VOLUME 17

PENNSYLVANIA-AMERICAN WATER COMPANY

2022 GENERAL BASE RATE CASE
R-2022-3031672 (WATER)
R-2022-3031673 (WASTEWATER)

STATEMENT NO. 12
DIRECT TESTIMONY OF CONSTANCE E. HEPPENSTALL

EXHIBIT NO. 12-A
WATER OPERATIONS
COST OF SERVICE AS OF DECEMBER 31, 2023

PAWC STATEMENT NO. 12

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

DIRECT TESTIMONY OF CONSTANCE E. HEPPENSTALL

ON BEHALF OF PENNSYLVANIA-AMERICAN WATER COMPANY

CONCERNING

COST OF SERVICE ALLOCATION

AND

CUSTOMER RATE DESIGN

DOCKET NOS.
R-2022-3031672 (WATER)
R-2022-3031673 (WASTEWATER)

DATE: April 29, 2022

DIRECT TESTIMONY OF
CONSTANCE E. HEPPENSTALL

Q. Please state your name and address.

A. My name is Constance E. Heppenstall. My business address is 1010 Adams Avenue, Audubon, PA 19403.

Q. By whom are you employed?

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

Q. Please describe your position with Gannett Fleming Valuation and Rate Consultants, LLC, and briefly state your general duties and responsibilities.

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

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

A. Yes. I have testified before the Pennsylvania Public Utility Commission ("Commission" or "PUC"), the Kentucky Public Service Commission, the Arizona Corporation Commission, the Missouri Public Service Commission, the Virginia State Corporation Commission, the Hawaii Public Utility Commission, the West Virginia Public Service Commission, the New Jersey Board of Public Utilities, the Indiana Utility Regulatory Commission and the California Public Utility Commission concerning revenue requirements, cost of service allocation, rate design and cash working capital claims. A list of cases in which I have testified is attached to my testimony.

Q. What is your educational background?

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

Q. Would you please describe your professional affiliations?

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

Q. Briefly describe your work experience.

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

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

A. The purpose of my testimony is to explain the cost-of-service allocation studies conducted under my direction and supervision for Pennsylvania-American Water Company ("PAWC" or the "Company") and to describe the results produced by those studies.

Q. What revenue requirement data did you use to prepare PAWC's cost of service studies?

A. The cost-of-service studies I performed are based on data from PAWC's separate revenue requirement studies for the following operations: (1) Water Operations; (2) Wastewater ("WW") Sanitary Sewer System ("SSS") General Operations; (3) WW SSS Royersford Operations; (4) WW SSS Upper Pottsgrove Operations; (4) WW SSS York Operations; and (5) Wastewater Combined Sewer System ("CSS") Operations. The Company's revenue requirements for each of those operations are developed in PAWC Exhibit 3-A, which is sponsored by PAWC witness Ashley E. Everette and discussed in her direct testimony.

Q. Have you prepared exhibits presenting the results of your studies?

A. Yes. The exhibits identified below accompany my testimony and are described in detail further in my testimony.

Exhibit Number	Type of Study	Operation	Rate Zones
12-A	Cost of Service	Water Operations	Water Zones 1-7
12-B	Cost of Service	WW SSS General Operations	Wastewater Zones 1, 2, 5, 7-9 and 11
12-C	Cost of Service	WW SSS Royersford Operations	Wastewater Zone 10
12-D	Cost of Service	WW SSS Upper Pottsgrove Operations	Acquisition
12-E	Cost of Service	WW SSS York Operations	Acquisition
12-F	Cost of Service	Wastewater CSS Operations	Wastewater Zones 3, 4 and 6

Q. Is the Company presenting separate cost-of-service and rate design studies for CSS and SSS wastewater operations?

A. Yes. A CSS collects and conveys a wastewater stream that consists of flows of sewage from homes and businesses, infiltration and in-flow ("I&I") and storm water. As explained by Ms. Everette in PAWC Statement No. 1, as part of the settlement of PAWC's last base rate case at Docket No. R-2020-3019369, the Company agreed to provide in its next base rate filing a separate revenue requirement study for CSS systems it owns and a cost-of-service study that separately identifies all storm water costs for CSS operations. Accordingly, I prepared a separate cost-of-service study to identify the cost of collecting, treating, and disposing of storm water in the CSS wastewater systems PAWC acquired from the Municipal Authority of the City of Scranton in 2016, the Municipal Authority of the City of McKeesport in 2017, and the Borough of Kane Authority in 2020.

Q. Why is the Company presenting separate cost-of-service studies for PAWC's Royersford and Upper Pottsgrove wastewater operations?

A. As explained by Company witness Charles B. Rea in PAWC Statement No. 10, PAWC is submitting separate cost of service studies in this proceeding pursuant to the Commission-approved settlements authorizing the Company to acquire the wastewater assets of Royersford Borough, Upper Pottsgrove Township and the York City Sewer Authority under Section 1329 of the Public Utility Code ("Code"), 66 Pa. C.S. § 1329.

COST OF SERVICE ALLOCATION – WATER OPERATIONS

Q. Please describe the revenue requirements included in the cost-of-service study for PAWC's water operations being presented in this case.

A. The cost-of-service study for Water Operations prepared for this case is based upon the Company's revenue requirement for the fully projected future test year ("FPFTY") ending December 31, 2023, including a portion of the revenue requirement of PAWC's wastewater operations, as authorized by Section 1311(c) of the Code. The development of the revenue requirements for Water Operations, including the revenue requirement allocated to Water Operations from the Company's Wastewater Operations, is explained by Ms. Everette in PAWC Statement No. 1.

Using the total revenue requirement for the FPFTY developed by the Company in the manner described by Ms. Everette, I prepared the cost-of-service study set forth in Exhibit No. 12-A (Water Operations). The cost-of-service study presented in Exhibit No. 12-A allocates among customer classes: (1) the entire revenue requirement of the Company's Water Operations; and (2) the portion of the revenue requirement of the Company's Wastewater Operations that will not be recovered from wastewater customers under the Company's proposed wastewater rates, which I will refer to, collectively, as the cost of service or total revenue requirement for the FPFTY.

Q. Briefly describe the purpose of your cost of water service allocation study.

A. The study applies generally accepted cost of service principles and procedures to allocate the total revenue requirement to the residential, commercial, industrial,

public, other water utilities, private fire protection and public fire protection classifications. The results of the cost-of-service study indicate the relative cost responsibilities of each class of customers. The allocated cost of service is one of several criteria that are appropriately considered in designing customer rates to produce the required revenues.

Q. Have you prepared exhibits that set forth the results of your study?

A. Yes. As I previously noted, Exhibit No. 12-A sets forth the results of my allocation of the pro forma cost of service for Water Operations as of December 31, 2023.

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

A. For Exhibit No. 12-A, the base-extra capacity method, as described in the 2017 (seventh edition) and prior editions of the Water Rates Manual published by AWWA, was used to allocate the pro forma costs that comprise the total revenue requirement. It is a recognized method for allocating the cost of providing water service to customer classifications in proportion to each classification's use of the commodity, facilities, and services of a water utility and has been accepted by this Commission for that purpose. Indeed, it is the method that was used in the Company's prior rate cases, including its last base rate case at Docket No. R-2020-3019369, and has been accepted by the Commission for use by the Company and other water utilities in the Commonwealth.

Q. Is the base-extra capacity method described in Exhibit No. 12-A?

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

Q. Please describe the procedure followed in the cost allocation studies.

A. Each identified category of cost in the pro forma cost of service was allocated to the customer classifications using appropriate allocation factors. This allocation is presented in Schedule D of Exhibit No. 12-A. The categories of cost, which consist of operation and maintenance expenses, depreciation expense, taxes and income available for return, are identified in columns 1 and 2 of Schedule D. The costs in each category, shown in column 4, are allocated to the several customer classifications based on allocation factors referenced in column 3. The development of the allocation factors is presented in Schedule E of each exhibit.

I will use some of the larger cost items to illustrate the principles and considerations used in the cost allocation methodology. Purchased water, purchased electric power and treatment chemicals are examples of costs that tend to vary with the amount of water consumed and are, therefore, considered base costs. These costs are allocated to the several customer classifications in direct proportion to the average daily consumption of those classifications using Factor 1. The development of Factor 1 is shown in Schedule E of Exhibit No. 12-A.

Other source of supply, water treatment and transmission costs are associated with meeting usage requirements more than the average. This means that these costs are incurred generally to meet maximum day requirements. Costs of this nature were allocated to customer classifications partially as base costs (i.e., in proportion to average daily consumption, pursuant to Factor 1), partially as maximum day extra capacity costs (i.e., in proportion to maximum day extra capacity, pursuant to Factor 2) and, for certain pumping stations and transmission mains, partially as fire

protection costs (i.e., pursuant to Factor 3). Factors 2 and 3 are developed in Schedule E of Exhibit No. 12-A.

Costs associated with storage facilities and the capital costs of distribution mains were allocated partly based on average consumption and partly based on 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 Factor 4, which is used for these allocations, is shown in Schedule E of Exhibit No. 12-A. Fire demand costs were allocated to public and private fire protection service and to general service in proportion to the relative potential demands on the system from hydrants and fire services and from commercial service lines sized to provide both fire protection and general service.

Costs associated with pumping facilities and the operation and maintenance of mains were allocated on the combined bases of maximum day and maximum hour extra capacity because these facilities serve both functions. The relative weightings of Factor 3 (maximum day) and Factor 4 (maximum hour) for pumping facilities and the operation and maintenance of mains were based on the functional use of pumps and footage of mains, respectively, serving maximum day and maximum hour functions. The weighted factors, identified as Factor 5, Factor 5A and Factor 8, are developed on Schedule E of Exhibit No. 12-A.

Costs associated with meters and services were allocated to customer classifications in proportion to the capital costs of the sizes and quantities of meters and services serving each classification. The factors for allocating the cost of meters

and services, identified as Factor 10 and Factor 11, are developed on Schedule E of Exhibit No. 12-A.

The costs of customer accounting, billing and collections were allocated based on the number of customers for each customer classification. The costs of meter reading were allocated based on the pro forma number of meters by classification. These factors, identified as Factor 14 and Factor 15, are developed on Schedule E of Exhibit No. 12-A. Bad debt expense was allocated based on the average net write-offs for 2018 and 2019 (Factor 22).

Administrative and general costs were allocated based on allocated direct costs excluding those costs that require little administrative and general expense, such as purchased water, power, chemicals, and waste disposal. The factor for this allocation is identified as Factor 16.

Annual depreciation accruals were allocated based on the function of the facilities in each plant account to which depreciation expense is recorded. The original cost less accrued depreciation of utility plant in service was also allocated based on the function of the plant recorded in each account for the purpose of developing Factor 19, which is used to allocate items such as return and income taxes.

Q. What was the source of the total cost of service data set forth in column 4 of Schedule D of Exhibit No. 12-A?

A. The pro forma costs of service were furnished by the Company and are the same as those set forth in PAWC Exhibit No. 3-A for Water Operations.

Q. Refer to Schedule E of Exhibit No. 12-A and explain the source of the system maximum day and maximum hour ratios used in the development of Factors 2, 3 and 4.

A. The ratios were based on a review of experienced Company data as a whole. The maximum day ratio of 1.4 times the average day approximates the ratio of maximum daily send-out experienced by the Company in 1988, 1995, 1996, 1999 and 2003. The maximum hour ratio of 2.1 times the average hour approximates the results of an analysis that was performed to determine the peak hour consumption experienced by the Company's three largest operating districts.

Q. Are the system maximum day and maximum hour ratios the same as those used in studies presented on behalf of the Company in prior proceedings before this Commission?

A. Yes, they are.

Q. Are the customer class extra capacity factors the same as those used in the most recent prior study for the Company?

A. Yes, the extra capacity factors used in Exhibit No. 12-A reflect the results of PAWC's most recent customer class demand study submitted in the Company's 2017 base rate case. A detailed explanation of the methods and procedures used, the sampling techniques, the areas and customers monitored, the results of the monitoring during the 2013-2015 period, and the conclusions from the study results are described in the text of the study provided in Appendix A of Exhibit No. 12-A.

Q. For Exhibit No. 12-A, did you make any adjustments to the cost allocation study?

A. Yes, four adjustments were made to the study. I will describe each adjustment and explain why it was made.

Q. Please explain the first adjustment.

A. The first adjustment was made to exclude the volume of contract sales under Riders DIS (Demand Industrial Sales) and DRS (Demand Resale Sales) in developing the allocation factors for the industrial classification and the sales for resale – Group A classification. As a result, costs are allocated only to the non-Rider DIS and non-Rider DRS customers. Correspondingly, the revenues received from those contract sales were deducted from the total cost of service and from each of the classes of service, as shown on Schedule D of Exhibit No. 12-A.

Q. Why did you make this adjustment?

A. This adjustment was made to provide a more meaningful comparison of allocated costs and revenues. Including contract sales would inappropriately reduce the relative rate of return for the applicable class because revenues from the contract sales reflect contract rates that, to address competitive situations and avoid loss of load (or gain incremental load), are lower than the non-Rider DIS and non-Rider DRS rates. By excluding contract sales, as I have done, the resulting cost of service and revenues properly reflect the costs and the rates for non-contract customers. The Commission, in approving Riders DIS and DRS, found that those riders create benefits for all the Company's customers by preserving or attracting incremental sales that, because of competitive forces, could not otherwise be made. Accordingly,

the revenues derived from Rider DIS and Rider DRS customers are reflected as deductions from all classes' cost of service.

Q. Please describe the second adjustment.

A. The second adjustment excludes from the extra capacity portion of Factors 2, 3 and 4 the curtailment volumes associated with service provided under the Company's industrial curtailment rate schedule. This adjustment properly accounts for the fact that curtailment volumes are interruptible and that a customer, to be eligible for this service, is required to meet certain minimum load factor requirements and have sufficient on-site storage capacity to meet its demands during periods of curtailment or interruption. This adjustment reflects the fact that a customer on this rate does not impose extra-capacity demand costs.

Q. Are the volumes associated with curtailment service included in the base portion of Factors 2, 3 and 4 in Exhibit No. 12-A?

A. Yes, they are.

Q. Please describe the third adjustment.

A. The third adjustment reallocates the unrecovered portion of public fire protection costs to the residential, commercial, industrial and public classifications. This was done to comply with Section 1328 of the Code, which provides that public fire hydrant rates may only recover 25% of the cost of public fire protection service and that the unrecovered portion should be recovered in the fixed charges of other customer classifications.

Q. How did you allocate the unrecovered portion of public fire service costs in Exhibit No. 12-A?

A. Consistent with the statutory requirement that these costs are to be recovered in fixed charges, I allocated the unrecovered public fire costs using Factor 21, which is based on the meter equivalents of the residential, commercial, industrial and public classifications.

Q. Please describe the fourth adjustment.

A. The fourth adjustment to the water cost-of-service study in Exhibit No. 12-A allocates a portion of the Company's total wastewater cost of to the cost of service of the Company's water operations. The wastewater cost of service allocated to Water Operations is the cost of wastewater service less the revenues the Company's proposed wastewater rates are expected to produce.

Q. What is the total amount of wastewater revenue requirement allocated to the Company's Water Operations?

A. As shown in column 3 of Schedule A of Exhibit No. 12-A, the wastewater cost of service allocated to the cost of service for PAWC's Water Operations totals $72,946,653.

Q. How are the Wastewater Operations revenue requirements allocated to the customer classes in Exhibit No. 12-A?

A. The wastewater operations revenue requirements are allocated to the customer classes in Exhibit No. 12-A based on the cost-of-service allocation of each class revenue contribution shown in the cost-of-service studies.

Q. Have you summarized the results of your cost allocation study in Exhibit No. 12-A?

A. Yes. In Exhibit No. 12-A, the results for the combined water and wastewater operations are summarized in columns 2, 3 and 4 of Schedule A. Column 5 presents each customer classification's cost responsibility as a percent of the total cost.

Q. Have you compared these cost responsibilities with the proportionate revenue under existing rates for each customer classification in Exhibit 12-A?

A. Yes. Allocated cost responsibilities can be compared to the percentage revenue under present rates, as shown on Schedule A. The percentage cost responsibilities (relative cost of service) can be compared to the percentage of pro forma revenues (relative revenues) under proposed rates, as shown on Schedule A in Exhibit No. 12-A.

COST OF SERVICE ALLOCATION – WASTEWATER SSS OPERATIONS

Q. Please describe the overall cost of service allocation studies for the Company's Wastewater SSS Operations.

A. The cost-of-service allocation study for the Company's Wastewater SSS General Operations includes the combined wastewater revenue requirements for PAWC's Wastewater Rate Zones 1, 2, 5, 7-9 and 11. As previously noted, I performed separate cost-of-service allocation studies for the Company's WW SSS Royersford Operations (Wastewater Rate Zone 10), WW SSS Upper Pottsgrove Operations, and WW SSS York Operations.

The purpose of each of those studies was to allocate the total cost of service, which is the total revenue requirement, to the several customer classifications. In the studies, the total costs were allocated to the residential, non-residential, large industrial, and bulk use customer classifications in accordance with generally accepted cost of service principles and procedures.

For the purposes of cost allocation in the Wastewater SSS General Operations study presented in Exhibit No. 12-B, small industrial customers are included in the non-residential class, which also includes commercial and public customers. In Exhibit No. 12-B, two large industrial customers are included in the large industrial class. The bulk user class also includes the Veterans Administration Hospital, which is served from the Coatesville system.

In Exhibit No. 12-C, costs were allocated to the residential, non-residential and bulk customer classes. In Exhibit No. 12-D and 12-E, costs were allocated to the residential and non-residential classes.

Q. Have you prepared exhibits presenting the results of your studies?

A. Yes. The results of my allocations of the pro forma cost of service as of December 31, 2023 are presented in Exhibit Nos. 12-B (Wastewater SSS General Operations), 12-C (WW SSS Royersford Operations), 12-D (WW SSS Upper Pottsgrove Operations) and 12-E (WW SSS York Operations).

Q. Please describe the method of cost allocation that was used in your studies presented in Exhibit Nos. 12-B, 12-C, 12-D and 12-E.

A. I used the functional cost allocation methodology described in "Financing and Charges for Wastewater Systems", Manual of Practice No. 27, published by the

Water Environment Federation ("Manual of Practice No. 27"). This method allocates the cost of providing wastewater service to customer classifications in proportion to each classification's use of the service provider's facilities and services. Costs are assigned to cost components using predominant operational purposes as cost-causative factors. The functional cost method is generally accepted as a sound method for allocating the cost of wastewater service.

Q. What procedures did you use to apply the cost allocation methodology for wastewater operations?

A. Each element of the cost of service is allocated to customer classifications according to the functional categories of flow, I&I, customer facilities and customer accounting. Except for certain depreciation and rate base items that are directly assigned to the bulk use class in Exhibit No. 12-B, the functional costs are allocated to customer classifications based on the amount of flow contributed to the system, the amount of I&I allocated to each class, and the number and relative size of customers.

Q. What costs have you directly assigned to the bulk user class for the Company's Wastewater SSS General Operations in Exhibit No. 12-B?

A. I have directly assigned certain components of rate base and annual depreciation expense related to wastewater treatment, gravity mains, and manholes based on the result of the allocation in the 2010 Coatesville cost of service study in Docket R-2010-216612 ("Prior Cost of Service Study"). This study allocated Coatesville Wastewater System capital costs to the bulk users in accordance with the design-basis methodology described in Manual of Practice No. 27 and the I&I study

submitted in compliance with the terms of the settlement at Docket No. R-2008-2032689. Pursuant to the terms of that settlement, the Company conducted a comprehensive study to determine the current and future flow volumes for each classification and the volume of I&I in the system as it relates to direct and bulk customers. The study was submitted with the Company's wastewater base rate filing at Docket No. R-2010-2166212 and was used in determining the cost of service for the bulk user class in that case. In this case, it is appropriate to continue to allocate certain capital costs related to treatment and mains to the remaining bulk users in the Coatesville area in Exhibit No. 12-B based on the Prior Cost of Service Study and I&I study.

Q. What is the basis for the volumes used to allocate costs to customer classifications in Factor 1?

A. Factor 1 is used to allocate costs related to wastewater treatment. In Factor 1, for the residential and non-residential classes, the flows were based on pro forma water usage billing determinants multiplied by a factor of 88%, consistent with the Coatesville I&I study, which determined that 88% of water use is returned to the sewer system. I then added average daily I&I in column 3 of Schedule E. In Exhibit No. 12-B, using the Company's flow records for the Coatesville District (which represent most of the Company's wastewater flow), it was determined that 37.5% of the average daily flow was from I&I. Using the Company's flow and certain assumptions, it was determined that 37.5%, 29.4% and 70.3% of the average daily flow was from I&I for WW SSS Royersford Operations, WW SSS Upper Pottsgrove Operations and WW SSS York Operations, respectively. Except for the bulk user

class for WW SSS General Operations, 1/3 of I&I was allocated to the customer classes based on average daily flow and 2/3 was allocated based on service equivalents. The I&I allocated to the bulk use class in Exhibit No. 12-B was based on the amount allocated in Factor 1 in the Prior Cost of Service Study.

Q. Please give a similar description of Factor 2 for Exhibit Nos. 12-B, 12-C, 12-D and 12-E.

A. Factor 2 is used to allocate costs related to collection. This factor was calculated in a similar manner as Factor 1. However, based on Company records, maximum day volumes were found to be 3.8 times total average flow for PAWC's WW SSS General Operations, 5.5 times total average flow for WW SSS Royersford Operations, 4.3 times total average flow for WW SSS Upper Pottsgrove Operations and 8.1 times total average flow for the Company's WW SSS York Operations. Except for the bulk use class for PAWC's WW SSS General Operations, 1/3 of I&I was allocated to the customer classes based on average daily flow and 2/3 was allocated based on service equivalents. The I&I allocated to the bulk use class in Exhibit No. 12-B was based on the amount allocated in Factor 2 in the Prior Cost of Service Study.

Q. Please explain the factors used to allocate capital costs.

A. Factors 3 and 3A are similar to Factors 1 and 2 except that Factors 3 and 3A exclude the bulk use class in Exhibit No. 12-B because assets for these customers have been directly assigned. Factors 3 and 3A are not used in Exhibit Nos. 12-C , 12-D and 12-E as these areas do not have bulk customers who have specific allocations relate to a wastewater treatment plant.

Q. Please explain the remaining cost allocation factors.

A. Factors 4 and 5 were used to allocate customer facilities and customer accounting costs. These factors were based on the number and relative size of the customers.

Factor 6 is a composite factor used to allocate employee pension and benefit expenses and payroll taxes. Factor 6 is based on the allocation of direct labor expense.

Factors 7 and 8 are based on the allocation of plant in service and rate base, respectively. Factor 7 allocates other rate base elements and Factor 8 is used to allocate return and taxes.

Factor 9 is based on the total cost of service and is used to allocate regulatory commission expense and other revenues.

Factor 10 is used to allocate administrative and general expenses and is based on the allocation of all other operating expenses exclusive of power, chemicals and waste disposal. Factor 11 allocates cash working capital and is based on the allocation of all operating expenses.

Q. Please explain the procedure for allocating costs to the several customer classifications.

A. The items of cost, which include operation and maintenance expenses, depreciation expense, taxes and income available for return, are identified in column 1 of Schedule D in Exhibit Nos. 12-B, 12-C, 12-D and 12-E. 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 E of each exhibit.

Q. What was the source of the total cost of service data set forth in column 3 of Schedule D of Exhibit Nos. 12-B, 12-C, 12-D and 12-E?

A. The pro forma costs of service were furnished by the Company and are the same as those set forth in Exhibit No. 3-A. The pro forma cost of service in Exhibit Nos. 12-B, 12-C, 12-D and 12-E was reduced by the $12,786,945, $1,504,562, $859,192 and $18,985,985 in revenue requirement, respectively, that is proposed to be recovered in water rates.

Q. Have you summarized the results of your cost allocation studies for the Company's SSS Wastewater Operations?

A. Yes. The results are summarized in columns 1, 2 and 3 of Schedule A of Exhibit Nos. 12-B, 12-C, 12-D and 12-E. Column 2 sets forth the total allocated pro forma cost of service as of December 31 for each customer classification identified in column 1. Column 3 presents each customer classification's cost responsibility as a percent of the total cost.

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 revenue under existing rates can be made by comparing columns 3 and 5 of Schedule A of Exhibit Nos. 12-B, 12-C, 12-D and 12-E. 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 each exhibit. The rate of return by customer

classification under present and proposed rates is set forth on Schedules B and C, respectively.

COST OF SERVICE ALLOCATION – WASTEWATER CSS OPERATIONS

Q. Please describe the cost of service allocation for the Company's Wastewater CSS Operations.

A. The cost-of-service allocation study is based on the revenue requirements developed by the Company in Exhibit 3-A for its Wastewater CSS Operations. The study allocated the combined cost of service of the Scranton, McKeesport and Kane operations to residential, non-residential, industrial, bulk, and stormwater classifications.

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

A. Yes. The results of my allocation of the pro forma cost of service as of December 31, 2023 is shown in Exhibit No. 12-F.

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

A. For this study, I also used the functional cost allocation methodology described in Manual of Practice No. 27. I modified the allocation method to determine the incremental cost related to handling stormwater for a CSS and combined sewer overflows ("CSO").

Q. What procedures did you use to apply the cost allocation methodology for Wastewater CSS Operations?

A. Each element of the cost of service is allocated to customer classifications according to the functional categories of sanitary flow (including normal I&I), stormwater

introduced from surface sources, customer facilities and customer accounting. Except for certain operating costs, depreciation, and rate base items that are directly assigned to either the sanitary system or to the stormwater function, the functional costs are allocated to customer classifications based on the amount of flow contributed to the system, the amount of I&I allocated to each class, the volume of stormwater, and the number and relative size of customers.

Q. What costs have you directly assigned to the sanitary sewer classifications?

A. I directly assigned rate base items and annual depreciation expense associated with pumping stations, wastewater treatment structures and equipment, gravity mains, and manholes to the sanitary sewer classes (residential, non-residential and large industrial). The wastewater collection systems in the Scranton operating district is not entirely a combined system. Approximately 63% of the collection system is combined sewers and the remaining 37% comprises sanitary sewers only. Therefore, for gravity mains, after assigning specific stormwater assets to the stormwater class described below, I allocated 37% of the remaining costs of gravity mains to the sanitary classes, and I allocated 63% on a combined system basis. The cost of manholes in Account 361.2 were allocated in the same manner. For the McKeesport operating district, the collection system is a combined system except for the Port Vue area where approximately 25% is combined sewers and 75% is sanitary only. For the Kane operating district, the collection system inside the Borough is a combined system and the collection system outside the Borough is sanitary only. The collection system assets allocated to sanitary only, allocated on a combined system basis and directly assigned to stormwater for each CSS operating district

were aggregated and used to allocate the combined investment to customer classifications.

For pumping system assets, the Froude Ave. pumping station in the Scranton operating district serves only sanitary sewers and, therefore, its cost was assigned solely to the sanitary classifications. The remaining pumping stations were allocated on a combined system basis.

For the wastewater treatment plants, a detailed analysis of the structures account and the equipment account was performed to identify the portions of the plants specifically related to secondary sanitary treatment. The portions of the plants thus identified were allocated to the sanitary classifications.

The remaining portions of the wastewater treatment structures and equipment accounts in the Scranton operating district, sized to handle 60 mgd of flow, was assigned 41.67% (25 mgd) to the sanitary classes and 58.33% (35 mgd) to stormwater. For the McKeesport operating district, the wastewater treatment plant costs were assigned based on the capacity of the McKeesport wastewater treatment plant (the largest treatment plant). This plant is sized to handle 56 mgd of combined flow, and 35.71% (20 mgd) was assigned to the sanitary classes and 64.29% (36 mgd) to stormwater. The Kinzua and Pine Street wastewater treatment plants in the Kane operating district are each sized for 1.5 mgd or a total of 3.0 mgd of combined flow. This capacity was assigned 66.67% (2 mgd) to the sanitary classes and 33.33% (1 mgd) to stormwater.

Q. What costs have you directly assigned to the stormwater classification?

A. I directly assigned approximately 10.9% of collection operating labor to stormwater for seven collection system employees who are specifically tasked with operating and maintaining the CSO assets within the collection systems. In addition to the pumping stations and portions of the treatment plant related to stormwater that I previously discussed, I also identified rate base items and associated annual depreciation expense for specific CSO assets within Account 361.10, Gravity Mains. These assets include catch basins, CSO outfalls, regulator chambers, diversion manholes, culverts, detention basins, and biofiltration catch basin systems. The costs of these assets were directly assigned to the stormwater classification.

Q. What other costs were directly assigned to the stormwater function?

A. For Account 391, Transportation Equipment, the cost of one vactor truck and the cost of a street sweeper in Scranton, as well as vactor truck assets in McKeesport and Kane were allocated directly to stormwater.

Q. What is the basis for the volumes used to allocate costs to customer classifications for operating and maintenance expenses?

A. Factors 1 and 2 are used to allocate operation and maintenance costs related to wastewater collection and treatment. For Factor 1, for the residential, non-residential, industrial, and bulk classes, the flows were based on pro forma water usage billing determinants multiplied by a factor of 88%, consistent with the Coatesville I&I study. I then added average daily I&I in column 3 of Schedule E. Using Company flow records for Wastewater Rate Zones 1, 2 and 3 (which represent 42% of the Company's wastewater flow excluding CSS operations), it was

determined that 37.5% of the average daily flow was from I&I. One-third of the I&I was allocated to the customer classes based on average daily flow and 2/3 was allocated based on service equivalents using Factor 1A.

Factor 2 is based on average daily sanitary flows from Factor 1 plus average daily stormwater flow. The total wastewater flow (sanitary and stormwater for Scranton, McKeesport and Kane CSS Operations combined) is based on the experienced average daily total flow for 2021 of 28.26 mgd.

Q. Please explain the factors used to allocate the capital costs.

A. Factors 3 and 4 are similar to Factors 1 and 2 except that Factors 3 and 4 include peak flows. For Factor 3, the total peak sanitary flow is based on 47 mgd (i.e., the sum of 25 mgd (Scranton), 20 mgd (McKeesport) and 2 mgd (Kane)), which reflects additional I&I under peak conditions. For Factor 4, the total peak wastewater flow capacity is based on 1,190 mgd, with the addition of 72 mgd of peak stormwater flow, which is the sum of 35 mgd (Scranton), 36 mgd (McKeesport) and 1 mgd (Kane).

Q. Please explain the remaining cost allocation factors.

A. Factors 5 and 6 were used to allocate customer facilities and customer accounting costs. These factors were based on the number and relative size of the customers.

Factor 7 is a composite factor used to allocate employee pension and benefit expenses and payroll taxes. Factor 7 is based on the allocation of direct labor expense.

Factors 8 and 9 are based on the allocation of plant in service and rate base, respectively. Factor 8 allocates other rate base elements, and Factor 9 is used to allocate return and taxes.

Factor 10 is based on the total cost of service and is used to allocate regulatory commission expense and other revenues. Factor 10A is based on the total cost of service with stormwater costs reallocated to the sanitary classes and is used to allocate the portion of the CSS wastewater cost of service to be recovered through water rates.

Factor 11 is used to allocate administrative and general expenses and is based on the allocation of all other operating expenses exclusive of power, chemicals and waste disposal. Factor 12 allocates cash working capital and is based on the allocation of all operating expenses.

Q. Please explain the procedure for allocating costs to the several customer classifications.

A. The items of cost, which include operation and maintenance expenses, depreciation expense, taxes and income available for return, are identified in column 1 of Schedule D. 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 E of the exhibit.

Q. What was the source of the total cost of service data set forth in column 3 of Schedule D of Exhibit No. 12-F?

A. The pro forma cost of service was furnished by the Company and are the same as those set forth in Exhibit No. 3-A. This pro forma cost of service was reduced by

$38,809,970, which is the amount the Company proposes to recover in water rates. The revenues under proposed rates for the WW CSS Operations are sufficient to recover the remaining revenue requirement.

Q. Have you summarized the results of your cost allocation studies for the Company's Wastewater CSS Operations?

A. Yes. The results are summarized in columns 1, 2 and 3 of Schedule A of Exhibit No. 12-F. Column 2 sets forth the total allocated pro forma cost of service as of December 31, 2023 for each customer classification identified in column 1. Column 3 presents each customer classification's cost responsibility as a percent of the total cost. The total cost of service associated with stormwater for the combined systems is $39, 790,373 in 2023, as shown in column 8 of Schedule D. This cost was reallocated to the sanitary classes based on Factor 1A.

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 revenue under existing rates can be made by comparing columns 3 and 5 of Schedule A of Exhibit No. 12-F. 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. 12-F. The rate of return by customer classification under present and proposed rates is set forth on Schedules B and C.

CONCLUSION

Q. Does this complete your direct testimony at this time?

A. Yes, it does.

CONSTANCE E. HEPPENSTALL – LIST OF CASES TESTIFIED

	Year	Jurisdiction	Docket No.	Client/Utility	Subject
1.	2010	AZ CC	W-01303A-09-0343 and SW-01303A-09-0343	Arizona American Water Company	Rate Consolidation
2.	2010	Pa PUC	R-2010-2179103	City of Lancaster – Water Fund	Revenue Requirements
3.	2012	Pa PUC	R-2012-2311725	Hanover Borough	Cost of Service/Rev Reqmts.
4.	2012	Pa PUC	R-2012-2310366	City of Lancaster – Sewer Fund	Revenue Requirements
5.	2013	Pa PUC	R-2013-2350509	City of DuBois – Bureau of Water	Revenue Requirements
6.	2013	Pa PUC	R-2013-2390244	City of Bethlehem – Bureau of Water	Revenue Requirements
7.	2014	Pa PUC	R-2014-2418872	City of Lancaster – Water Fund	Revenue Requirements
8.	2014	Pa PUC	R-2014-2428304	Hanover Borough	Revenue and Revenue Reqmts.
9.	2015	KY PSC	Case No.2015-000143	Northern Kentucky Water District	Cost of Service
10.	2016	Pa PUC	R-2016-2554150	City of DuBois – Bureau of Water	Cost of Service/Revenue Reqmts.
11.	2016	AZ CC	WS-01303A-16-0145	EPCOR Water Arizona, Inc.	Cost of service/Rate Design
12.	2017	MO PSC	WR-2017-0285	Missouri-American Water Company	Cost of Service/Rate Design
13.	2017	MO PSC	SR-2017-0286	Missouri-American Water Company	Cost of Service/Rate Design
14.	2017	VA SCC	PUR-2017-00082	Aqua Virginia, Inc.	Cost of Service/Rate Design
15.	2017	AZ CC	WS-01303A-17-0257	EPCOR Water Arizona, Inc.	Cost of Service/Rate Design
16.	2017	HI PUC	2017-0446	Hana Water Systems LLC – North	Cost of Service/Rate Design
17.	2017	HI PUC	2017-0447	Hana Water Systems LLC – South	Cost of Service/Rate Design
18.	2018	PA PUC	2018-3000834	SUEZ Water Pennsylvania, Inc.	Revenue Requirements
19.	2018	KY PSC	2018-00208	Water Service Corp. of KY	Cost of Service/Rate Design
20.	2018	WV PSC	18-0573-W-42T	West Virginia American Water Company	Cost of Service
21.	2018	IN IRC	50208	Indiana American Water Company	Cost of Service/Demand Study
22.	2018	KY PSC	2018-00291	Northern Kentucky Water District	Cost of Service/Rate Design
23.	2018	KY PSC	2018-00358	Kentucky American Water	Cost of Service/Rate Design
24.	2019	PA PUC	R-2019-3006904	Newtown Artesian Water Co.	Revenue Reqmts/Rate Design
25.	2019	PA PUC	R-2019-3010955	City of Lancaster – Sewer Fund	Rev. Reqmts/Cost of Service/Rates
26.	2020	PA PUC	R-2020-3017206	Philadelphia Gas Works	Cost of Service

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PENNSYLVANIA PUBLIC UTILITY COMMISSION	:	
v.	:	**DOCKET NOS. R-2022-3031672 (WATER)** **R-2022-3031673 (WASTEWATER)**
PENNSYLVANIA-AMERICAN WATER COMPANY	:	

VERIFICATION

I, **Constance E. Heppenstall**, hereby state that the facts set forth in the pre-marked Statement No. 12 and accompanying exhibits, if any, are true and correct to the best of my knowledge, information, and belief. I understand that this verification is made subject to the provisions and penalties of 18 Pa.C.S. § 4904 (relating to unsworn falsification to authorities).

Date: April 29, 2022

Constance E. Heppenstall

EXHIBIT NO. 12-A - WATER OPERATIONS

COST OF SERVICE

AS OF DECEMBER 31, 2023

Exhibit 12-A
Witness: C. Heppenstall

PENNSYLVANIA-AMERICAN WATER COMPANY

Mechanicsburg, Pennsylvania

WATER OPERATIONS

WATER COST OF SERVICE

ALLOCATION STUDY

AS OF DECEMBER 31, 2023

GANNETT FLEMING VALUATION AND RATE CONSULTANTS, LLC

Camp Hill, Pennsylvania

Gannett Fleming
Valuation and Rate Consultants, LLC

Corporate Headquarters
207 Senate Avenue
Camp Hill, PA 17011
P 717.763.7211 | **F** 717.763.8150

gannettfleming.com

April 20, 2022

Pennsylvania-American Water Company
852 Wesley Drive
Mechanicsburg, PA 17055

Attention: Ashley E. Everette
Senior Director, Rates & Regulatory

Dear Ms. Everette:

Pursuant to your request, we have conducted a cost of service allocation study based on pro forma revenue requirements estimated for the test year ended December 31, 2023.

The attached report presents the results of the allocation study, as well as supporting schedules which set forth the detailed cost allocation calculations. Schedule A presents a comparison of the cost of service by customer classification with the pro forma revenues produced by each classification under present and proposed rates.

Respectfully submitted,

GANNETT FLEMING VALUATION
AND RATE CONSULTANTS, LLC

CONSTANCE E. HEPPENSTALL
Senior Project Manager, Rate Studies

GREGORY R. HERBERT
Analyst, Rate Studies

CEH:mle
070800.200

CONTENTS

PART I. INTRODUCTION

PENNSYLVANIA-AMERICAN WATER COMPANY

WATER COST OF SERVICE ALLOCATION STUDY
AS OF DECEMBER 31, 2023

PART I. INTRODUCTION

PLAN OF REPORT

The report sets forth the results of the cost of service allocation study for the water operations based on pro forma costs as of December 31, 2023, or the fully forecasted future test year (FFTY), for Pennsylvania- American Water Company. Part I, Introduction, contains statements with respect to the basis of the study, the procedures employed, and a summary of the results of the study. Schedule A summarizes the cost allocation for the water and wastewater operations and total revenues under present and proposed rates. Part II, Cost of Service by Customer Classification - Water Operations, presents detailed schedules of the allocation of costs to customer classifications, as well as the basis for the allocations for the FFTY. Schedule A in Part II summarizes the water cost allocation and the revenues produced under present and proposed rates.

BASIS OF STUDY

The purpose of the cost allocation study was to determine the relative cost of service responsibilities of the several customer classifications based on considerations of quantity of water consumed, variability of rate of consumption, and costs associated with customer metering, billing and accounting. The allocation study incorporated generally- accepted principles and procedures for allocating the several categories of cost to customer classifications in proportion to each classification's use of facilities, commodities and services required in providing water service.

ALLOCATION PROCEDURES

The allocation study was based on the Base-Extra Capacity Method for allocating costs to customer classifications. The method is described in the 2017 and prior editions of the Water Rates Manual published by the American Water Works Association. The four basic categories of cost responsibility are base, extra capacity, customer, and fire protection costs. The following discussion presents a brief description of these costs and the manner in which they were allocated.

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 were allocated to customer classifications on the basis of average daily usage.

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

Customer Costs are costs associated with serving customers regardless of their usage or demand characteristics. Customer costs include the operating and capital costs related to meters and services, meter reading costs, and billing and collecting costs. The customer costs were allocated on the bases of the capital cost of meters and services, the man-hours required to read meters and the number of customers.

Fire Protection Costs are costs associated with providing the facilities to meet the potential peak demand of fire protection service. Fire Protection costs are subdivided into

costs to meet Public Fire Protection and Private Fire Protection demands. The extra capacity costs assigned to fire protection service were allocated to Public and Private Fire Protection and Commercial General Service on the basis of the total relative demands of the hydrants, fire service lines, and commercial service lines sized to provide fire protection, as well as general service.

RESULTS OF STUDY

The results for the cost of service allocation study is set forth on the following pages. The data summarized in Schedule A, Comparison of Pro Forma Cost of Service with Revenues Under Present and Proposed Rates for the Twelve Months Ended December 31, 2023, constitute the principal results of the cost allocation studies and subsequent rate design.

The water operations cost of service by customer classification is shown in column 2 of Schedule A and are developed in Schedule D, Allocation of Cost of Service to Customer Classifications water operations. The allocation of the total cost of service to the several customer classifications was performed by applying the allocation factors referenced in column 2 of Schedule D to the cost of service set forth in column 3. The bases for the allocation factors are presented in Schedule E. The other cost of service shown in column 3 includes wastewater cost of service not recovered by wastewater rates.

Schedule F presents the calculation of the firm standby service and interruptible standby service commodity-demand rates based on the unit costs of service by function for the water operation.

Schedule G sets forth the average day, maximum day system sendout, and maximum day ratios.

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PART II. COST OF SERVICE BY CUSTOMER CLASSIFICATION

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

COMPARISON OF PRO FORMA COST OF SERVICE WITH REVENUES UNDER PRESENT AND PROPOSED RATES
FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Customer Classification	Pro Forma Cost of Service, as of December 31, 2023				Pro Forma Revenues Under Present Rates		Pro Forma Revenues Under Proposed Rates		Proposed Increase	
	Cost of Service	Allocation of Other COS*	Total Amount	Percent of Total	Amount	Percent of Total	Amount	Percent of Total	Amount	Percent Increase
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Residential	$ 510,855,495	$ 48,509,221	$ 559,364,716	65.7%	$ 457,907,960	65.5%	$ 559,366,395	65.6%	$ 101,458,435	22.2%
Commercial	199,068,741	18,902,935	217,971,676	25.6%	175,141,809	25.1%	217,967,237	25.6%	42,825,428	24.5%
Industrial	33,678,149	1,967,039	35,645,188	4.2%	30,550,032	4.4%	37,250,055	4.4%	6,700,023	21.9%
Public (Municipal)	20,715,090	3,567,458	24,282,548	2.8%	21,180,396	3.0%	22,678,754	2.7%	1,498,358	7.1%
Other Water Utilities - Group A	279,034		279,034	0.0%	244,982	0.0%	271,466	0.0%	26,484	10.8%
Other Water Utilities - Group B	50,471		50,471	0.0%	54,566	0.0%	59,162	0.0%	4,596	8.4%
Private Fire Protection	5,267,167		5,267,167	0.6%	4,925,568	0.7%	5,268,028	0.6%	342,460	7.0%
Public Fire Protection	9,449,695	-	9,449,695	1.1%	8,842,466	1.3%	9,448,871	1.1%	606,405	6.9%
Total Sales of Water	779,363,842	72,946,653	852,310,495	100.0%	698,847,779	100.0%	852,309,968	100.0%	153,462,189	22.0%
Other Water Revenues	11,115,826		11,115,826		10,157,762		11,115,826		958,064	9.4%
Contract Sales - Industrial	3,891,115		3,891,115		3,891,115		3,891,115		-	0.0%
Contract Sales - Resale	2,733,803		2,733,803		2,733,803		2,733,803		-	0.0%
Total	$ 797,104,586	$ 72,946,653	$ 870,051,239		$ 715,630,458		$ 870,050,711		$ 154,420,253	21.6%

* Includes unrecovered Wastewater Cost of Service.

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

DEVELOPMENT OF RATE OF RETURN BY CUSTOMER CLASSIFICATION
UNDER PRESENT RATES

ITEM	COST OF SERVICE	RESIDENTIAL	COMMERCIAL	INDUSTRIAL	PUBLIC	OTHER WATER UTILITIES		FIRE PROTECTION	
						GROUP A	GROUP B	PRIVATE	PUBLIC
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. REVENUES FROM SALES	$ 698,847,779	$ 457,907,960	$ 175,141,809	$ 30,550,032	$ 21,180,396	$ 244,982	$ 54,566	$ 4,925,568	$ 8,842,466
2. OTHER REVENUES	16,782,679	12,367,276	3,060,656	460,853	328,450	17,409	860	160,911	386,266
3. TOTAL OPERATING REVENUES	715,630,458	470,275,236	178,202,465	31,010,885	21,508,846	262,391	55,426	5,086,479	9,228,732
4. LESS: OPERATING EXPENSES (INCLUDES REALLOCATION OF FIRE & WW ALLOC.)	402,972,735	283,501,423	99,450,804	16,576,003	10,530,891	142,247	12,017	2,273,024	(9,513,676)
5. RETURN AND INCOME TAXES	312,657,723	186,773,813	78,751,661	14,434,882	10,977,955	120,144	43,409	2,813,455	18,742,408
6. LESS: TAXABLE EXCLUSIONS (FACTOR 19)	76,378,768	45,934,191	19,881,393	3,421,769	2,039,313	30,552	7,638	618,668	4,445,244
7. TAXABLE INCOME	236,278,955	140,839,622	58,870,267	11,013,113	8,938,642	89,592	35,771	2,194,787	14,297,164
8. LESS: INCOME TAXES (TAX. INC.)	49,183,089	29,316,736	12,254,251	2,292,455	1,860,640	18,649	7,446	456,860	2,976,053
9. NET RETURN (Line 5 - Line 8)	263,474,634	157,457,077	66,497,410	12,142,427	9,117,315	101,495	35,963	2,356,595	15,766,355
10. ORIGINAL COSTS MEASURE OF VALUE	4,034,404,744	2,426,483,617	1,049,988,406	180,772,131	107,654,432	1,667,380	206,029	32,840,354	234,792,378
11. RATE OF RETURN, PERCENT	6.53	6.49	6.33	6.72	8.47	6.09	17.46	7.18	6.72
12. RELATIVE RATE OF RETURN	1.00	0.99	0.97	1.03	1.30	0.93	2.67	1.10	1.03

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

DEVELOPMENT OF RATE OF RETURN BY CUSTOMER CLASSIFICATION
UNDER PROPOSED RATES

ITEM	COST OF SERVICE	RESIDENTIAL	COMMERCIAL	INDUSTRIAL	PUBLIC	OTHER WATER UTILITIES GROUP A	OTHER WATER UTILITIES GROUP B	FIRE PROTECTION PRIVATE	FIRE PROTECTION PUBLIC
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. REVENUES FROM SALES	$ 852,309,968	$ 559,366,395	$ 217,967,237	$ 37,250,055	$ 22,678,754	$ 271,466	$ 59,162	$ 5,268,028	$ 9,448,871
2. OTHER REVENUES	17,740,744	13,073,808	3,234,584	485,526	351,688	20,474	860	179,357	394,448
3. TOTAL OPERATING REVENUES	870,050,711	572,440,203	221,201,821	37,735,581	23,030,442	291,940	60,022	5,447,385	9,843,319
4. LESS: OPERATING EXPENSES (INCLUDES REALLOCATION OF FIRE & WW ALLOC.)	477,444,904	336,285,812	119,050,092	18,541,950	14,151,647	142,465	12,071	2,266,413	(13,005,546)
5. RETURN AND INCOME TAXES	392,605,807	236,154,390	102,151,729	19,193,631	8,878,795	149,475	47,951	3,180,972	22,848,865
6. LESS: TAXABLE EXCLUSIONS (FACTOR 19)	76,404,122	45,957,079	19,880,353	3,422,905	2,039,990	30,562	7,640	618,873	4,446,720
7. TAXABLE INCOME	316,201,685	190,197,311	82,271,376	15,770,726	6,838,805	118,913	40,310	2,562,099	18,402,145
8. LESS: INCOME TAXES (TAX. INC.)	72,274,597	43,473,627	18,804,867	3,604,734	1,563,154	27,180	9,214	585,622	4,206,200
9. NET RETURN (Line 5 - Line 8)	320,331,210	192,680,764	83,346,862	15,588,897	7,315,641	122,295	38,737	2,595,350	18,642,665
10. ORIGINAL COSTS MEASURE OF VALUE	4,034,404,744	2,427,005,536	1,049,576,924	180,766,020	107,601,832	1,667,380	206,029	32,816,382	234,764,625
11. RATE OF RETURN, PERCENT	7.94	7.94	7.94	8.62	6.80	7.33	18.80	7.91	7.94
12. RELATIVE RATE OF RETURN	1.00	1.00	1.00	1.09	0.86	0.92	2.37	1.00	1.00

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

ALLOCATION OF COST OF SERVICE TO CUSTOMER CLASSIFICATIONS
FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Account Number (1)	Account Description (2)	Factor Ref. (3)	Cost of Service (4)	Residential (5)	Commercial (6)	Industrial (7)	Other Public Authority (8)	Other Water Utilities Group A (9)	Other Water Utilities Group B (10)	Private Fire Protection (11)	Public Fire Protection (12)
OPERATION AND MAINTENANCE EXPENSES											
	Source of Supply Expenses										
	----Operation----										
601.1	Salaries and Wages	2	$ 171,055	$ 98,990	$ 53,592	$ 11,221	$ 6,141	$ 86	$ 17	$ 171	$ 838
610.1	Purchased Water	1	3,218,122	1,835,939	965,115	250,370	138,379	1,931	-	4,505	21,883
615.1	Purchased Power	1	2,460,179	1,403,532	737,808	191,402	105,788	1,476	-	3,444	16,729
616.1	Purchased Fuel	1	54,748	31,234	16,419	4,259	2,354	33	-	77	372
618.1	Chemicals	1	-	-	-	-	-	-	-	-	-
620.1	Materials and Supplies	2	67,428	39,021	21,125	4,423	2,421	34	7	67	330
631.1	Contract Services -Engineering	2	144,399	83,564	45,240	9,473	5,184	72	14	144	708
633.1	Contract Services -Legal	2	-	-	-	-	-	-	-	-	-
636.1	Contract Services -Other	2	735,938	425,887	230,569	48,278	26,420	368	74	736	3,606
641.1	Rental of Building	2	-	-	-	-	-	-	-	-	-
642.1	Rental of Equipment	2	26	15	8	2	1	-	-	-	-
650.1	Transportation	2	959	555	300	63	34	-	-	1	5
675.1	Miscellaneous Expenses	2	1,265,396	732,285	396,449	83,010	45,428	633	127	1,265	6,200
	Total Operation		8,118,250	4,651,022	2,466,625	602,501	332,150	4,633	239	10,410	50,671
	----Maintenance----										
601.2	Salaries and Wages	2	269,066	155,708	84,298	17,651	9,659	135	27	269	1,318
620.2	Materials and Supplies	2	25,162	14,561	7,883	1,651	903	13	3	25	123
636.2	Contract Services	2	-	-	-	-	-	-	-	-	-
631.2	Contract Services - Engineering	2	341,001	197,337	106,836	22,370	12,242	171	34	341	1,671
636.2	Contract Services - Other	2	111,104	64,296	34,809	7,288	3,989	56	11	111	544
650.1	Transportation	2	-	-	-	-	-	-	-	-	-
675.2	Misc. Maintenance Expense	2	46,564	26,947	14,589	3,055	1,672	23	5	47	228
	Total Maintenance		792,897	458,849	248,415	52,015	28,465	398	80	793	3,884
	Total Source of Supply Expenses		8,911,147	5,109,871	2,715,040	654,516	360,615	5,031	319	11,203	54,555
	Water Treatment Expenses										
	----Operation----										
601.3	Salaries and Wages										
	Power and Pumping and Other Dept Exp	5A	$ 1,181,890	$ 674,150	$ 357,640	$ 68,904	$ 39,357	$ 591	$ 118	$ 6,264	$ 34,866
	Purification and Laboratory	2	11,244,381	6,507,123	3,522,865	737,631	403,673	5,622	1,124	11,244	55,097
615.3	Purchased Power	1	9,793,574	5,587,234	2,937,093	761,940	421,124	5,876	-	13,711	66,596
618.3	Chemicals	1	17,156,856	9,787,987	5,145,341	1,334,803	737,745	10,294	-	24,020	116,667
620.3	Materials and Supplies	6	682,859	394,624	213,257	44,318	24,378	341	68	956	4,917
631.3	Contract Services -Engineering	6	106,422	61,501	33,236	6,907	3,799	53	11	149	766

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

ALLOCATION OF COST OF SERVICE TO CUSTOMER CLASSIFICATIONS
FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Account Number	Account Description	Factor Ref.	Cost of Service	Residential	Commercial	Industrial	Other Public Authority	Other Water Utilities Group A	Other Water Utilities Group B	Private Fire Protection	Public Fire Protection
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
635.3	Contract Services -Testing	6	185,347	107,112	57,884	12,029	6,617	93	19	259	1,334
636.3	Contract Services -Other	6	1,007,884	582,456	314,762	65,412	35,981	504	101	1,411	7,257
641.3	Rental of Building	6	5,759	3,328	1,799	374	206	3	1	8	41
642.3	Rental of Equipment	6	5,274	3,048	1,647	342	188	3	1	7	38
650.3	Transportation	6	75,247	43,485	23,500	4,884	2,686	38	8	105	542
675.3	Miscellaneous Expenses										
	Waste Disposal	1	2,218,559	1,265,688	665,346	172,604	95,398	1,331	-	3,106	15,086
	Other	6	4,564,391	2,637,762	1,425,459	296,229	162,949	2,282	456	6,390	32,864
	Total Operation		48,228,445	27,655,498	14,699,829	3,506,377	1,934,101	27,031	1,907	67,630	336,071
	----Maintenance----										
601.4	Salaries and Wages										
	Power and Pumping	5A	548,098	312,635	165,855	31,954	18,252	274	55	2,905	16,169
	Purification and Laboratory	2	2,526,948	1,462,345	791,693	165,768	90,717	1,263	253	2,527	12,382
620.4	Materials and Supplies	7	724,532	418,200	225,619	46,587	25,648	362	72	1,304	6,738
631.4	Contract Services - Engineering	7	49,624	28,643	15,453	3,191	1,757	25	5	89	462
636.4	Contract Services	7	1,232,773	711,557	383,886	79,267	43,640	616	123	2,219	11,465
636.4	Contract Services - Other	7	-	-	-	-	-	-	-	-	-
650.4	Transportation	7	16,230	9,368	5,054	1,044	575	8	2	29	151
675.4	Miscellaneous Expenses - Waste Disposal	1	114,478	65,309	34,332	8,906	4,923	69	-	160	778
	Total Maintenance		5,212,683	3,008,057	1,621,892	336,717	185,512	2,617	510	9,233	48,145
	Total Water Treatment Expenses		$ 53,441,127	$ 30,663,555	$ 16,321,721	$ 3,843,094	$ 2,119,613	$ 29,648	$ 2,417	$ 76,863	$ 384,216
	Transmission & Distribution Expenses										
	----Operation----										
601.5	Salaries and Wages										
	Supervision & Other Dept. Exps.	12	$ 2,905,142	$ 1,793,344	$ 767,829	$ 113,010	$ 76,986	$ 1,162	$ -	$ 27,599	$ 125,212
	Mains	8	2,715,511	1,545,397	789,670	128,172	80,108	1,358	-	25,526	145,280
	Storage Facilities	4	115,210	66,234	33,054	4,747	3,180	58	-	1,187	6,751
	Miscellaneous Meter Expense	10	471,098	366,001	89,457	3,689	8,649	80	61	3,161	-
	Services on Customer Premises	11	223,151	198,116	19,425	478	1,366	4	4	3,758	-
615.5	Purchased Power	1	549,734	313,623	164,865	42,769	23,639	330	-	770	3,738
620.5	Materials and Supplies	12	1,219,421	752,749	322,293	47,435	32,315	488	-	11,584	52,557
631.5	Contract Services -Engineering	12	161,951	99,972	42,804	6,300	4,292	65	-	1,539	6,980
636.5	Contract Services -Other	12	617,022	380,888	163,079	24,002	16,351	247	-	5,862	26,594
641.5	Rental of Building	12	46,883	28,941	12,391	1,824	1,242	19	-	445	2,021
642.5	Rental of Equipment	12	658	406	174	26	17	-	-	6	28
650.5	Transportation	12	33,687	20,795	8,903	1,310	893	13	-	320	1,452
675.5	Miscellaneous Expenses	12	1,660,003	1,024,720	438,739	64,574	43,990	664	-	15,770	71,546
	Total Operation		10,719,470	6,591,186	2,852,683	438,336	293,028	4,488	65	97,527	442,159

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

ALLOCATION OF COST OF SERVICE TO CUSTOMER CLASSIFICATIONS
FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Account Number (1)	Account Description (2)	Factor Ref. (3)	Cost of Service (4)	Residential (5)	Commercial (6)	Industrial (7)	Other Public Authority (8)	Other Water Utilities Group A (9)	Other Water Utilities Group B (10)	Private Fire Protection (11)	Public Fire Protection (12)
	----Maintenance----										
601.6	Salaries and Wages										
	Supervision and Engineering	13	183,729	119,204	32,447	4,318	3,087	37	-	2,131	22,507
	Structures and Improvements	4	38,706	22,252	11,105	1,595	1,068	19	-	399	2,268
	Mains	8	1,478,920	841,653	430,070	69,805	43,628	739	-	13,902	79,122
	Services	11	1,335,564	1,185,727	116,261	2,858	8,174	27	27	22,491	-
	Meters	10	5,559	4,319	1,056	44	102	1	1	37	-
	Storage Facilities	4	5,050	2,903	1,449	208	139	3	-	52	296
	Fire Hydrants	9	306,814	-	-	-	-	-	-	-	306,814
	Other	13	6,001,186	3,893,570	1,059,809	141,028	100,820	1,200	-	69,614	735,145
620.6	Materials and Supplies	13	1,761,922	1,143,135	311,155	41,405	29,600	352	-	20,438	215,835
636.6	Contract Services	13	1,245,599	808,145	219,973	29,272	20,926	249	-	14,449	152,586
637.6	Contract Services - Engineering	13	37,154	24,106	6,561	873	624	7	-	431	4,551
650.6	Transportation	13	110,789	71,880	19,565	2,604	1,861	22	-	1,285	13,572
675.6	Miscellaneous Expenses	13	4,287,157	2,781,507	757,112	100,748	72,024	857	-	49,731	525,177
	Total Maintenance		16,798,151	10,898,401	2,966,563	394,758	282,053	3,513	28	194,960	2,057,873
	Total Transmission and Distribution Expenses		$ 27,517,621	$ 17,489,587	$ 5,819,246	$ 833,094	$ 575,081	$ 8,001	$ 93	$ 292,487	$ 2,500,032
	Customer Accounting Expenses										
601.7	Salaries and Wages										
	Meter Reading and Other Expense	15	$ 3,621,069	$ 3,356,079	$ 248,297	$ 2,969	$ 13,108	$ 36	$ 36	$ 543	$ -
	Meter Services	10	2,031,928	1,578,625	385,843	15,910	37,306	345	264	13,634	-
620.7	Materials and Supplies	14	43,808	40,341	2,985	36	158	-	-	262	26
636.7	Contract Services -Other	14	142,784	131,484	9,728	117	514	1	1	852	86
642.7	Rental of Equipment	14	1,680	1,547	114	1	6	-	-	10	1
650.7	Transportation	14	1,759	1,620	120	1	6	-	-	11	1
670.7	Bad Debt	22	11,499,249	10,268,829	1,198,222	3,450	10,349	-	-	18,399	-
675.7	Miscellaneous Expenses	14	2,803,073	2,581,237	190,973	2,299	10,091	28	28	16,734	1,682
	Total Customer Accounting Expenses		20,145,350	17,959,762	2,036,282	24,783	71,538	410	329	50,445	1,796
	Administrative and General Expenses										
601.8	Salaries and Wages	16	$ 23,326,900	$ 15,960,265	$ 5,082,932	$ 811,776	$ 501,528	$ 6,998	$ -	$ 118,967	$ 844,434
603.8	Salaries of Officers	16	-	-	-	-	-	-	-	-	-
604.8	Employees Pension and Benefits	17	2,605,460	1,723,251	602,904	100,050	62,010	782	-	14,069	102,395
615.8	Purchased Power	16	34,016	23,274	7,412	1,184	731	10	-	173	1,231

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

ALLOCATION OF COST OF SERVICE TO CUSTOMER CLASSIFICATIONS
FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Account Number	Account Description	Factor Ref.	Cost of Service	Residential	Commercial	Industrial	Other Public Authority	Other Water Utilities Group A	Other Water Utilities Group B	Private Fire Protection	Public Fire Protection
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
621	Materials and Supplies	16	225,313	154,159	49,096	7,841	4,844	68	-	1,149	8,156
631.8	Contract Services -Engineering	16	107,905	73,829	23,512	3,755	2,320	32	-	550	3,906
632.8	Contract Services -Accounting	16	592,202	405,185	129,041	20,609	12,732	178	-	3,020	21,438
633.8	Contract Services -Legal	16	2,043,636	1,398,256	445,308	71,119	43,938	613	-	10,423	73,980
634.8	Contract Services -Management										
	Customer Related	14	13,811,900	12,718,827	941,005	11,326	49,723	138	138	82,457	8,287
	Employee Related	17	4,320,309	2,857,452	999,720	165,900	102,823	1,296	-	23,330	169,788
	Water Quality Related	2	580,525	335,950	181,878	38,082	20,841	290	58	581	2,845
	Other	16	39,680,614	27,149,476	8,646,406	1,380,885	853,133	11,904	-	202,371	1,436,438
636.8	Contract Services -Other	16	1,698,269	1,161,955	370,053	59,100	36,513	509	-	8,661	61,477
641.8	Rental of Buildings	16	103,080	70,527	22,461	3,587	2,216	31	-	526	3,731
642.8	Rental of Equipment	16	44,866	30,697	9,776	1,561	965	13	-	229	1,624
650.8	Transportation	16	3,243,498	2,219,201	706,758	112,874	69,735	973	-	16,542	117,415
656.8	Insurance -Vehicles	16	274,493	187,808	59,812	9,552	5,902	82	-	1,400	9,937
657.8	Insurance -General Liability	16	10,348,397	7,080,373	2,254,916	360,124	222,491	3,105	-	52,777	374,612
658.8	Insurance -Workers Comp	17	844,450	558,519	195,406	32,427	20,098	253	-	4,560	33,187
659.8	Insurance -Other	16	3,082,948	2,109,353	671,774	107,287	66,283	925	-	15,723	111,603
660.8	Advertising	14	-	-	-	-	-	-	-	-	-
666.8	Amortization of Rate Case Exp.	20	1,101,087	693,024	271,968	46,906	28,408	440	110	7,487	52,742
667.8	Regulatory Commission	20	53,046	33,387	13,102	2,260	1,369	21	5	361	2,541
675.8	Miscellaneous Expenses	16	7,343,370	5,024,334	1,600,120	255,549	157,882	2,203	-	37,451	265,830
	Total Administrative and General Expenses		115,466,285	81,969,102	23,285,360	3,603,754	2,266,485	30,864	311	602,807	3,707,597
	Total Operation & Maintenance Expenses		$ 225,481,530	$ 153,191,877	$ 50,177,649	$ 8,959,241	$ 5,393,332	$ 73,954	$ 3,469	$ 1,033,805	$ 6,648,196

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

ALLOCATION OF COST OF SERVICE TO CUSTOMER CLASSIFICATIONS
FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Account Number (1)	Account Description (2)	Factor Ref. (3)	Cost of Service (4)	Residential (5)	Commercial (6)	Industrial (7)	Other Public Authority (8)	Other Water Utilities Group A (9)	Other Water Utilities Group B (10)	Private Fire Protection (11)	Public Fire Protection (12)
DEPRECIATION EXPENSE											
303.99	Comprehensive Planning Studies	18	$ 890,720	535,323	232,122	39,993	23,693	356	-	7,304	51,929
304.15	Other Water Source Structures	2	1,411,772	816,992	442,308	92,612	50,683	706	141	1,412	6,918
304.20	Power and Pumping Structures	5A	3,260,263	1,859,654	986,556	190,073	108,567	1,630	326	17,279	96,178
304.30	Purification Buildings	2	8,242,250	4,769,790	2,582,297	540,692	295,897	4,121	824	8,242	40,387
304.36	Waste Handling & Treatment Structures	1	845,434	482,320	253,546	65,775	36,354	507	-	1,184	5,749
304.39	Purification Buildings - Tank Painting	2	2,244	1,299	703	147	81	1	-	2	11
304.61	Office Buildings	16	1,203,063	823,136	262,147	41,867	25,866	361	-	6,136	43,551
304.62	Stores, Shop and Garage Bldgs.	16	1,727,861	1,182,202	376,501	60,130	37,149	518	-	8,812	62,549
304.63	Misc. Structures and Improvements	16	9,213	6,304	2,008	321	198	3	-	47	334
305.00	Collecting & Impounding Reservoirs	1	3,289,022	1,876,387	986,378	255,886	141,428	1,973	-	4,605	22,365
306.00	Lake, River and Other Intakes	2	458,711	265,456	143,714	30,091	16,468	229	46	459	2,248
307.00	Wells and Springs	2	406,182	235,058	127,257	26,646	14,582	203	41	406	1,990
310.00	Power Generation Equipment	5A	1,117,761	637,571	338,234	65,165	37,221	559	112	5,924	32,974
311.00	Pumping Equipment Other	5	1,578,003	885,417	467,247	87,737	50,654	789	158	12,940	73,062
311.52	Pumping Equipment Source of Supply	2	501,115	289,995	156,999	32,873	17,990	251	50	501	2,455
311.53	Pumping Equipment Water Treatment	2	1,236,547	715,590	387,410	81,117	44,392	618	124	1,237	6,059
311.54	Pumping Equipment Transmission and Distribution	8	663,436	377,562	192,927	31,314	19,571	332	-	6,236	35,494
320.00	Purification System	2	15,542,235	8,994,292	4,869,382	1,019,571	557,966	7,771	1,554	15,542	76,157
330.00	Distr. Reservoirs and Standpipes	4	7,596,498	4,367,227	2,179,435	312,976	209,663	3,798	-	78,244	445,155
331.00	Mains and Accessories										
	10-inch and Over	3	20,518,751	11,367,388	6,172,040	1,288,578	705,845	10,259	2,052	147,735	824,854
	Under 10-inch	4	32,839,295	18,879,311	9,421,594	1,352,979	906,365	16,420	-	338,245	1,924,383
333.00	Services	11	13,146,133	11,671,268	1,144,371	28,133	80,454	263	263	221,381	-
334.00	Meters	10	14,542,673	11,298,349	2,761,508	113,869	267,003	2,472	1,891	97,581	-
335.00	Fire Hydrants	9	3,176,850	-	-	-	-	-	-	-	3,176,850
340.00	Office Furniture	16	305,608	209,097	66,592	10,635	6,571	92	-	1,559	11,063
340.00	Computers and Peripheral Equipment	16	2,399,737	1,641,900	522,903	83,511	51,594	720	-	12,239	86,870
340.00	Other Office Equipment	16	1,009	690	220	35	22	-	-	5	37
340.00	Computer Software	16	10,262,881	7,021,863	2,236,282	357,148	220,652	3,079	-	52,341	371,516
340.00	Computer Software	16	1,374,416	940,376	299,485	47,830	29,550	412	-	7,010	49,754
340.00	Computer Software - CIS	14	704,604	648,841	48,005	578	2,537	7	7	4,206	423
341.00	Transportation Equipment	16	8,972,346	6,138,879	1,955,074	312,238	192,905	2,692	-	45,759	324,799
342.00	Stores Equipment	16	28,476	19,483	6,205	991	612	9	-	145	1,031
343.00	Tools and work Equipment	16	2,494,738	1,706,900	543,603	86,817	53,637	748	-	12,723	90,310
344.00	Laboratory Equipment	2	162,389	93,975	50,876	10,653	5,830	81	16	162	796
345.00	Power Operated Equipment	16	119,836	81,993	26,112	4,170	2,576	36	-	611	4,338
346.00	Communication Equipment	16	2,370,614	1,621,975	516,557	82,497	50,968	711	-	12,090	85,816
347.00	Miscellaneous Equipment	16	1,258,470	861,044	274,221	43,795	27,057	378	-	6,418	45,557
348.00	Other Tangible Equipment	16	32,578	22,290	7,099	1,134	700	10	-	166	1,179
	Citizens Acquisition CIAC and CAC	4A	(339,044)	(190,780)	(100,798)	(24,038)	-	-	-	(3,492)	(19,936)
	Total Depreciation Expense		$ 164,354,690	$ 103,156,417	$ 40,939,120	$ 6,776,539	$ 4,293,301	$ 63,115	$ 7,605	$ 1,133,396	$ 7,985,205

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

ALLOCATION OF COST OF SERVICE TO CUSTOMER CLASSIFICATIONS
FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2023

Account Number (1)	Account Description (2)	Factor Ref. (3)	Cost of Service (4)	Residential (5)	Commercial (6)	Industrial (7)	Other Public Authority (8)	Other Water Utilities Group A (9)	Other Water Utilities Group B (10)	Private Fire Protection (11)	Public Fire Protection (12)
	Amortizations	19	$ 1,117,300	$ 672,056	$ 290,721	$ 50,055	$ 29,832	$ 447	$ 112	$ 9,050	$ 65,027
	Taxes, Other Than Income										
	Local Property and Miscellaneous	19	$ 1,506,446	$ 906,127	$ 391,977	$ 67,489	$ 40,222	$ 603	$ 151	$ 12,202	$ 87,675
	Federal and State Payroll Taxes	17	4,698,002	3,107,259	1,087,118	180,403	111,812	1,409	-	25,369	184,631
	State Capital Stock Tax	19	-	-	-	-	-	-	-	-	-
	PUC and OCA Assessments	20	5,281,426	3,324,129	1,304,512	224,989	136,261	2,113	528	35,914	252,980
	Public Utility Realty Taxes	19	2,058,857	1,238,402	535,715	92,237	54,971	824	206	16,677	119,825
	Total Taxes Other Than Income Taxes		$ 13,544,731	$ 8,575,917	$ 3,319,322	$ 565,118	$ 343,266	$ 4,949	$ 885	$ 90,162	$ 645,111
	Total O&M, Depreciation, Amort,and Taxes Other than Inc.		404,498,251	265,596,267	94,726,812	16,350,953	10,059,731	142,465	12,071	2,266,413	15,343,539
	Federal and State Income Taxes	19	72,274,597	$ 43,473,171	$ 18,805,850	$ 3,237,902	$ 1,929,732	$ 28,910	$ 7,227	$ 585,424	$ 4,206,382
	Utility Operating Income Available for Return	19	320,331,737	192,679,541	83,350,318	14,350,862	8,552,857	128,133	32,033	2,594,687	18,643,307
	Total Cost of Service - Water		$ 797,104,585	$ 501,748,979	$ 196,882,980	$ 33,939,717	$ 20,542,320	$ 299,508	$ 51,331	$ 5,446,524	$ 38,193,228
469	Other Water Revenues - Intercompany Rent	20	(549,788)	(346,037)	(135,798)	(23,421)	(14,185)	(220)	(55)	(3,739)	(26,335)
470	Other Water Revenues -Late Payment Fees	23	(5,362,330)	(4,059,820)	(927,683)	(133,522)	(125,479)	(17,159)	-	(98,667)	-
471	Other Water Revenues - Misc. Service Revenues	14	(4,196,166)	(3,864,081)	(285,885)	(3,441)	(15,106)	(42)	(42)	(25,051)	(2,518)
472	Other Water Revenues - Rents from Other Properties	20	(1,007,542)	(634,147)	(248,863)	(42,921)	(25,995)	(403)	(101)	(6,851)	(48,261)
	Revenue from Contract Sales	20	(6,624,918)	(4,169,723)	(1,636,355)	(282,221)	(170,923)	(2,650)	(662)	(45,049)	(317,334)
	Unrecovered Public Fire	9	(28,349,085)	-	-	-	-	-	-	-	(28,349,085)
	Reallocate Unrecovered Public Fire	21	28,349,085	22,180,324	5,420,345	223,958	524,458	-	-	-	-
	Total Cost of Service Related to Sales of Water		$ 779,363,841	$ 510,855,495	$ 199,068,741	$ 33,678,149	$ 20,715,090	$ 279,034	$ 50,471	$ 5,267,167	$ 9,449,695
	Wastewater Allocation	DA	72,946,653	48,509,221	18,902,935	1,967,039	3,567,458	-	-	-	-
	Total Allocation		72,946,653	48,509,221	18,902,935	1,967,039	3,567,458	-	-	-	-
	Total Cost of Service Including WW Alloc.		$ 852,310,494	$ 559,364,716	$ 217,971,676	$ 35,645,188	$ 24,282,548	$ 279,034	$ 50,471	$ 5,267,167	$ 9,449,695

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS

FACTOR 1. ALLOCATION OF COSTS WHICH VARY WITH THE AMOUNT OF WATER CONSUMED.

Factors are based on the pro forma future test year average daily consumption for each customer classification.

Customer Classification	Average Daily Consumption, 100 Gallons	Allocation Factor
(1)	(2)	(3)
Residential	664,978	0.5705
Commercial	349,605	0.2999
Industrial	90,652	0.0778
Public	50,161	0.0430
Other Water Utilities A	644	0.0006
Other Water Utilities B	13	0.0000
Private Fire Protection	1,601	0.0014
Public Fire Protection	7,984	0.0068
Total	1,165,638	1.0000

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS

FACTOR 2. ALLOCATION OF COSTS ASSOCIATED WITH FACILITIES SERVING BASE AND MAXIMUM DAY EXTRA CAPACITY FUNCTIONS.

(Factor 1) and the factors derived from maximum day extra capacity demand for each customer classification, as follows:

	Average Daily Consumption		Maximum Day Extra Capacity		
Customer Classification	Allocation Factor 1	Weighted Factor	Allocation Factor	Weighted Factor	Allocation Factor
(1)	(2)	(3)=(2)x 0.7143	(4)	(5)=(4)x 0.2857	(6)=(3)+(5)
Residential	0.5705	0.4075	0.5997	0.1712	0.5787
Commercial	0.2999	0.2142	0.3468	0.0991	0.3133
Industrial	0.0778	0.0556	0.0351	0.0100	0.0656
Public	0.0430	0.0307	0.0181	0.0052	0.0359
Other Water Utilities A	0.0006	0.0004	0.0002	0.0001	0.0005
Other Water Utilities B	0.0000	0.0000	0.0001	0.0001	0.0001
Private Fire Protection	0.0014	0.0010			0.0010
Public Fire Protection	0.0068	0.0049			0.0049
Total	1.0000	0.7143	1.0000	0.2857	1.0000

The derivation of the maximum day extra capacity factors in column 4 and the basis for the column 3 and column 5 weightings are presented on the following page.

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PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS, cont.

FACTOR 2. ALLOCATION OF COSTS ASSOCIATED WITH FACILITIES SERVING BASE AND MAXIMUM DAY EXTRA CAPACITY FUNCTIONS, cont.

		Maximum Day Extra Capacity		
Customer Classification	Average Daily Consumption, 100 Gallons	Factor*	Rate of Flow, 100 Gallons Per Day	Allocation Factor
(1)	(2)	(3)	(4)	(5)
Residential	664,978	1.0	664,978	0.5997
Commercial	349,605	1.1	384,566	0.3468
Industrial	77,889	0.5	38,945	0.0351
Public	50,161	0.4	20,064	0.0181
Other Water Utilities A	644	0.4	258	0.0002
Other Water Utilities B	13	9.0	117	0.0001
Total	1,143,290		1,108,928	1.0000

The weighting of the factors is based on the maximum day ratio of 1.4, based on a review of maximum day ratios experienced by the company. (See Schedule G)

	Maximum Day Ratio	Weight
Average Day	1.0	0.7143
Maximum Day Extra Capacity	0.4	0.2857
Total	1.4	1.0000

* Ratio of maximum day to average day minus 1.0.

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS, cont.

FACTOR 3. ALLOCATION OF COSTS ASSOCIATED WITH FACILITIES SERVING BASE, MAXIMUM DAY EXTRA CAPACITY AND FIRE PROTECTION FUNCTIONS.

Factors are based on the weighting of the average daily consumption, the maximum day extra capacity demand, and the fire protection demand for each customer classification.

	Average Daily Consumption		Maximum Day Extra Capacity		Fire Protection		
Customer Classification	Allocation Factor 1	Weighted Factor	Allocation Factor	Weighted Factor	Allocation Factor	Weighted Factor	Allocation Factor
(1)	(2)	(3)=(2) X 0.6837	(4)	(5)=(4) X 0.2735	(6)	(7)=(6) X 0.0428	(8)=(3)+ (5)+(7)
Residential	0.5705	0.3901	0.5997	0.1639			0.5540
Commercial	0.2999	0.2050	0.3468	0.0948	0.0225	0.0010	0.3008
Industrial	0.0778	0.0532	0.0351	0.0096			0.0628
Public	0.0430	0.0294	0.0181	0.0050			0.0344
Other Water Utilities A	0.0006	0.0004	0.0002	0.0001			0.0005
Other Water Utilities B	0.0000	0.0000	0.0001	0.0001			0.0001
Private Fire Protection	0.0014	0.0010			0.1445	0.0062	0.0072
Public Fire Protection	0.0068	0.0046			0.8330	0.0356	0.0402
Total	1.0000	0.6837	1.0000	0.2735	1.0000	0.0428	1.0000

The basis for the column 3, column 5 and column 7 weightings are presented on the following page.

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS, cont.

FACTOR 3. ALLOCATION OF COSTS ASSOCIATED WITH FACILITIES SERVING BASE, MAXIMUM DAY EXTRA CAPACITY AND FIRE PROTECTION FUNCTIONS, cont.

The weighting of the factors is based on the potential demand of general and fire protection service. The bases for the potential demand of general service are the maximum day ratio of 1.4 and the average pumpage for the test year ended 12/31/19. The system demand for fire protection is 20,000 gpm, for 10 hours.

	Ratio	Rate of Flow, (GPD)	Weight
Average Day	1.0	191,704,096	0.6837
Maximum Day Extra Capacity	0.4	76,681,638	0.2735
Subtotal	1.4	268,385,734	0.9572
Fire Protection		12,000,000	0.0428
Total		280,385,734	1.0000

The allocation factors in column 6 on the preceding page are based on the relative potential fire demands of General Service and Public and Private Fire Protection Service.

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS, cont.

FACTOR 4. ALLOCATION OF COSTS ASSOCIATED WITH FACILITIES SERVING BASE AND MAXIMUM HOUR EXTRA CAPACITY FUNCTIONS.

fire protection demand for each customer classification.

Customer Classification	Average Hourly Consumption			Maximum Hour Extra Capacity		Fire Protection		
	100 Gals.	Allocation Factor	Weighted Factor	Allocation Factor	Weighted Factor	Allocation Factor	Weighted Factor	Allocation Factor
(1)	(2)	(3)	(4)=(3) X 0.4444	(5)	(6)=(5) X 0.4888	(7)	(8)=(7) X 0.0668	(9)=(4)+(6)+(8)
Residential	27,707.4	0.5705	0.2535	0.6574	0.3214			0.5749
Commercial	14,566.9	0.2999	0.1333	0.3112	0.1521	0.0225	0.0015	0.2869
Industrial	3,777.2	0.0778	0.0346	0.0135	0.0066			0.0412
Public	2,090.0	0.0430	0.0191	0.0174	0.0085			0.0276
Other Water Utilities A	26.8	0.0006	0.0003	0.0004	0.0002			0.0005
Other Water Utilities B	0.5	0.0000	0.0000	0.0001	0.0000			0.0000
Private Fire Protection	66.7	0.0014	0.0006			0.1445	0.0097	0.0103
Public Fire Protection	332.7	0.0068	0.0030			0.8330	0.0556	0.0586
Total	48,568.3	1.0000	0.4444	1.0000	0.4888	1.0000	0.0668	1.0000

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS, cont.

FACTOR 4A. ALLOCATION OF CITIZENS ACQUISITION CONTRIBUTIONS

fire protection demand for each customer classification.

Customer Classification	Average Hourly Consumption 100 Gals.	Average Hourly Consumption Allocation Factor	Average Hourly Consumption Weighted Factor	Maximum Hour Extra Capacity Allocation Factor	Maximum Hour Extra Capacity Weighted Factor	Fire Protection Allocation Factor	Fire Protection Weighted Factor	Allocation Factor
(1)	(2)	(3)	(4)=(3) X 0.4444	(5)	(6)=(5) X 0.4888	(7)	(8)=(7) X 0.0668	(9)=(4)+(6)+(8)
Residential	27,707.4	0.5965	0.2651	0.6087	0.2976			0.5627
Commercial	14,566.9	0.3136	0.1394	0.3200	0.1564	0.0225	0.0015	0.2973
Industrial	3,777.2	0.0813	0.0361	0.0713	0.0348			0.0709
Public	0.0	0.0000	0.0000		0.0000			0.0000
Other Water Utilities A	0.0	0.0000	0.0000		0.0000			0.0000
Other Water Utilities B	0.0	0.0000	0.0000		0.0000			0.0000
Private Fire Protection	66.7	0.0014	0.0006			0.1445	0.0097	0.0103
Public Fire Protection	332.7	0.0072	0.0032			0.8330	0.0556	0.0588
Total	46,450.9	1.0000	0.4444	1.0000	0.4888	1.0000	0.0668	1.0000

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS, cont.

FACTOR 4. ALLOCATION OF COSTS ASSOCIATED WITH FACILITIES SERVING BASE AND MAXIMUM HOUR EXTRA CAPACITY FUNCTIONS, cont.

The weighting of the factors is based on the potential demand of general and fire protection service. The bases for the potential demand of general service are the maximum hour ratio of 2.1, and the average pumpage for the test year ended 12/31/2019. The system demand for fire protection is 20,000 gpm.

	Ratio	Rate of Flow, (GPM)	Weight
Average Hour	1.0	133,128	0.4444
Maximum Hour Extra Capacity	1.1	146,441	0.4888
Subtotal	2.1	279,569	0.9332
Fire Protection		20,000	0.0668
Total		299,569	1.0000

The allocation factors in column 7 of Factor 4 are based on the relative potential fire demands of General Service and Public and Private Fire Protection Service..

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS, cont.

FACTOR 4. ALLOCATION OF COSTS ASSOCIATED WITH FACILITIES SERVING BASE, MAXIMUM HOUR EXTRA CAPACITY AND FIRE PROTECTION FUNCTIONS, cont.

BASIS FOR ALLOCATING DEMAND RELATED COSTS OF FIRE SERVICE TO COMMERCIAL, PRIVATE FIRE PROTECTION AND PUBLIC FIRE PROTECTION CUSTOMER CLASSIFICATIONS

Description	Restrictive Diameters Squared	Quantity	Relative Demand	Allocation Factor
(1)	(2)	(3)	(4)=(2)x(3)	(5)
General Service - Commercial				
4 -inch meter	16.00	249	3,984	
6 -inch meter	36.00	357	12,852	
8 -inch meter	64.00	77	4,928	
		683	21,764	0.0225
Private Fire Protection				
Fire Lines				
1 -inch fire line	1.00	15	15	
1.25 -inch fire line	1.56	2	3	
1.5 -inch fire line	2.25	3	7	
2 -inch fire line	4.00	87	348	
3 -inch fire line	9.00	26	234	
4 -inch fire line	16.00	388	6,208	
6 -inch fire line	36.00	1,242	44,712	
8 -inch fire line	64.00	616	39,424	
10 -inch fire line	100.00	62	6,200	
12 -inch fire line	144.00	15	2,160	
Hydrants	25.00	1,619	40,475	
Total Private Fire Protection		4,075	139,786	0.1445
Public Fire Protection				
Total Fire Hydrants	20.75 Avg.	38,821	805,536	
Total Public Fire Protection		38,821	805,536	0.8330
Total Fire Protection		43,579	967,086	1.0000

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS, cont.

FACTOR 4 AND 4A. ALLOCATION OF COSTS ASSOCIATED WITH FACILITIES SERVING BASE AND MAXIMUM HOUR EXTRA CAPACITY FUNCTIONS, cont.

Customer Classification	Average Hourly Consumption 100 Gals.	Maximum Hour Extra Capacity Factor*	Maximum Hour Extra Capacity Rate, 100 Gals. Per Hour	Factor 4 Allocation Factor	Factor 4A Allocation Factor
(1)	(2)	(3)	(4)=(2)x(3)	(5)	(5)
Residential	27,707.4	4.0	110,829.7	0.6574	0.6087
Commercial	14,566.9	3.6	52,440.8	0.3112	0.3200
Industrial	3,245.4	0.7	2,271.8	0.0135	0.0713
Public	2,090.0	1.4	2,926.1	0.0174	
Other Water Utilities A	26.8	2.2	59.0	0.0004	
Other Water Utilities B	0.5	19.0	10.3	0.0001	
Total	47,637.1		168,537.6	1.0000	1.0000

* Ratio Of Maximum Hour To Average Hour Minus 1.0.

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PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS, cont.

FACTOR 5. ALLOCATION OF COSTS ASSOCIATED WITH POWER AND PUMPING EQUIPMENT OTHER

Factors are based on the weighting of the maximum daily consumption with fire, Factor 3, and the maximum hour consumption, Factor 4, for each customer classification, as follows.

Customer Classification	Maximum Daily Consumption		Maximum Hourly Consumption		Allocation Factor
	Allocation Factor 3	Weighted Factor	Allocation Factor 4	Weighted Factor	
(1)	(2)	(3)=(2)x 0.6667	(4)	(5)=(4)x 0.3333	(6)=(3)+5
Residential	0.5540	0.3694	0.5749	0.1917	0.5611
Commercial	0.3008	0.2005	0.2869	0.0956	0.2961
Industrial	0.0628	0.0419	0.0412	0.0137	0.0556
Public	0.0344	0.0229	0.0276	0.0092	0.0321
Other Water Utilities A	0.0005	0.0003	0.0005	0.0002	0.0005
Other Water Utilities B	0.0001	0.0001	0.0000	0.0000	0.0001
Private Fire Protection	0.0072	0.0048	0.0103	0.0034	0.0082
Public Fire Protection	0.0402	0.0268	0.0586	0.0195	0.0463
Total	1.0000	0.6667	1.0000	0.3333	1.0000

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS, cont.

FACTOR 5A. ALLOCATION OF COSTS ASSOCIATED WITH POWER AND PUMPING FACILITIES.

Factors are based on the a composite of rate base costs related to pumping equipment.

Customer Classification	Account 311 Net Original Cost Measure of Value	Allocation Factor
(1)	(2)	(3)
Residential	$ 47,007,827	0.5704
Commercial	24,936,521	0.3026
Industrial	4,805,862	0.0583
Public	2,740,146	0.0333
Other Water Utilities A	41,201	0.0005
Other Water Utilities B	6,584	0.0001
Private Fire Protection	433,846	0.0053
Public Fire Protection	2,429,546	0.0295
Total	$ 82,401,533	1.0000

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS

FACTOR 6. ALLOCATION OF WATER TREATMENT OPERATION EXPENSES.

Factors are based on the allocation of water treatment operation salaries and wages, as follows:

Customer Classification	Water Treatment Operation Salaries and Wages	Allocation Factor
(1)	(2)	(3)
Residential	$ 7,181,273	0.5779
Commercial	3,880,505	0.3123
Industrial	806,535	0.0649
Public	443,030	0.0357
Other Water Utilities A	6,213	0.0005
Other Water Utilities B	1,242	0.0001
Private Fire Protection	17,508	0.0014
Public Fire Protection	89,963	0.0072
Total	$ 12,426,269	1.0000

FACTOR 7. ALLOCATION OF WATER TREATMENT MAINTENANCE EXPENSES.

Factors are based on the allocation of water treatment maintenance salaries and wages, as follows:

Customer Classification	Water Treatment Maintenance Salaries and Wages	Allocation Factor
(1)	(2)	(3)
Residential	$ 1,774,980	0.5772
Commercial	957,548	0.3114
Industrial	197,722	0.0643
Public	108,969	0.0354
Other Water Utilities A	1,537	0.0005
Other Water Utilities B	308	0.0001
Private Fire Protection	5,432	0.0018
Public Fire Protection	28,551	0.0093
Total	$ 3,075,047	1.0000

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS, cont.

FACTOR 8. ALLOCATION OF COSTS ASSOCIATED WITH MAINS.

Factors are based on the weighting of the maximum daily consumption, Factor 3, and the maximum hour consumption, Factor 4, for each customer classification, as follows:

	10-inch and Larger		Under 10-inch		
Customer Classification	Allocation Factor 3	Weighted Factor	Allocation Factor 4	Weighted Factor	Allocation Factor
(1)	(2)	(3)=(2)x 0.2788	(4)	(5)=(4)x 0.7212	(6)=(3)+(5)
Residential	0.5540	0.1545	0.5749	0.4146	0.5691
Commercial	0.3008	0.0839	0.2869	0.2069	0.2908
Industrial	0.0628	0.0175	0.0412	0.0297	0.0472
Public	0.0344	0.0096	0.0276	0.0199	0.0295
Other Water Utilities A	0.0005	0.0001	0.0005	0.0004	0.0005
Other Water Utilities B	0.0001	0.0000	0.0000	0.0000	0.0000
Private Fire Protection	0.0072	0.0020	0.0103	0.0074	0.0094
Public Fire Protection	0.0402	0.0112	0.0586	0.0423	0.0535
Total	1.0000	0.2788	1.0000	0.7212	1.0000

The weighting of the factors is based on the length of transmission mains and distribution mains, as follows:

	Length of Mains (Feet)	Weight
10-inch and Larger	15,096,964	0.2788
Under 10-inch	39,056,779	0.7212
Total	54,153,743	1.0000

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS, cont.

FACTOR 9. ALLOCATION OF COSTS ASSOCIATED WITH FIRE HYDRANTS.

These costs are assigned directly to Public Fire Protection.

Customer Classification	Allocation Factor
(1)	(2)
Public Fire Protection	1.0000

FACTOR 10. ALLOCATION OF COSTS ASSOCIATED WITH METERS.

Factors are based on the relative cost of meters by size and customer classification, as developed on the following page and summarized below.

Customer Classification	5/8" Dollar Equivalents	Allocation Factor
(1)	(2)	(3)
Residential	648,508	0.77691
Commercial	158,500	0.18989
Industrial	6,532	0.00783
Public	15,322	0.01836
Other Water Utilities A	140	0.00017
Other Water Utilities B	105	0.00013
Private Fire Protection	5,597	0.00671
Total	834,704	1.00000

FACTOR 11. ALLOCATION OF COSTS ASSOCIATED WITH SERVICES.

Factors are based on the relative cost of services by size and customer classification, as developed on the second of the following pages, and summarized below.

Customer Classification	3/4" Dollar Equivalents	Allocation Factor
(1)	(2)	(3)
Residential	614,030	0.88781
Commercial	60,206	0.08705
Industrial	1,478	0.00214
Public	4,232	0.00612
Other Water Utilities A	13	0.00002
Other Water Utilities B	16	0.00002
Private Fire Protection	11,650	0.01684
Total	691,625	1.00000

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

BASIS FOR ALLOCATING METER COSTS TO CUSTOMER CLASSIFICATIONS

Meter Size	5/8" Dollar Equivalent	Residential		Commercial		Industrial		Public		Other Water Utilities A		Other Water Utilities B		Private Fire Protection		Total	
		Number of Meters	Weighting	Number of Meters	Weighting	Number of Meters	Weighting	Number of Meters	Weighting	Number of Meters	Weighting	Number of Meters	Weighting	Number of Meters	Weighting	Number of Meters	Weighting
(1)	(2)	(3)	(4)=(2)X(3)	(5)	(6)=(2)X(5)	(7)	(8)=(2)X(7)	(9)	(10)=(2)X(9)	(11)	(12)=(2)X(11)	(13)	(14)=(2)X(13)	(15)	(16)=(2)X(15)	(17)	(18)
5/8	1.0	606,879	606,879	29,077	29,077	52	52	822	822	0	0	0	0	0	0	636,831	636,830
3/4	1.6	948	1,485	1,766	2,767	7	11	62	98	0	0	0	0	0	0	2,783	4,361
1	1.9	20,085	38,446	6,864	13,139	88	169	464	887	0	0	0	0	15	29	27,516	52,670
1-1/2	2.2	347	773	1,322	2,941	42	93	84	187	0	0	0	0	3	7	1,798	4,001
2	2.9	131	384	3,734	10,930	165	483	591	1,729	1	3	3	9	40	117	4,665	13,655
3	8.5	0	0	119	1,011	12	101	31	264	0	0	1	4	11	93	174	1,473
4	21.0	14	299	1,578	33,198	66	1,393	142	2,982	1	19	3	62	69	1,452	1,873	39,405
6	30.7	8	242	1,447	44,374	73	2,248	204	6,247	4	118	1	30	81	2,484	1,817	55,743
8	34.2	0	0	518	17,721	41	1,403	50	1,725	0	0	0	0	26	889	636	21,738
10	52.6	0	0	64	3,342	11	579	7	381	0	0	0	0	10	526	91.82167	4,828
Total		628,413	648,508	46,490	158,500	557	6,532	2,457	15,322	6	140	7	105	255	5,597	678,186	834,704

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

BASIS FOR ALLOCATING SERVICE COSTS TO CUSTOMER CLASSIFICATIONS

Service Size	3/4" Dollar Equivalent	Residential		Commercial		Industrial		Public		Other Water Utilities A		Other Water Utilities B		Private Fire Protection		Total	
		Number of Services	Weighting	Number of Services	Weighting	Number of Services	Weighting	Number of Services	Weighting	Number of Services	Weighting	Number of Services	Weighting	Number of Services	Weighting	Number of Services	Weighting
(1)	(2)	(3)	(4)=(2)X(3)	(5)	(6)=(2)X(5)	(7)	(8)=(2)X(7)	(9)	(10)=(2)X(9)	(11)	(12)=(2)X(11)	(13)	(14)=(2)X(13)	(15)	(16)=(2)X(15)	(17)	(18)
3/4 & 1"	1.00	613,181 *	613,181	37,134 **	37,134	147	147	1,348	1,348	0	0	0	0	17	17	651,828	651,827
1-1/2	1.18	347	409	1,322	1,556	42	49	84	99	0	0	0	0	3	4	1,798	2,117
2	2.24	131	294	3,734	8,375	165	370	591	1,325	1	2	3	7	87	195	4,712	10,568
3	2.09	0	0	119	249	12	25	31	65	0	0	1	1	26	54	189	394
4	1.93	14	27	1,578	3,047	66	128	142	274	1	2	3	6	388	749	2,192	4,233
6	2.35	14	33	1,447	3,400	73	172	204	479	4	9	1	2	1,242	2,919	2,985	7,014
8	10.85	8	86	518	5,624	41	445	50	548	0	0	0	0	616	6,686	1,234	13,389
10	12.92	0	0	64	821	11	142	7	94	0	0	0	0	62	801	144	1,858
12	14.98	0	0	0	0	0	0	0	0	0	0	0	0	15	225	15	225
Total		613,696	614,030	45,916	60,206	557	1,478	2,457	4,232	6	13	7	16	2,456	11,650	665,097	691,625

* Reduced by 14,731 service lines.
** Reduced by 574 service lines.

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS, cont.

FACTOR 12. ALLOCATION OF TRANSMISSION AND DISTRIBUTION OPERATION SUPERVISION AND ENGINEERING AND OTHER OPERATION DEPARTMENT EXPENSES.

The factors are based on the allocation of Transmission and Distribution Operation Salaries and Wages, as follows:

Customer Classification	Transmission & Distribution Operation Salaries & Wages	Allocation Factor
(1)	(2)	(3)
Residential	$ 2,175,748	0.6173
Commercial	931,606	0.2643
Industrial	137,086	0.0389
Public	93,303	0.0265
Other Water Utilities A	1,500	0.0004
Other Water Utilities B	65	0.0000
Private Fire Protection	33,632	0.0095
Public Fire Protection	152,031	0.0431
Total	$ 3,524,971	1.0000

FACTOR 13. ALLOCATION OF TRANSMISSION AND DISTRIBUTION MAINTENANCE SUPERVISION AND ENGINEERING AND OTHER MAINTENANCE DEPARTMENT EXPENSES.

The factors are based on the allocation of Transmission and Distribution Maintenance Salaries and Wages, as follows:

Customer Classification	Transmission & Distribution Maintenance Salaries & Wages	Allocation Factor
(1)	(2)	(3)
Residential	$ 2,056,854	0.6488
Commercial	559,941	0.1766
Industrial	74,510	0.0235
Public	53,111	0.0168
Other Water Utilities A	789	0.0002
Other Water Utilities B	28	0.0000
Private Fire Protection	36,881	0.0116
Public Fire Protection	388,500	0.1225
Total	$ 3,170,614	1.0000

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS, cont.

FACTOR 14. ALLOCATION OF CUSTOMER ACCOUNTING, BILLING AND COLLECTING COSTS.

Factors are based on the pro forma number of customers, as follows:

Customer Classification	Proforma Number of Customers	Allocation Factor
(1)	(2)	(3)
Residential	628,413	0.92086
Commercial	46,490	0.06813
Industrial	557	0.00082
Public	2,457	0.00360
Other Water Utilities A	6	0.00001
Other Water Utilities B	7	0.00001
Private Fire Protection	4,075	0.00597
Public Fire Protection	409	0.00060
Total	682,415	1.00000

FACTOR 15. ALLOCATION OF METER READING COSTS.

Factors are based on the number of meters by class.

Customer Classification	Pro Forma Number of Meters	Allocation Factor
(1)	(2)	(3)
Residential	628,413	0.92682
Commercial	46,490	0.06857
Industrial	557	0.00082
Public	2,457	0.00362
Other Water Utilities A	6	0.00001
Other Water Utilities B	7	0.00001
Private Fire Protection	105	0.00015
Total	678,036	1.00000

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS, cont.

FACTOR 16. ALLOCATION OF ADMINISTRATIVE AND GENERAL EXPENSES.

The factors are based on the allocation of all other operation and maintenance expenses excluding purchased water, power, fuel, chemicals and waste disposal expenses.

Customer Classification	Operation & Maintenance Expenses	Allocation Factor
(1)	(2)	(3)
Residential	$ 50,932,229	0.6842
Commercial	16,225,970	0.2179
Industrial	2,588,434	0.0348
Public	1,597,497	0.0215
Other Water Utilities A	21,750	0.0003
Other Water Utilities B	3,158	0.0000
Private Fire Protection	381,205	0.0051
Public Fire Protection	2,698,750	0.0362
Total	$ 74,448,993	1.0000

FACTOR 16A. ALLOCATION OF CASH WORKING CAPITAL - EXPENSES

The functions are based on the allocation of all other operation and maintenance expenses excluding regulatory commission expense.

Customer Classification	Operation & Maintenance Expenses	Allocation Factor
(1)	(2)	(3)
Residential	$ 152,465,466	0.6797
Commercial	49,892,579	0.2224
Industrial	8,910,075	0.0397
Public	5,363,555	0.0239
Other Water Utilities A	73,493	0.0003
Other Water Utilities B	3,354	0.0000
Private Fire Protection	1,025,957	0.0046
Public Fire Protection	6,592,913	0.0294
Total	$ 224,327,392	1.0000

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS, cont.

FACTOR 17. ALLOCATION OF LABOR RELATED TAXES AND BENEFITS.

The factors are based on the allocation of direct salaries and wages as follows:

Customer Classification	Salaries and Wages	Allocation Factor
(1)	(2)	(3)
Residential	$ 40,144,640	0.6614
Commercial	14,044,647	0.2314
Industrial	2,333,736	0.0384
Public	1,447,048	0.0238
Other Water Utilities A	20,038	0.0003
Other Water Utilities B	1,987	0.0000
Private Fire Protection	326,381	0.0054
Public Fire Protection	2,388,499	0.0393
Total	$60,706,976	1.0000

FACTOR 18. ALLOCATION OF ORGANIZATION, FRANCHISES AND CONSENTS, OTHER INTANGIBLE PLANT AND OTHER RATE BASE ELEMENTS.

The factors are based on the allocation of the original cost less depreciation other than those items being allocated, as follows:

Customer Classification	Original Cost Less Depreciation	Allocation Factor
(1)	(2)	(3)
Residential	$ 3,016,993,310	0.6010
Commercial	1,308,065,424	0.2606
Industrial	225,630,512	0.0449
Public	133,402,177	0.0266
Other Water Utilities A	2,056,741	0.0004
Other Water Utilities B	206,029	0.0000
Private Fire Protection	41,023,184	0.0082
Public Fire Protection	292,925,362	0.0583
Total	$ 5,020,302,739	1.0000

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS, cont.

FACTOR 19. ALLOCATION OF INCOME TAXES AND INCOME AVAILABLE FOR RETURN.

The factors are based on the allocation of the original cost measure of value rate base as shown on the following pages and summarized below:

Customer Classification	Original Cost Measure of Value	Allocation Factor
(1)	(2)	(3)
Residential	$ 2,427,005,536	0.6015
Commercial	1,049,576,924	0.2602
Industrial	180,766,020	0.0448
Public	107,601,832	0.0267
Other Water Utilities A	1,667,380	0.0004
Other Water Utilities B	206,029	0.0001
Private Fire Protection	32,816,382	0.0081
Public Fire Protection	234,764,625	0.0582
Total	$ 4,034,404,728	1.0000

FACTOR 20. ALLOCATION OF REGULATORY COMMISSION EXPENSES, ASSESSMENTS AND OTHER WATER REVENUES.

The factors are based on the allocation of the total cost of service, excluding those items being allocated.

Customer Classification	Total Cost of Service	Allocation Factor
(1)	(2)	(3)
Residential	$ 497,698,439	0.6294
Commercial	195,293,398	0.2470
Industrial	33,665,562	0.0426
Public	20,376,282	0.0258
Other Water Utilities A	296,934	0.0004
Other Water Utilities B	50,688	0.0001
Private Fire Protection	5,402,762	0.0068
Public Fire Protection	37,884,965	0.0479
Total	$ 790,669,030	1.0000

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

FACTOR 19. ORIGINAL COSTS MEASURE OF VALUE RATE BASE ALLOCATED TO CUSTOMER CLASSIFICATIONS

Account Number	Account Description	Factor Ref.	Cost of Service	Residential	Commercial	Industrial	Other Public Authority	Other Water Utilities Group A	Other Water Utilities Group B	Private Fire Protection	Public Fire Protection
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Nondepreciable Plant										
301.00	Organization	18	$ 766,405	$ 460,609	$ 199,725	$ 34,412	$ 20,386	$ 307	$ -	$ 6,285	$ 44,681
302.00	Franchises and Consents	18	2,404,599	1,445,164	626,639	107,967	63,962	962	-	19,718	140,188
303.00	Other Intangible Plant	18	15,572	9,359	4,058	699	414	6	-	128	908
303.11	Water Rights	1		-	-	-	-	-	-	-	-
303.12	Reservoir Land	1		-	-	-	-	-	-	-	-
303.13	Other Sources of Supply Land	2		-	-	-	-	-	-	-	-
303.20	Power and Pumping Land	5	6,315,147	3,543,429	1,869,915	351,122	202,716	3,158	632	51,784	292,391
303.30	Purification Land	2	446,173	258,199	139,786	29,269	16,018	223	45	446	2,186
303.40	Transmission and Distribution Land	8	3,299,941	1,877,995	959,623	155,757	97,348	1,650	-	31,019	176,547
303.50	Distr. Reservoir & Standpipe Land	4	9,308,301	5,351,340	2,670,551	383,502	256,909	4,654	-	95,875	545,466
303.61	Office Land	16	3,472,993	2,376,222	756,765	120,860	74,669	1,042	-	17,712	125,722
303.62	Stores, Shop and Garage Land	16		-	-	-	-	-	-	-	-
	Total Nondepreciable Plant		26,029,130	15,322,317	7,227,062	1,183,588	732,422	12,002	677	222,967	1,328,089
	Depreciable Plant										
303.14	Water Rights - Hibernia Dam	1	-	-	-	-	-	-	-	-	-
303.35	Waste Handling & Treatment Land	1	-	(1)	-	-	-	-	-	-	-
304	Comprehensive Planning Studies	18	2,135,211	1,283,262	556,436	95,871	56,797	854	-	17,509	124,483
304.15	Other Water Source Structures	2	41,080,953	23,773,547	12,870,663	2,694,911	1,474,806	20,540	4,108	41,081	201,297
304.20	Power and Pumping Structures	5A	103,147,576	58,041,140	30,665,774	7,313,163	-	-	-	1,062,420	6,065,077
304.30	Purification Buildings	2	230,553,754	133,421,457	72,232,491	15,124,326	8,276,880	115,277	23,055	230,554	1,129,713
304.36	Waste Handling & Treatment Structures	1	17,799,241	10,154,467	5,337,992	1,384,781	765,367	10,680	-	24,919	121,035
304.38	Waste Handling & Treatment Structure	1	998,222	569,486	299,367	77,662	42,924	599	-	1,398	6,788
304.39	Purification Buildings - Tank Painting	2	3,366	1,948	1,055	221	121	2	-	3	16
304.61	Office Buildings	16	36,468,069	24,951,453	7,946,392	1,269,089	784,063	10,940	-	185,987	1,320,144
304.62	Stores, Shop and Garage Bldgs.	16	49,783,673	34,061,988	10,847,862	1,732,472	1,070,349	14,935	-	253,897	1,802,169
304.63	Misc. Structures and Improvements	16	277,287	189,720	60,421	9,650	5,962	83	-	1,414	10,038
305.00	Collecting & Impounding Reservoirs	1	167,681,702	95,662,411	50,287,742	13,045,636	7,210,313	100,609	-	234,754	1,140,236
306.00	Lake, River and Other Intakes	2	12,151,561	7,032,108	3,807,084	797,142	436,241	6,076	1,215	12,152	59,543
307.00	Wells and Springs	2	11,172,991	6,465,809	3,500,498	732,948	401,110	5,586	1,117	11,173	54,748
310.00	Power Generation Equipment	5A	30,030,000	16,897,880	8,927,919	2,129,127	-	-	-	309,309	1,765,764
311.20	Pumping Equipment Other	5	29,482,058	16,542,383	8,729,637	1,639,202	946,374	14,741	2,948	241,753	1,365,019
311.52	Pumping Equipment Source of Supply	2	12,506,065	7,237,260	3,918,150	820,398	448,968	6,253	1,251	12,506	61,280
311.53	Pumping Equipment Water Treatment	2	23,845,076	13,799,145	7,470,662	1,564,237	856,038	11,923	2,385	23,845	116,841
311.54	Pumping Equipment T&D	8	16,568,335	9,429,039	4,818,072	782,025	488,766	8,284	-	155,742	886,406
320.00	Purification System	2	305,624,582	176,864,946	95,752,182	20,048,973	10,971,922	152,812	30,562	305,625	1,497,560
330.00	Distr. Reservoirs and Standpipes	4	145,544,018	83,673,256	41,756,579	5,996,414	4,017,015	72,772	-	1,499,103	8,528,879
331.00	Mains and Accessories										
	10-inch and Over	3	1,086,181,194	601,744,382	326,723,303	68,212,179	37,364,633	543,091	108,618	7,820,505	43,664,484
	Under 10-inch	4	1,738,381,883	999,395,744	498,741,762	71,621,334	47,979,340	869,191	-	17,905,333	101,869,178
333.00	Services	11	515,442,433	457,614,946	44,869,264	1,103,047	3,154,508	10,309	10,309	8,680,051	-

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

FACTOR 19. ORIGINAL COSTS MEASURE OF VALUE RATE BASE ALLOCATED TO CUSTOMER CLASSIFICATIONS

Account Number	Account Description	Factor Ref.	Cost of Service	Residential	Commercial	Industrial	Other Public Authority	Other Water Utilities Group A	Other Water Utilities Group B	Private Fire Protection	Public Fire Protection
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
334.00	Meters	10	150,557,597	116,969,703	28,589,382	1,178,866	2,764,237	25,595	19,572	1,010,241	-
335.00	Fire Hydrants	9	114,686,964	-	-	-	-	-	-	-	114,686,964
340.00	Office Furniture	16	3,846,920	2,632,063	838,244	133,873	82,709	1,154	-	19,619	139,259
340.00	Computers and Peripheral Equipment	16	7,111,642	4,865,785	1,549,627	247,485	152,900	2,133	-	36,269	257,441
340.00	Other Office Equipment	16	5,548	3,796	1,209	193	119	2	-	28	201
340.00	Computer Software	16	17,142,826	11,729,122	3,735,422	596,570	368,571	5,143	-	87,428	620,570
340.00	Computer Software	16	12,309,510	8,422,167	2,682,242	428,371	264,654	3,693	-	62,779	445,604
341.00	Computer Software - CIS	14	6,310,553	5,811,136	429,938	5,175	22,718	63	63	37,674	3,786
341.00	Transportation Equipment	16	33,222,982	22,731,164	7,239,288	1,156,160	714,294	9,967	-	169,437	1,202,672
342.00	Stores Equipment	16	307,716	210,539	67,051	10,709	6,616	92	-	1,569	11,139
343.00	Tools and work Equipment	16	33,550,332	22,955,137	7,310,617	1,167,552	721,332	10,065	-	171,107	1,214,522
344.00	Laboratory Equipment	2	1,491,006	862,845	467,132	97,810	53,527	746	149	1,491	7,306
345.00	Power Operated Equpment	16	992,766	679,250	216,324	34,548	21,344	298	-	5,063	35,938
346.00	Communication Equipment	16	21,051,909	14,403,716	4,587,211	732,606	452,616	6,316	-	107,365	762,079
347.00	Miscellaneous Equipment	16	19,846,700	13,579,112	4,324,596	690,665	426,704	5,954	-	101,218	718,451
348.00	Other Tangible Equipment	16	301,193	206,076	65,630	10,482	6,476	90	-	1,536	10,903
	Total Depreciable Plant		4,999,595,414	3,004,869,387	1,302,225,220	224,685,873	132,811,314	2,046,868	205,352	40,843,857	291,907,533
	Total Utility Plant in Service (Net)		5,025,624,544	3,020,191,704	1,309,452,282	225,869,461	133,543,736	2,058,870	206,029	41,066,824	293,235,622
	Other Rate Base Elements										
	Materials and Supplies	18	11,145,046	6,698,172	2,904,399	500,413	296,458	4,458	-	91,389	649,756
	Cash Working Capital - Expenses	16A	23,311,966	15,845,143	5,184,581	925,485	557,156	6,994	-	107,235	685,372
	Cash Working Capital - Interest	18	(7,295,957)	(4,384,870)	(1,901,326)	(327,588)	(194,072)	(2,918)	-	(59,827)	(425,354)
	Accrued and Prepaid Taxes	18	6,838,143	4,109,724	1,782,020	307,033	181,895	2,735	-	56,073	398,664
	Extension Deposits in Suspense	4	(13,696)	(7,874)	(3,929)	(564)	(378)	(7)	-	(141)	(803)
	Unamortized Investment Tax Credit	18	(236,891)	(142,371)	(61,734)	(10,636)	(6,301)	(95)	-	(1,943)	(13,811)
	Deferred Taxes	18	(1,007,764,482)	(605,666,454)	(262,623,424)	(45,248,625)	(26,806,535)	(403,106)	-	(8,263,669)	(58,752,669)
	Citizens Acquistion CIAC & CAC	4A	(18,326,990)	(10,312,597)	(5,448,614)	(1,299,384)	-	-	-	(188,768)	(1,077,627)
	Tax Cust and Jobs Act- Stub Period	18	(5,541,711)	(3,330,568)	(1,444,170)	(248,823)	(147,410)	(2,217)	-	(45,442)	(323,082)
	Other Additions	18	414,924	249,369	108,129	18,630	11,037	166	-	3,402	24,190
	Other Deductions	18	(473,043)	(284,299)	(123,275)	(21,240)	(12,583)	(189)	-	(3,879)	(27,578)
	Acquisition Adjustments	18	6,722,891	4,040,457	1,751,985	301,858	178,829	2,689	-	55,128	391,945
	Total Other Rate Base Elements		(991,219,800)	(593,186,168)	(259,875,358)	(45,103,441)	(25,941,904)	(391,490)	-	(8,250,442)	(58,470,997)
	Total Original Cost Rate Base		4,034,404,744	2,427,005,536	1,049,576,924	180,766,020	107,601,832	1,667,380	206,029	32,816,382	234,764,625

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS, cont.

FACTOR 21. ALLOCATION OF UNRECOVERED PUBLIC FIRE PROTECTION.

Factors are based on the relative cost of meters by size for the Residential, Commercial, Industrial, and Public classifications, as follows:

Customer Classification	5/8" Dollar Equivalents	Allocation Factor
(1)	(2)	(3)
Residential	$ 648,508	0.7824
Commercial	158,500	0.1912
Industrial	6,532	0.0079
Public	15,322	0.0185
Total	$ 828,860	1.0000

FACTOR 22. ALLOCATION OF BAD DEBT EXPENSE.

Factors are based on the historic net charge offs by class.

Customer Classification	Net Charge Off	Allocation Factor
(1)	(2)	(3)
Residential	$ 9,347,510	0.8930
Commercial	1,090,397	0.1042
Industrial	3,276	0.0003
Public	8,925	0.0009
Other Water Utilities A	413	0.0000
Other Water Utilities B	-	0.0000
Private Fire Protection	17,001	0.0016
Public Fire Protection	-	0.0000
Total	$ 10,467,520	1.0000

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

FACTORS FOR ALLOCATING COST OF SERVICE TO CUSTOMER CLASSIFICATIONS, cont.

FACTOR 23. ALLOCATION OF LATE PAYMENT FEES.

Factors based on collection of Late Payment fees by class.

Customer Classification	Late Payment Fees	Allocation Factor
(1)	(2)	(3)
Residential	$ 1,021,320	0.7571
Commercial	233,476	0.1730
Industrial	33,581	0.0249
Public	31,598	0.0234
Other Water Utilities A	4,375	0.0032
Other Water Utilities B	-	0.0000
Private Fire Protection	24,842	0.0184
Public Fire Protection	-	0.0000
Total	$ 1,349,191	1.0000

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

CALCULATION OF COMMODITY/DEMAND RATES FOR STANDBY SERVICE
UNDER PROPOSED LEVEL OF REVENUE

Firm Standby Service:

Description	Cost of Service Annual	Cost of Service Per Month	Units Hundred Gals.	Cost Per Unit	
Total Base Costs	$ 396,805,061				
Less: Variable Costs	35,274,607		421,959,612	$ 0.0836	Per Hundred Gallons
Fixed Base Costs	361,530,454	30,127,538	1,156,054 Avg Day	26.0607	Per Hundred of Avg. Day
Max Day Extra Capacity	91,188,762	7,599,064	2,264,982 Peak Day	3.3550	Per Hundred of Peak Day
Max Hour Extra Capacity	124,832,579	10,402,715	262,912 Peak Hour	39.5673	Per Hundred of Peak Hour

Interruptible Standby Service:

Description	Cost of Service Annual	Cost of Service Per Month	Units Hundred Gals.	Cost Per Unit	
Fixed Base Costs	$ 361,530,454				
Less: Depreciation Return and Taxes	261,856,449				
Total	99,674,005	8,306,167	1,156,054 Avg Day	$ 7.1849	Per Hundred of Avg. Day
Max Day Extra Capacity	91,188,762				
Less: Depreciation Return and Taxes	62,126,342				
Total	29,062,420	2,421,868	2,264,982 Peak Day	1.0693	Per Hundred of Peak Day
Max Hour Extra Capacity	124,832,579				
Less: Depreciation Return and Taxes	98,723,442				
Total	26,109,137	2,175,761	262,912 Peak Hour	8.2755	Per Hundred of Peak Hour
Depreciation, Return & Taxes for Base, Max Day and Max Hour	422,706,233				
Plus: Variable Costs	35,274,607				
Total	457,980,840		421,959,612	1.0854	Per Hundred Gallons

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

SUMMARY OF AVERAGE AND MAXIMUM DAY SYSTEM SENDOUT AND MAXIMUM DAY RATIOS

Year	Average Daily Sendout (MGD)	Maximum Day Sendout (MGD)	Ratio, Maximum to Average
1987	153.4	207.7	1.35
1988	152.7	209.1	1.37
1989	144.8	188.6	1.30
1990	144.9	192.5	1.33
1991	145.1	192.3	1.32
1992	141.5	181.4	1.28
1993	138.7	184.3	1.33
1994	149.4	202.1	1.35
1995	144.1	198.5	1.38
1996	211.4	290.9	1.38
1997	220.3	297.7	1.35
1998	212.2	279.6	1.32
1999	199.1	275.0	1.38
2000	207.5	263.6	1.27
2001	200.5	249.5	1.24
2002	210.4	259.6	1.23
2003	199.8	273.7	1.37
2004	218.1	279.7	1.28
2005	215.3	268.2	1.25
2006	210.1	259.8	1.24
2007	220.9	266.6	1.21
2008	212.4	254.3	1.20
2009	206.0	267.8	1.30
2010	205.8	262.4	1.28
2011	202.3	240.0	1.19
2012	194.0	236.3	1.22
2013	192.7	221.3	1.15
2014	195.7	222.7	1.14
2015	194.7	226.7	1.16
2016	190.7	214.0	1.12
2017	184.8	207.3	1.12
2018	192.2	220.3	1.15
2019	193.7	215.8	1.11
2020	189.7	222.1	1.17
2021	191.7	219.1	1.14

APPENDIX A

PENNSYLVANIA-AMERICAN WATER COMPANY

RESPONSES TO RATE STRUCTURE
AND COST OF SERVICE FILING REQUIREMENTS

RS1. Provide a complete (fully allocated) cost of service study if an interval of approximately three years has passed between a previous cost of service study and the historic test year date of the current filing. The cost of service study shall provide the necessary data to determine if the water rate structure is fair and equitable to all classifications of water users (including public and private fire protection customers) and reflects, as nearly as possible, the cost of providing the service. The study shall correspond to the test year proposed revenue requirements (future test year only, if used). Summaries of conclusions and all back-up calculations shall be made part of the submission of the cost of service study, and shall include the following:

a. A description of the allocation methods used. A comparison of the allocated cost of service by class with the present and proposed revenues. A cost of service schedule showing the Rate of Return produced by present and proposed rates by class of service.

RESPONSE

A description of the methods used for the cost of service study is provided on Exhibit 12-A and in PAWC Statement No. 12. A comparison of the allocated cost of service by class with the present and proposed revenues is provided on Schedule A of Exhibit 12-A. Schedules B and C showing the rate of return produced by present and proposed rates by customer classification are provided in Exhibit 12-A.

PENNSYLVANIA-AMERICAN WATER COMPANY

RESPONSES TO RATE STRUCTURE
AND COST OF SERVICE FILING REQUIREMENTS

RS1. Provide a complete (fully allocated) cost of service study if an interval of approximately three years has passed between a previous cost of service study and the historic test year date of the current filing. The cost of service study shall provide the necessary data to determine if the water rate structure is fair and equitable to all classifications of water users (including public and private fire protection customers) and reflects, as nearly as possible, the cost of providing the service. The study shall correspond to the test year proposed revenue requirements (future test year only, if used). Summaries of conclusions and all back-up calculations shall be made part of the submission of the cost of service study, and shall include the following:

b. Indicate if the method used for establishing the allocation factors in the Cost of Service Study deviates from the previous study submitted in the last rate case. If yes, indicate which allocation factors were changed and discuss the reason for the changes.

RESPONSE

The methods used for establishing the allocation factors in the cost of service study have not deviated from the previous study submitted in the last case.

PENNSYLVANIA-AMERICAN WATER COMPANY

RESPONSES TO RATE STRUCTURE
AND COST OF SERVICE FILING REQUIREMENTS

RS1. Provide a complete (fully allocated) cost of service study if an interval of approximately three years has passed between a previous cost of service study and the historic test year date of the current filing. The cost of service study shall provide the necessary data to determine if the water rate structure is fair and equitable to all classifications of water users (including public and private fire protection customers) and reflects, as nearly as possible, the cost of providing the service. The study shall correspond to the test year proposed revenue requirements (future test year only, if used). Summaries of conclusions and all back-up calculations shall be made part of the submission of the cost of service study, and shall include the following:

c. Supply the average day, the maximum day and the maximum hour deliveries to the system adjusted for storage for the test year and two prior years. Also provide workpapers, analyses, comparative data or other documentation supporting the estimated maximum day and peak hour demands by customer class reflected in the Company's cost of service study.

RESPONSE

Refer to Schedule G of Exhibit 12-A for the average day and maximum day system deliveries for the years 1987 through 2021. Support for the system maximum hour ratio is provided below and on the attached schedules.

The peak hour consumption analysis in support of the 2.1 system peak hour ratio is attached and summarized below.

Analyses were made to determine hourly water consumption during 1988 peak periods of sendout for PAWC's three largest operating districts, as follows:

Pittsburgh	July 5, 6 and 7, 1988
Riverton	July 6 and 7, 1988
Norristown	July 6, 7 and 8, 1988

These dates had the greatest sendouts experienced in recent years.

PENNSYLVANIA-AMERICAN WATER COMPANY

RESPONSES TO RATE STRUCTURE
AND COST OF SERVICE FILING REQUIREMENTS

RS1c., cont.

Recording charts or other hourly logs of total production were read to derive total hourly delivery to each of the districts. Recording charts for storage reservoirs were read to derive hourly draw or fill from each reservoir. The total hourly delivery plus hourly draw less hourly fill equals hourly consumption.

District	Average M.G.D.	Max Hour M.G.D.	Max Hour Ratio
Pittsburgh	69.28	140.88	2.03
Riverton	10.16	26.17	2.58
Norristown	12.68	22.53	1.78
Total	92.12	189.58	2.06

The attachments set forth the hourly deliveries, storage draws and fills and hourly consumption for the several days and districts which support the above amounts.

Support for the customer class demand factors is provided on the attached pages, Customer Class Demand Study, which was included in the Company's 2017 Rate Case that was filed on April 28, 2017 (Docket No. R-2017-2595853).

Witness: P. R. Herbert

PENNSYLVANIA AMERICAN WATER COMPANY

Hershey, Pennsylvania

CUSTOMER CLASS DEMAND STUDY

GANNETT FLEMING VALUATION AND RATE CONSULTANTS, LLC
Harrisburg, Pennsylvania

Gannett Fleming

Excellence Delivered ***As Promised***

February 27, 2017

Pennsylvania American Water Company
800 West Hersheypark Drive
Hershey, PA 17033-2400

Attention John Cox
Manager of Rates and Regulations

Gentlemen:

Pursuant to your request, we have prepared a customer class demand study. The study was conducted to provide a basis for the selection of class maximum day and hour demand ratios for use in the cost of service allocation study.

The attached report presents a description of the methods and procedures used, the usage data for each monitored customer, and the detailed calculations of maximum day and hour ratios by classification. The results of the study are presented on page I-9 of the report.

Respectfully submitted,

GANNETT FLEMING VALUATION
AND RATE CONSULTANTS, LLC

Paul R Herbert

PAUL R. HERBERT
President

CONSTANCE E. HEPPENSTALL
Project Manager, Rate Studies

PRH:mlw
058602

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PART III. DAILY AND HOURLY USAGE DATA (electronic file)

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PART I. INTRODUCTION

PLAN OF REPORT

The report sets forth the results of the customer class demand study conducted during the period of January 2013 through October 2015 for Pennsylvania American Water Company (Company). The study is organized into three parts. Part I, Introduction, contains statements with respect to the basis and purpose of the study, a description of the methods and procedures used, and a summary of the study results. Part II, Maximum Day and Hour Ratios, describes the calculations of the maximum day and maximum hour ratios for each customer class using the observed demand data. Part III, Daily and Hourly Usage Data, provides the daily usage for each monitored location and the hourly usage for selected days during the study period. Unless noted otherwise, all residential usage units are gallons and non-residential units are hundred gallons.

BASIS OF STUDY

Pursuant to the Join Petition for Settlement at Docket No. R-2011-2232243, approved by the Commission's Final Order entered November 10, 2011, the Joint Petitioners agreed that the Company would prepare and submit a study on the feasibility and costs of conducting a customer class demand study including the timetable required to complete such a study. In February 2012, the Company submitted the required Feasibility Study to the Joint Petitioners for their review and comment. The Feasibility Study outlined the scope of the proposed demand study, the facilities and equipment that would be required, and an estimate of the total costs. Subsequent to a meeting of the Joint Petitioners to discuss the Feasibility Study, the parties decided to move forward with the Demand Study.

PURPOSE OF STUDY

In the Base Extra-Capacity method of cost allocation, as described in AWWA Manual M1 - Principles of Water Rates, Fees, and Charges, the extra capacity portion of the water system is allocated to customer classifications based on the non-coincident demands of each classification. The non-coincident demand is the sum of the peaks for each class regardless of the day or hour such peaks may occur. The purpose of a customer class demand study is to establish a basis for selecting maximum day and maximum hour ratios for each customer classification. The ratios will be used for allocating maximum day and hour extra capacity costs in the cost of service allocation study prepared for the Company's rate filing. The results of the cost of service allocation study are used as a guide for designing the proposed rate structure.

METHOD AND PROCEDURES

Overview

The customers were selected for the study with the objective of obtaining a representative sample of customers in each class. Originally, customer usage was to be monitored for one year, with an extension possible if the weather was deemed insufficiently dry to capture typical peak water use behaviors. In order to determine whether to extend the study in subsequent years, the Palmer Drought Severity Index (PDSI) was used. The National Oceanic and Atmospheric Administration publishes the PDSI, among other measures of drought conditions. The PDSI is a long term measure that is used in determining the severity of droughts. The decision criterion for applying the PDSI to the demand study was that, if there was not at least one summer month (June-August) in which the PDSI was less than 1.0, the study would continue. As shown by the presence of green shading in Table 1-1 below, this threshold was met in the first study year for all but two climate divisions and had been met by August 2014 for all climate divisions. Since neither 2013 nor 2014 had remarkably dry summers, it was deemed worthwhile to continue monitoring through a third summer.

Table 1-1
Palmer (Long Term) Drought Severity Index for Summer 2013, 2014 , and 2015

		2013			2014			2015		
	Cimate Division	June	July	August	June	July	August	June	July	August
1	Poconos	1.29	1.11	1.17	-0.30	-0.18	-0.25	-0.93	-0.94	-1.13
2	East Central Mountains	1.02	0.96	1.08	0.96	-0.19	0.94	1.13	1.36	0.98
3	Southeastern Piedmon	1.48	1.84	2.11	2.61	2.67	-0.29	1.45	1.38	0.76
4	Lower Susquehanna	0.46	0.54	0.77	2.20	2.15	2.19	1.92	1.84	1.34
5	Middle Susquehanna	-0.70	-0.68	-1.05	0.46	0.71	1.35	1.59	1.75	1.37
6	Upper Susquehanna	0.58	1.01	0.86	0.60	0.44	0.79	1.12	1.31	-0.29
7	Central Mountains	0.45	0.62	-0.46	1.03	1.24	2.01	1.66	2.25	1.72
8	South central Mountain	0.43	-0.16	-0.10	1.04	1.24	1.38	1.80	1.89	1.14
9	SW Plateau	0.76	1.69	2.54	1.98	2.05	2.44	2.07	1.85	0.95
10	NW Plateau	0.71	1.01	-0.13	1.77	2.04	2.56	1.51	-0.16	-0.72

Source: National Oceanic and Atmospheric Administration at http://www.ncdc.noaa.gov/cag/time-series/us

Legend

Greater than Threshold

Within threshold for acceptability of usage data (less than 1)

Table 1-2 below displays the values for a short-term soil moisture index, the Palmer Moisture Anomaly or "Z" index. This index better reflects the immediate term weather conditions that influence water use for lawn and garden watering. The blue shading indicates relatively moist months and the light orange shading relatively dry months. The table displays that the driest months in general were experienced in late summer of 2015.

Table 1-2
Palmer (Short Term) Moisture Anomaly Index for Summer 2013, 2014 , and 2015

		2013			2014			2015		
	Cimate Division	June	July	August	June	July	August	June	July	August
1	Poconos	3.87	-0.15	0.52	-0.41	0.25	-0.36	3.71	-0.32	-0.88
2	East Central Mountains	3.06	0.12	0.67	0.49	1.04	-0.44	3.41	1.05	-0.74
3	Southeastern Piedmont	4.46	1.53	1.38	0.23	0.99	-1.05	4.19	0.13	-1.23
4	Lower Susquehanna	1.39	0.38	0.88	0.72	0.52	0.82	5.75	0.36	-0.94
5	Middle Susquehanna	1.26	-0.14	-1.28	0.29	0.91	2.29	4.77	0.95	-0.60
6	Upper Susquehanna	1.59	1.48	-0.14	-0.52	-0.29	1.08	3.37	0.89	-0.90
7	Central Mountains	1.33	0.64	-1.40	1.21	0.94	3.33	4.96	2.27	-0.89
8	South Central Mountains	1.30	-0.47	0.13	2.61	0.90	0.72	5.36	0.79	-1.69
9	SW Plateau	2.29	3.01	3.06	1.71	0.81	1.66	6.21	-0.02	-2.13
10	NW Plateau	2.12	1.13	-0.41	3.84	1.34	2.11	4.56	-0.47	-1.72

Source: National Oceanic and Atmospheric Administration at http://www.ncdc.noaa.gov/cag/time-series/us

Legend

	Moderately to extremely moist (greater than 1.00)
	Near normal (between 1 and negative 1.24)
	Moderately to very dry (negative 1.25 and lower)

Residential Sample

The source of the usage data for the residential sample is the Company's SCADA information system. The SCADA information system continuously monitors flows through a pump or valve and relays the information to a central location. Some of these monitored pumps or valves serve a closed loop of customers, allowing the data to be used to measure daily and hourly flows for the *group* of residential customers consuming water that passes through that pump or valve.

In order to make the results of the customer demand study representative, residential customers are categorized by housing density to insure that each type of residential user is included. Residential peak demands are primarily influenced by income, lawn size and the amount of precipitation and evapotranspiration. Housing density is used to categorize monitoring points because it represents a measure of both income level and lawn size. The residential monitoring points are located throughout the Company's service area, as indicated in the locator map in Attachment A. The residential class sample consists of approximately 2,500 customers from the following ten SCADA monitoring points that serve a closed loop of exclusively or predominantly residential customers.

System	Housing Density	Residential Customers
Shire Oaks	Low	306
Linnwood	Low	93
Sandy Ridge	Low	31
Sutton Hills	Low	76
Thornburgh and Rosslyn	Medium	649
Winter Road	Medium	212
Ridge Road	Medium	62
Silver	Medium	347
North Strabane	High	106
Millview	High	660
Total		2,542

Commercial Sample

Because the Company serves a large and diverse set of commercial customers, statistical stratified sampling techniques were applied to the design of the commercial sample. The sample design for this report was based on the recommendations of Dr. Berwood Yost, Director of the Floyd Institute's Center for Opinion and Research at Franklin and Marshall College. The sampling used consumption records available for the most recent twelve month period prior to sample design. The customer consumption records were stratified by consumption level into nine strata, using generally accepted statistical techniques for determining strata boundaries. Strata numbers six through nine encompass customers that consume less than 37,000 gallons per year (3,075 gallons per month). The total 2011 consumption by these customers accounted for approximately two percent of total commercial consumption. Because the consumption within these strata is too small to have an impact on the ratio estimates, the customers in these strata were not included in the sampling.

For the five study strata, simple random sampling was used to draw a sample within each stratum. The sampling approach and sample sizes are designed such that each stratum sample yields a reasonable estimate of the consumption for the population of customers within the stratum. This approach of stratification by size, which is common in large populations with skewed distributions, achieves desired precision levels with smaller sample sizes than can be achieved with simple random sampling from the entire population. The total number of customers and the minimum required and actual sample sizes for each stratum are shown in Table 1-3 below. The stratum boundaries and number of customers monitored in each stratum are for the time period when the sample was drawn. The proportion of all commercial customers in each stratum is fixed for the study period by the stratification design; the stratum boundaries vary slightly from year to year as the consumption totals for each customer change. The monitored customers are placed in the stratum for each year based on how their consumption for the year compares to the stratum boundaries for the year. For this reason the number of monitoring points in each stratum varies slightly from year to year.

The commercial customer sample includes monitoring points in each of the Company's six service regions and a broad variety of types including but not limited to apartments, mobile home parks, nursing homes, hotels, office buildings, golf courses, medical facilities, health clubs, stores, restaurants, and private schools.

Table 1-3
Commercial Sample Design

Stratum	Stratum Lower Boundary (1,000 gallons / year)	Number of Customers	Recommended Sample Size	Customers Monitored
1	13,587	94	13	17
2	3,101	597	18	21
3	708	2,790	19	25
4	162	8,163	19	22
5	37	16,053	17	21
Total		27,697	86	106

Monitoring data results support the accuracy of the sample design and selection. The total commercial consumption estimated from the sample varied from the actual total billed consumption for the class by no more than seven percent. This performance exceeds the target used to determine the minimum sample size, which was set in order to produce a 95% likelihood of being within twenty percent of the actual population amount.

Industrial and Public Samples

Both the industrial and public customer classes are characterized by the concentration of consumption among a small number of very large customers. This concentration allows for the production of reasonably reliable estimates with relatively modest sample sizes. The industrial sample included 29 monitoring points representing 25 customer accounts. The consumption at these monitoring points constituted 42% to 44% of total industrial class consumption in the three study years. The public sample included 32 customers, which accounted for 50% to 57% of total public class consumption in the three study years.

Sales for Resale Sample

The study included all six sales for resale customers and a total of nine monitoring points, with one customer having four different meter locations.

Data Collection and Processing Procedures

SCADA monitoring data for residential customers was processed by Company staff on a monthly basis. Hourly flows were estimated by averaging the flows reported for fifteen minute intervals. For systems which included a storage tank, the change in tank level was used to calculate flows into and out of the tank and used in determining net flows to customers for each hour. Because the tank level change and average hourly flow data do not line up precisely, sometimes the net flow calculated after the tank adjustment can appear to indicate a negative flow or an extreme high hour. Another adjustment was made for Thornburgh and Rosslyn, a residential system with two significant non-residential customers. The usage of the large customers was monitored with data logging devices and deducted from the flows for the SCADA monitoring point to yield a net flow for the remaining customers.

Radio read data logging devices were installed on the non-residential sample customers. The device attaches to a customer's meter head and records hourly usage for a fixed period of time, which is then periodically read by a mobile device. The majority of the data logging devices were the "Hot Rod" sold by Mueller/Hersey. The Mueller Hot Rod can store approximately five months of data. Most of the remaining devices were "e-coders" by Neptune, which store data for approximately three months. Several non-residential customers had been fitted with Sensus r900i meters, which have built-in data logging capability, but only keep approximately 31 days of data. Regardless of the device used, Company personnel were on a monthly schedule to download the monitoring data. The accuracy of the data was verified by comparing the logged data to consumption recorded by meter reading for billing purposes.

The hourly and daily monitoring data for each location and customer are summarized in spreadsheet format for each customer class, where each sampled customer's data is in a column, with each day (hour) on a different row. Part III of this report contains the spreadsheets with the daily monitoring data along with hourly data for the day on which the maximum hour occurs. For each day (hour), a consumption per sampled customer is calculated. This amount per average customer is the sum of each customer's consumption divided by the number of customers reporting that day. The *average* customer is calculated because technical difficulties with the data logging equipment or anomalous events at the customer locations can result in the absence of data on any given day for one or several customers. Having a missing data point would result in the simple sum of usage representing an underestimate of the total for that day. As a result, a potential maximum day might be missed.

For sales for resale customers, a total consumption is calculated, because all of the customers are monitored. Use of a total rather than average is advised in this case because the high variance in customer size means that occasional missing datapoints can significantly alter the calculated average and produce false peaks.

Identifying Peaks and Calculating Maximum Day and Hour Ratios

The maximum day (hour) is the highest day (hour) of consumption in the class or stratum as a whole for the year. It is the peak that occurs in the calculated average usage per customer in the stratum or class. The maximum day ratios were calculated for each customer and for the class by dividing the peak day consumption by the annual average consumption per day. Maximum hour ratios were calculated similarly, using hourly peaks and annual hourly averages. For the residential monitoring stations, the annual average usages were calculated from the SCADA monitoring station data. For the non-residential customers, the annual average usages were determined from the billing records over a twelve-month period.

RESULTS OF STUDY

A description and results of the calculations of the maximum day and hour ratios for each customer classification are provided in Part II of the report. Part III contains the detailed tables of monitoring data for each customer and residential SCADA monitoring area. A summary of the resulting calculated ratios for the samples is shown in the Table I-4 below and Figure I-1 on the following page. The selected ratios for use in the Company's future cost of service allocation study are summarized in Table 1-5 below.

Table I-4
Ratio Results from Study Samples

	Maximum Day Ratios			Maximum Hour Ratios		
	2013	2014	2015	2013	2014	2015
Residential	1.79	1.72	1.98	5.68	5.29	6.17
Commercial	2.12	1.96	1.63	4.61	4.02	3.95
Industrial	1.46	1.27	1.23	1.72	1.56	1.64
Public	1.32	1.33	1.36	1.82	1.88	2.41
Sales for Resale	1.36	1.19	1.38	3.42	5.06	2.68

Table I-5
Summary of Maximum Day and Hour Ratios

Customer Classification	Maximum Day Ratio	Maximum Hour Ratio
Residential	2.0	5.0
Commercial	2.1	4.6
Industrial	1.5	1.7
Public	1.4	2.4
Sales for Resale	1.4	3.2

PENNSYLVANIA-AMERICAN WATER COMPANY

RESPONSES TO RATE STRUCTURE
AND COST OF SERVICE FILING REQUIREMENTS

RS1. Provide a complete (fully allocated) cost of service study if an interval of approximately three years has passed between a previous cost of service study and the historic test year date of the current filing. The cost of service study shall provide the necessary data to determine if the water rate structure is fair and equitable to all classifications of water users (including public and private fire protection customers) and reflects, as nearly as possible, the cost of providing the service. The study shall correspond to the test year proposed revenue requirements (future test year only, if used). Summaries of conclusions and all back-up calculations shall be made part of the submission of the cost of service study, and shall include the following:

d. Explain thoroughly the methodology employed if the Company distinguishes between transmission and distribution mains in its allocation of costs.

RESPONSE

For cost allocation purposes, mains that are 10-inch and larger are considered to be transmission mains and are allocated using Factor 3, which is based on average and maximum day extra capacity demands plus the daily requirement for fire demand. Mains sized under 10-inch are considered distribution mains and are allocated using Factor 4, which is based on average and maximum hour extra capacity demands plus the hourly requirement for fire demands.

PENNSYLVANIA-AMERICAN WATER COMPANY

RESPONSES TO RATE STRUCTURE
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e. Provide a detailed explanation of how storage is utilized to meet base, maximum day and maximum hour demands.

RESPONSE

Storage facilities have been considered to be adequate if the effective volume of the facility, or groups of facilities acting together, provided sufficient volume during peak hour demands and to meet equalization needs on the maximum day and provide a fire protection reserve. The effective volume of storage is that quantity, which can be used from the tank while maintaining adequate system pressures under the domestic, and fire flow conditions for distribution mains. The equalization volume is that quantity of water needed to allow production plant or booster station output rates to be constant and equal to the daily demand on the maximum day of the year. The use of equalization storage enables a reasonably constant rate of treatment plant operation and thereby promotes overall system efficiently and economy. Existing storage capacity has also been analyzed on a case-by-case basis to determine its contribution to overall system reliability. Where appropriate recommendations are made if additional storage will significantly improve a system's reliability (e.g., its ability to maintain service to its customers during an emergency, such as a spill or power outage.)

PENNSYLVANIA-AMERICAN WATER COMPANY

RESPONSES TO RATE STRUCTURE
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f. Provide workpapers, calculations and supporting documentation which develop the equivalent meters and equivalent service weights reflected in the Company's cost of service study.

RESPONSE

The 5/8-inch dollar equivalent was developed using actual installation costs by meter size, provided by the Company for the years 2009-2021, as follows:

Meter Size	Actual Installation Cost 2011-2021	5/8-Inch Dollar Equivalent
5/8"	$ 183.72	1.0
3/4"	287.87	1.6
1"	351.66	1.9
1-1/2"	408.70	2.2
2"	537.71	2.9
3"	1,556.79	8.5
4"	3,864.96	21.0
6"	5,635.00	30.7
8"	6,282.93	34.2
10"	9,661.78	52.6

PENNSYLVANIA-AMERICAN WATER COMPANY

RESPONSES TO RATE STRUCTURE
AND COST OF SERVICE FILING REQUIREMENTS

RS1f., cont.

The 3/4-inch dollar equivalent was developed using the actual installation costs by size, for the years 2009-2021, provided by the Company, as follows:

Service Size	Actual Installation Cost 2011-2021	1-Inch Equivalent
3/4" & 1"	$ 1,623.90	1.00
1-1/2"	2,844.86	1.18
2"	5,420.50	2.24
4"	4,667.47	1.93
6"	5,680.08	2.35
8"	26,234.99	10.85
10"	14,235.83	5.89
12"	36,206.09	14.98

PENNSYLVANIA-AMERICAN WATER COMPANY

RESPONSES TO RATE STRUCTURE
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g. Provide all workpapers and supporting documentation for the fire flow requirement and duration utilized in the cost of service study.

RESPONSE

The source for the estimated fire protection demand of 20,000 gpm is published fire flow criteria for the population served. The 20,000 gpm estimate is the maximum fire flow requirement generally accepted by published authorities, regardless of population size. This maximum has been established by the National Board of Fire Underwriters (now the American Insurance Association).

General fire-fighting requirements, based on population established by the National Board of Fire Underwriters, are as follows:

a) For populations of 200,00 or less, $Q = 1020 \sqrt{P} (1 - 0.01\sqrt{P})$, where Q is the fire draft in gpm and P is the population in thousands.

b) For populations in excess of 200,00, Q = 12,000 gpm plus 2,000 to 8,000 gpm for a potential second fire.

Inasmuch as PAWC serves a population in excess of 1.5 million, the maximum fire flow of 12,000 gpm would apply. Also, in consideration of the population being well over 200,000, the maximum of the additional allowance to provide for a second fire was selected for a maximum fire flow of 20,000 gpm.

The foregoing requirements were published in Volume I, "Water and Wastewater Engineering," by Fair, Geyer & Okon, published in 1966 by John Wiley & Sons, Inc.

The required fire flow duration is ten hours.

PENNSYLVANIA-AMERICAN WATER COMPANY

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h. Provide a breakdown of the number and size of private fire services according to the general water service class of customer.

RESPONSE

Please refer to Volume 6 Filing Requirement Section II, Question OR-10a.

PENNSYLVANIA-AMERICAN WATER COMPANY

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i. Provide a calculation of the Company's base cost of water per unit of consumption.

RESPONSE

The calculation of the base cost of water per hundred gallons is as follows:

Base Cost of Water (See attached Functional Allocation)	$361,221,685
Pro Forma Water Consumption (Hundred Gallons)	421,959,612
Base Cost per Hundred Gallons	$0.8561

PENNSYLVANIA-AMERICAN WATER COMPANY- WATER OPERATIONS

ALLOCATION OF COST OF SERVICE TO COST FUNCTIONS
FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2021

Account Number	Account Description	Factor Ref.	Total Company Test Year	Base	Extra Capacity		Customer Facilities		Customer Accounting		Fire Service		
					Maximum Day	Maximum Hour	Meters	Services	Billing	Meter Reading	Private	Public	General
OPERATION AND MAINTENANCE EXPENSES													
	Source of Supply Expenses												
	----Operation----												
601.1	Salaries and Wages	2	$ 171,055	$ 121,175	$ 48,870	$ -	$ -	$ -	$ -	$ -	$ 171	$ 838	$ -
610.1	Purchased Water	1	3,218,122	3,191,733	-	-	-	-	-	-	4,505	21,883	-
615.1	Purchased Power	1	2,460,179	2,440,006	-	-	-	-	-	-	3,444	16,729	-
616.1	Purchased Fuel	1	54,748	54,299	-	-	-	-	-	-	77	372	-
618.1	Chemicals	1	-	-	-	-	-	-	-	-	-	-	-
620.1	Materials and Supplies	2	67,428	47,766	19,264	-	-	-	-	-	67	330	-
631.1	Contract Services -Engineering	2	144,399	102,292	41,255	-	-	-	-	-	144	708	-
633.1	Contract Services -Legal	2	-	-	-	-	-	-	-	-	-	-	-
636.1	Contract Services -Other	2	735,938	521,338	210,257	-	-	-	-	-	736	3,606	-
	Rental of Building	2	-	-	-	-	-	-	-	-	-	-	-
642.1	Rental of Equipment	2	26	18	7	-	-	-	-	-	-	-	-
	Transportation	2	959	679	274	-	-	-	-	-	1	5	-
675.1	Miscellaneous Expenses	2	1,265,396	896,407	361,524	-	-	-	-	-	1,265	6,200	-
	Total Operation		8,118,250	7,375,713	681,451	-	-	-	-	-	10,410	50,671	-
	----Maintenance----												
601.2	Salaries and Wages	2	269,066	190,606	76,872	-	-	-	-	-	269	1,318	-
620.2	Materials and Supplies	2	25,162	17,825	7,189	-	-	-	-	-	25	123	-
636.2	Contract Services	2	-	-	-	-	-	-	-	-	-	-	-
	Contract Services - Engineering	2	341,001	241,565	97,424	-	-	-	-	-	341	1,671	-
	Contract Services - Other	2	111,104	78,706	31,742	-	-	-	-	-	111	544	-
(Pumping equipment T&D rate base)		2											
675.2	Misc. Maintenance Expense	2	46,564	32,986	13,303	-	-	-	-	-	47	228	-
	Total Maintenance		792,897	561,688	226,530	-	-	-	-	-	793	3,884	-
	Total Source of Supply Expenses		8,911,147	7,937,401	907,981	-	-	-	-	-	11,203	54,555	-
	Water Treatment Expenses												
	----Operation----												
601.3	Salaries and Wages												
	Power and Pumping	5a	1,181,890	779,220	282,944	86,278	-	-	-	-	5,082	27,774	591
	Purification and Laboratory	2	11,244,381	7,965,519	3,212,520	-	-	-	-	-	11,244	55,097	-
615.3	Purchased Power	1	9,793,574	9,713,267	-	-	-	-	-	-	13,711	66,596	-
618.3	Chemicals	1	17,156,856	17,016,170	-	-	-	-	-	-	24,020	116,667	-
620.3	Materials and Supplies	6	682,859	480,596	192,088	4,712	-	-	-	-	888	4,575	-
631.3	Contract Services -Engineering	6	106,422	74,900	29,937	734	-	-	-	-	138	713	-
635.3	Contract Services -Testing	6	185,347	130,447	52,138	1,279	-	-	-	-	241	1,242	-
636.3	Contract Services -Other	6	1,007,884	709,349	283,518	6,954	-	-	-	-	1,310	6,753	-
641.3	Rental of Building	6	5,759	4,053	1,620	40	-	-	-	-	7	39	-

PENNSYLVANIA-AMERICAN WATER COMPANY- WATER OPERATIONS

ALLOCATION OF COST OF SERVICE TO COST FUNCTIONS
FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2021

Account Number	Account Description	Factor Ref.	Total Company Test Year	Base	Extra Capacity		Customer Facilities		Customer Accounting		Fire Service		
					Maximum Day	Maximum Hour	Meters	Services	Billing	Meter Reading	Private	Public	General
642.3	Rental of Equipment	6	5,274	3,712	1,484	36	-	-	-	-	7	35	-
650.3	Transportation	6	75,247	52,959	21,167	519	-	-	-	-	98	504	-
675.3	Miscellaneous Expenses												
	Waste Disposal	1	2,218,559	2,200,367	-	-	-	-	-	-	3,106	15,086	-
	Other	6	4,564,391	3,212,419	1,283,963	31,494	-	-	-	-	5,934	30,581	-
	Total Operation		48,228,445	42,342,978	5,361,379	132,046	-	-	-	-	65,786	325,662	591
	----Maintenance----												
601.4	Salaries and Wages												
	Power and Pumping	5A	548,098	361,361	131,215	40,011	-	-	-	-	2,357	12,880	274
	Purification and Laboratory	2	2,526,948	1,790,090	721,949	-	-	-	-	-	2,527	12,382	-
620.4	Materials and Supplies	7	724,532	400,884	158,962	158,962	-	-	-	-	942	4,709	72
631.4	Contract Services - Engineering	7	49,624	27,457	10,888	10,888	-	-	-	-	65	323	5
636.4	Contract Services	7	1,232,773	682,093	270,470	270,470	-	-	-	-	1,603	8,013	123
	Contract Services - Other	7	-	-	-	-	-	-	-	-	-	-	-
650.4	Transportation	7	16,230	8,980	3,561	3,561	-	-	-	-	21	105	2
675.4	Miscellaneous Expenses	1	114,478	113,539	-	-	-	-	-	-	160	778	-
	Total Maintenance		5,212,683	3,384,404	1,297,045	483,892	-	-	-	-	7,675	39,190	476
	Total Water Treatment Expenses		53,441,127	45,727,382	6,658,424	615,938	-	-	-	-	73,461	364,852	1,067
	Transmission & Distribution Expenses												
	----Operation----												
601.5	Salaries and Wages												
	Supervision & Other Dept. Exps.	12	2,905,142	1,176,292	170,822	835,228	385,803	180,700	-	-	27,889	125,212	3,196
	Mains	8	2,715,511	1,376,221	207,193	957,218	-	-	-	-	25,797	145,280	3,802
	Storage Facilities	4	115,210	50,773	-	56,314	-	-	-	-	1,198	6,751	173
	Miscellaneous Meter Expense	10	471,098	-	-	-	467,941	-	-	-	3,156	-	-
	Services on Customer Premises	11	223,151	-	-	-	-	219,402	-	-	3,749	-	-
615.5	Purchased Power	1	549,734	545,226	-	-	-	-	-	-	770	3,738	-
620.5	Materials and Supplies	12	1,219,421	493,744	71,702	350,584	161,939	75,848	-	-	11,706	52,557	1,341
631.5	Contract Services -Engineering	12	161,951	65,574	9,523	46,561	21,507	10,073	-	-	1,555	6,980	178
636.5	Contract Services -Other	12	617,022	249,832	36,281	177,394	81,941	38,379	-	-	5,923	26,594	679
641.5	Rental of Building	12	46,883	18,983	2,757	13,479	6,226	2,916	-	-	450	2,021	52
642.5	Rental of Equipment	12	658	266	39	189	87	41	-	-	6	28	1
650.5	Transportation	12	33,687	13,640	1,981	9,685	4,474	2,095	-	-	323	1,452	37
675.5	Miscellaneous Expenses	12	1,660,003	672,135	97,608	477,251	220,448	103,252	-	-	15,936	71,546	1,826
	Total Operation		10,719,470	4,662,686	597,906	2,923,903	1,350,366	632,706	-	-	98,458	442,159	11,285

PENNSYLVANIA-AMERICAN WATER COMPANY- WATER OPERATIONS

ALLOCATION OF COST OF SERVICE TO COST FUNCTIONS
FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2021

Account Number	Account Description	Factor Ref.	Total Company Test Year	Base	Extra Capacity		Customer Facilities		Customer Accounting		Fire Service		
					Maximum Day	Maximum Hour	Meters	Services	Billing	Meter Reading	Private	Public	General
	----Maintenance----												
601.6	Salaries and Wages												
	Supervision and Engineering	13	183,729	44,536	6,541	31,454	312	76,101	-	-	2,150	22,507	129
	Structures and Improvements	4	38,706	17,058	-	18,920	-	-	-	-	403	2,268	58
	Mains	8	1,478,920	749,517	112,842	521,319	-	-	-	-	14,050	79,122	2,070
	Services	11	1,335,564	-	-	-	-	1,313,127	-	-	22,437	-	-
	Meters	10	5,559	-	-	-	5,522	-	-	-	37	-	-
	Storage Facilities	4	5,050	2,226	-	2,468	-	-	-	-	53	296	8
	Fire Hydrants	9	306,814	-	-	-	-	-	-	-	-	306,814	-
	Other	13	6,001,186	1,454,688	213,642	1,027,403	10,202	2,485,691	-	-	70,214	735,145	4,201
620.6	Materials and Supplies	13	1,761,922	427,090	62,724	301,641	2,995	729,788	-	-	20,614	215,835	1,233
636.6	Contract Services	13	1,245,599	301,933	44,343	213,247	2,118	515,927	-	-	14,574	152,586	872
	Contract Services - Engineering	13	37,154	9,006	1,323	6,361	63	15,389	-	-	435	4,551	26
650.6	Transportation	13	110,789	26,855	3,944	18,967	188	45,889	-	-	1,296	13,572	78
675.6	Miscellaneous Expenses	13	4,287,157	1,039,207	152,623	733,961	7,288	1,775,740	-	-	50,160	525,177	3,001
	Total Maintenance		16,798,151	4,072,116	597,982	2,875,741	28,688	6,957,652	-	-	196,423	2,057,873	11,676
	Total Transmission and Distribution Expenses		27,517,621	8,734,802	1,195,888	5,799,644	1,379,054	7,590,358	-	-	294,881	2,500,032	22,961

PENNSYLVANIA-AMERICAN WATER COMPANY- WATER OPERATIONS

ALLOCATION OF COST OF SERVICE TO COST FUNCTIONS
FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2021

Account Number	Account Description	Factor Ref.	Total Company Test Year	Base	Extra Capacity		Customer Facilities		Customer Accounting		Fire Service		
					Maximum Day	Maximum Hour	Meters	Services	Billing	Meter Reading	Private	Public	General
	Customer Accounting Expenses												
601.7	Salaries and Wages												
	Meter Reading	15	3,621,069	-	-	-	-	-	-	3,620,345	724	-	-
	Meter Services	10	2,031,928	-	-	-	2,018,314	-	-	-	13,614	-	-
620.7	Materials and Supplies	14	43,808	-	-	-	-	-	43,520	-	262	26	-
636.7	Contract Services -Other	14	142,784	-	-	-	-	-	141,846	-	852	86	-
642.7	Rental of Equipment	14	1,680	-	-	-	-	-	1,669	-	10	1	-
650.7	Transportation	14	1,759	-	-	-	-	-	1,747	-	11	1	-
670.7	Bad Debt	22	11,499,249	-	-	-	-	-	11,480,850	-	18,399	-	-
675.7	Miscellaneous Expenses	14	2,803,073	-	-	-	-	-	2,784,656	-	16,734	1,682	-
	Total Customer Accounting Expenses		20,145,350	-	-	-	2,018,314	-	14,454,288	3,620,345	50,606	1,796	-
	Administrative and General Expenses												
601.8	Salaries and Wages	16	23,326,900	8,521,317	2,740,911	2,006,113	1,063,707	2,374,678	4,523,086	1,133,687	118,967	837,436	6,998
603.8	Salaries of Officers	16	-	-	-	-	-	-	-	-	-	-	-
604.8	Employees Pension and Benefits	17	2,605,460	1,055,472	340,273	239,702	169,615	285,298	194,107	204,008	14,069	101,873	1,042
	Purchased Power	16	34,016	12,426	3,997	2,925	1,551	3,463	6,596	1,653	173	1,221	10
621	Materials and Supplies	16	225,313	82,307	26,474	19,377	10,274	22,937	43,688	10,950	1,149	8,089	68
631.8	Contract Services -Engineering	16	107,905	39,418	12,679	9,280	4,920	10,985	20,923	5,244	550	3,874	32
632.8	Contract Services -Accounting	16	592,202	216,331	69,584	50,929	27,004	60,286	114,828	28,781	3,020	21,260	178
633.8	Contract Services -Legal	16	2,043,636	746,540	240,127	175,753	93,190	208,042	396,261	99,321	10,423	73,367	613
634.8	Contract Services -Management												
	Customer Related	14	13,811,900	-	-	-	-	-	13,721,156	-	82,457	8,287	-
	Employee Related	17	4,320,309	1,750,157	564,232	397,468	281,252	473,074	321,863	338,280	23,330	168,924	1,728
	Water Quality Related	2	580,525	411,244	165,856	-	-	-	-	-	581	2,845	-
	Other	16	39,680,614	14,495,328	4,662,472	3,412,533	1,809,436	4,039,487	7,694,071	1,928,478	202,371	1,424,534	11,904
636.8	Contract Services -Other	16	1,698,269	620,377	199,547	146,051	77,441	172,884	329,294	82,536	8,661	60,968	509
641.8	Rental of Buildings	16	103,080	37,655	12,112	8,865	4,700	10,494	19,987	5,010	526	3,701	31
642.8	Rental of Equipment	16	44,866	16,390	5,272	3,858	2,046	4,567	8,700	2,180	229	1,611	13
650.8	Transportation	16	3,243,498	1,184,850	381,111	278,941	147,904	330,188	628,914	157,634	16,542	116,442	973
656.8	Insurance -Vehicles	16	274,493	100,272	32,253	23,606	12,517	27,943	53,224	13,340	1,400	9,854	82
657.8	Insurance -General Liability	16	10,348,397	3,780,270	1,215,937	889,962	471,887	1,053,467	2,006,554	502,932	52,777	371,507	3,105
658.8	Insurance -Workers Comp	17	844,450	342,087	110,285	77,689	54,974	92,467	62,912	66,120	4,560	33,018	338
659.8	Insurance -Other	16	3,082,948	1,126,201	362,246	265,134	140,582	313,844	597,784	149,831	15,723	110,678	925
660.8	Advertising	14	-	-	-	-	-	-	-	-	-	-	-
666.8	Amortization of Rate Case Exp.	20	1,101,087	507,601	116,715	159,768	51,751	107,026	81,701	16,186	7,487	52,192	661
667.8	Regulatory Commission	20	53,046	24,454	5,623	7,697	2,493	5,156	3,936	780	361	2,514	32
675.8	Miscellaneous Expenses	16	7,343,370	2,682,533	862,846	631,530	334,858	747,555	1,423,879	356,888	37,451	263,627	2,203
	Total Administrative and General Expenses		115,466,285	37,753,230	12,130,552	8,807,181	4,762,102	10,343,841	32,253,464	5,103,839	602,807	3,677,822	31,445
	Total Operation & Maintenance Expenses		225,481,530	100,152,815	20,892,845	15,222,763	8,159,470	17,934,199	46,707,752	8,724,184	1,032,958	6,599,057	55,473

PENNSYLVANIA-AMERICAN WATER COMPANY- WATER OPERATIONS

ALLOCATION OF COST OF SERVICE TO COST FUNCTIONS
FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2021

Account Number	Account Description	Factor Ref.	Total Company Test Year	Base	Extra Capacity		Customer Facilities		Customer Accounting		Fire Service		
					Maximum Day	Maximum Hour	Meters	Services	Billing	Meter Reading	Private	Public	General
DEPRECIATION EXPENSE													
303.99	Comprehensive Planning Studies	18	890,720	428,614	97,178	171,820	28,503	94,238	9,353	2,049	7,126	51,127	713
304.15	Other Water Source Structures	2	1,411,772	1,000,099	403,343	-	-	-	-	-	1,412	6,918	-
304.20	Power and Pumping Structures	5A	3,260,263	2,149,491	780,507	237,999	-	-	-	-	14,019	76,616	1,630
304.30	Purification Buildings	2	8,242,250	5,838,810	2,354,811	-	-	-	-	-	8,242	40,387	-
304.36	Waste Handling & Treatment Struct.	1	845,434	838,501	-	-	-	-	-	-	1,184	5,749	-
304.39	Purification Buildings	2	2,244	1,590	641	-	-	-	-	-	2	11	-
304.61	Office Buildings	16	1,203,063	439,479	141,360	103,463	54,860	122,472	233,274	58,469	6,136	43,190	361
304.62	Stores, Shop and Garage Bldgs.	16	1,727,861	631,188	203,024	148,596	78,790	175,896	335,032	83,974	8,812	62,030	518
304.63	Misc. Structures and Improvements	16	9,213	3,366	1,083	792	420	938	1,786	448	47	331	3
305.00	Collecting & Impounding Reservoirs	1	3,289,022	3,262,052	-	-	-	-	-	-	4,605	22,365	-
306.00	Lake, River and Other Intakes	2	458,711	324,951	131,054	-	-	-	-	-	459	2,248	-
307.00	Wells and Springs	2	406,182	287,739	116,046	-	-	-	-	-	406	1,990	-
310.40	Other Power Prod. Equipment	5A	1,117,761	736,940	267,592	81,597	-	-	-	-	4,806	26,267	559
311.50	Pumping Equipment Other	5	1,578,003	945,066	287,670	257,057	-	-	-	-	13,097	73,219	1,894
311.52	Pumping Equipment Source of Supply	2	501,115	354,990	143,169	-	-	-	-	-	501	2,455	-
311.53	Pumping Equipment Water Treatment	2	1,236,547	875,970	353,281	-	-	-	-	-	1,237	6,059	-
311.54	Pumping Equipment Transmission and Distributio	8	663,436	336,229	50,620	233,861	-	-	-	-	6,303	35,494	929
320.00	Purification System	2	15,542,235	11,010,119	4,440,417	-	-	-	-	-	15,542	76,157	-
330.00	Distr. Reservoirs and Standpipes	4	7,596,498	3,347,777	-	3,713,168	-	-	-	-	79,004	445,155	11,395
331.00	Mains and Accessories												
	10-inch and Over	3	20,518,751	13,911,713	5,611,878	-	-	-	-	-	147,735	826,906	20,519
	Under 10-inch	4	32,839,295	14,472,277	-	16,051,847	-	-	-	-	341,529	1,924,383	49,259
333.00	Services	11	13,146,133	-	-	-	-	12,925,278	-	-	220,855	-	-
334.00	Meters	10	14,542,673	-	-	-	14,445,237	-	-	-	97,436	-	-
334.00	Fire Hydrants	9	3,176,850	-	-	-	-	-	-	-	-	3,176,850	-
340.00	Office Furniture	16	305,608	111,639	35,909	26,282	13,936	31,111	59,257	14,853	1,559	10,971	92
340.00	Computers and Peripheral Equipment	16	2,399,737	876,624	281,969	206,377	109,428	244,293	465,309	116,627	12,239	86,151	720
340.00	Other Office Equipment	16	1,009	369	119	87	46	103	196	49	5	36	-
340.00	Computer Software	16	10,262,881	3,749,030	1,205,889	882,608	467,987	1,044,761	1,989,973	498,776	52,341	368,437	3,079
340.00	Computer Software BT	16	1,374,416	502,074	161,494	118,200	62,673	139,916	266,499	66,797	7,010	49,342	412
340.00	Computer Software BT - CIS	14	704,604	-	-	-	-	-	699,974	-	4,206	423	-
341	Transportation Equipment	16	8,972,346	3,277,598	1,054,251	771,622	409,139	913,385	1,739,738	436,056	45,759	322,107	2,692
342.00	Stores Equipment	16	28,476	10,402	3,346	2,449	1,299	2,899	5,521	1,384	145	1,022	9
343.00	Tools and work Equipment	16	2,494,738	911,328	293,132	214,547	113,760	253,964	483,730	121,244	12,723	89,561	748
344.00	Laboratory Equipment	2	162,389	115,036	46,395	-	-	-	-	-	162	796	-
345.00	Power Operated Equipment	16	119,836	43,776	14,081	10,306	5,465	12,199	23,236	5,824	611	4,302	36
346.00	Communication Equipment	16	2,370,614	865,985	278,547	203,873	108,100	241,329	459,662	115,212	12,090	85,105	711
347.00	Miscellaneous Equipment	16	1,258,470	459,719	147,870	108,228	57,386	128,112	244,017	61,162	6,418	45,179	378
348.00	Other Tangible Equipment	16	32,578	11,901	3,828	2,802	1,486	3,316	6,317	1,583	166	1,170	10
	Citizens Acquisition CIAC and CAC	4	(339,044)	(149,417)	-	(165,725)	-	-	-	-	(3,526)	(19,868)	(509)
	Total Depreciation Expense		164,354,690	71,983,025	18,910,504	23,381,856	15,958,515	16,334,210	7,022,874	1,584,507	1,132,403	7,950,641	96,158

PENNSYLVANIA-AMERICAN WATER COMPANY- WATER OPERATIONS

ALLOCATION OF COST OF SERVICE TO COST FUNCTIONS
FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2021

Account Number	Account Description	Factor Ref.	Total Company Test Year	Base	Extra Capacity		Customer Facilities		Customer Accounting		Fire Service		
					Maximum Day	Maximum Hour	Meters	Services	Billing	Meter Reading	Private	Public	General
	Amortizations	19	1,117,300	537,533	122,344	213,293	35,865	118,546	13,072	2,793	8,938	64,021	894
	Taxes, Other Than Income												
	Local Property and Miscellaneous	19	1,506,446	724,751	164,956	287,581	48,357	159,834	17,625	3,766	12,052	86,319	1,205
	Federal and state Payroll Taxes	17	4,698,002	1,903,161	613,559	432,216	305,840	514,431	350,001	367,854	25,369	183,692	1,879
	State Capital Stock Tax	19	-	-	-	-	-	-	-	-	-	-	-
	PUC and OCA Assessments	20	5,281,426	2,434,737	559,831	766,335	248,227	513,355	391,882	77,637	35,914	250,340	3,169
	Public Utility Realty Taxes	19	2,058,857	990,516	225,445	393,036	66,089	218,445	24,089	5,147	16,471	117,973	1,647
	Total Taxes Other Than Income Taxes		13,544,731	6,053,165	1,563,791	1,879,168	668,513	1,406,065	783,597	454,404	89,806	638,324	7,900
	Total O&M, Deprec. Amort, Other Taxes		404,498,251	178,726,538	41,489,484	40,697,080	24,822,363	35,793,020	54,527,295	10,765,888	2,264,105	15,252,043	160,425
	Federal and State Income Taxes	19	72,274,597	34,771,309	7,914,068	13,797,221	2,320,015	7,668,335	845,613	180,686	578,197	4,141,334	57,820
	Utility Operating Income Available for Return	19	320,331,737	154,111,599	35,076,325	61,151,329	10,282,649	33,987,197	3,747,881	800,829	2,562,654	18,355,009	256,265
	Total Cost of Service		797,104,585	367,609,446	84,479,877	115,645,630	37,425,027	77,448,552	59,120,789	11,747,403	5,404,956	37,748,386	474,510
	Other Water Revenues - Billing and Collecting	20	(549,788)	(253,452)	(58,278)	(79,774)	(25,840)	(53,439)	(40,794)	(8,082)	(3,739)	(26,060)	(330)
	Other Water Revenues -Penalties	23	(5,362,330)	(2,615,745)	(601,117)	(823,118)	(266,508)	(551,248)	(420,943)	(83,652)	-	-	-
	Other Water Revenues - Misc. Service Revenues	14	(4,196,166)	-	-	-	-	-	(4,168,597)	-	(25,051)	(2,518)	-
	Other Water Revenues -Rents from Other Propert	20	(1,007,542)	(464,477)	(106,799)	(146,194)	(47,354)	(97,933)	(74,760)	(14,811)	(6,851)	(47,757)	(605)
	Revenue from Contract Sales	20	(6,624,918)	(3,054,087)	(702,241)	(961,276)	(311,371)	(643,942)	(491,569)	(97,386)	(45,049)	(314,021)	(3,975)
	Unrecovered Public Fire	9	(28,349,085)	-	-	-	-	-	-	-	-	(28,349,085)	-
	Reallocate Unrecovered Public Fire	21	28,349,085	-	-	-	28,349,085	-	-	-	-	-	-
	Total Cost of Service Related to Sales		$ 779,363,841	$ 361,221,685	$ 83,011,442	$ 113,635,268	$ 65,123,039	$ 76,101,990	$ 53,924,126	$ 11,543,472	$ 5,324,266	$ 9,008,945	$ 469,600
	Wastewater Allocation	23	72,946,653	35,583,376	8,177,320	11,197,311	3,625,449	7,498,916	5,726,312	1,137,968	-	-	-
	Total Wastewater Allocation		72,946,653	35,583,376	8,177,320	11,197,311	3,625,449	7,498,916	5,726,312	1,137,968	-	-	-
	Total Cost of Service After WW Subsidy		$ 852,310,494	$ 396,805,061	$ 91,188,762	$ 124,832,579	$ 68,748,488	$ 83,600,906	$ 59,650,438	$ 12,681,440	$ 5,324,266	$ 9,008,945	$ 469,600

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

FUNCTION 19. ORIGINAL COSTS MEASURE OF VALUE RATE BASE ALLOCATED TO COST FUNCTIONS

Account Number	Account Description	Factor Ref.	Total Company Test Year	Base	Extra Capacity		Customer Facilities		Customer Accounting		Fire Service		
					Maximum Day	Maximum Hour	Meters	Services	Billing	Meter Reading	Private	Public	General
	Nondepreciable Plant												
301.00	Organization	18	$ 766,405	$ 368,794	$ 83,615	$ 147,840	$ 24,525	$ 81,086	$ 8,047	$ 1,763	$ 6,131	$ 43,992	$ 613
302.00	Franchises and Consents	18	2,404,599	1,157,093	262,342	463,847	76,947	254,407	25,248	5,531	19,237	138,024	1,924
303.00	Other Intangible Plant	18	15,572	7,493	1,699	3,004	498	1,648	164	36	125	894	12
303.11	Water Rights	1	-	-	-	-	-	-	-	-	-	-	-
303.12	Reservoir Land	1	-	-	-	-	-	-	-	-	-	-	-
303.13	Other Sources of Supply Land	2	-	-	-	-	-	-	-	-	-	-	-
303.20	Power and Pumping Land	5	6,315,147	3,782,141	1,151,251	1,028,737	-	-	-	-	52,416	293,023	7,578
303.30	Purification Land	2	446,173	316,069	127,472	-	-	-	-	-	446	2,186	-
303.40	Land and Rights of Way	8	3,299,941	1,672,410	251,785	1,163,229	-	-	-	-	31,349	176,547	4,620
303.50	Distr. Reservoir & Standpipe Land	4	9,308,301	4,102,168	-	4,549,897	-	-	-	-	96,806	545,466	13,962
303.61	Office Land	16	3,472,993	1,268,684	408,077	298,677	158,368	353,551	673,413	168,787	17,712	124,680	1,042
303.62	Stores, Shop and Garage Land	16	-	-	-	-	-	-	-	-	-	-	-
	Total Nondepreciable Plant		26,029,130	12,674,852	2,286,241	7,655,231	260,338	690,692	706,872	176,117	224,222	1,324,812	29,751
	Depreciable Plant												
303.14	Water Rights - Hibernia Dam	1	-	-	-	-	-	-	-	-	-	-	-
303.35	Waste Handling & Treatment Land	1	-	-	-	-	-	-	-	-	-	-	-
304	Comprehensive Planning Studies	18	2,135,211	1,027,464	232,952	411,882	68,327	225,905	22,420	4,911	17,082	122,561	1,708
304.15	Other Water Source Structures	2	41,080,953	29,101,747	11,736,828	-	-	-	-	-	41,081	201,297	-
304.20	Power and Pumping Structures	5A	103,147,576	68,005,197	24,693,530	7,529,773	-	-	-	-	443,535	2,423,968	51,574
304.30	Purification Buildings	2	230,553,754	163,324,279	65,869,208	-	-	-	-	-	230,554	1,129,713	-
304.36	Waste Handling & Treatment Structures	1	17,799,241	17,653,287	-	-	-	-	-	-	24,919	121,035	-
304.38	Waste Handling & Treatment Structure Painti	1	998,222	990,037	-	-	-	-	-	-	1,398	6,788	-
304.39	Purification Buildings - Tank Painting	2	3,366	2,384	962	-	-	-	-	-	3	16	-
304.61	Office Buildings	16	36,468,069	13,321,786	4,284,998	3,136,254	1,662,944	3,712,449	7,071,159	1,772,348	185,987	1,309,204	10,940
304.62	Stores, Shop and Garage Bldgs.	16	49,783,673	18,185,976	5,849,582	4,281,396	2,270,135	5,067,978	9,653,054	2,419,487	253,897	1,787,234	14,935
304.63	Misc. Structures and Improvements	16	277,287	101,293	32,581	23,847	12,644	28,228	53,766	13,476	1,414	9,955	83
305.00	Collecting & Impounding Reservoirs	1	167,681,702	166,306,712	-	-	-	-	-	-	234,754	1,140,236	-
306.00	Lake, River and Other Intakes	2	12,151,561	8,608,166	3,471,701	-	-	-	-	-	12,152	59,543	-
307.00	Wells and Springs	2	11,172,991	7,914,947	3,192,124	-	-	-	-	-	11,173	54,748	-
310.00	Power Generation Equipment	5A	30,030,000	19,798,779	7,189,182	2,192,190	-	-	-	-	129,129	705,705	15,015
311.20	Pumping Equipment Other	5	29,482,058	17,656,805	5,374,579	4,802,627	-	-	-	-	244,701	1,367,967	35,378
311.52	Pumping Equipment Source of Supply	2	12,506,065	8,859,296	3,572,983	-	-	-	-	-	12,506	61,280	-
311.53	Pumping Equipment Water Treatment	2	23,845,076	16,891,852	6,812,538	-	-	-	-	-	23,845	116,841	-
311.54	Pumping Equipment T&D	8	16,568,335	8,396,832	1,264,164	5,840,338	-	-	-	-	157,399	886,406	23,196
320.00	Purification System	2	305,624,582	216,504,454	87,316,943	-	-	-	-	-	305,625	1,497,560	-
330.00	Distr. Reservoirs and Standpipes	4	145,544,018	64,141,249	-	71,141,916	-	-	-	-	1,513,658	8,528,879	218,316
331.00	Mains and Accessories												
	10-inch and Over	3	1,086,181,194	736,430,850	297,070,557	-	-	-	-	-	7,820,505	43,773,102	1,086,181
	Under 10-inch	4	1,738,381,883	766,104,896	-	849,721,064	-	-	-	-	18,079,172	101,869,178	2,607,573
333.00	Services	11	515,442,433	-	-	-	-	506,783,000	-	-	8,659,433	-	-
334.00	Meters	10	150,557,597	-	-	-	149,548,861	-	-	-	1,008,736	-	-

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

FUNCTION 19. ORIGINAL COSTS MEASURE OF VALUE RATE BASE ALLOCATED TO COST FUNCTIONS

Account Number	Account Description	Factor Ref.	Total Company Test Year	Base	Extra Capacity		Customer Facilities		Customer Accounting		Fire Service		
					Maximum Day	Maximum Hour	Meters	Services	Billing	Meter Reading	Private	Public	General
335.00	Fire Hydrants	9	114,686,964	-	-	-	-	-	-	-	-	114,686,964	-
340.00	Office Furniture	16	3,846,920	1,405,280	452,013	330,835	175,420	391,616	745,918	186,960	19,619	138,104	1,154
340.00	Computers and Peripheral Equipment	16	7,111,642	2,597,883	835,618	611,601	324,291	723,965	1,378,947	345,626	36,269	255,308	2,133
340.00	Other Office Equipment	16	5,548	2,027	652	477	253	565	1,076	270	28	199	2
340.00	Computer Software	16	17,142,826	6,262,274	2,014,282	1,474,283	781,713	1,745,140	3,323,994	833,141	87,428	615,427	5,143
340.00	Computer Software BT	16	12,309,510	4,496,664	1,446,367	1,058,618	561,314	1,253,108	2,386,814	598,242	62,779	441,911	3,693
341.00	Computer Software BT - CIS	14	6,310,553	-	-	-	-	-	6,269,093	-	37,674	3,786	-
341	Transportation Equipment	16	33,222,982	12,136,355	3,903,700	2,857,176	1,514,968	3,382,100	6,441,936	1,614,637	169,437	1,192,705	9,967
342.00	Stores Equipment	16	307,716	112,409	36,157	26,464	14,032	31,325	59,666	14,955	1,569	11,047	92
343.00	Tools and work Equipment	16	33,550,332	12,255,936	3,942,164	2,885,329	1,529,895	3,415,424	6,505,409	1,630,546	171,107	1,204,457	10,065
344.00	Laboratory Equipment	2	1,491,006	1,056,229	425,980	-	-	-	-	-	1,491	7,306	-
345.00	Power Operated Equpment	16	992,766	362,657	116,650	85,378	45,270	101,064	192,497	48,248	5,063	35,640	298
346.00	Communication Equipment	16	21,051,909	7,690,262	2,473,599	1,810,464	959,967	2,143,084	4,081,965	1,023,123	107,365	755,764	6,316
347.00	Miscellaneous Equipment	16	19,846,700	7,250,000	2,331,987	1,706,816	905,010	2,020,394	3,848,275	964,550	101,218	712,497	5,954
348.00	Other Tangible Equipment	16	301,193	110,026	35,390	25,903	13,734	30,661	58,401	14,638	1,536	10,813	90
	Total Depreciable Plant		4,999,595,414	2,405,066,290	545,979,971	961,954,631	160,388,778	531,056,006	52,094,390	11,485,158	40,215,241	287,245,144	4,109,806
	Total Utility Plant in Service (Net)		5,025,624,544	2,417,741,142	548,266,212	969,609,862	160,649,116	531,746,698	52,801,262	11,661,275	40,439,463	288,569,956	4,139,557
	Other Rate Base Elements												
	Materials and Supplies	18	11,145,046	5,362,996	1,215,925	2,149,879	356,641	1,179,146	117,023	25,634	89,160	639,726	8,916
	Cash Working Capital - Expenses	16A	23,311,966	10,355,175	2,158,688	1,564,233	841,562	1,850,970	4,844,227	904,504	107,235	680,709	4,662
	Cash Working Capital - Interest	18	(7,295,957)	(3,510,815)	(795,989)	(1,407,390)	(233,471)	(771,912)	(76,608)	(16,781)	(58,368)	(418,788)	(5,837)
	Accrued and Prepaid Taxes	18	6,838,143	3,290,514	746,041	1,319,078	218,821	723,476	71,801	15,728	54,705	392,509	5,471
	Extension Deposits in Suspense	4	(13,696)	(6,036)	-	(6,695)	-	-	-	-	(142)	(803)	(21)
	Unamortized Investment Tax Credit	18	(236,891)	(113,992)	(25,845)	(45,696)	(7,581)	(25,063)	(2,487)	(545)	(1,895)	(13,598)	(190)
	Deferred Taxes	18	(1,007,764,482)	(484,936,269)	(109,947,105)	(194,397,769)	(32,248,463)	(106,621,482)	(10,581,527)	(2,317,858)	(8,062,116)	(57,845,681)	(806,212)
	Citizens Acquistion CIAC & CAC	4	(18,326,990)	(8,076,704)	-	(8,958,233)	-	-	-	-	(190,601)	(1,073,962)	(27,490)
	Tax Cust and Jobs Act- Stub Period	18	(5,541,711)	(2,666,671)	(604,601)	(1,068,996)	(177,335)	(586,313)	(58,188)	(12,746)	(44,334)	(318,094)	(4,433)
	Other Additions	18	414,924	199,661	45,268	80,039	13,278	43,899	4,357	954	3,319	23,817	332
	Other Deductions	18	(473,043)	(227,628)	(51,609)	(91,250)	(15,137)	(50,048)	(4,967)	(1,088)	(3,784)	(27,153)	(378)
	Acquisition Adjustments	18	6,722,891	3,235,055	733,467	1,296,846	215,133	711,282	70,590	15,463	53,783	385,894	5,378
	Total Other Rate Base Elements		(991,219,800)	(477,094,714)	(106,525,760)	(199,565,954)	(31,036,552)	(103,546,045)	(5,615,779)	(1,386,735)	(8,053,038)	(57,575,424)	(819,802)
	Total Original Cost Rate Base		4,034,404,744	1,940,646,428	441,740,452	770,043,908	129,612,564	428,200,653	47,185,483	10,274,540	32,386,425	230,994,532	3,319,755

PENNSYLVANIA-AMERICAN WATER COMPANY

RESPONSES TO RATE STRUCTURE
AND COST OF SERVICE FILING REQUIREMENTS

RS1. Provide a complete (fully allocated) cost of service study if an interval of approximately three years has passed between a previous cost of service study and the historic test year date of the current filing. The cost of service study shall provide the necessary data to determine if the water rate structure is fair and equitable to all classifications of water users (including public and private fire protection customers) and reflects, as nearly as possible, the cost of providing the service. The study shall correspond to the test year proposed revenue requirements (future test year only, if used). Summaries of conclusions and all back-up calculations shall be made part of the submission of the cost of service study, and shall include the following:

j. Provide a detailed cost analysis that supports the Company's customer charges, by meter size, showing all direct and indirect costs included.

RESPONSE

Please refer to the attached schedules for the year ended December 31, 2023.

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

CALCULATION OF THE 5/8-INCH CUSTOMER COSTS PER MONTH
INCLUDING THE UNRECOVERED PUBLIC FIRE COSTS

Cost Function	Cost of Service	Number of Units	Unit Cost Per Month
Meters	36,773,954	829,107 5/8 Equivalents	$ 3.70
Services	76,101,990	679,975 3/4 Equvalents	9.33
Billing/Collecting	53,924,126	8,135,170 Bills	6.63
Meter Reading	11,543,472	8,135,170 Bills	1.42
Subtotal	178,343,542		21.08
Unrecovered Public Fire	28,349,085	829,107 5/8 Equivalents	2.85
Total	206,692,627		$ 23.93

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

CALCULATION OF THE 5/8-INCH CUSTOMER COSTS PER MONTH
INCLUDING THE UNRECOVERED PUBLIC FIRE COSTS

Cost Function	Cost of Service*	Number of Units	Unit Cost Per Month
Meters	33,657,106	829,107 5/8 Equivalents	$ 3.38
Services	67,686,562	679,975 3/4 Equvalents	8.30
Billing/Collecting	30,781,002	8,135,170 Bills	3.78
Meter Reading	5,459,043	8,135,170 Bills	0.67
Subtotal	137,583,714		16.13
Unrecovered Public Fire	28,349,085	829,107 5/8 Equivalents	2.85
Total	165,932,799		$ 18.98

* Includes only direct customer costs as shown on the attached schedules.

PENNSYLVANIA-AMERICAN WATER COMPANY - WATER OPERATIONS

ANALYSIS OF DIRECT CUSTOMER COSTS

Description	Meters	Services	Billing & Collecting	Meter Reading
Operation and Maintenance Expenses				
T&D Supervision - Operation	$ 385,803	$ 180,700	$ -	$ -
Miscellaneous Meter Expense	467,941	-	-	-
Services on Customer Premises	-	219,402	-	-
T&D Supervision - Maintenance	312	76,101	-	-
Services Maintenance	-	1,313,127	-	-
Meter Maintenance	5,522	-	-	-
Customer Accounting Expenses	2,018,314	-	14,454,288	3,620,345
Management Fees - Customer	-	-	13,721,156	-
Employee Pension and Benefits	169,615	285,298	194,107	204,008
Transportation Expense	147,904	330,188	628,914	157,634
Worker's Compensation	54,974	92,467	62,912	66,120
Advertising Expense	-	-	-	-
Office Rents	(47,354)	(97,933)	(74,760)	(14,811)
Other Rev. Billing and Collecting	(25,840)	(53,439)	(40,794)	(8,082)
Other Rev. Customer Related	-	-	(4,168,597)	-
Subtotal	3,177,191	2,345,911	24,777,226	4,025,214
Depreciation Expense				
Meters	14,445,237	-	-	-
Services	-	12,925,278	-	-
Office Buildings	54,860	122,472	233,274	58,469
Office Furniture & Equipment	13,936	31,111	59,257	14,853
Computer Software BT CIS			704,604	
Transportation Equipment	409,139	913,385	1,739,738	436,056
Subtotal	14,923,172	13,992,246	2,736,873	509,378
Taxes Other Than Income				
Payroll Taxes	305,840	514,431	350,001	367,854
Assessments	248,227	513,355	391,882	77,637
Subtotal	554,067	1,027,786	741,883	445,491
Rate Base				
Meters	149,548,861	-	-	-
Services	-	506,783,000	-	-
Office Land/Buildings	1,821,312	4,066,000	7,744,572	1,941,135
Office Furniture and Equipment	1,281,677	2,861,286	5,449,935	1,365,997
Computer Software BT CIS			6,310,553	
Transportation Equipment	1,514,968	3,382,100	6,441,936	1,614,637
Subtotal	154,166,818	517,092,386	25,946,996	4,921,769
Return and Income Taxes	15,002,676	50,320,619	2,525,021	478,960
Total Direct Customer Costs	$ 33,657,106	$ 67,686,562	$ 30,781,002	$ 5,459,043

PENNSYLVANIA-AMERICAN WATER COMPANY

RESPONSES TO RATE STRUCTURE
AND COST OF SERVICE FILING REQUIREMENTS

RS2. Provide a listing of negotiated special rate contracts which includes a comparison of revenues under special rate contracts and under tariff rates. Provide the cost of service treatment of any deficiency in revenues resulting from the negotiated special rate contracts.

RESPONSE

Please refer to Confidential Attachment RS2 for for the comparison of the present and proposed tariff revenues with contract revenues for the following customers:

Industrial
- Demand Base Industrial Service 1
- Demand Base Industrial Service 2
- Demand Base Industrial Service 3

Other Water Utilities
- Demand Base Resale Service 1
- Demand Base Resale Service 2
- Demand Base Resale Service 3
- Demand Base Resale Service 4
- Demand Base Resale Service 5
- Demand Base Resale Service 6
- Demand Base Resale Service 7