

BEFORE THE  
PHILADELPHIA WATER, SEWER AND STORM WATER RATE BOARD

IN RE: APPLICATION OF THE )  
PHILADELPHIA WATER DEPARTMENT ) FISCAL YEARS 2019-2021 RATES  
FOR INCREASED RATES AND CHARGES )

DIRECT TESTIMONY  
OF  
JEROME D. MIERZWA

ON BEHALF OF THE PUBLIC ADVOCATE

April 20, 2018

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PHILADELPHIA WATER, SEWER AND STORMWATER RATE BOARD

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FOR INCREASED RATES AND )

Direct Testimony of Jerome D. Mierzwa

1

**I. INTRODUCTION**

2 Q.

WOULD YOU PLEASE STATE YOUR NAME AND BUSINESS  
ADDRESS?

3

4 A.

My name is Jerome D. Mierzwa. I am a principal and Vice President of Exeter Associates, Inc. (“Exeter”). My business address is 10480 Little Patuxent Parkway, Suite 300, Columbia, Maryland 21044. Exeter specializes in providing public utility-related consulting services.

7

8 Q.

PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND  
EXPERIENCE.

9

10 A.

I graduated from Canisius College in Buffalo, New York, in 1981 with a Bachelor of Science Degree in Marketing. In 1985, I received a Master’s Degree in Business Administration with a concentration in finance, also from Canisius College. In July 1986, I joined National Fuel Gas Distribution Corporation (“NFG Distribution”) as a Management Trainee in the Research and Statistical Services Department (“RSS”). I was promoted to Supervisor RSS in January 1987. While employed with NFG Distribution, I conducted various financial and statistical analyses related to the Company’s market research activity and state regulatory affairs. In April 1987, as part of a corporate reorganization, I was transferred to National Fuel Gas Supply

18

1 Corporation's ("NFG Supply") rate department where my responsibilities included  
2 utility cost of service and rate design analysis, expense and revenue requirement  
3 forecasting and activities related to federal regulation. I was also responsible for  
4 preparing NFG Supply's Federal Energy Regulatory Commission ("FERC") Purchase  
5 Gas Adjustment ("PGA") filings and developing interstate pipeline and spot market  
6 supply gas price projections. These forecasts were utilized for internal planning  
7 purposes as well as in NFG Distribution's annual state-purchased gas cost regulatory  
8 proceedings.

9 In April 1990, I accepted a position as a Utility Analyst with Exeter. In  
10 December 1992, I was promoted to Senior Regulatory Analyst. Effective April 1, 1996,  
11 I became a principal of Exeter. Since joining Exeter, my assignments have included  
12 water and gas utility class cost of service and rate design analysis, evaluating the gas  
13 purchasing practices and policies of natural gas utilities, sales and rate forecasting,  
14 performance-based incentive regulation, revenue requirement analysis, the unbundling  
15 of utility services, and the evaluation of customer choice natural gas transportation  
16 programs.

17 Q. HAVE YOU PREVIOUSLY TESTIFIED IN REGULATORY  
18 PROCEEDINGS ON UTILITY RATES?

19 A. Yes. I have provided testimony on more than 300 occasions in proceedings before the  
20 FERC, utility regulatory commissions in Arkansas, Delaware, Georgia, Illinois,  
21 Indiana, Louisiana, Maine, Massachusetts, Montana, Nevada, New Jersey, Ohio,  
22 Pennsylvania, Rhode Island, Texas, Utah, and Virginia, as well as before the  
23 Philadelphia Water, Sewer and Storm Water Rate Board ("Board").

24 Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

1 A. Exeter Associates, Inc. was retained by Community Legal Services serving as the  
2 Public Advocate to assist it in the evaluation of the General Rate Filing submitted by  
3 the Philadelphia Water Department (“PWD”). In this testimony, I present my findings  
4 and recommendations on behalf of the Public Advocate regarding the class cost of  
5 service (“CCOS”) studies and rate design recommendations presented by PWD for  
6 water, sanitary sewer, and storm water service. My colleague, Mr. Lafayette K.  
7 Morgan, Jr., presents the Public Advocate’s findings regarding the overall revenue  
8 increase, if any, to which PWD is entitled for its water, sanitary sewer, and storm water  
9 operations for its Rate Period (Fiscal Years (“FYs”) 2019 through 2021).

10 Q. HAVE YOU PREVIOUSLY PRESENTED TESTIMONY IN PWD  
11 PROCEEDINGS?

12 A. Yes. I previously submitted testimony on behalf of the Public Advocate in the 2008  
13 proceeding in which PWD’s rates for FYs 2009-2012 were established, and the 2016  
14 proceeding in which PWD’s rates for FYs 2017-2018 were established.

15 Q. PLEASE SUMMARIZE YOUR FINDINGS AND RECOMMENDATIONS  
16 CONCERNING PWD’S CCOS STUDIES AND RATE DESIGN  
17 PROPOSALS IN THIS PROCEEDING.

18 A. My findings and recommendations concerning PWD’s CCOS studies and rate design  
19 proposals in this proceeding are as follows:

- 20 • While the PWD’s water CCOS study is generally reasonable, the system-wide  
21 maximum day and maximum hour extra-capacity factors reflected in that  
22 study should be revised to reflect more recent actual experience, and  
23 modifications should be made to the customer class specific extra-capacity  
24 factors reflected in that study. This CCOS study with revised system-wide  
25 and customer class specific extra-capacity factors should be relied upon to  
26 determine the distribution of the revenue increase, if any, authorized in this  
27 proceeding. However, because PWD uses the same usage rates for all  
28 customer classes, it is nearly impossible to set rates to recover the indicated  
29 cost of service for each customer class. Therefore, I recommend that PWD be  
30 required to adopt separate volumetric usage rates for each customer class that

1 recovers the cost of service indicated by my revised CCOS study,  
2 proportionately scaled back to achieve the revenue increase authorized by the  
3 Board in this proceeding.  
4

- 5 • In the alternative, the existing rates of Residential customers significantly  
6 exceed the indicated cost of service. Most Residential class consumption falls  
7 within the 0 to 2 Mcf usage block. If separate usage rates for each class  
8 cannot be adopted in this proceeding, I recommend that the current 0 to 2 Mcf  
9 usage block be maintained during the FY 2019 – FY 2021 rate period, and any  
10 increase authorized by the Board in this proceeding be recovered through  
11 proportional increase to the remaining usage block rates. I further recommend  
12 that separate usage rates be adopted for each customer class in PWD’s next  
13 proceeding.  
14
- 15 • The PWD’s wastewater (sanitary sewer and stormwater) CCOS studies appear  
16 reasonable. I am proposing no changes to these CCOS studies. If an increase  
17 in rates is authorized by the Board in this proceeding, I recommend the rates  
18 initially proposed by PWD be proportionately scaled back to achieve the  
19 revenue increase authorized in this proceeding. If no increase is authorized by  
20 the Board, PWD’s existing sewer and stormwater service rates should remain  
21 unchanged.

22 Q. HAVE YOU PREPARED SCHEDULES TO ACCOMPANY YOUR  
23 TESTIMONY?

24 A. Yes. I have prepared Schedule JDM-1 which is attached to my testimony.

25 Q. WHAT MATERIAL DID YOU REVIEW IN PREPARATION OF YOUR  
26 TESTIMONY?

27 A. I have reviewed the CCOS studies and the supporting Direct and Supplemental  
28 Testimony of the Black and Veatch Corporation (“B&V”) witnesses submitted on  
29 behalf of the PWD as part of its February 2018 filing. I have also reviewed PWD’s  
30 responses to the Standard Interrogatories related to water, sanitary sewer, and storm  
31 water cost allocation and rate design as well as PWD’s responses to the discovery  
32 requests submitted by the Public Advocate on my behalf as well as other related  
33 discovery responses.

34 Q. HOW IS THE REMAINDER OF YOUR TESTIMONY ORGANIZED?

1 A. Following this introductory section, my testimony is divided into two additional  
2 sections. The first section addresses PWD’s water CCOS study and rate design  
3 proposals. In the next section, I address PWD’s wastewater CCOS studies and rate  
4 design proposals.

5 **II. PWD’S WATER CLASS COST OF SERVICE STUDY**

6 Q. WHAT IS THE OBJECTIVE OF A CLASS COST OF SERVICE STUDY?

7 A. A CCOS study is conducted to assist a utility or commission in determining the level  
8 of costs properly recoverable from each of the various classes to which the utility  
9 provides service. Allocation of recoverable costs to each class of service is generally  
10 based on cost causation principles.

11 Q. WHAT ARE THE PRIMARY CCOS STUDY METHODOLOGIES  
12 UTILIZED FOR WATER UTILITIES?

13 A. The two most commonly used and widely recognized methods of allocating costs  
14 to customer classes for water utilities are the base extra-capacity method and the  
15 commodity-demand method. Both of these methods are set forth in the American  
16 Water Works Association’s (“AWWA”) *Principles of Water Rates, Fees and Charges*,  
17 *Manual of Water Supply Practices* (“AWWA M1 Manual”).

18 Q. PLEASE SUMMARIZE EACH OF THESE METHODS.

19 A. Under the base extra-capacity method, investment and costs are generally first assigned  
20 to utility functional cost centers which include: source of supply, pumping, storage,  
21 treatment, distribution, customer, and general administration. These functional costs  
22 are then allocated into four primary cost categories: base or average capacity, extra  
23 capacity, customer, and direct fire protection. Customer costs are commonly further  
24 divided between meter- and service-related, and account- or bill-related costs. Extra-  
25 capacity costs may also be divided between maximum day and maximum hour costs.

1           Once investment and costs are classified to these primary cost categories, they are then  
2 allocated to customer classes. Base costs are allocated according to average water use,  
3 and extra-capacity costs are allocated on the basis of the excess of peak demands over  
4 average demands. Meter- and service-related customer costs are allocated on the basis  
5 of relative meter and service investment or a proxy thereof. Account-related customer  
6 costs are allocated in proportion to the number of customers or the number of bills. The  
7 water CCOS presented by the PWD in this proceeding utilizes the base extra-capacity  
8 methodology.

9           The commodity-demand method follows the same general procedures.  
10 However, usage-related costs are classified as commodity- and demand-related rather  
11 than as base- and extra-capacity related. Commodity-related costs are allocated to  
12 customer classes on the basis of total water use (which is equivalent to average  
13 demand), and demand-related costs are allocated on the basis of each class'  
14 contribution to peak demand rather than on the basis of class demands in excess  
15 of average use.

16 Q.           PLEASE DESCRIBE IN GREATER DETAIL THE FOUR PRIMARY  
17 COST CATEGORIES AND HOW THEY ARE ALLOCATED TO THE  
18 VARIOUS CUSTOMER CLASSES UNDER THE BASE EXTRA-  
19 CAPACITY METHOD.

20 A.           **Base Costs** are costs that tend to vary with the quantity of water used, plus costs  
21 associated with supplying, treating, pumping and distributing water to customers under  
22 average load conditions. Base costs were allocated to customer classes on the basis of  
23 average daily usage in PWD's CCOS study.

24           **Extra-capacity Costs** are costs associated with meeting usage requirements in  
25 excess of average day usage. This includes operating and capital costs for additional

1 plant and system capacity beyond that required for average day usage. Extra-capacity  
2 costs in PWD's CCOS study have been subdivided into costs necessary to meet  
3 maximum day extra demand and maximum hour extra demand. These extra-capacity  
4 costs were allocated to customer classes on the basis of each class' maximum day and  
5 maximum hour usage in excess of average day and average hour usage, respectively.

6 **Customer Costs** are costs associated with serving customers regardless of their  
7 usage or demand characteristics. Customer costs include the operating costs related to  
8 meters and services, meter reading costs, and billing and collecting costs. Customer  
9 costs were allocated on the basis of the capital cost of meters and services and the  
10 number of customer bills.

11 **Fire Protection Costs** are costs associated with providing the facilities  
12 necessary to meet the potential peak demand of fire protection service. In PWD's  
13 study, fire protection costs have been subdivided into the costs associated with meeting  
14 Public Fire Protection and Private Fire Protection demands. The extra-capacity costs  
15 assigned to fire protection were allocated to Public and Private Fire Protection on the  
16 basis of the total relative demands of hydrants and fire service lines. Effective with FY  
17 2019, Public Fire Protection costs are proposed to be recovered from all other retail  
18 water customers. PWD is proposing to recover Public Fire Protection costs from retail  
19 customers through a meter size-based service charge. PWD's Public Fire Protection  
20 cost recovery proposal is addressed by Mr. Roger Colton, who is also testifying on  
21 behalf of the Public Advocate in this proceeding.

22 Q. PLEASE IDENTIFY THE CUSTOMER CLASSES PWD HAS INCLUDED  
23 IN ITS WATER CCOS STUDY?

24 A. PWD has separately identified the cost of serving twelve (12) retail customer classes:  
25 Residential, Senior Citizens, Commercial, Industrial, Public Utilities, Housing



1 Authority, Charities/Schools, Hospital/University, Hand Billed, Flat Rate, Public Fire  
2 Protection, and Private Fire Protection. The cost of serving PWD's wholesale  
3 customer, Aqua Pennsylvania, has also been separately identified.

4 Q. PLEASE DESCRIBE IN GREATER DETAIL PWD'S ASSIGNMENT OF  
5 INVESTMENT AND COSTS TO UTILITY FUNCTIONAL COST  
6 CENTERS AND THE ALLOCATION OF THESE COSTS TO COST  
7 CATEGORIES.

8 A. As shown on Tables W-8 through W-10 of PWD's CCOS study, costs have been  
9 assigned to four functional cost centers:

- 10 • Raw Water Supply and Pumping
- 11 • Purification and Treatment
- 12 • Transmission and Distribution
- 13 • Administrative and General

14 The costs assigned to these functional cost centers have subsequently been allocated to  
15 the following cost categories:

- 16 • Base capacity;
- 17 • Maximum day extra capacity;
- 18 • Maximum hour extra capacity;
- 19 • Customer; and
- 20 • Direct fire protection.

21 Customer costs, such as meters and services, and direct fire protection costs,  
22 such as hydrants, are directly assigned to their respective cost category. Remaining  
23 costs are allocated to the base, maximum day, and maximum hour cost categories based  
24 on the degree to which they are associated with meeting those service requirements.  
25 Cost that meet base (average day) service requirements are allocated 100 percent to  
26 base category. Costs that meet maximum day service requirements are allocated

1 between the base and the maximum day cost categories. Costs that meet maximum  
2 hour service requirements are allocated to the base, maximum day, and maximum hour  
3 cost categories.

4 PWD Statement No. 9A, page 59, lines 15-19 indicates that based on the  
5 historical demands experienced on the PWD system, the system-wide maximum day  
6 demand is 130 percent of average day demand. Consequently, and as confirmed in  
7 Statement No. 9A, 77 percent (100/130) of maximum day costs should be allocated to  
8 the base category and 23 percent to the maximum day category. However, as I explain  
9 later in my testimony, PWD's CCOS study does not reflect a system-wide maximum  
10 day demand that is 130 percent of average day demand.

11 Similarly, in PWD Statement No. 9A, page 59, line 21 through page 60, line 2,  
12 PWD claims that the maximum hour demand on the PWD system is approximately 174  
13 percent of average day demands. Consequently, and as also confirmed in Statement  
14 No. 9A, the costs associated with facilities designed to meet maximum hour demands  
15 should be allocated 57 percent (100/174) to the base category, 17 percent to the  
16 maximum hour category [(130-100)/174], and the remaining 26 percent to the  
17 maximum hour category. However, as also explained later in my testimony, PWD's  
18 CCOS study does not reflect a system-wide maximum hour extra-capacity factor that  
19 is 174 percent of average day demand, and in developing the maximum hour extra-  
20 capacity allocations, PWD has used a maximum day demand that differs from the  
21 maximum hour demand used in the determination of those costs that should be  
22 allocated between maximum day and average day demands.

23 Q. PLEASE DESCRIBE IN GREATER DETAIL THE ALLOCATION OF  
24 SYSTEM-WIDE MAXIMUM DAY AND MAXIMUM HOUR EXTRA-  
25 CAPACITY COSTS TO CUSTOMER CLASS UNDER THE BASE

1 EXTRA-CAPACITY METHOD AS SET FORTH IN THE AWWA M1  
2 MANUAL.

3 A. Under the base extra-capacity method, maximum day and maximum hour extra-  
4 capacity costs are allocated to customer class based on the excess of each class'  
5 non-coincident maximum day and maximum hour demands over average day and  
6 average hour demands, respectively. As an example, as shown on Schedule BV-E1,  
7 Table W-11, the average day water usage of Residential customers was determined to  
8 be 8,650 Mcf, and the maximum day usage of Residential customers was determined  
9 to be 200 percent of average day usage, or 17,300 Mcf. Thus, the maximum day extra-  
10 capacity usage of Residential customers is 8,650 Mcf (17,300 Mcf maximum day usage  
11 less 8,650 Mcf average day usage). Maximum day extra-capacity costs are allocated  
12 to the Residential class based on the Residential class' proportionate share of total  
13 system maximum day extra-capacity usage.

14 With respect to the allocation of maximum hour extra-capacity costs, as also  
15 shown on Schedule BV-E1, Table W-11, PWD determined that the maximum hour  
16 usage (on a 24-hour basis) of the Residential class is 360 percent of average day usage,  
17 or 31,140 Mcf. Thus, the maximum hour extra-capacity usage of Residential customers  
18 is 13,840 Mcf above maximum day usage (31,140 Mcf maximum hour usage less  
19 17,300 Mcf maximum day usage). Maximum hour capacity costs are allocated to the  
20 Residential class based on the Residential class' proportionate share of total system  
21 maximum hour extra-capacity usage.

22 Q. THE BASE-EXTRA CAPACITY METHOD UTILIZES NON-  
23 COINCIDENT PEAK DEMANDS TO ALLOCATE EXTRA-CAPACITY  
24 COSTS TO THE VARIOUS CUSTOMER CLASS. IS THIS SIMPLY THE

1 DEMANDS OF EACH CUSTOMER CLASSIFICATION AT THE TIME  
2 OF SYSTEM PEAK DAY AND PEAK HOUR DEMANDS?

3 A. No. Non-coincident peak demands represent the maximum demands of the individual  
4 customer classifications regardless of when those demands occur. Thus, the sum of  
5 each customer class' non-coincident demands will exceed the system coincident peak  
6 demand. The ratio obtained by dividing non-coincident demands by coincident  
7 demands is referred to as the system diversity ratio in the AWWA M1 Manual.

8 Q. WHY ARE NON-COINCIDENT DEMANDS UTILIZED UNDER THE  
9 BASE EXTRA-CAPACITY METHOD?

10 A. The basis for using non-coincident maximum day and minimum hour demands is set  
11 forth in the AWWA M1 Manual:

12  
13 It is important that the reader understand the rationale of  
14 using the non-coincident demands in distributing the  
15 functionally allocated costs to each class. The rationale for  
16 supporting the use of non-coincident peaking factors is that  
17 the benefits of diversity in customer class consumption  
18 patterns should accrue to all classes in proportion to their  
19 use of the system, and not be allocated primarily to a  
20 particular class that happens to peak at a time different  
21 from other users of the system. The concept is illustrated  
22 through the following example: Assume that a utility was  
23 going to build a *separate system* (source of supply,  
24 treatment, pumping, transmission and distribution, etc.) for  
25 *each of the customer classes* served by the utility. These  
26 separate water systems would need to be sized to meet the  
27 base, maximum-day extra capacity, and maximum-hour  
28 extra-capacity demands related to each class. The sum of  
29 those systems would compose the overall water system,  
30 and the costs associated with each of the individual systems  
31 would be allocable to each class (based on their respective  
32 non-coincidental demands that were the basis for sizing the  
33 individual components of the system).

34  
35 Assume that a concept is developed that efficiencies,  
36 economies of scale, and reduction in the overall size of the  
37 "system" could be achieved if the system is an integrated,

1 diversified system. With this concept in mind, recognizing  
2 the diversities of demands of the various classes and using  
3 the coincidental demands of all classes to size the plant, a  
4 smaller system could be built. Total fixed capital costs and  
5 most operation and maintenance expenses, except perhaps  
6 for power and chemical costs, would be reduced in sizing  
7 the overall system facilities on the basis of the coincidental  
8 demands of all the classes of customers.  
9

10 The question at hand is, considering that there is a smaller,  
11 more efficient, and less costly system, how should the cost  
12 savings of that system be allocated among the individual  
13 customer classes? One appropriate manner to allocate  
14 these costs, and have each customer class share equitably in  
15 the overall cost savings, is to allocate the total new, smaller  
16 system costs on the basis of the non-coincidental demands  
17 of each customer class. In this manner, all classes share  
18 proportionately in the economies of scale and cost savings  
19 of this smaller, integrated, and diverse system.  
20

21 [AWWA M1 Manual, Appendix A, pages 314 - 316, 7th  
22 Edition (2017).]

23 Q. HOW DID THE COMPANY DEVELOP THE MAXIMUM DAY AND  
24 MAXIMUM HOUR DEMANDS OF THE VARIOUS CUSTOMER CLASS  
25 REFLECTED IN ITS WATER CCOS STUDY?

26 A. When asked to explain in detail how the maximum day and maximum hour extra-  
27 capacity factors for each customer class were determined in PA-ADV-42, PWD  
28 responded:

29 The customer type extra-capacity factors were determined based on previous  
30 cost of service studies and rate proceedings. To review and verify the reasonableness  
31 of the capacity factors, Black & Veatch performed a capacity factor analysis according  
32 to the methodology outlined in Appendix A of AWWA Manual M-1: Principles of  
33 Water Rates, Fees, and Charges. Accordingly, Black & Veatch used the FY 2016  
34 monthly customer billing data, and system historical peak demands, and weekly and

1 hourly usage adjustments to derive an estimate of capacity factors for each customer  
2 class.

3 Q. WHAT IS YOUR GENERAL ASSESSMENT OF THE WATER CCOS  
4 STUDY SPONSORED BY PWD?

5 A. I generally agree with PWD's use of the base extra-capacity methodology. However,  
6 as indicated previously, PWD's CCOS study should be revised to reflect a system-wide  
7 maximum day extra-capacity factor that is consistent with recent experience and the  
8 testimony presented in PWD Statement No. 9A, and the system-wide maximum hour  
9 extra-capacity factor should be revised to reflect recent actual experience. In addition,  
10 I believe that adjustments to the maximum day and maximum hour extra-capacity  
11 factors relied upon by PWD to determine and allocate costs to the various customer  
12 classifications are appropriate.

13 Q. PLEASE ELABORATE UPON YOUR EARLIER CONCERNS THAT THE  
14 SYSTEM-WIDE MAXIMUM DAY AND MAXIMUM HOUR CAPACITY  
15 FACTORS USED BY PWD IN ITS CCOS STUDY TO ALLOCATE COSTS  
16 TO COST CATEGORIES ARE INCONSISTENT WITH PWD'S  
17 TESTIMONY.

18 A. As I indicated previously, PWD Exhibit No. 9A indicates that PWD's system-wide  
19 maximum day demand is 130 percent of average day demand. Recent actual  
20 experience also supports the use of a maximum day demand that is 130 percent of  
21 average day. However, PWD's CCOS study reflects a maximum day demand that is  
22 140 percent of average day demand. PWD's CCOS study should be modified to be  
23 consistent with actual recent experience and the 130 percent maximum day to average  
24 day experience identified in PWD Statement No. 9A.

1           With respect to the appropriate maximum hour percentage of average day,  
2 PWD's testimony indicates that system-wide maximum hour is 174 percent of average  
3 day use. However, PWD's CCOS study reflects a maximum hour to average day  
4 demand of 190 percent. In addition, in developing the allocation of costs between the  
5 average day, maximum day, and maximum hour cost categories, PWD's CCOS study  
6 relies on a maximum day that is 125 percent of average day rather than the 130 percent  
7 discussed in PWD Statement No. 9A. Recent actual experience supports the use of a  
8 system-wide maximum hour demand that is 190 percent of average day, and the same  
9 130 percent maximum day demand percentage should be used to develop both the  
10 maximum day and maximum hour extra-capacity factors.

11 Q.           WHAT IS YOUR CONCERN WITH THE EXTRA-CAPACITY FACTORS  
12 UTILIZED IN PWD'S WATER CCOS STUDY TO ALLOCATE COSTS  
13 TO THE VARIOUS CUSTOMER CLASSES?

14 A.           The extra-capacity factors utilized in PWD's CCOS study for several customer classes  
15 do not appear to be reflective of the extra-capacity demands of these customer classes  
16 utilizing the methodology outlined in AWWA Manual M-1.

17 Q.           WHAT DO YOU RECOMMEND WITH RESPECT TO THE CUSTOMER  
18 CLASS EXTRA-CAPACITY FACTORS THAT SHOULD BE USED IN  
19 PWD'S WATER CCOS STUDY?

20 A.           Ideally, the most reliable approach to determining extra-capacity factors would be to  
21 conduct a formal study that samples the actual daily and hourly demands of the various  
22 customer classes. However, such studies are generally expensive and time consuming.  
23 The PWD has not conducted a formal study of actual customer class demands. In lieu  
24 of such a study, and as indicated previously in response to PA-ADV-42, Appendix A  
25 of the AWWA M1 Manual ("AWWA Method") presents an alternative approach to

1 developing extra-capacity factors. PWD claims to have used the AWWA Method to  
2 develop extra-capacity factors. However, the extra-capacity factors reflected in PWD's  
3 CCOS study are inconsistent with those resulting from application of the AWWA  
4 Method.

5 Q. HAVE YOU INDEPENDENTLY DEVELOPED CUSTOMER CLASS  
6 EXTRA-CAPACITY FACTORS BASED ON THE PROCEDURES  
7 DESCRIBED UNDER THE AWWA METHOD?

8 A. Yes. I developed extra-capacity factors for each customer class included in PWD's  
9 CCOS study using the procedures described under the AWWA Method. This analysis  
10 is presented on Schedule JDM-1. To develop these factors, I used the system-wide  
11 maximum day and maximum hour demands previously identified, and customer billing  
12 records from FY 2014 – FY 2016 (July 2013 – June 2016). I would note that; however,  
13 the resulting customer extra-capacity factors would not vary significantly if data solely  
14 from FY 2016 had been utilized, which was the approach used by PWD.

15 Q. WHAT DO THE RESULTS OF YOUR ANALYSIS OF EXTRA-  
16 CAPACITY FACTORS INDICATE?

17 A. There were varying degrees of differences between both the customer class specific  
18 maximum day and maximum hour extra-capacity factors reflected in PWD's CCOS  
19 Study from those indicated by my analysis. Those differences are identified in  
20 Schedule JDM-1. Among the most significant difference affecting the CCOS study is  
21 that the maximum hour and extra-capacity factors of the Residential and Senior Citizen  
22 classes are too high, while the factors for the Commercial class is too low.

23 Q. HAVE YOU REVISED PWD'S CCOS STUDY TO REFLECT THE  
24 APPROPRIATE SYSTEM-WIDE MAXIMUM DAY AND MAXIMUM



1 HOUR EXTRA-CAPACITY FACTORS AND YOUR CALCULATED  
2 CUSTOMER CLASS EXTRA-CAPACITY FACTORS?

3 A. Yes. Table 1 presents a comparison of the indicated cost of service for each customer  
4 class under the CCOS study initially filed by the PWD and the CCOS study revised to  
5 reflect the appropriate system-wide and customer class specific extra-capacity factors.  
6 Also included are revenues under existing rates.

<b>Table 1.</b>				
<b>Comparison of Class Cost of Service Study Results and Revenues under Existing Rates</b>				
<b>General Service</b>	<b>PWD Filed (1)</b>	<b>Revised (2)</b>	<b>Revenues at Existing Rates (3)</b>	<b>Difference (4) = (2)-(3)</b>
Residential	\$159,910,000	\$153,349,000	\$161,416,441	(\$8,067,441)
Senior Citizens	4,712,000	4,535,000	4,808,089	(273,089)
Commercial	59,115,000	63,126,000	59,524,948	3,601,052
Industrial	3,186,000	3,498,000	3,306,084	191,916
Public Utilities	388,000	604,000	431,736	172,264
<b>Subtotal:</b>	<b>\$227,311,000</b>	<b>\$225,112,000</b>	<b>\$229,487,298</b>	<b>(\$4,375,298)</b>
<b>Other Retail Service</b>				
Housing Authority	\$6,553,000	\$6,540,000	\$6,156,440	\$383,560
Charities & Schools	5,603,000	6,029,000	5,727,773	301,227
Hospitals & University	7,665,000	8,947,000	7,343,824	1,603,176
Hand Billed	20,059,000	20,536,000	16,985,587	3,550,413
Scheduled (Flat Rate)	0	0	1,227	(1,227)
Private Fire Protection	2,318,000	2,316,000	3,271,631	(955,631)
Public Fire Protection	0	0	0	0
Wholesale	3,759,000	3,444,000	3,246,853	197,147
<b>Total:</b>	<b>\$273,268,000</b>	<b>\$272,924,000</b>	<b>\$272,220,633</b>	<b>\$703,367</b>
Note: Class cost of service study results reflect the reallocation of discounts.				

7 Q. HOW DID PWD PROPOSE TO DISTRIBUTE THE PROPOSED  
8 INCREASE IT IS REQUESTING IN THIS PROCEEDING TO THE  
9 VARIOUS CUSTOMER CLASSES?

1 A. PWD claims that it is proposing rates that generally recover the indicated cost of service  
2 from each customer class. The indicated cost of service for each customer class and  
3 the percentage increase in existing rates necessary to increase rates to the indicated cost  
4 of service for each customer class is presented in Exhibit BV-E1, Table W-17.

5 Q. WHAT IS YOUR PROPOSAL WITH RESPECT TO THE DISTRIBUTION  
6 OF THE REVENUE INCREASES AWARDED IN THIS PROCEEDING?

7 A. I generally agree with PWD that it is reasonable to set rates based on the indicated cost  
8 of providing service. However, PWD's CCOS study does not reflect the appropriate  
9 system-wide or customer class specific extra-capacity factors and, therefore, should not  
10 be relied upon to determine the distribution of the revenue increases awarded in this  
11 proceeding. The revised CCOS study reflecting the appropriate extra-capacity demand  
12 factors provides a reasonable basis to determine the distribution of the revenue  
13 increases, if any, awarded in this proceeding.

14 The usage charges currently assessed by PWD and those proposed by PWD in  
15 this proceeding vary based on monthly consumption. The currently effective usage  
16 rates are as follows:

	<u>Usage Block</u>	<u>Charge Per Mcf</u>
17		
18	0 to 2 Mcf	\$41.11
19	2 to 100 Mcf	\$35.91
20	100 to 2,000 Mcf	\$29.28
21	Over 2,000 Mcf	\$28.48

22 These rates are applicable for all metered usage for all customer classes. As  
23 such, a change in one usage block rate will generally affect the revenues recovered  
24 from all customer classes. Because of this, it is nearly impossible to set rates to recover  
25 the indicated cost of service for each customer class. Therefore, I recommend that  
26 PWD be required to adopt separate volumetric usage rates for each customer class that

1 recovers the cost of service indicated by my revised CCOS study, proportionately  
2 scaled back to achieve the revenue increase authorized by the Board in this proceeding.

3 In the alternative, as indicated in Table 1, the existing rates of Residential  
4 customers significantly exceeds the indicated cost of service. Most Residential class  
5 consumption falls within the 0 to 2 Mcf usage block. If separate usage rates for each  
6 class cannot be adopted in this proceeding, I recommend that the current 0 to 2 Mcf  
7 usage block be maintained during the FY 2019 – FY 2021 rate period, and any increase  
8 authorized by the Board in this proceeding be recovered through proportional increase  
9 to the remaining usage block rates. I further recommend that separate usage rates be  
10 adopted for each customer class in PWD’s next proceeding.

11 **III. WASTEWATER COST OF SERVICE AND RATE DESIGN**

12 Q. PLEASE SUMMARIZE THE WASTEWATER CCOS STUDY FILED BY  
13 PWD IN THIS PROCEEDING.

14 A. Much like for water service, PWD has prepared a class cost of service study for  
15 wastewater service using FY17 costs as the starting point. In its study, PWD  
16 determines the average unit cost of providing each of the functional components of  
17 service. These functions include: annual volumes; capacity costs separated into those  
18 related to collection system demands, pumping demands, and treatment demands;  
19 suspended solids and BOD loadings; and customer costs separated into meter related  
20 and bill related. Next, costs are distributed to customer classes in proportion to each  
21 class’ ratio of its units of service by function to the sum of the units of service by  
22 function for all customer classes. Initially, costs are apportioned between PWD’s ten  
23 wholesale contract customers and its retail customers. The costs allocated to retail  
24 customers are then apportioned between sanitary sewer service and stormwater service

1 as discussed in more detail subsequently. Finally, rates are designed to recover the  
2 allocated costs.

3 Q. PLEASE SUMMARIZE THE RATES DESIGN FOR SANITARY SEWER  
4 SERVICE.

5 A. PWD's proposed sanitary sewer rate design consists of a series of flat monthly charges  
6 that increase as a function of meter size, and a uniform, non-varying quantity charge.  
7 Surcharges apply for high strength wastewater that requires additional treatment costs  
8 to be incurred. The proposed rates for wastewater service reflect the CCOS study  
9 results after accounting for the fact that senior citizens, charities and schools receive a  
10 25 percent discount and the Philadelphia Housing Authority receives a 5 percent  
11 discount.

12 Q. YOU NOTED EARLIER THAT RETAIL COSTS MUST BE  
13 APPORTIONED BETWEEN SANITARY WASTEWATER SERVICE AND  
14 STORMWATER SERVICE. PLEASE EXPLAIN.

15 A. Because the wastewater system is comprised of both separate sanitary and storm  
16 sewers, wastewater system costs are separated between sanitary sewer and stormwater  
17 costs based on the volumes, demands, loadings and revenues associated with each type  
18 of service. This is done to allow stormwater costs to be recovered separately from  
19 sanitary sewer service costs using parcel-based charges.

20 Q. HAS THE PWD PROPOSED ANY SIGNIFICANT CHANGES AS TO  
21 HOW COSTS ARE APPORTIONED BETWEEN SANITARY  
22 WASTEWATER SERVICE AND STORMWATER SERVICE IN THIS  
23 PROCEEDING?

24 A. No.

1 Q. PLEASE EXPLAIN HOW STORMWATER COSTS ARE RECOVERED  
2 FROM THE VARIOUS RETAIL CUSTOMER CLASSES.

3 A. In this proceeding, PWD is proposing to retain its parcel based stormwater cost  
4 allocation methodology under which stormwater costs other than billing and collection  
5 costs are allocated and recovered based on a combination of gross and impervious area  
6 (GA and IA). In particular, 80 percent of total stormwater related costs (excluding  
7 fixed costs such as customer billing) are allocated between Residential and non-  
8 Residential customers based on impervious property area and 20 percent are allocated  
9 based on total gross property area. The amounts allocated to Residential customers are  
10 recovered based through a uniform monthly charge that is the same for all Residential  
11 customers. Billing and collection costs are collected through a uniform charge per  
12 Residential account.

13 The GA and IA costs allocated to non-Residential customers are being  
14 recovered through monthly GA and IA charges that are individually calculated for each  
15 parcel based on the applicable (non-Residential) GA and IA rate and the parcel's  
16 specific billable GA and IA square footage. Non-Residential customers are also  
17 assessed a monthly billing and collection charge.

18 Q. ARE YOU PROPOSING ANY CHANGES TO PWD'S SANITARY  
19 SEWER OR STORMWATER CCOS STUDIES OR THE DISTRIBUTION  
20 OF THE REVENUE INCREASE AUTHORIZED BY THE BOARD IN  
21 THIS PROCEEDING, IF AN INCREASE IS AUTHORIZED BY THE  
22 BOARD?

23 A. I am proposing no changes to PWD's wastewater or stormwater CCOS studies. If an  
24 increase in rates is authorized by the Board in this proceeding, I recommend that the  
25 increase in rates initially proposed by PWD be proportionately scaled back to achieve

1 the revenue increase authorized in this proceeding. If no increase is authorized by the  
2 Board, PWD's existing wastewater and stormwater service rates should remain  
3 unchanged.

4 Q. DOES THIS COMPLETE YOUR TESTIMONY?

5 A. Yes. It does.

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BEFORE THE  
PHILADELPHIA WATER COMMISSIONER

IN RE: APPLICATION OF THE )  
PHILADELPHIA WATER DEPARTMENT ) FISCAL YEARS 2017-2018 RATES  
FOR INCREASED RATES AND )

SCHEDULE ACCOMPANYING THE  
DIRECT TESTIMONY

OF

JEROME D. MIERZWA

ON BEHALF OF THE PUBLIC ADVOCATE

April 20, 2018

**PHILADELPHIA WATER DEPARTMENT**  
 Calculation of Extra Capacity Demand Factors

Customer Class	Ave Day in	System Max	Weekly	MAXIMUM DAY FACTOR		
	Max Month/ Annual Ave Day Ratio (a) (1)	Day/Max Month Ave Day Ratio (2)		Usage Adjustment Adjustment (3)	Calculated (4)=(1x2x3)	PWD (5)
General Service-Residential	1.08	1.30	1.35	189	200	11
General Service-Commercial	1.22	1.30	1.17	186	180	(6)
General Service-Industrial	1.22	1.30	1.17	185	160	(25)
General Service-Public Utilities	2.09	1.30	1.17	317	160	(157)
P.H.A	1.13	1.30	1.26	186	190	4
Charity/Schools	1.25	1.30	1.17	190	180	(10)
Senior Citizens Discount	1.08	1.30	1.35	190	200	10
Hand Bill	1.13	1.30	1.17	172	180	8
Hospital/University	1.34	1.30	1.17	204	180	(24)
Scheduled	1.58	1.30	1.17	240	200	(40)

Customer Class	Ave Day in	Maximum	Max Hour/ Max Day	MAXIMUM HOUR FACTOR		
	Max Month/ Annual Ave Day Ratio (a) (1)	Day Factor (2)	Ratio (3)	Calculated (4)=(1x2x3)	PWD (5)	Change (6)=(5-4) Use (7)
General Service-Residential	1.08	1.90	1.66	315	360	45
General Service-Commercial	1.22	1.85	1.66	307	265	(42)
General Service-Industrial	1.22	1.85	1.33	246	200	(46)
General Service-Public Utilities	2.09	3.15	1.66	523	200	(323)
P.H.A	1.13	1.85	1.66	307	313	6
Charity/Schools	1.25	1.90	1.66	315	270	(45)
Senior Citizens Discount	1.08	1.90	1.66	315	360	45
Hand Bill	1.13	1.70	1.66	282	270	(12)
Hospital/University	1.34	2.00	1.66	332	233	(99)
Scheduled	1.58	2.40	1.66	398	360	(38)

Notes: (a) Reflects FY 2014 - 2016 Average