs of Raising Capital,” *Journal of Financial Research* Vol 19 No 1 (Spring 1996) pp. 59—74.

Table 2

Direct Costs of Raising Capital 1990—1994
Utility versus Non-Utility Companies[4]

Equities

Non-Utilities	IPOs			SEOs		
Proceeds ($ in millions)	No. of Issues	Gross Spreads	Total Direct Costs	No. Of Issues	Gross Spreads	Total Direct Costs
2-9.99	332	9.04%	16.97%	154	7.91%	13.76%
10-19.99	388	7.24%	11.64%	278	6.42%	9.01%
20-39.99	528	7.01%	9.70%	399	5.70%	7.07%
40-59.99	214	6.96%	8.71%	240	5.17%	6.02%
60-79.99	78	6.74%	8.21%	131	4.68%	5.31%
80-99.99	47	6.46%	7.88%	60	4.35%	4.84%
100-199.99	101	6.01%	7.01%	137	3.97%	4.36%
200-499.99	44	5.65%	6.49%	50	3.27%	3.48%
500 and up	10	5.21%	5.72%	8	3.12%	3.25%
Total/Average	1,742	7.31%	11.01%	1,457	5.57%	7.32%
Utilities Only						
2-9.99	5	9.40%	16.54%	13	5.41%	7.68%
10-19.99	1	7.00%	8.77%	32	4.59%	6.21%
20-39.99	5	7.00%	9.86%	26	4.17%	4.96%
40-59.99	1	6.98%	11.55%	21	3.69%	4.12%
60-79.99	1	6.50%	7.55%	12	3.39%	3.72%
80-99.99	4	6.57%	8.24%	11	3.68%	4.11%
100-199.99	5	6.45%	7.96%	15	2.83%	2.98%
200-499.99	3	5.88%	7.00%	5	3.19%	3.48%
500 and up	0			1	2.25%	2.31%
Total/Average	25	7.15%	10.14%	136	4.01%	4.92%

[4] Lee *et al, op. cit*.

Table 2 (continued)
Direct Costs of Raising Capital 1990—1994
Utility versus Non-Utility Companies[5]

Bonds

Non- Utilities	Convertible Bonds			Straight Bonds		
Proceeds ($ in millions)	No. of Issues	Gross Spreads	Total Direct Costs	No. of Issues	Gross Spreads	Total Direct Costs
2-9.99	4	6.07%	8.75%	29	2.07%	4.53%
10-19.99	12	5.54%	8.65%	47	1.70%	3.28%
20-39.99	16	4.20%	6.23%	63	1.59%	2.52%
40-59.99	28	3.26%	4.30%	76	0.73%	1.37%
60-79.99	47	2.64%	3.23%	84	1.84%	2.44%
80-99.99	12	2.54%	3.19%	104	1.61%	2.25%
100-199.99	55	2.34%	2.77%	381	1.83%	2.38%
200-499.99	26	1.97%	2.16%	154	1.87%	2.27%
500 and up	3	2.00%	2.09%	19	1.28%	1.53%
Total/Average	203	2.90%	3.75%	957	1.70%	2.34%
Utilities Only						
2-9.99	0			3	2.00%	3.28%
10-19.99	2	5.13%	8.72%	31	0.86%	1.35%
20-39.99	2	3.88%	5.18%	26	1.40%	2.06%
40-59.99	0			14	0.63%	1.10%
60-79.99	0			8	0.87%	1.13%
80-99.99	1	1.13%	1.34%	8	0.71%	0.98%
100-199.99	2	2.50%	2.74%	28	1.06%	1.42%
200-499.99	1	2.50%	2.65%	16	1.00%	1.40%
500 and up	0			1	3.50%	na[6]
Total/Average	8	3.33%	4.66%	135	1.04%	1.47%

Notes:
Total proceeds raised in the United States, excluding proceeds from the exercise of over allotment options.
Gross spreads as a percentage of total proceeds (including management fee, underwriting fee, and selling concession).
Other direct expenses as a percentage of total proceeds (including registration fee and printing, legal, and auditing costs).

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[5] Lee *et al, op. cit*.

[6] Not available because of missing data on other direct expenses.

TABLE 3
ILLUSTRATION OF PATTERSON APPROACH TO FLOTATION COST RECOVERY

TIME PERIOD	RATEBASE	EARNINGS @ 12.32%	EARNINGS @ 12.00%	DIVIDENDS	AMORTIZATION INITIAL FC
0	95.00				
1	100.70	11.70	11.40	6.00	0.3000
2	106.74	12.40	12.08	6.36	0.3180
3	113.15	13.15	12.81	6.74	0.3371
4	119.94	13.93	13.58	7.15	0.3573
5	127.13	14.77	14.39	7.57	0.3787
6	134.76	15.66	15.26	8.03	0.4015
7	142.84	16.60	16.17	8.51	0.4256
8	151.42	17.59	17.14	9.02	0.4511
9	160.50	18.65	18.17	9.56	0.4782
10	170.13	19.77	19.26	10.14	0.5068
11	180.34	20.95	20.42	10.75	0.5373
12	191.16	22.21	21.64	11.39	0.5695
13	202.63	23.54	22.94	12.07	0.6037
14	214.79	24.96	24.32	12.80	0.6399
15	227.67	26.45	25.77	13.57	0.6783
16	241.33	28.04	27.32	14.38	0.7190
17	255.81	29.72	28.96	15.24	0.7621
18	271.16	31.51	30.70	16.16	0.8078
19	287.43	33.40	32.54	17.13	0.8563
20	304.68	35.40	34.49	18.15	0.9077
21	322.96	37.52	36.56	19.24	0.9621
22	342.34	39.77	38.76	20.40	1.0199
23	362.88	42.16	41.08	21.62	1.0811
24	384.65	44.69	43.55	22.92	1.1459
25	407.73	47.37	46.16	24.29	1.2147
26	432.19	50.21	48.93	25.75	1.2876
27	458.12	53.23	51.86	27.30	1.3648
28	485.61	56.42	54.97	28.93	1.4467
29	514.75	59.81	58.27	30.67	1.5335
30	545.63	63.40	61.77	32.51	1.6255
Present Value@12%		195.00	190.00	100.00	5.00

APPENDIX 4
EX ANTE RISK PREMIUM APPROACH

My ex ante risk premium method is based on studies of the DCF expected return on proxy companies compared to the interest rate on Moody's A-rated utility bonds. Specifically, for each month in my study period, I calculate the risk premium using the equation,

$$RP_{PROXY} = DCF_{PROXY} - I_A$$

where:

RP_{PROXY}	=	the required risk premium on an equity investment in the proxy group of companies,
DCF_{PROXY}	=	average DCF estimated cost of equity on a portfolio of proxy companies; and
I_A	=	the yield to maturity on an investment in A-rated utility bonds.

For my ex ante risk premium analysis, I begin with my comparable group of natural gas companies shown in Schedule 2. Previous studies have shown that the ex ante risk premium tends to vary inversely with the level of interest rates, that is, the risk premium tends to increase when interest rates decline, and decrease when interest rates go up. To test whether my studies also indicate that the ex ante risk premium varies inversely with the level of interest rates, I perform a regression analysis of the relationship between the ex ante risk premium and the yield to maturity on A-rated utility bonds, using the equation,

$$RP_{PROXY} = a + (b \times I_A) + e$$

where:

RP_{PROXY} = risk premium on proxy company group;

I_A = yield to maturity on A-rated utility bonds;

e = a random residual; and

a, b = coefficients estimated by the regression procedure.

Regression analysis assumes that the statistical residuals from the regression equation are random. My examination of the residuals reveals that there is a significant probability that the residuals are serially correlated (non-zero serial correlation indicates that the residual in one time period tends to be correlated with the residual in the previous time period). Therefore, I make adjustments to my data to correct for the possibility of serial correlation in the residuals.

The common procedure for dealing with serial correlation in the residuals is to estimate the regression coefficients in two steps. First, a multiple regression analysis is used to estimate the serial correlation coefficient, *r*. Second, the estimated serial correlation coefficient is used to transform the original variables into new variables whose serial correlation is approximately zero. The regression coefficients are then re-estimated using the transformed variables as inputs in the regression equation. Based on my knowledge of the statistical relationship between the yield to maturity on A-rated utility bonds and the required risk premium, my estimate of the ex ante risk premium on an investment in my proxy natural gas company group as compared to an investment in A-rated utility bonds is given by the equation:

$$RP_{PROXY} = \underset{(13.97)}{8.70} \quad \underset{(-6.016)}{-0.605 \times I_A}.$$ [7]

[7] The t-statistics are shown in parentheses.

Using a 6.3 percent forecasted yield to maturity on A-rated utility bonds at November 2015,[8] the regression equation produces an ex ante risk premium based on the natural gas proxy group equal to 4.91 percent (8.70 – 6.05 x 6.27= 4.91).

To estimate the cost of equity using the ex ante risk premium method, one may add the estimated risk premium over the yield on A-rated utility bonds to the forecasted yield to maturity on A-rated utility bonds. As described above, my analyses produce an estimated risk premium over the yield on A-rated utility bonds equal to 4.9 percent. Adding an estimated risk premium of 4.9 percent to the 6.3 percent forecasted yield to maturity on A-rated utility bonds produces a cost of equity estimate of 11.2 percent using the ex ante risk premium method.

[8] As described above, I obtain the forecasted bond yield using data from Value Line and Energy Information Administration ("EIA"). Value Line Selection & Opinion (Dec. 4, 2015) projects a AAA-rated Corporate bond yield equal to 5.8 percent. The Nov. 2015 average spread between A-rated utility bonds and Aaa-rated Corporate bonds is 34 basis points (A-rated utility, 4.4 percent, less Aaa-rated Corporate, 4.06 percent, equals 34 basis points). Adding 34 basis points to the 5.8 percent Value Line Aaa Corporate bond forecast equals a forecast yield of 6.14 percent for the A-rated utility bonds. The EIA forecasts an AA-rated utility bond yield equal to 6.21 percent. The average spread between AA-rated utility and A-rated utility bonds at Nov. 2015 is 18 basis points (4.4 percent less 4.22 percent). Adding 18 basis points to EIA's 6.21 percent AA-utility bond yield forecast equals a forecast yield for A-rated utility bonds equal to 6.39 percent. The average of the forecasts (6.14 percent using Value Line data and 6.39 percent using EIA data) is 6.3 percent.

APPENDIX 5
RISK PREMIUM APPROACH

Source

Stock price and yield information is obtained from Standard & Poor's Security Price publication. Standard & Poor's derives the stock dividend yield by dividing the aggregate cash dividends (based on the latest known annual rate) by the aggregate market value of the stocks in the group. The bond price information is obtained by calculating the present value of a bond due in thirty years with a $4.00 coupon and a yield to maturity of a particular year's indicated Moody's A-rated utility bond yield. The values shown in the exhibits are the January values of the respective indices. Standard & Poor's discontinued its S&P Utilities Index in December 2001, replacing its utilities stock index with separate indices for electric and natural gas utilities. Thus, to continue my study, I based the stock returns beginning in 2002 on the total returns for the EEI Index of U.S. shareholder-owned electric utilities, as reported by EEI on its website.
http://www.eei.org/whatwedo/DataAnalysis/IndusFinanAnalysis/Pages/QtrlyFinancialUpdates.aspx

Calculation of Stock and Bond Returns

Sample calculation of "Stock Return" column:

$$\text{StockReturn}(2014) = \left[\frac{\text{StockPrice}(2015 - \text{StockPrice}(2014) + \text{Dividend}(2014)}{\text{StockPrice}(2014)} \right]$$

where Dividend (2014) = Stock Price (2014) x Stock Div. Yield (2014)

Sample calculation of "Bond Return" column:

$$\text{Bond Return (2014)} = \left[\frac{\text{Bond Price (2015) - Bond Price (2014) + Interest (2014)}}{\text{Bond Price (2014)}} \right]$$

where Interest = $4.00.