

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

SUPPLEMENTAL
DIRECT TESTIMONY OF

HAROLD J. SMITH

ON BEHALF OF
THE PITTSBURGH WATER
AND SEWER AUTHORITY

Docket Nos.

R-2020-3017951 (Water)

R-2020-3017970 (Wastewater)

P-2020-3019019 (DSIC)

TOPICS:

Impact of Act 70 on Rate Filing

Class Peaking Factors

Readiness to Service Component

Allocation of CAP-BDP & LSLR Costs

Stormwater Cost of Service

Municipal Units of Service

Adjustments to Class Cost of Service

Gradualism

August 18, 2020

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1 **I. INTRODUCTION**

2 **Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

3 A. My name is Harold J. Smith and my business address is 5619 DTC Parkway Suite 850
4 Greenwood Village, CO 80111.

5 **Q. HAVE YOU PREVIOUSLY TESTIFIED IN THIS PROCEEDING?**

6 A. Yes, I submitted direct testimony sponsoring Pittsburgh Water and Sewer Authority’s
7 (“PWSA” or the “Authority”) class cost of service study (“CCOSS”). The primary
8 purpose of my direct testimony was to describe the principles, methodology, and data
9 utilized in PWSA’s CCOSS (the “Original CCOSS”). I also submitted Supplemental
10 Testimony and schedules related to a revised CCOSS that was prepared in response to
11 direction provided by the Commission in its March 26, 2020 Order regarding PWSA’s
12 Stage 1 Compliance Plan¹; and, (2) to correct some errors in the CCOSS model that had
13 come to light during the discovery process.

14 **Q. HAVE YOU REVIEWED THE TESTIMONY SUBMITTED BY THE OTHER**
15 **PARTIES IN THIS RATE CASE?**

16 A. Yes, specifically I have reviewed the testimony submitted by Cline, representing the
17 Bureau of Investigation and Enforcement (“I&E”); Rubin, representing the Office of the
18 Consumer Advocate (“OCA”); and Kalcic, representing the Office of the Small Business
19 Advocate (“OSBA”).

20 **Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?**

21 A. In my rebuttal testimony I will first address the implications of the enactment of Act 70
22 with respect to PWSA’s rate filing in this docket. I will then respond to the direct
23 testimony of other witnesses, in the following areas:

¹ *Implementation of Chapter 32 of the Public Utility Code Regarding Pittsburgh Water and Sewer Authority – Stage 1, Docket Nos. M-2018-2640802 and M-2018-2640803 (Order entered March 26, 2020) (“Stage 1 Compliance Plan Order”).*

- 1 • Development of class peaking factors
- 2 • Allocation of costs to a Readiness to Serve Component
- 3 • Allocation of CAP-BDP costs
- 4 • Allocation of LSL Replacement costs
- 5 • Stormwater cost of service, cost allocation, and impact on wastewater
- 6 conveyance rates
- 7 • Municipal units of service
- 8 • Adjustments to class cost of service
- 9 • Gradualism

10 **Q. ARE YOU SPONSORING ANY EXHIBITS?**

11 A. Yes, attached to my testimony is a complete set of schedules generated by the updated
12 Rebuttal CCOSS model similar to the schedules that were submitted with my direct and
13 supplemental testimony. The Rebuttal CCOSS will also be provided to the parties.

14 **II. IMPACT OF ACT 70 ON PWSA’S RATE FILING**

15 **Q. PLEASE PROVIDE A BRIEF DESCRIPTION OF THE ELEMENTS OF ACT 70**
16 **THAT RELATE TO PWSA’S RATE FILING IN THIS DOCKET.**

17 A. Ms. Lestitian provides a detailed discussion of Act 70 and its implications with respect to
18 PWSA’s rate filing in this docket. (PWSA St. No. 2-R). From a rate making perspective,
19 Act 70, which was passed on July 23, 2020, stipulates that rates and charges assessed to
20 City of Pittsburgh (City) owned water and sewer accounts will be consistent with the
21 terms expressed in the cooperation agreement (Co-op) entered into between the City and
22 PWSA dated October 3, 2019.(See PWSA Exh. DML-1). Specifically, the Co-op states
23 that the City shall pay PWSA normal charges for water and sewer conveyance service
24 but, the rates paid by the City will be phased in over a five year period according to the
25 following schedule:

26

<u>Year</u>	<u>% of Usage Charged</u>
2020	20%
2021	40%
2022	60%
2023	80%
2024	100%

Additionally, the Co-op states that any City accounts that are not metered by January 1, 2024 will be assessed a flat rate consistent with PWSA policy and practices.

Q. HOW DOES THIS TESTIMONY AND THE ACCOMPANYING CCOSS ADDRESS THE RAMIFICATIONS OF ACT 70?

A. The enactment of Act 70 effectively obviates the need for most of the revisions to the CCOSS and PWSA’s proposed rates that were made in my Supplemental Testimony which included the development of a separate Municipal rate that incorporated the phase-in contemplated in the Co-op and the development of a Municipal flat rate that would be assessed to unmetered City accounts immediately upon approval by the Commission.

It should be noted that it is my understanding that Act 70 dictates that the City will be charged for water and wastewater conveyance service according to the terms of the Co-op Agreement. As such, my testimony will not address portions of the testimony of others that make recommendations that are contrary to the terms of the Co-op Agreement.

22III. DEVELOPMENT OF CLASS PEAKING FACTORS

Q. PLEASE SUMMARIZE THE COMMENTS OF OTHER WITNESSES RELATED TO THE DEVELOPMENT OF CLASS PEAKING FACTORS.

A. Both Messrs. Rubin and Kalcic call into question the validity of the class peaking factors PWSA used to allocate extra capacity costs to customer classes. (OCA St. No. 1 at 38-41; OSBA St. No. 1 at 11-16). Mr. Rubin focuses his testimony on the way in which the

1 peaking factors for the Industrial class were developed, while Mr. Kalcic argues that data
 2 from FY2017 should not have been used to develop the class peaking factors.
 3 Additionally, Kalcic argues that the variance factors used to develop estimates of class
 4 max day and max hour factors are not based on actual data from PWSA.

5 **Q. PLEASE ELABORATE ON THE CONCERNS THAT MR. RUBIN RAISED**
 6 **REGARDING CLASS PEAKING FACTORS.**

7 A. Mr. Rubin points out that PWSA used the demand characteristics of PWSA’s largest
 8 industrial customer as a proxy for the Industrial class demand characteristics. He goes on
 9 to suggest that it would be more appropriate to use the peaking characteristics of the
 10 Industrial class’ nine largest customers as a proxy for the class demand characteristics
 11 and calculates a recommended Industrial class max day peaking factor of 1.5.

12 **Q. DO YOU AGREE WITH MR. RUBIN’S RECOMMENDATION?**

13 A. I agree with Mr. Rubin’s suggestion to use an Industrial max day peaking factor of 1.5 as
 14 suggested by the demand characteristics of the nine largest customers in the Industrial
 15 class and have revised the CCOSS to reflect this change.

16 **Q. PLEASE ELABORATE ON THE CONCERNS THAT MR. KALCIC RAISED**
 17 **REGARDING THE WEEKLY ADJUSTMENT FACTORS AND ESTIMATED**
 18 **MAX HOUR TO MAX DAY RATIOS IN THE DEVELOPMENT OF CLASS**
 19 **PEAKING FACTORS.**

20 A. Mr. Kalcic notes that PWSA used the methodology presented in Appendix A of
 21 AWWA’s M-1 manual to develop estimates of customer class max day and max hour
 22 peaking factors. He also recognizes that PWSA attempted to use meter data relating to
 23 daily variations in peak demand for each class but determined that the available data was
 24 unreliable and therefore used a Weekly Adjustment Factor of 1.0.

25 Similarly, Mr. Kalcic also points out that PWSA used Estimated MH/MD Ratios
 26 that are the same as those used in the M-1 manual.

1 Mr. Kalcic did not suggest Weekly Adjustment Factors or Estimated Max Hour to
2 Max Day Ratios that he believed PWSA should have used.

3 **Q. WHAT IS YOUR RESPONSE TO MR. KALCIC’S TESTIMONY ON THIS**
4 **MATTER?**

5 A. I agree with Mr. Kalcic’s characterization of the role that Weekly Adjustment Factors and
6 Estimated Max Hour to Max Day Ratios play in the estimation of class peaking factors
7 using the methodology described in M-1. However, given the fact that there is no reliable
8 PWSA specific data on which to base a PWSA specific Weekly Adjustment Factor I
9 believe that PWSA’s decision that it was better to assume there were no fluctuations in
10 peak demands for each class is better than using adjustment factors based on unreliable
11 data or arbitrarily assume a certain variability for each class. As such, PWSA will
12 continue to use a Weekly Adjustment Factor of 1.0 for all classes until such time as there
13 is reliable data that will allow for the determination of a better Weekly Adjustment
14 Factor.

15 As for the use of Estimated Max Hour to Max Day Ratios, absent detailed data
16 relating to daily and hourly demand for each class, the methodology for estimating max
17 hour demand factors relies on assumptions relating to daily and hourly variability in
18 demand by each class. The Estimated Max Hour to Max Day Ratios that are used to
19 develop Max Hour peaking factors for each class reflect the assumption that the
20 Industrial class likely has more stable usage patterns and will likely exhibit lower peaks.
21 As such, PWSA will continue to use the proposed Estimated Max Hour to Max Day
22 Ratios until such time as there is reliable data that supports the use of other ratios.

1 **Q. PLEASE ELABORATE ON MR. KALCIC’S CONCERNS REGARDING THE**
2 **USE OF DATA FROM FY2017 IN THE DEVELOPMENT OF PEAKING**
3 **FACTORS.**

4 A. Mr. Kalcic notes that PWSA used three years of data (FY2017-FY2019) in the
5 development of class peaking factors and suggests that the data from FY2017 be
6 excluded from the analysis due to inconsistencies in the data from that year that could
7 make that data unreliable for the purposes of rate setting.

8 **Q. DO YOU AGREE WITH HIS SUGGESTION TO EXCLUDE THE DATA FROM**
9 **FY2017 WHEN DEVELOPING CLASS PEAKING FACTORS?**

10 A. I concur with Mr. Kalcic’s suggestion and the revised CCOSS submitted with this
11 testimony uses class peaking factors that were developed using data from FY2018 and
12 FY2019.

13 **IV. ALLOCATION OF COSTS TO A READINESS TO SERVE COMPONENT**

14 **Q. PLEASE SUMMARIZE THE COMMENTS ON THE REMOVAL OF THE**
15 **READINESS-TO-SERVE COMPONENT OF THE WATER SERVICE**
16 **MINIMUM CHARGES.**

17 A. Mr. Rubin addressed the readiness-to-serve component in the water minimum charges
18 and disagrees with its inclusion. Mr. Rubin states that “The Authority apparently chose
19 25% as an arbitrary amount to try to meet some pre-conceived notion of an “appropriate”
20 level of customer charge. In other words, the arbitrary cost allocation was designed to
21 provide a rationale for a higher customer charge; it is not reflective of the cost of
22 providing service.” Mr. Rubin also states that “Determining the appropriate level of
23 customer charge or other fixed charge is a question of rate design”(OCA St. No. 1 at 43,
24 lines 15-16).

1 **Q. DO YOU AGREE WITH MR. RUBIN’S PROPOSAL TO REMOVE THE**
2 **READINESS-TO-SERVE COMPONENT FROM THE WATER SERVICE**
3 **MINIMUM CHARGES?**

4 A. No. The readiness-to-serve component of the water minimum charges is an important
5 component of the PWSA rate structure. The readiness-to-serve component is a common
6 ratemaking technique that adds numerous key benefits.

7 **Q. IS THE INCLUSION OF A READINESS-TO-SERVE COMPONENT AN**
8 **INDUSTRY ACCEPTED RATEMAKING PRACTICE?**

9 A. Yes. In fact, the concept of allocating a portion of debt service to readiness-to-serve
10 charges is addressed in the AWWA M-1 Manual on page 97. It is a recommended
11 practice used to capture, “the costs of having a system in place to provide water to the
12 customer regardless of whether the customer consumes any water in a given service
13 period” (AWWA M-1 Manual – 7th Edition).

14 **Q. WHAT ARE THE BENEFITS OF THE READINESS-TO-SERVE COMPONENT**
15 **FOR THE WATER SERVICE MINIMUM CHARGES?**

16 A. A readiness-to-serve component within a base charge better aligns revenue recovery with
17 the nature of utility costs, which in PWSA’s case, are largely fixed. This enhances
18 revenue recovery stability and exposes PWSA to less financial risk.

19 **Q. IS 25% OF DEBT SERVICE A COST-JUSTIFIABLE AMOUNT TO INCLUDE**
20 **IN A READINESS-TO-SERVE COMPONENT?**

21 A. Yes. While there are no specific guidelines for the amount of debt service that should be
22 allocated to the readiness-to-serve component, 25% is not unreasonably high and it is not
23 an “... arbitrary amount to try to meet some pre-conceived notion of an “appropriate”
24 level of customer charge.” as characterized by Mr. Rubin. In fact, it is likely that a 25%
25 allocation of debt service is an under estimate of the investment PWSA has made to
26 ensure the water is system is in place and has the capacity to meet expected customer

1 demands.

2 Additionally, when you consider PWSA’s cost structure, the majority of the
 3 Authority’s costs are fixed. In fact, for water, debt service accounts for over 30% of the
 4 allocated net revenue requirements alone. Allocating a small portion of the Authority’s
 5 debt service better aligns the nature of these costs with their recovery.

6 **Q. DO YOU AGREE THAT DETERMINING THE APPROPRIATE LEVEL OF**
 7 **CUSTOMER CHARGE IS A QUESTION OF RATE DESIGN?**

8 A. I do agree that determining the appropriate level of customer charge can be a question of
 9 rate design, but it is not only a question of rate design. It is also a question of cost
 10 allocation as demonstrated by the practice of allocating costs associated with billing and
 11 customer service to the billing cost category and allocating metering costs to the meter
 12 cost category. Readiness to serve costs are no different in that the utility incurs certain
 13 costs to ensure that a utility system is in place and capable of meeting customer demands
 14 even if those demands never materialize. Customers benefit from having that system in
 15 place and should pay for that benefit regardless of how much water they use. Allocating
 16 these costs to a readiness to serve cost category is a perfectly acceptable way to ensure
 17 that these costs will be recovered if the expected demand does not materialize.

18 **V. ALLOCATION OF THE CAP-BDP TO THE RESIDENTIAL CLASS**

19 **Q. PLEASE DESCRIBE THE RECOMMENDATION OF THE OSBA TO**
 20 **ALLOCATE THE COSTS OF THE CAP-BDP TO THE RESIDENTIAL CLASS.**

21 A. Mr. Kalcic recommends that the costs of the CAP-BDP should be recovered solely by the
 22 Residential customer class, citing Commission decisions in previous dockets as the basis
 23 for this recommendation. (OSBA St. No. 1 at 19-23).

1 **Q. DO YOU AGREE WITH MR. KALCIC’S RECOMMENDATION?**

2 A. No, I do not. PWSA has always recovered the costs of its BDP-CAP from all customer
 3 classes and should be allowed to continue doing so. The CAP-BDP benefits the entire
 4 Pittsburgh community, including businesses by helping to ensure that all residents located
 5 in PWSA’s service area are able to afford water for essential uses, such as drinking,
 6 cooking and cleaning. These residents are the workforce that area businesses rely on to
 7 keep their businesses running, and the BDP-CAP helps ensure that employees are able to
 8 meet their most basic nutrition and hygiene needs. I have also been informed by counsel
 9 that allocation of CAP costs to all customer classes is the approach taken by the other
 10 municipal utility fully regulated by the PUC – PGW. Moreover, I understand that the
 11 Commission’s CAP Policy Statement Order entered in November 2019 states that “...the
 12 Commission finds it appropriate to consider recovery of the costs of CAP costs from all
 13 ratepayer classes. Utilities and stakeholders are advised to be prepared to address CAP
 14 cost recovery in utility-specific rate cases consistent with the understanding that the
 15 Commission will no longer routinely exempt non-residential classes from universal
 16 service obligations.² As such, PWSA does not support Mr. Kalcic’s recommendations.

17 **VI. ALLOCATION OF THE LSL REPLACEMENT PROGRAM TO THE**
 18 **RESIDENTIAL CLASS**

19 **Q. PLEASE DESCRIBE THE RECOMMENDATION OF THE OSBA TO**
 20 **ALLOCATE THE COSTS OF THE LSL REPLACEMENT PROGRAM TO THE**
 21 **RESIDENTIAL CLASS.**

22 A. Mr. Kalcic recommends that the costs of the LSL replacement program should be
 23 recovered solely by the Residential customer class citing consistency with Commission’s

² 2019 Amendments to Policy Statement on Customer Assistance Program, 52 Pa. Code § 69.261-69.267, Docket No. M-2019-3012599, Final Policy Statement and Order entered November 5, 2019 at 97(citations omitted).

1 policy on BDP-CAP costs, that since only the Residential class is eligible for the benefits,
2 it should bear all of the costs. (OSBA St. No. 1 at 23-27).

3 **Q. DO YOU AGREE WITH MR. KALCIC'S RECOMMENDATION?**

4 A. No. Similar to the BDP-CAP, the LSL replacement program is a city-wide health and
5 safety issue and all customers, whether they are home owners or business owners, benefit
6 from programs that reduce the likelihood that the water being consumed by the residents
7 of Pittsburgh contains unhealthy levels of lead.

8VII. STORMWATER COST OF SERVICE

9 **Q. HAS ANY PARTY RAISED ISSUES WITH THE DEVELOPMENT OF**
10 **STORMWATER REVENUE REQUIREMENTS?**

11 A. Yes. Mr. Rubin has questioned and made suggestions regarding the allocation of
12 wastewater conveyance costs to stormwater and the resulting impacts to the current rate
13 case's proposed wastewater conveyance rates. (OCA St. No. 1 at 54-56).

14 **Q. WILL ANY CHANGES BE ADDRESSED BASED ON ISSUES RAISED BY MR.**
15 **RUBIN?**

16 A. No. Since no stormwater fee (a \$0 fee) is included in this current rate filing, these
17 considerations are ultimately not relevant to the proposed rates and charges of this
18 case. PWSA will take these considerations under advisement and will address them in
19 the next filing.

20VIII. MUNICIPAL UNITS OF SERVICE

21 **Q. PLEASE DESCRIBE THE RECOMMENDATION OF I&E TO INCREASE**
22 **PROJECTED WATER AND SEWER VOLUMES FROM MUNICIPAL (CITY OF**
23 **PITTSBURGH) CONNECTIONS.**

24 A. Mr. Cline recommends that PWSA increase projected metered and unmetered City usage
25 in FPPTY 2021 from 272.6 million gallons (as filed) to 600 million gallons per year. Mr.
26 Cline's position is established on three arguments:

- 1 1. that the City “was granted an annual 600 million gallons of water service by PWSA
2 free of charge” (I&E St. No. 3 at 11: 21-22) as part of the 1995 Cooperation
3 agreement;
- 4 2. that PWSA’s Compliance Plan states that PWSA “suspects” that total City usage is in
5 excess of 600 million gallons (I&E St. No. 3 at 12: 6-7); and
- 6 3. that a PWSA Senior Manager “believes” that City usage may be close to “one billion
7 gallons of water annually” (I&E St. No. 3 at 12: 11-12).

8
9 **Q. DO YOU AGREE WITH MR. CLINE’S RECOMMENDATION?**

10 A. No, I do not. Mr. Cline’s position is based on a misinterpretation of the 1995 Cooperation
11 Agreement, conjecture, and “beliefs”, not actual water usage data or analysis of the type
12 of properties that are currently unmetered. The 1995 Cooperation Agreement states that
13 “The City shall be entitled to receive up to 600,000,000 gallons of water each year”
14 (1995 Cooperation Agreement pg7). The 600 million gallon figure was not provided as
15 an estimate for City usage but as a threshold above which City usage would be billed. As
16 such, each of Mr. Cline’s arguments does not rely upon actual usage data or property
17 characteristics.

18 **Q. WILL ANY CHANGES TO PROJECTED CITY USAGE BE MADE BASED ON**
19 **THE RECOMMENDATION BY MR. CLINE?**

20 A. No. As meters are installed on unmetered City properties, the ability to forecast City
21 usage will improve but for this filing, PWSA will use the best information available.
22 Since the original analysis used to project City usage was based on actual data, PWSA
23 will continue relying upon this analysis and units of service as-filed.

24 **Q. IS PWSA PROJECTING ANY CHANGES IN MUNICIPAL METERED OR**
25 **UNMETERED DEMANDS IN FPFTY 2021 OR 2022?**

26 A. PWSA does not plan to add any additional municipal customers aside from metering
27 unmetered customers. New municipal connections would be contingent upon the City of
28 Pittsburgh’s constructing new municipal facilities. Since construction plans for the City

1 of Pittsburgh are unknown, PWSA has not planned for and does not anticipate new
 2 municipal connections.

3 Since flows for unmetered City connections have been estimated based on usage
 4 characteristics from similar City property types, the total volumes projected for the
 5 Municipal class is not projected to change. Essentially, as unmetered properties become
 6 metered, estimated usage will be replaced with actual meter read data. Since the changes
 7 in volumes are contingent upon many factors (property type, usage characteristics, date of
 8 meter installation, etc.), an accurate forecast cannot be prepared at this time.

9 IX. **ADJUSTMENTS TO CLASS COST OF SERVICE**

10 **Q. PLEASE DESCRIBE THE RECOMMENDATION FROM THE OSBA AND OCA**
 11 **FOR THE ALLOCATION OF UNRECOVERED PUBLIC FIRE COSTS.**

12 A. PWSA used billing volumes to reallocate the unrecovered public fire costs among
 13 customer classes. Mr. Kalcic and Mr. Rubin both recommend that, instead, PWSA should
 14 use bills or equivalent meters. (OSBA St. No. 1 at 30-31; OCA St. No. 1 at 48).

15 **Q. DO YOU AGREE WITH THEIR RECOMMENDATION TO ALLOCATE**
 16 **UNRECOVERED PUBLIC FIRE COSTS BY EQUIVALENT METERS OR**
 17 **BILLS?**

18 A. Yes, I agree that unrecovered public fire protection costs should be allocated by and
 19 recovered through equivalent meters. The revised CCOSS submitted with this testimony
 20 reallocates the unrecovered public fire protection costs by equivalent meters and recovers
 21 these costs through the monthly base charge.

22 **Q. PLEASE DESCRIBE THE RECOMMENDATION FROM THE OSBA FOR THE**
 23 **ALLOCATION OF MUNICIPAL COSTS.**

24 A. PWSA used billing volumes to reallocate the municipal revenue shortfall among
 25 customer classes. Mr. Kalcic recommends that, instead, PWSA should use unadjusted
 26 cost of service for the allocation of Municipal costs. Mr. Kalcic argues that adjustments

1 to Class Cost of Service are a rate design question and, therefore, such costs should be
2 allocated based on unadjusted cost of service. (OSBA St. No. 1 at 29-30)

3 **Q. DO YOU AGREE WITH MR. KALCIC'S RECOMMENDATION TO**
4 **ALLOCATE MUNICIPAL COSTS BY UNADJUSTED COST OF SERVICE?**

5 A. Yes and no. I agree that a composite Class Cost of Service allocation likely aligns closer
6 to the manner in which these costs are incurred; at least more so than billed volumes.
7 PWSA is proposing to reallocate the Municipal costs on Adjusted Cost of Service, after
8 wholesale, public fire, and bad debt adjustments are made. These three adjustments are
9 made after the initial COS analysis but are required by contract, required by law, and
10 allocated in the manner they are incurred, respectively. The revised CCOSS submitted
11 with this testimony allocates Municipal costs by Adjusted Cost of Service.

12 **Q. PLEASE DESCRIBE THE RECOMMENDATION FROM THE OSBA FOR THE**
13 **ALLOCATION OF WHOLESALE COSTS.**

14 A. PWSA used billing volumes to reallocate the unrecovered wholesale costs among
15 customer classes. Mr. Kalcic recommends that, instead, PWSA should use unadjusted
16 cost of service for the allocation of unrecovered wholesale costs. Mr. Kalcic argues that
17 adjustments to Class Cost of Service are a rate design question and, therefore, such costs
18 should be allocated based on unadjusted cost of service. (OSBA St. No. 1 at 26-32).

19 **Q. DO YOU AGREE WITH MR. KALCIC'S RECOMMENDATION TO**
20 **ALLOCATE WHOLESALE COSTS BY UNADJUSTED COST OF SERVICE?**

21 A. No. PWSA is committed to setting rates as closely to allocated cost-of-service as possible
22 while achieving other financial and pricing objectives. This requires aligning cost
23 recovery as closely as reasonably possible with the manner in which costs are incurred.
24 Since unrecovered wholesale costs are largely volumetric, it is most reasonable to
25 allocate these costs by billed volumes.

1 **X. GRADUALISM**

2 **Q. HAS PWSA INCORPORATED GRADUALISM IN THE DEVELOPMENT OF**
3 **ITS PROPOSED RATES?**

4 A. Yes, the proposed rates to be assessed to City accounts are designed to recover 40% of
5 the cost to serve the City customers in FY 2021 and then gradually increase each year
6 such that they will recover the full cost of service in FY 2024.

7 **Q. WHY WAS GRADUALISM USED IN THE DEVELOPMENT OF RATES FOR**
8 **CITY ACCOUNTS AND NOT USED IN THE DEVELOPMENT OF RATES FOR**
9 **OTHER CUSTOMER CLASSES?**

10 A. As mentioned earlier in my testimony, Act 70 stipulates that rates assessed to the City
11 must be consistent with the terms of the Co-op agreement and the Co-op agreement
12 stipulates that rates assessed to the City will be phased in over a five year period such that
13 the City will not pay full cost of service rates until FY2024. To meet this requirement
14 rates assessed to the City during the FPFTY will be set at a level equal to 40% of the
15 tariffed Commercial rate.

16 PWSA did not initially incorporate gradualism into the development of rates for
17 other classes because gradualism is a policy decision that effects the rates of all customer
18 classes and we did not feel that decision should be made unilaterally.

19 **Q. DID WITNESSES FROM THE OTHER PARTIES ADDRESS GRADUALISM IN**
20 **THEIR TESTIMONY?**

21 A. Yes, several witnesses discussed the appropriateness of implementing gradualism in the
22 development of the rates to be assessed to City accounts, but considering that Act 70
23 effectively dictates the phase in of City rates there is not much room for discussion on
24 that topic. Mr. Rubin is the only witness that explicitly recommended the implementation
25 of gradualism in the development of rates for a class other than the City. (OCA St. No. 1
26 at 47-48).

1 **Q. PLEASE SUMMARIZE MR. RUBIN’S POSITION ON GRADUALISM.**

2 A. Mr. Rubin recommends that cost of service rates should be adjusted such that no class
3 experiences a rate increase that exceeds 1.5 times the system average increase and no
4 class receives a rate decrease.

5 **Q. DO YOU AGREE WITH MR. RUBINS RECOMMENDATION?**

6 A. I agree that his recommendation is an appropriate way to implement gradualism and we
7 have adopted that position in determining the rate proposal included with this testimony.
8 It should be noted that gradualism is difficult to implement appropriately until an
9 agreement has been reached with respect to the revenue requirements that need to be
10 recovered from rates in that reductions in certain categories of revenue requirements may
11 result in a set of rates that do not require the use of gradualism. To the extent that the
12 parties agree to a set of revenue requirements that are different than those used in the
13 current CCOSS, it is likely that adjustments will need to be made to the way in which
14 gradualism is implemented.

15 **XI. CONCLUSION**

16 **Q. MR. SMITH, DOES THAT CONCLUDE YOUR TESTIMONY?**

17 A. Yes; however, I do reserve the right to supplement this testimony as may be appropriate.

PWSA Exh. HJS-1-R

Pittsburgh Water and Sewer Authority
Revenue Requirements by Utility

	FPPTY 2021			
	Water	Wastewater Conveyance	Stormwater	Total
Base Rate Revenue Requirements				
<u>Operating Expenses</u>				
<i>Direct Operating Expenses</i>				
Administrative Division				
Executive Director	\$ 1,656,931	\$ 278,444	\$ 295,430	\$ 2,230,804
Customer Service	2,121,771	2,633,718	2,412,761	7,168,249
Management Information Systems	2,778,727	466,959	495,446	3,741,132
Finance	5,380,521	904,185	959,344	7,244,051
Procurement	-	-	-	-
Human Resources	934,981	157,121	166,707	1,258,809
Legal	3,356,269	564,014	598,421	4,518,704
Public Affairs	1,103,464	185,435	196,747	1,485,646
Operations Division				
Environmental Compliance	1,436,211	1,333,624	1,333,624	4,103,460
Ops Capital Assets	-	-	-	-
Warehouse	450,629	75,727	80,347	606,703
Water Treatment Plant	26,912,878	-	-	26,912,878
Water Quality (Lab)	1,639,947	-	-	1,639,947
Water Distribution	15,132,271	-	-	15,132,271
Sewer Operations	-	2,681,628	3,341,628	6,023,256
Engineering & Construction Division				
Engineering & Construction	19,233,486	6,843,154	6,848,412	32,925,052
<i>Subtotal: Direct Operating Expenses</i>	\$ 82,138,087	\$ 16,124,009	\$ 16,728,867	\$ 114,990,962
<i>Other Operating Expenses</i>				
Loss / (Gain) on ALCOSAN Billings	\$ -	\$ 770,497	\$ -	\$ 770,497
City Services	3,257,213	503,589	531,199	4,292,000
Non-City Water Payments	475,975	-	-	475,975
<i>Subtotal: Other Operating Expenses</i>	\$ 3,733,188	\$ 1,274,086	\$ 531,199	\$ 5,538,472
<i>Subtotal: Operating Expenses</i>	\$ 85,871,274	\$ 17,398,095	\$ 17,260,065	\$ 120,529,434
<u>Debt Service</u>				
<i>Existing Debt</i>				
Senior Debt Service	\$ 27,591,954	\$ 23,312,749	\$ -	\$ 50,904,703
Subordinate Debt Service	5,398,314	4,561,096	-	9,959,410
<i>Subtotal: Existing Debt</i>	\$ 32,990,268	\$ 27,873,845	\$ -	\$ 60,864,113
<i>Proposed Debt</i>				
Revolving Line of Credit Interest	\$ 1,816,658	\$ 547,523	\$ 635,819	\$ 3,000,000
Revenue Bonds	5,412,281	1,880,425	1,927,779	9,220,485
SRF Loans	1,341,839	461,776	475,952	2,279,567
<i>Subtotal: Proposed Debt</i>	\$ 8,570,778	\$ 2,889,724	\$ 3,039,550	\$ 14,500,052
<i>Subtotal: Debt Service</i>	\$ 41,561,046	\$ 30,763,569	\$ 3,039,550	\$ 75,364,165
<u>Capital Expenditures & Transfers</u>				
Internally Generated Funds / PAYGO	\$ 4,567,106	\$ 1,250,031	\$ 1,251,510	\$ 7,068,647
Other Transfers to Reserves	615,885	384,115	-	1,000,000
Reimbursements from Municipalities	-	-	-	-
Remarketing & Liquidity Charges	-	-	-	-
Bad Debt Expense	1,332,171	830,849	-	2,163,020
<i>Subtotal: Capital Expenditures & Transfers</i>	\$ 6,515,162	\$ 2,464,995	\$ 1,251,510	\$ 10,231,667
Total: Base Rate Revenue Requirements	\$ 133,947,482	\$ 50,626,659	\$ 21,551,125	\$ 206,125,266
<i>% Change</i>				
DSIC Costs	\$ 12,725,041	\$ 6,939,959	\$ -	\$ 19,665,000
Total System Revenue Requirements	\$ 146,672,523	\$ 57,566,618	\$ 21,551,125	\$ 225,790,266

PWSA Exh. HJS-2-R

**Pittsburgh Water and Sewer Authority
 Revenue Requirements by Utility**

	2022			
	Water	Wastewater Conveyance	Stormwater	Total
Base Rate Revenue Requirements				
<u>Operating Expenses</u>				
<i>Direct Operating Expenses</i>				
Administrative Division				
Executive Director	\$ 1,745,342	\$ 293,301	\$ 311,194	\$ 2,349,836
Customer Service	2,245,620	2,791,584	2,569,693	7,606,897
Management Information Systems	2,830,522	475,663	504,681	3,810,866
Finance	5,484,337	921,631	977,855	7,383,822
Procurement	-	-	-	-
Human Resources	974,759	163,806	173,799	1,312,364
Legal	3,298,273	554,268	588,080	4,440,621
Public Affairs	1,170,383	196,680	208,679	1,575,742
Operations Division				
Environmental Compliance	1,475,312	1,369,932	1,369,932	4,215,176
Ops Capital Assets	-	-	-	-
Warehouse	461,802	77,605	82,339	621,746
Water Treatment Plant	22,401,447	-	-	22,401,447
Water Quality (Lab)	1,165,712	-	-	1,165,712
Water Distribution	16,559,300	-	-	16,559,300
Sewer Operations	-	2,812,399	3,532,399	6,344,798
Engineering & Construction Division				
Engineering & Construction	19,622,967	7,167,645	7,172,932	33,963,543
<i>Subtotal: Direct Operating Expenses</i>	\$ 79,435,775	\$ 16,824,514	\$ 17,491,583	\$ 113,751,871
<i>Other Operating Expenses</i>				
Loss / (Gain) on ALCOSAN Billings	\$ -	\$ 778,202	\$ -	\$ 778,202
City Services	3,342,234	513,327	541,439	4,397,000
Non-City Water Payments	475,975	-	-	475,975
<i>Subtotal: Other Operating Expenses</i>	\$ 3,818,209	\$ 1,291,529	\$ 541,439	\$ 5,651,177
<i>Subtotal: Operating Expenses</i>	\$ 83,253,984	\$ 18,116,043	\$ 18,033,022	\$ 119,403,048
<u>Debt Service</u>				
<i>Existing Debt</i>				
Senior Debt Service	\$ 27,571,492	\$ 23,295,461	\$ -	\$ 50,866,953
Subordinate Debt Service	5,376,700	4,542,834	-	9,919,533
<i>Subtotal: Existing Debt</i>	\$ 32,948,192	\$ 27,838,295	\$ -	\$ 60,786,486
<i>Proposed Debt</i>				
Revolving Line of Credit Interest	\$ 2,481,556	\$ 520,920	\$ 497,523	\$ 3,500,000
Revenue Bonds	14,970,657	4,769,271	4,893,693	24,633,621
SRF Loans	2,118,699	729,122	751,506	3,599,327
<i>Subtotal: Proposed Debt</i>	\$ 19,570,912	\$ 6,019,314	\$ 6,142,721	\$ 31,732,948
<i>Subtotal: Debt Service</i>	\$ 52,519,104	\$ 33,857,608	\$ 6,142,721	\$ 92,519,434
<u>Capital Expenditures & Transfers</u>				
Internally Generated Funds / PAYGO	\$ 3,835,842	\$ 694,957	\$ 567,995	\$ 5,098,794
Other Transfers to Reserves	615,885	384,115	-	1,000,000
Reimbursements from Municipalities	-	-	-	-
Remarketing & Liquidity Charges	-	-	-	-
Bad Debt Expense	1,425,808	889,249	-	2,315,057
<i>Subtotal: Capital Expenditures & Transfers</i>	\$ 5,877,534	\$ 1,968,321	\$ 567,995	\$ 8,413,851
Total: Base Rate Revenue Requirements	\$ 141,650,623	\$ 53,941,972	\$ 24,743,738	\$ 220,336,333
<i>% Change</i>				
DSIC Costs	13,424,906	7,575,094	-	\$ 21,000,000
Total System Revenue Requirements	\$ 155,075,528	\$ 61,517,066	\$ 24,743,738	\$ 241,336,333

PWSA Exh. HJS-3-R

**Pittsburgh Water and Sewer Authority
Allocation Factors - Between Utilities**

Allocations to Utilities (Revenue Requirements & Assets)				
<i>Code</i>	<i>Description</i>	<i>Water</i>	<i>Sewer</i>	<i>Stormwater</i>
A	Water Only	100.0%	0.0%	0.0%
B	Wastewater Only	0.0%	100.0%	0.0%
C	Stormwater Only	0.0%	0.0%	100.0%
D	Customer Service - Meters	51.3%	48.7%	0.0%
E	Customer Bills	26.8%	35.2%	38.0%
F	Operations Cost	74.3%	12.5%	13.2%
G	Engineering and Construction	64.6%	17.7%	17.7%
H	Environmental Compliance	35.0%	32.5%	32.5%
I	Customer Service - Composite	29.2%	36.3%	34.5%
J	Wastewater - Conveyance	0.0%	50.0%	50.0%
K	Existing Debt Service - Assets	54.2%	45.8%	0.0%

Sewer / Stormwater Allocation Factor Detail

	Sewer	Stormwater
Conveyance	50.0%	50.0%
Debt Service	100.0%	0.0%

PWSA Exh. HJS-4-R

Pittsburgh Water and Sewer Authority
City Services Mapped to Budget Departments (1)

Department	GL Code	GL Name	2021	2022
325 Water Distribution	7015	Permits	\$ 564,000	\$ 600,000
424 Sewer Operations	7015	Permits	102,000	105,000
913 Finance	5491	Vehicle Repairs	720,000	780,000
913 Finance	7422	Fuel-Gasses	306,000	312,000
913 Finance	8005	City Indirect Costs	<u>2,600,000</u>	<u>2,600,000</u>
			\$ 4,292,000	\$ 4,397,000

(1) City Services costs are picked up in the specified budget departments so the individual line items can be allocated with similar costs.

PWSA Exh. HJS-5-R

**Pittsburgh Water and Sewer Authority
 Revenue Requirements by Utility**

	FPFTY 2021		
	Water	Wastewater Conveyance	Total
Base Rate Revenue Requirements			
<u>Operating Expenses</u>			
<i>Direct Operating Expenses</i>			
Administrative Division			
Executive Director	\$ 1,656,931	\$ 278,444	\$ 1,935,374
Customer Service	2,121,771	2,633,718	4,755,489
Management Information Systems	2,778,727	466,959	3,245,686
Finance	8,073,734	1,356,774	9,430,508
Procurement	-	-	-
Human Resources	934,981	157,121	1,092,102
Legal	3,356,269	564,014	3,920,282
Public Affairs	1,103,464	185,435	1,288,898
Operations Division			
Environmental Compliance	1,436,211	1,333,624	2,769,835
Ops Capital Assets	-	-	-
Warehouse	450,629	75,727	526,357
Water Treatment Plant	26,912,878	-	26,912,878
Water Quality (Lab)	1,639,947	-	1,639,947
Water Distribution	15,696,271	-	15,696,271
Sewer Operations	-	2,732,628	2,732,628
Engineering & Construction Division			
Engineering & Construction	19,233,486	6,843,154	26,076,640
<i>Subtotal: Direct Operating Expenses</i>	<u>\$ 85,395,299</u>	<u>\$ 16,627,598</u>	<u>\$ 102,022,897</u>
<i>Other Operating Expenses (1)</i>			
Loss / (Gain) on ALCOSAN Billings	\$ -	\$ 770,497	\$ 770,497
Non-City Water Payments	475,975	-	475,975
<i>Subtotal: Other Operating Expenses (1)</i>	<u>\$ 475,975</u>	<u>\$ 770,497</u>	<u>\$ 1,246,472</u>
<i>Subtotal: Operating Expenses</i>	<u>\$ 85,871,274</u>	<u>\$ 17,398,095</u>	<u>\$ 103,269,369</u>
<u>Debt Service</u>			
<i>Existing Debt</i>			
Senior Debt Service	\$ 27,591,954	\$ 23,312,749	\$ 50,904,703
Subordinate Debt Service	5,398,314	4,561,096	9,959,410
<i>Subtotal: Existing Debt</i>	<u>\$ 32,990,268</u>	<u>\$ 27,873,845</u>	<u>\$ 60,864,113</u>
<i>Proposed Debt</i>			
Revolving Line of Credit Interest	\$ 1,816,658	\$ 547,523	\$ 2,364,181
Revenue Bonds	5,412,281	1,880,425	7,292,706
SRF Loans	1,341,839	461,776	1,803,615
<i>Subtotal: Proposed Debt</i>	<u>\$ 8,570,778</u>	<u>\$ 2,889,724</u>	<u>\$ 11,460,502</u>
<i>Subtotal: Debt Service</i>	<u>\$ 41,561,046</u>	<u>\$ 30,763,569</u>	<u>\$ 72,324,615</u>
<u>Capital Expenditures & Transfers</u>			
Internally Generated Funds / PAYGO	\$ 4,567,106	\$ 1,250,031	\$ 5,817,137
Other Transfers to Reserves	615,885	384,115	1,000,000
Reimbursements from Municipalities	-	-	-
Remarketing & Liquidity Charges	-	-	-
Bad Debt Expense	1,332,171	830,849	2,163,020
<i>Subtotal: Capital Expenditures & Transfers</i>	<u>\$ 6,515,162</u>	<u>\$ 2,464,995</u>	<u>\$ 8,980,157</u>
Stormwater	\$ -	\$ 21,551,125	\$ 21,551,125
Total: Base Rate Revenue Requirements	\$ 133,947,482	\$ 72,177,784	\$ 206,125,266
<i>% Change</i>			
DSIC Costs	\$ 12,725,041	\$ 6,939,959	\$ 19,665,000
Total System Revenue Requirements	\$ 146,672,523	\$ 79,117,744	\$ 225,790,266

(1) City Services has been reallocated to the respective Direct Operating Departments as shown on HJS-4.

PWSA Exh. HJS-6-R

**Pittsburgh Water and Sewer Authority
 Revenue Requirements by Utility**

	2022		
	Water	Wastewater Conveyance	Total
Base Rate Revenue Requirements			
<u>Operating Expenses</u>			
<i>Direct Operating Expenses</i>			
Administrative Division			
Executive Director	\$ 1,745,342	\$ 293,301	\$ 2,038,643
Customer Service	2,245,620	2,791,584	5,037,204
Management Information Systems	2,830,522	475,663	3,306,185
Finance	8,226,571	1,382,457	9,609,029
Procurement	-	-	-
Human Resources	974,759	163,806	1,138,565
Legal	3,298,273	554,268	3,852,540
Public Affairs	1,170,383	196,680	1,367,063
Operations Division			
Environmental Compliance	1,475,312	1,369,932	2,845,244
Ops Capital Assets	-	-	-
Warehouse	461,802	77,605	539,407
Water Treatment Plant	22,401,447	-	22,401,447
Water Quality (Lab)	1,765,712	-	1,765,712
Water Distribution	16,559,300	-	16,559,300
Sewer Operations	-	2,864,899	2,864,899
Engineering & Construction Division			
Engineering & Construction	19,622,967	7,167,645	26,790,612
<i>Subtotal: Direct Operating Expenses</i>	\$ 82,778,009	\$ 17,337,841	\$ 100,115,849
<i>Other Operating Expenses (1)</i>			
Loss / (Gain) on ALCOSAN Billings	\$ -	\$ 778,202	\$ 778,202
Non-City Water Payments	475,975	-	475,975
<i>Subtotal: Other Operating Expenses (1)</i>	\$ 475,975	\$ 778,202	\$ 1,254,177
<i>Subtotal: Operating Expenses</i>	\$ 83,253,984	\$ 18,116,043	\$ 101,370,027
<u>Debt Service</u>			
<i>Existing Debt</i>			
Senior Debt Service	\$ 27,571,492	\$ 23,295,461	\$ 50,866,953
Subordinate Debt Service	5,376,700	4,542,834	9,919,533
<i>Subtotal: Existing Debt</i>	\$ 32,948,192	\$ 27,838,295	\$ 60,786,486
<i>Proposed Debt</i>			
Revolving Line of Credit Interest	\$ 2,481,556	\$ 520,920	\$ 3,002,477
Revenue Bonds	14,970,657	4,769,271	19,739,928
SRF Loans	2,118,699	729,122	2,847,821
<i>Subtotal: Proposed Debt</i>	\$ 19,570,912	\$ 6,019,314	\$ 25,590,226
<i>Subtotal: Debt Service</i>	\$ 52,519,104	\$ 33,857,608	\$ 86,376,713
<u>Capital Expenditures & Transfers</u>			
Internally Generated Funds / PAYGO	\$ 3,835,842	\$ 694,957	\$ 4,530,799
Other Transfers to Reserves	615,885	384,115	1,000,000
Reimbursements from Municipalities	-	-	-
Remarketing & Liquidity Charges	-	-	-
Bad Debt Expense	1,425,808	889,249	2,315,057
<i>Subtotal: Capital Expenditures & Transfers</i>	\$ 5,877,534	\$ 1,968,321	\$ 7,845,855
Stormwater	\$ -	\$ 24,743,738	\$ 24,743,738
Total: Base Rate Revenue Requirements	\$ 141,650,623	\$ 78,685,710	\$ 220,336,333
<i>% Change</i>			
DSIC Costs	\$ 13,424,906	\$ 7,575,094	\$ 21,000,000
Total System Revenue Requirements	\$ 155,075,528	\$ 86,260,805	\$ 241,336,333

(1) City Services has been reallocated to the respective Direct Operating Departments as shown on HJS-4.

PWSA Exh. HJS-1W-R

Pittsburgh Water and Sewer Authority

HJS-1W-R

2021 COS & Rate Design

FPFTY Water Revenue Requirements

	2021 FPFTY Revenue Requirements
Water System Revenue Requirements	
<u>Operating Expenses</u>	
<i>Direct Operating Expenses</i>	
Administrative Division	
Executive Director	\$ 1,656,931
Customer Service	2,121,771
Management Information Systems	2,778,727
Finance	8,073,734
Procurement	-
Human Resources	934,981
Legal	3,356,269
Public Affairs	1,103,464
Operations Division	
Environmental Compliance	1,436,211
Ops Capital Assets	-
Warehouse	450,629
Water Treatment Plant	26,912,878
Water Quality (Lab)	1,639,947
Water Distribution	15,696,271
Sewer Operations	-
Engineering & Construction	
Engineering & Construction	19,233,486
<i>Other Operating Expenses</i>	
Loss / (Gain) on ALCOSAN Billings	-
Non-City Water Payments	475,975
<i>Total Operating Expenses</i>	\$ 85,871,274
<u>Debt Service</u>	
Existing Debt	\$ 32,990,268
Future Debt	8,570,778
<i>Subtotal: Debt Service</i>	\$ 41,561,046
<u>Capital Expenditures & Transfers</u>	
Internally Generated Funds / PAYGO	\$ 4,567,106
Internally Generated Funds / PAYGO (DSIC)	12,725,041
Other Transfers to Reserves	615,885
Reimbursements from Municipalities	-
Remarketing & Liquidity Charges	-
Bad Debt Expense	1,332,171
Bad Debt Expense	-
<i>Subtotal: Capital Expenditures & Transfers</i>	\$ 19,240,203
Total: Water System Revenue Requirements	\$ 146,672,523
<i>Capital Costs to be Recovered through DSIC</i>	\$ (12,725,041)
Total: Water System Base Rate Revenue Requirement	\$ 133,947,482

PWSA Exh. HJS-2W-R

Water Operating Costs	FY 2021	Allocation	Water Functional Categories								
			Supply	Treatment	Storage	Transmission	Distribution	Meters	Billing	Fire Protection	Admin Support
Operating Expenses											
<i>Operating Expenses</i>											
<i>Direct Operating Expenses</i>											
Administrative Division											
Executive Director	\$ 1,656,931	W-H									100.0%
Customer Service	2,121,771	W-I					29.3%	70.7%			
Management Information Systems	2,778,727	W-H									100.0%
Finance	8,073,734	W-H									100.0%
Procurement	-	W-H									100.0%
Human Resources	934,981	W-H									100.0%
Legal	3,356,269	W-H									100.0%
Public Affairs	1,103,464	W-H									100.0%
Operations Division											
Environmental Compliance	1,436,211	W-H									100.0%
Ops Capital Assets	-	W-H									100.0%
Warehouse	450,629	W-H									100.0%
Water Treatment Plant	26,912,878	W-B		100.0%							
Water Quality (Lab)	1,639,947	W-B		100.0%							
Water Distribution	15,696,271	W-D				37.8%	62.2%				
Sewer Operations	-	n/a									
Engineering & Construction Division											
Engineering & Construction	19,233,486	W-J		18.2%	41.6%	36.9%					3.3%
<i>Subtotal: Direct Operating Expenses</i>											
<i>Other Operating Expenses</i>											
Loss / (Gain) on ALCOSAN Billings	-	n/a									100.0%
Non-City Water Payments	475,975	W-H									100.0%
<i>Subtotal: Other Operating Expenses</i>											
Total: Operating Expenses											
\$ 85,871,274											

Pittsburgh Water and Sewer Authority

HJS-2W-R

2021 COS & Rate Design

Assignment to Functional Categories

Water Operating Expenses	FY 2021	Allocation	Water Functional Categories								Admin Support	
			Supply	Treatment	Storage	Transmission	Distribution	Meters	Billing	Fire Protection		
<i>Direct Operating Expenses</i>												
<i>FPPTY</i>												
<i>Administrative Division</i>												
Executive Director	\$ 1,656,931	W-H	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,656,931
Customer Service	2,121,771	W-I	-	-	-	-	-	-	621,634	1,500,137	-	-
Management Information Systems	2,778,727	W-H	-	-	-	-	-	-	-	-	-	2,778,727
Finance	8,073,734	W-H	-	-	-	-	-	-	-	-	-	8,073,734
Procurement	-	W-H	-	-	-	-	-	-	-	-	-	-
Human Resources	934,981	W-H	-	-	-	-	-	-	-	-	-	934,981
Legal	3,356,269	W-H	-	-	-	-	-	-	-	-	-	3,356,269
Public Affairs	1,103,464	W-H	-	-	-	-	-	-	-	-	-	1,103,464
<i>Operations Division</i>												
Environmental Compliance	1,436,211	W-H	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,436,211
Ops Capital Assets	-	W-H	-	-	-	-	-	-	-	-	-	-
Warehouse	450,629	W-H	-	-	-	-	-	-	-	-	-	450,629
Water Treatment Plant	26,912,878	W-B	-	26,912,878	-	-	-	-	-	-	-	-
Water Quality (Lab)	1,639,947	W-B	-	1,639,947	-	-	-	-	-	-	-	-
Water Distribution	15,696,271	W-D	-	-	-	5,935,763	9,760,509	-	-	-	-	-
Sewer Operations	-	n/a	-	-	-	-	-	-	-	-	-	-
<i>Engineering & Construction Division</i>												
Engineering & Construction	19,233,486	W-J	-	3,504,019	8,000,892	7,092,953	-	-	-	-	-	635,622
<i>Subtotal: Direct Operating Expenses</i>	\$ 85,395,299		\$ -	\$ 32,056,845	\$ 8,000,892	\$ 13,028,715	\$ 9,760,509	\$ 621,634	\$ 1,500,137	\$ -	\$ -	\$ 20,426,568
<i>Other Operating Expenses</i>												
Loss / (Gain) on ALCOSAN Billings	-	n/a	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Non-City Water Payments	475,975	W-H	-	-	-	-	-	-	-	-	-	475,975
Affordability Program Placeholder	-		-	-	-	-	-	-	-	-	-	-
<i>Subtotal: Other Operating Expenses</i>	\$ 475,975		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 475,975
Allocated Water Operating Costs	\$ 85,871,274		\$ -	\$ 32,056,845	\$ 8,000,892	\$ 13,028,715	\$ 9,760,509	\$ 621,634	\$ 1,500,137	\$ -	\$ -	\$ 20,902,543
Allocation Percentage	-		0.00%	37.33%	9.32%	15.17%	11.37%	0.72%	1.75%	0.00%	-	24.34%

Allocated Water Assets				Water Functional Categories										
Row Labels	Acquisition Cost	Allocated to Water	Allocated Costs	Allocation	Supply	Treatment	Storage	Transmission	Distribution	Meters	Billing	Fire Protection	Admin Support	Total
Customer Service	3,404,918	29.62%	1,008,643	W-I						29.30%	70.70%			100.00%
Distribution	268,054,032	100.00%	268,054,032	W-D				37.82%	62.18%					100.00%
Engineering	2,235,799	64.61%	1,444,567	W-D				37.82%	62.18%					100.00%
Executive Director	969,720	74.28%	720,260	W-H									100.00%	100.00%
Finance	79,614	74.28%	59,133	W-H									100.00%	100.00%
Fire	14,942,263	100.00%	14,942,263	W-E								100.00%		100.00%
Membrane Plant	20,355,348	100.00%	20,355,348	W-B		100.00%								100.00%
Meters	31,890,342	100.00%	31,890,342	W-E						100.00%				100.00%
Mgt Info Systems	12,589,169	74.28%	9,350,610	W-H									100.00%	100.00%
Plant Operations	64,260,881	100.00%	64,260,881	W-B		100.00%								100.00%
Pumping	25,727,651	100.00%	25,727,651	W-D				37.82%	62.18%					100.00%
Sewer Operations	397,654,629	0.00%	-	n/a										0.00%
Stormwater	26,127,083	0.00%	-	n/a										0.00%
Supply	920,461	100.00%	920,461	W-A	100.00%									100.00%
Warehouse	4,180,082	74.28%	3,104,757	W-B		100.00%								100.00%
Water Quality	1,477,505	100.00%	1,477,505	W-B		100.00%								100.00%
Water Storage	67,450,916	100.00%	67,450,916	W-C			100.00%							100.00%
Total	942,320,412		510,767,368		\$ 920,461	\$ 89,198,491	\$ 67,450,916	\$ 111,643,902	\$ 183,582,348	\$ 32,185,853	\$ 713,132	\$ 14,942,263	\$ 10,130,003	\$510,767,368

Allocation Factors for Capital Costs	0.18%	17.46%	13.21%	21.86%	35.94%	6.30%	0.14%	2.93%	1.98%	100.00%
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Allocation of Capital Costs	Readiness-to-Serve	Water Functional Categories										Readiness-to-Serve
		Supply	Treatment	Storage	Transmission	Distribution	Meters	Billing	Fire Protection	Admin Support		
Debt Service	25.0%	\$ 41,561,046	\$ 56,173	\$ 5,443,548	\$ 4,116,351	\$ 6,813,333	\$ 11,203,546	\$ 1,964,218	\$ 43,521	\$ 911,887	\$ 618,207	\$ 10,390,261
Internally Generated Funds / PAYGO	0.0%	4,567,106	8,230	797,582	603,123	998,281	1,641,530	287,795	6,377	133,609	90,579	-
Other Transfers to Reserves	0.0%	615,885	1,110	107,556	81,333	134,621	221,364	38,810	860	18,017	12,215	-
Reimbursements from Municipalities	0.0%	-	-	-	-	-	-	-	-	-	-	-
Remarketing & Liquidity Charges	0.0%	-	-	-	-	-	-	-	-	-	-	-
Bad Debt Expense (1)	0.0%	-	-	-	-	-	-	-	-	-	-	-
Total: Allocated Capital Costs		\$ 46,744,037	\$ 65,514	\$ 6,348,686	\$ 4,800,807	\$ 7,946,235	\$ 13,066,440	\$ 2,290,822	\$ 50,757	\$ 1,063,513	\$ 721,001	\$ 10,390,261

(1) Bad Debt Expense allocated directly to customer classes based on each classes responsibility for historical bad debt.

PWSA Exh. HJS-3W-R

FY 2021 **Allocation**
 FPFTY

Water Cost Drivers						
Base	Max Day	Peak Hour	Meters	Bills	Readiness-to-Serve	Fire Protection

Water Revenue Requirement
 Functional Categories

Supply	\$ 65,514	W-AA
Treatment	38,405,532	W-BB
Storage	12,801,698	W-CC
Transmission	20,974,950	W-BB
Distribution	22,826,949	W-CC
Meters	2,912,456	W-DD
Billing	1,550,894	W-EE
Fire Protection	1,063,513	W-FF
Admin Support	21,623,544	W-GG
Readiness-to-Serve (Debt Service)	10,390,261	W-HH
Total: Water Revenue Requirements	\$ 132,615,311	

100.00%						
69.04%	29.38%					1.58%
54.81%	18.36%	19.14%				7.69%
69.04%	29.38%					1.58%
54.81%	18.36%	19.14%				7.69%
			100.00%			
				100.00%		
						100.00%
54.21%	21.46%	6.10%	2.61%	1.39%	10.00%	4.24%
					100.00%	

FY 2021 **Allocation**
 FPFTY

Water Cost Drivers						
Base	Max Day	Peak Hour	Meters	Bills	Readiness-to-Serve	Fire Protection

Water Revenue Requirement
 Functional Categories

Supply	\$ 65,514	W-AA
Treatment	38,405,532	W-BB
Storage	12,801,698	W-CC
Transmission	20,974,950	W-BB
Distribution	22,826,949	W-CC
Meters	2,912,456	W-DD
Billing	1,550,894	W-EE
Fire Protection	1,063,513	W-FF
Admin Support	21,623,544	W-GG
Readiness-to-Serve (Debt Service)	10,390,261	W-HH
Total: Water Revenue Requirements	\$ 132,615,311	

\$ 65,514	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
26,514,887	11,282,240	-	-	-	-	608,404
7,017,156	2,350,440	2,450,197	-	-	-	983,905
14,480,946	6,161,727	-	-	-	-	332,276
12,512,423	4,191,114	4,368,992	-	-	-	1,754,420
-	-	-	2,912,456	-	-	-
-	-	-	-	1,550,894	-	-
-	-	-	-	-	-	1,063,513
11,721,211	4,639,958	1,319,161	563,410	300,018	2,162,354	917,432
-	-	-	-	-	10,390,261	-
\$ 72,312,139	\$ 28,625,479	\$ 8,138,350	\$ 3,475,866	\$ 1,850,912	\$ 12,552,616	\$ 5,659,951

Costs to Recover from Water Charges

\$ 132,615,311

\$ 72,312,139	\$ 28,625,479	\$ 8,138,350	\$ 3,475,866	\$ 1,850,912	\$ 12,552,616	\$ 5,659,951
54.5%	21.6%	6.1%	2.6%	1.4%	9.5%	4.3%

PWSA Exh. HJS-4W-R

Cost Functionalization: Water										
Code	Description	Supply	Treatment	Storage	Transmission	Distribution	Meters	Billing	Fire Protection	Admin Support
W-A	Supply Only	100.00%								
W-B	Treatment Only		100.00%							
W-C	Storage Only			100.00%						
W-D	Transmission & Distribution Only				37.82%	62.18%				
W-E	Meters Only						100.00%			
W-F	Billing Only							100.00%		
W-G	Fire Protection Only								100.00%	
W-H	Admin Support Only									100.00%
W-I	Customer Service						29.30%	70.70%		
W-J	Engineering & Construction		18.22%	41.60%	36.88%					3.30%

Allocation to Cost Drivers: Water								
Code	Description	Base	Max Day	Peak Hour	Meters	Bills	Readiness-to-Serve	Fire Protection
W-AA	Base	100.00%						
W-BB	Maximum Day	69.04%	29.38%					1.58%
W-CC	Peak Hour	54.81%	18.36%	19.14%				7.69%
W-DD	Customer - Meters				100.00%			
W-EE	Customer - Billing					100.00%		
W-FF	Fire Protection							100.00%
W-GG	Admin Support (Composite)	54.21%	21.46%	6.10%	2.61%	1.39%	10.00%	4.24%
W-HH	Readiness-to-Serve						100.00%	

PWSA Exh. HJS-5W-R

and

PWSA Exh. HJS-5WW-R

Factor Derivations - Allocation to Functional Categories & Cost Components					
Code(s)	Description	Calculations			
W-I	Customer Service	2021 Customer Service Budget			
WW-E	- This factor allocates the 2021 customer service budget between meter- and billing-related costs.	Salaries	FPPTY	Meter	Billing
		Benefits	\$ 3,105,381	28.60%	71.40%
		Computer & Peripherals	866,363	28.60%	71.40%
		Customer CC Fees	10,000	100.00%	0.00%
		Postage	378,396	0.00%	100.00%
		Billing Contract	257,500	0.00%	100.00%
		Consultants	618,000	0.00%	100.00%
		Meter Services	26,400	100.00%	0.00%
		Prof Service Other	824,000	100.00%	0.00%
		Office Supplies	678,856	20.00%	80.00%
		TE Airfare	6,000	50.00%	50.00%
		TE Lodging	2,800	50.00%	50.00%
		TE Seminars/Conferences	2,800	50.00%	50.00%
		TE Training	5,400	50.00%	50.00%
		TE Travel Misc	15,000	50.00%	50.00%
		Customer Refund AP	100	0.00%	100.00%
		One Call	504,000	0.00%	100.00%
			30,900	0.00%	100.00%
		Total	\$ 7,331,896	\$2,148,090	\$5,183,806
		Allocation Factors		29.30%	70.70%

W-D Water Pipe Inventory

- Allocate costs between transmission and distribution functional categories. Assumes Pipes less than or equal to 16" are Distribution-related.

Breakdown		
Distribution	34,244,035	62.2%
Transmission	20,825,193	37.8%
Total	55,069,228	100.0%

Inch-Foot Analysis		
Diameter (in)	Linear Feet	Inch-Feet
0.75	799	599
1	1,292	1,292
1.5	575	862
2	11,495	22,989
2.5	16	39
3	837	2,511
4	140,568	562,273
6	2,052,282	12,313,692
8	1,112,168	8,897,342
10	85,574	855,742
12	598,051	7,176,608
14	1,296	18,147
15	15,566	233,483
16	259,903	4,158,456
18	277	4,991
20	209,650	4,192,996
24	85,178	2,044,268
28	104	2,911
30	116,321	3,489,627
36	83,070	2,990,503
42	11,253	472,624
42.5	12,606	535,735
48	16,545	794,162
50	23,682	1,184,096
50.25	12,005	603,231
60	55,175	3,310,514
66	1,492	98,501
72	3,697	266,159
84	3,979	334,248
96	4,560	437,764
120	524	62,860
NULL	172	n/a
	4,920,710	55,069,228

Factor Derivations - Allocation to Functional Categories & Cost Components				
Code(s)	Description	Calculations		

W-J	Engineering & Construction	<u>2021 Water CIP Costs</u>	<u>\$\$ Amount</u>	<u>Allocation</u>
		Treatment	\$ 31,260,131	18.22%
	- This factor uses the 2021 Water CIP	Storage	71,377,720	41.60%
	costs to allocate Engineering & Construction	Trans. & Distr.	63,277,796	36.88%
	costs to the various functional categories.	Admin	<u>5,670,528</u>	3.30%
		Total Water CIP	\$ 171,586,175	100.00%

W-BB Maximum Day

- Maximum day costs are allocated using a peak day determined using system daily production records. In addition, 0.25% is allocated to fire protection service.

Plant Production Data	
2017-2019 Avg Plant Production	70.26 mgd
2017-2019 Avg. Peak Day	90.90 mgd
Peak Hour Factor (1.6)	112.42 mgd
Base	69.04%
Maximum Day	29.38%
Fire Protection	1.58%

W-CC Peak Hour

- Peak hour costs are allocated using an estimated peak hour compared to system average and maximum day processed. In addition, 0.25% is allocated to fire protection service.

Plant Production Data	
2017 Average Processed	70.26 mgd
Peak Day	90.90 mgd
Peak Hour Factor (1.6)	112.42 mgd
Peak Hour / Avg	54.81%
Max Day (Plug)	18.36%
Peak Hr / Peak Day	19.14%
Fire Protection	7.69%

Equivalency Flow Ratios

- Used to escalate metering and readiness-to-serve costs, these ratios are industry standard and obtained from the American Waterworks Association

- Fire ratios are pegged to a 1" meter.

Equivalency Ratios			
	<i>Flow</i>		<i>Fire</i>
5/8"	1.00	1" or Less	2.50
3/4"	1.50	1 1/2"-3"	8.00
1"	2.50	4"	25.00
1 1/2"	5.00	6" or Greater	50.00
2"	8.00		
3"	16.00		
4"	25.00		
6"	50.00		
8"	80.00		
10"	115.00		
Unmetered	1.00		

PWSA Exh. HJS-6W-R

Pittsburgh Water and Sewer Authority

2021 COS & Rate Design

Water Units of Service

HJS-6W-R

	FY 2021 Consumption	Allocated Consumption	Average Day	Maximum Day			Peak Hour			Equivalent Meters	Total Bills	Fire Equivalents
				Cap. Factor	Total Cap.	Extra Cap.	Cap. Factor	Total Cap.	Extra Cap.			
Units of Service												
<u>Retail Service</u>												
Residential (1)	2,719,759	2,719,759	7,451	135.0%	10,059	2,608	220.0%	16,393	6,334	822,685	764,267	-
Residential - CAP	123,773	123,773	339	135.0%	458	119	220.0%	746	288	35,877	35,454	-
Commercial (1)	3,263,531	3,263,531	8,941	140.0%	12,518	3,576	230.0%	20,565	8,047	368,331	80,767	-
Industrial	206,706	206,706	566	175.0%	991	425	230.0%	1,303	311	10,909	1,158	-
Health or Education	1,205,593	1,205,593	3,303	150.0%	4,954	1,651	250.0%	8,257	3,303	86,288	5,805	-
Municipal - Metered	225,528	225,528	617.88	140.0%	865	247	230.0%	1,421	556	6,120	936	-
Municipal - Unmetered (2)	47,052	47,052	128.91	140.0%	180	52	230.0%	296	116	5,070	948	-
Private Fire Systems	14,668	14,668	40	175.0%	70	30	290.0%	117	46	51,260	15,222	51,260
Public Fire	-	-	-	100.0%	-	-	100.0%	-	-	-	-	4,485,000
<i>Subtotal: Retail Service</i>	<u>7,806,610</u>	<u>7,806,610</u>	<u>21,388</u>		<u>30,096</u>	<u>8,708</u>		<u>49,098</u>	<u>19,002</u>	<u>1,386,538</u>	<u>904,557</u>	<u>4,536,260</u>
<u>Wholesale & Bulk</u>												
Wholesale	803,729	803,729	2,202	140.0%	3,083	881	230.0%	5,065	1,982	-	-	-
Bulk	-	-	-	0.0%	-	-	0.0%	-	-	-	-	-
<i>Subtotal: Wholesale & Bulk</i>	<u>803,729</u>	<u>803,729</u>	<u>2,202</u>		<u>3,083</u>	<u>881</u>		<u>5,065</u>	<u>1,982</u>	<u>-</u>	<u>-</u>	<u>-</u>
Total: Water Units of Service	<u>8,610,339</u>	<u>8,610,339</u>	<u>23,590</u>		<u>33,179</u>	<u>9,589</u>		<u>54,163</u>	<u>20,984</u>	<u>1,386,538</u>	<u>904,557</u>	<u>4,536,260</u>

- (1) Includes unmetered units and equivalent usage.
- (2) Assumed usage for unmetered municipal properties

	Maximum Day			Peak Hour		
	Class MM/AD	System MD/MM	Weekly Use Adjustment	MD Peaking Factor (2)	Estimated MH/MD	MH Peaking Factor (2)
Peaking Factors (1)						
Residential	1.15	1.16	1.00	1.35	1.66	2.20
Commercial	1.19	1.16	1.00	1.40	1.66	2.30
Industrial	1.50	1.16	1.00	1.75	1.33	2.30
Health or Education	1.28	1.16	1.00	1.50	1.66	2.50
Fire System	1.50	1.16	1.00	1.75	1.66	2.90
Wholesale	1.22	1.16	1.00	1.40	1.66	2.30

- (1) Peaking factors determined using customer billing information from 2018-2019.
- (2) Maximum Day and Maximum Hour peaking factors are rounded.

PWSA Exh. HJS-7W-R

Pittsburgh Water and Sewer Authority

HJS-7W-R

2021 COS & Rate Design

Fire Protection Cost Allocation and Units of Service

Determination of Allocation Factors for Public & Private Fire Costs

Required Fire Flow	6,000	GPM
Required Duration for Fire Flow (Hours)	4	hours
Maximum Day - Fire	1,440,000	gallons
Maximum Day - System	90,900,000	gallons
% of Maximum Day for Fire	1.58%	
Peak Hour - Fire	360,000	gallons
Peak Hour - System	4,684,000	gallons
% of Maximum Day for Fire	7.69%	

Fire Service Units	Connections	Equivalent Factor	Equivalent Units	Percent
<u>Allocation to Public/Private</u>				
Public Hydrants	7,475	50.00	373,750	98.87%
Private Fire				
1" or Less	1,195	2.50	2,988	
1 1/2"-3"	54	8.00	429	
4"	5	25.00	125	
6" or Greater	15	50.00	729	
<i>Subtotal: Private Fire</i>	1,269		4,272	1.13%
Total	8,744		378,022	

PWSA Exh. HJS-8W-R

Development of Unit Costs of Service	FY 2021 FPFTY	Unit Costs						
		Base	Extra Capacity		Meters	Bills	Readiness-to-Serve	Fire Protection
			Max Day	Peak Hour				
<u>Units of Service</u>								
Retail		7,806,610	8,708	19,002	1,386,538	904,557	1,386,538	4,536,260
Wholesale		803,729	881	1,982	-	-	-	-
Total System Units		8,610,339	9,589	20,984	1,386,538	904,557	1,386,538	4,536,260
Units		<i>kgal</i>	<i>kgal/day</i>	<i>kgal/day</i>	<i>Eq. Cost Meter</i>	<i>Total Bills</i>	<i>Eq. Flow Meter</i>	<i>Eq. Fire Cnx</i>
<u>Allocated Revenue Requirement</u>								
Supply	\$ 65,514	\$ 65,514	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Treatment	38,405,532	26,514,887	11,282,240	-	-	-	-	608,404
Storage	12,801,698	7,017,156	2,350,440	2,450,197	-	-	-	983,905
Transmission	20,974,950	14,480,946	6,161,727	-	-	-	-	332,276
Distribution	22,826,949	12,512,423	4,191,114	4,368,992	-	-	-	1,754,420
Meters	2,912,456	-	-	-	2,912,456	-	-	-
Billing	1,550,894	-	-	-	-	1,550,894	-	-
Fire Protection	1,063,513	-	-	-	-	-	-	1,063,513
Admin Support	21,623,544	11,721,211	4,639,958	1,319,161	563,410	300,018	2,162,354	917,432
Readiness-to-Serve (Debt Service)	10,390,261	-	-	-	-	-	10,390,261	-
Total: Revenue Requirements	\$ 132,615,311	\$ 72,312,139	\$ 28,625,479	\$ 8,138,350	\$ 3,475,866	\$ 1,850,912	\$ 12,552,616	\$ 5,659,951
Revenue Offsets	(3,221,571)	(1,756,650)	(695,387)	(197,702)	(84,438)	(44,963)	(304,936)	(137,495)
Total: Costs of Service	\$ 129,393,740	\$ 70,555,489	\$ 27,930,092	\$ 7,940,648	\$ 3,391,428	\$ 1,805,948	\$ 12,247,680	\$ 5,522,456
Gross Unit Cost		\$ 8.19	\$ 2,912.71	\$ 378.42	\$ 2.45	\$ 2.00	\$ 8.83	\$ 1.22
<i>Unit Cost - Retail (\$ / Unit) (Includes Distribution)</i>		\$ 8.34	\$ 2,956.92	\$ 400.14	\$ 2.45	\$ 2.00	\$ 8.83	\$ 1.22
<i>Unit Cost - Wholesale (\$ / Unit) (Excludes Distribution)</i>		\$ 6.74	\$ 2,475.64	\$ 170.21	\$ 2.45	\$ 2.00	\$ 8.83	\$ 1.22

PWSA Exh. HJS-9W-R

Customer Class Cost of Service	Unit Costs							Total
	Base	Extra Capacity		Meters	Bills	Readiness-to-Serve	Fire Protection	
		Max Day	Peak Hour					
<u>Residential</u>								
Unit Costs (\$/unit)	\$ 8,344	\$ 2,956,918	\$ 400,137	\$ 2,446	\$ 1,997	\$ 8,833	\$ 1,217	
Units of Service	2,719,759	2,608	6,334	822,685	764,267	822,685	-	
Cost of Service	\$ 22,693,369	\$ 7,711,609	\$ 2,534,344	\$ 2,012,261	\$ 1,525,860	\$ 7,267,006	\$ -	\$ 43,744,450
<u>Residential - CAP</u>								
Unit Costs (\$/unit)	\$ 8,344	\$ 2,956,918	\$ 400,137	\$ 2,446	\$ 1,997	\$ 8,833	\$ 1,217	
Units of Service	123,773	119	288	35,877	35,454	35,877	-	
Cost of Service	\$ 1,032,749	\$ 350,946	\$ 115,335	\$ 87,753	\$ 70,783	\$ 316,907	\$ -	\$ 1,974,474
<u>Commercial</u>								
Unit Costs (\$/unit)	\$ 8,344	\$ 2,956,918	\$ 400,137	\$ 2,446	\$ 1,997	\$ 8,833	\$ 1,217	
Units of Service	3,263,531	3,576	8,047	368,331	80,767	368,331	-	
Cost of Service	\$ 27,230,534	\$ 10,575,335	\$ 3,219,929	\$ 900,925	\$ 161,251	\$ 3,253,568	\$ -	\$ 45,341,543
<u>Industrial</u>								
Unit Costs (\$/unit)	\$ 8,344	\$ 2,956,918	\$ 400,137	\$ 2,446	\$ 1,997	\$ 8,833	\$ 1,217	
Units of Service	206,706	425	311	10,909	1,158	10,909	-	
Cost of Service	\$ 1,724,732	\$ 1,255,917	\$ 124,633	\$ 26,682	\$ 2,312	\$ 96,358	\$ -	\$ 3,230,633
<u>Health or Education</u>								
Unit Costs (\$/unit)	\$ 8,344	\$ 2,956,918	\$ 400,137	\$ 2,446	\$ 1,997	\$ 8,833	\$ 1,217	
Units of Service	1,205,593	1,651	3,303	86,288	5,805	86,288	-	
Cost of Service	\$ 10,059,329	\$ 4,883,341	\$ 1,321,651	\$ 211,058	\$ 11,590	\$ 762,206	\$ -	\$ 17,249,175
<u>Municipal - Metered</u>								
Unit Costs (\$/unit)	\$ 8,344	\$ 2,956,918	\$ 400,137	\$ 2,446	\$ 1,997	\$ 8,833	\$ 1,217	
Units of Service	225,528	247	556	6,120	936	6,120	-	
Cost of Service	\$ 1,881,780	\$ 730,814	\$ 222,515	\$ 14,969	\$ 1,869	\$ 54,060	\$ -	\$ 2,906,007
<u>Municipal - Unmetered</u>								
Unit Costs (\$/unit)	\$ 8,344	\$ 2,956,918	\$ 400,137	\$ 2,446	\$ 1,997	\$ 8,833	\$ 1,217	
Units of Service	47,052	52	116	5,070	948	5,070	-	
Cost of Service	\$ 392,597	\$ 152,470	\$ 46,423	\$ 12,401	\$ 1,893	\$ 44,785	\$ -	\$ 650,569
<u>Private Fire System</u>								
Unit Costs (\$/unit)	\$ 8,344	\$ 2,956,918	\$ 400,137	\$ 2,446	\$ 1,997	\$ 8,833	\$ 1,217	
Units of Service	14,668	30	46	51,260	15,222	51,260	51,260	
Cost of Service	\$ 122,388	\$ 89,121	\$ 18,492	\$ 125,379	\$ 30,391	\$ 452,790	\$ 62,403	\$ 900,965
<u>Public Fire Protection</u>								
Unit Costs (\$/unit)	\$ 8,344	\$ 2,956,918	\$ 400,137	\$ 2,446	\$ 1,997	\$ 8,833	\$ 1,217	
Units of Service							4,485,000	
Cost of Service	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 5,460,052	\$ 5,460,052
<u>Wholesale</u>								
Unit Costs (\$/unit)	\$ 6,741	\$ 2,475,637	\$ 170,212	\$ 2,446	\$ 1,997	\$ 8,833	\$ 1,217	
Units of Service	803,729	881	1,982					
Cost of Service	\$ 5,418,009	\$ 2,180,538	\$ 337,326	\$ -	\$ -	\$ -	\$ -	\$ 7,935,873
Total: Costs of Service	\$ 70,555,489	\$ 27,930,092	\$ 7,940,648	\$3,391,428	\$1,805,948	\$ 12,247,680	\$ 5,522,456	\$ 129,393,740

PWSA Exh. HJS-10W-R

Pittsburgh Water and Sewer Authority

2021 COS & Rate Design

Adjustments to Cost of Service - Water

HJS-10W-R

Allocation Method	Residential	Residential - CAP	Commercial	Industrial	Health or Education	Municipal - Metered	Municipal - Unmetered	Private Fire System	Public Fire Protection	Wholesale	Total			
Allocated Cost of Service (Unadjusted)	\$ 43,744,450	\$ 1,974,474	\$ 45,341,543	\$ 3,230,633	\$ 17,249,175	\$ 2,906,007	\$ 650,569	\$ 900,965	\$ 5,460,052	\$ 7,935,873	\$ 129,393,740			
% of COS	33.8%	1.5%	35.0%	2.5%	13.3%	2.2%	0.5%	0.7%	4.2%	6.1%	100.0%			
	Billing	RTS	Volume											
Adjustments to Cost of Service														
Public Fire Protection	0.0%	100.0%	0.0%	2,523,014	110,026	1,129,598	33,454	264,629	18,769	15,549	-	(4,095,039)	-	-
Wholesale Contracts	0.0%	0.0%	100.0%	1,625,192	73,961	1,950,122	123,517	720,402	134,764	28,116	8,765	-	(4,664,839)	-
Add: Bad Debt Expense	0.0%	0.0%	100.0%	971,933	27,195	237,888	-	47,578	-	-	47,578	-	-	1,332,171
Total: Adjusted Cost of Service (Before CAP & City Adjustment)	\$ 48,864,589	\$ 2,185,656	\$48,659,152	\$3,387,604	\$18,281,782	\$3,059,540	\$ 694,233	\$ 957,307	\$ 1,365,013	\$ 3,271,034	\$ 130,725,911			
% of COS	37.4%	1.7%	37.2%	2.6%	14.0%	2.3%	0.5%	0.7%	1.0%	2.5%	100.0%			

Revenue Under Existing Rates	Unadjusted COS	Adjusted COS	Impacts		
			% Increase Unadjusted	% Increase Adjusted	
Residential	\$ 44,459,448	\$ 43,744,450	\$ 48,864,589	-1.61%	9.91%
Residential - CAP	1,243,999	1,974,474	2,185,656	58.72%	75.70%
Commercial	41,860,908	45,341,543	48,659,152	8.31%	16.24%
Industrial	2,165,551	3,230,633	3,387,604	49.18%	56.43%
Health or Education	18,444,801	17,249,175	18,281,782	-6.48%	-0.88%
Municipal - Metered	1,025,432	2,906,007	3,059,540	183.39%	198.37%
Municipal - Unmetered	-	650,569	694,233	100.00%	100.00%
Private Fire System	804,307	900,965	957,307	12.02%	19.02%
Public Fire Protection	-	5,460,052	1,365,013	100.00%	100.00%
Wholesale	2,911,475	7,935,873	3,271,034	172.57%	12.35%
Subtotal: All User Charge Revenue	\$ 112,915,921	\$129,393,740	\$ 130,725,911	14.59%	15.77%

PWSA Exh. HJS-11W-R

Pittsburgh Water and Sewer Authority
 2021 COS & Rate Design
 Volume Charge Calculation

HJS-11W-R

	Fixed Charge Revenue	Net Volumetric Rev. Req	Billed Volume	COS Rates
<u>Volume Charge (per kgal)</u>				
Residential	\$ 23,154,937	\$20,589,512	1,935,013	\$ 10.64
Residential - CAP	970,628	1,003,845	90,447	11.10
Commercial	16,065,172	29,276,372	2,620,824	11.17
Industrial	579,916	2,650,717	187,994	14.10
Health or Education	4,333,732	12,915,442	1,022,005	12.64
Municipal - Metered	270,790	2,635,217	221,594	11.89
Municipal - Unmetered	200,649	449,920	36,624	12.28
Private Fire System	670,963	230,002	14,668	15.68
Wholesale	-	7,935,873	803,729	9.87
<i>Total: User Charge Revenue</i>	<u>46,246,787</u>	<u>77,686,901</u>	<u>6,932,896</u>	<u>\$ 11.21</u>

Rates Under Full Municipal Rates							
Adjusted Revenue Requirement	Fixed Charge Revenue	CAP BDP Cost (Forgone Revenue)	CAP BDP Adjustment	Total Volumetric Rev Req	Billed Volume	Proposed Rates	
<u>Volume Charge (per kgal)</u>							
Residential + CAP	\$ 51,050,245	\$25,588,233	\$ (1,076,758)	\$ 439,284	\$ 24,824,538	2,025,459	12.26
Commercial	48,659,152	17,153,254		418,709	31,924,606	2,620,824	12.18
Industrial	3,387,604	612,137		29,150	2,804,618	187,994	14.92
Health or Education	18,281,782	4,588,594		157,314	13,850,502	1,022,005	13.55
Municipal (Metered)	3,059,540	288,867		26,327	2,797,000	221,594	12.18
Municipal (Unmetered)	694,233	-		5,974	700,207	36,624	12.18
Private Fire System	957,307	670,990		-	286,317	14,668	19.52
Public Fire System	1,365,013	546,273		-	818,740	-	n/a
Wholesale	3,271,034	-		-	3,271,034	n/a	n/a
<i>Total: User Charge Revenue</i>	<u>\$ 130,725,911</u>	<u>49,448,349</u>	<u>(1,076,758)</u>	<u>1,076,758</u>	<u>81,277,562</u>	<u>6,129,167</u>	<u>13.26</u>

Proposed Adjustments for Gradualism								
Adjusted Revenue Requirement	Fixed Charge Revenue	Gradualism Adjustment (Municipal)	Gradualism Adjustment (All Other)	Reallocation of Costs	Total Volumetric Rev Req	Billed Volume	Proposed Rates	
<u>Volume Charge (per kgal)</u>								
Residential + CAP	\$ 50,412,771	\$25,588,233	\$ -	\$ 1,740,582	\$ 26,565,121	2,025,459	\$ 13.12	
Commercial	49,077,861	17,153,254	-	1,659,057	33,583,663	2,620,824	12.81	
Industrial	3,416,754	612,137	-	(768,000)	2,152,120	187,994	11.45	
Health or Education	18,439,096	4,588,594	-	623,326	14,473,828	1,022,005	14.16	
Municipal (Metered)	3,085,868	115,549	(1,851,521)		1,118,798	221,594	5.12	
Municipal (Unmetered)	700,207	-	(700,207)		-	36,624	-	
Private Fire System	957,307	670,990	-		286,317	14,668	19.52	
Public Fire System	1,365,013	546,273	(818,740)		-	-	n/a	
Wholesale	3,271,034	-	-		3,271,034	n/a	n/a	
<i>Total: User Charge Revenue</i>	<u>\$ 130,725,911</u>	<u>49,275,031</u>	<u>(3,370,468)</u>	<u>(768,000)</u>	<u>4,138,468</u>	<u>81,450,880</u>	<u>6,129,167</u>	<u>13.29</u>

PWSA Exh. HJS-12W-R

	FTY Prior Tariff Rates	FPFTY Proposed Rates	Percent Difference	Dollar Difference
Existing & Proposed Rates				
<u>Minimum Charge</u>				
5/8"	\$ 27.27	\$ 29.81	9.3%	\$ 2.54
3/4"	44.37	50.50	13.8%	6.13
1"	89.82	105.46	17.4%	15.64
1 1/2"	175.30	208.92	19.2%	33.62
2"	289.14	346.65	19.9%	57.51
3"	641.48	772.76	20.5%	131.28
4"	1,084.28	1,308.14	20.6%	223.86
6"	2,558.16	3,089.43	20.8%	531.27
8"	4,596.96	5,552.80	20.8%	955.84
10" & Above	7,515.81	9,078.39	20.8%	1,562.58
<u>Minimum Charge - CAP (1)</u>				
5/8"	\$ 6.82	\$ -	-100.0%	\$ (6.82)
3/4"	11.09	-	-100.0%	(11.09)
1"	22.46	-	-100.0%	(22.46)
<u>Minimum Charges - Municipal</u>				
5/8"	\$ -	\$ 11.93	100.0%	\$ 11.93
3/4"	-	20.20	100.0%	20.20
1"	-	42.19	100.0%	42.19
1 1/2"	-	83.57	100.0%	83.57
2"	-	138.66	100.0%	138.66
3"	-	309.11	100.0%	309.11
4"	-	523.26	100.0%	523.26
6"	-	1,235.77	100.0%	1,235.77
8"	-	2,221.12	100.0%	2,221.12
10" & Above	-	3,631.36	100.0%	3,631.36
<u>Fire System Charges</u>				
Private				
1" or Less	\$ 31.60	\$ 33.24	5.2%	\$ 1.64
1 1/2"-3"	83.30	101.97	22.4%	18.67
4"	177.57	314.42	77.1%	136.85
6" or Greater	507.98	626.83	23.4%	118.85
Public				
Per Hydrant	\$ -	\$ 6.09	100.0%	\$ 6.09
<u>Volume Charge</u>				
Residential	\$ 11.04	\$ 13.12	18.8%	\$ 2.08
Residential - CAP	11.04	13.12	18.8%	2.08
Commercial	10.48	12.81	22.2%	2.33
Industrial	8.81	11.45	30.0%	2.64
Health or Education	14.32	14.16	-1.1%	(0.16)
Municipal	-	5.12	100.0%	5.12
Fire System	13.49	19.52	44.7%	6.03
Wholesale	n/a	9.87	100.0%	9.87
<u>Unmetered Charges (per Unit)</u>				
Residential	\$ 44.36	\$ 69.17	55.9%	\$ 24.81
Residential - CAP	23.91	39.36	64.6%	15.45
Commercial	88.26	81.05	-8.2%	(7.21)
<u>Unmetered - Municipal</u>				
EMS / Fire / Police Station	\$ -	\$ -	0.0%	\$ -
Public Park or Playground	-	-	0.0%	-
Swimming Pool	-	-	0.0%	-
Municipal Building	-	-	0.0%	-
Municipal Garage	-	-	0.0%	-
Rec Center	-	-	0.0%	-
Other	-	-	0.0%	-
DSIC (Applies to all retail customers)	0.0%	10.0%	n/a	n/a

(1) Proposed 100% discount on Minimum Charge for CAP-BDP customers in 2021.

PWSA Exh. HJS-13W-R

Comparison of Base Rate Revenues by Customer Class

	FPFTY Revenue at Existing Rates	FPFTY Indicated COS by Customer Class	Percent Difference	Dollar Difference
User Charge Revenue				
Residential	\$ 44,459,448	\$ 43,744,450	-1.6%	\$ (714,998)
Residential - CAP	1,243,999	1,974,474	58.7%	730,474
Commercial	41,860,908	45,341,543	8.3%	3,480,635
Industrial	2,165,551	3,230,633	49.2%	1,065,081
Health or Education	18,444,801	17,249,175	-6.5%	(1,195,626)
Municipal (Metered & Unmetered)	1,025,432	3,556,576	246.8%	2,531,144
Private Fire System	804,307	900,965	12.0%	96,658
Public Fire Protection	-	5,460,052	100.0%	5,460,052
Wholesale	2,911,475	7,935,873	172.6%	5,024,398
Total: Base Rate Revenues	\$ 112,915,921	\$ 129,393,740	14.6%	\$ 16,477,819

	FPFTY Indicated COS by Customer Class	FPFTY Adjusted COS by Customer Class	Percent Difference	Dollar Difference
User Charge Revenue				
Residential	\$ 43,744,450	\$ 49,226,112	12.5%	\$ 5,481,662
Residential - CAP	1,974,474	1,186,659	-39.9%	(787,814)
Commercial	45,341,543	49,077,861	8.2%	3,736,317
Industrial	3,230,633	3,416,754	5.8%	186,122
Health or Education	17,249,175	18,439,096	6.9%	1,189,921
Municipal (Metered & Unmetered)	3,556,576	3,085,868	-13.2%	(470,708)
Private Fire System	900,965	957,307	6.3%	56,342
Public Fire Protection	5,460,052	1,365,013	-75.0%	(4,095,039)
Wholesale	7,935,873	3,271,034	-58.8%	(4,664,839)
Total: Base Rate Revenues	\$ 129,393,740	\$ 130,025,704	0.5%	\$ 631,964

	FPFTY Revenue at Existing Rates	FPFTY Adjusted COS by Customer Class	Percent Difference	Dollar Difference
User Charge Revenue				
Residential	\$ 44,459,448	\$ 49,226,112	10.7%	\$ 4,766,664
Residential - CAP	1,243,999	1,186,659	-4.6%	(57,340)
Commercial	41,860,908	49,077,861	17.2%	7,216,952
Industrial	2,165,551	3,416,754	57.8%	1,251,203
Health or Education	18,444,801	18,439,096	0.0%	(5,705)
Municipal (Metered & Unmetered)	1,025,432	3,085,868	200.9%	2,060,436
Private Fire System	804,307	957,307	19.0%	153,000
Public Fire Protection	-	1,365,013	100.0%	1,365,013
Wholesale	2,911,475	3,271,034	12.3%	359,559
Total: Base Rate Revenues	\$ 112,915,921	\$ 130,025,704	15.2%	\$ 17,109,783

	FPFTY Revenue at Existing Rates	FPFTY Revenue at Proposed Rates	Percent Difference	Dollar Difference
User Charge Revenue				
Residential	\$ 44,459,448	\$ 50,975,600	14.7%	\$ 6,516,153
Residential - CAP	1,243,999	1,186,659	-4.6%	(57,340)
Commercial	41,860,908	50,726,004	21.2%	8,865,095
Industrial	2,165,551	2,764,667	27.7%	599,116
Health or Education	18,444,801	19,060,180	3.3%	615,379
Municipal (Metered & Unmetered)	1,025,432	1,250,994	22.0%	225,563
Private Fire System	804,307	957,311	19.0%	153,004
Public Fire Protection	-	546,273	100.0%	546,273
Wholesale	2,911,475	3,271,034	12.3%	359,559
Total: Base Rate Revenues	\$ 112,915,921	\$ 130,738,723	15.8%	\$ 17,822,802

PWSA Exh. HJS-14W-R

Pittsburgh Water and Sewer Authority

2021 COS & Rate Design

FPPTY CCOS Comparison - Water

HJS-14W-R

	Adjusted COS		Revenue at Existing Rates		Revenue at Proposed Rates		Proposed Increase	
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
Base Rate Revenues								
Residential	\$ 49,226,112	37.9%	\$ 44,459,448	39.4%	\$ 50,975,600	39.0%	\$ 6,516,153	14.7%
Residential - CAP	1,186,659	0.9%	1,243,999	1.1%	1,186,659	0.9%	(57,340)	-4.6%
Commercial	49,077,861	37.7%	41,860,908	37.1%	50,726,004	38.8%	8,865,095	21.2%
Industrial	3,416,754	2.6%	2,165,551	1.9%	2,764,667	2.1%	599,116	27.7%
Health or Education	18,439,096	14.2%	18,444,801	16.3%	19,060,180	14.6%	615,379	3.3%
Municipal (Metered & Unmetered)	3,085,868	2.4%	1,025,432	0.9%	1,250,994	1.0%	225,563	22.0%
Private Fire System	957,307	0.7%	804,307	0.7%	957,311	0.7%	153,004	19.0%
Public Fire Protection	1,365,013	1.0%	-	0.0%	546,273	0.4%	546,273	100.0%
Wholesale & Bulk	3,271,034	2.5%	2,911,475	2.6%	3,271,034	2.5%	359,559	12.3%
Subtotal: Base Rate Revenues	\$ 130,025,704	100.0%	\$ 112,915,921	100.0%	\$ 130,738,723	100.0%	\$ 17,822,802	15.8%
DSIC Revenues								
Residential	n/a	n/a	\$ -	0.0%	\$ 5,097,560	40.2%	\$ 5,097,560	
Residential - CAP	n/a	n/a	-	0.0%	118,666	0.9%	118,666	
Commercial	n/a	n/a	-	0.0%	5,072,600	40.0%	5,072,600	
Industrial	n/a	n/a	-	0.0%	276,467	2.2%	276,467	
Health or Education	n/a	n/a	-	0.0%	1,906,018	15.0%	1,906,018	
Municipal (Metered & Unmetered)	n/a	n/a	-	0.0%	125,099	1.0%	125,099	
Private Fire System	n/a	n/a	-	0.0%	95,731	0.8%	95,731	
Public Fire Protection	n/a	n/a	-	0.0%	-	0.0%	-	
Subtotal: DSIC Revenues	n/a	n/a	\$ -	100.0%	\$ 12,692,142	100.0%	\$ 12,692,142	
Total: User Charge Revenues	\$ 130,025,704		\$ 112,915,921		\$ 143,430,864		\$ 30,514,943	27.0%
Other Revenues								
Miscellaneous Revenues	3,221,571		3,221,571		3,221,571		-	0.0%
Total: Water Revenues	\$ 133,247,275		\$ 116,137,492		\$ 146,652,435		\$ 30,514,943	26.3%

PWSA Exh. HJS-15W-R

Pittsburgh Water and Sewer Authority

HJS-15W-R

2021 COS & Rate Design

Typical Bill Comparison

	Customer Usage		FTY Existing Rates		FPFTY Proposed Rates	Percent Difference	Dollar Difference
Customer Impacts (1)							
<u>Residential</u>							
	5/8"	1 kgal	\$ 27.27	\$	32.79	20.2%	\$ 5.52
	5/8"	3 kgal	49.35		61.66	24.9%	12.31
	5/8"	5 kgal	71.43		90.52	26.7%	19.09
	5/8"	7 kgal	93.51		119.38	27.7%	25.87
	5/8"	12 kgal	148.71		191.54	28.8%	42.83
	1"	20 kgal	255.42		332.49	30.2%	77.07
<u>Commercial</u>							
	5/8"	3 kgal	\$ 48.23	\$	60.97	26.4%	\$ 12.74
	5/8"	5 kgal	69.19		89.16	28.9%	19.97
	5/8"	12 kgal	142.55		187.79	31.7%	45.24
	1"	13 kgal	173.66		228.73	31.7%	55.07
	2"	80 kgal	949.38		1,269.05	33.7%	319.67
	4"	160 kgal	2,027.48		2,707.14	33.5%	679.66
<u>Industrial</u>							
	1"	30 kgal	\$ 310.07	\$	430.88	39.0%	\$ 120.81
	1"	60 kgal	574.37		808.73	40.8%	234.36
	2"	100 kgal	1,020.37		1,426.70	39.8%	406.33
	4"	680 kgal	6,458.38		9,121.90	41.2%	2,663.52
	6"	400 kgal	4,540.41		6,232.25	37.3%	1,691.84
	8"	800 kgal	8,781.71		12,090.71	37.7%	3,309.00
<u>Health or Education</u>							
	5/8"	5 kgal	\$ 84.55	\$	95.10	12.5%	\$ 10.55
	5/8"	10 kgal	156.15		172.98	10.8%	16.83
	1"	40 kgal	591.02		661.17	11.9%	70.15
	2"	50 kgal	761.70		895.32	17.5%	133.62
	4"	200 kgal	2,945.88		3,463.83	17.6%	517.95
	6"	650 kgal	9,360.16		10,796.97	15.4%	1,436.81

(1) FPFTY customer bills at proposed rates include a 10% DSIC.

PWSA Exh. HJS-16W-R

	2021 Revenue @ Existing Rates			2021 Revenue @ COS Rates			2021 Revenue @ Proposed Rates		
	Units	Rates	Revenue	Units	Rates	Revenue	Units	Rates	Revenue
Base Rate Revenues									
Minimum Charges									
Residential									
5/8"	701,053	\$ 27.27	\$ 19,117,708	701,053	\$ 26.85	\$ 18,824,471	701,053	\$ 29.81	\$ 20,898,382
3/4"	30,650	44.37	1,359,960	30,650	46.07	1,411,983	30,650	50.50	1,547,847
1"	28,486	89.82	2,558,583	28,486	98.07	2,793,716	28,486	105.46	3,004,098
1 1/2"	70	175.30	12,271	70	194.15	13,591	70	208.92	14,624
2"	12	289.14	3,470	12	323.02	3,876	12	346.65	4,160
Unmetered	3,996	44.36	177,263	3,996	58.77	234,852	3,996	69.17	276,403
<i>Subtotal: Residential</i>	764,267		\$ 23,229,254	764,267		\$ 23,282,490	764,267		\$ 25,745,516
Residential - CAP-BDP									
5/8"	34,947	\$ 6.82	\$ 238,254	34,947	\$ 26.85	\$ 938,397	34,947	\$ -	\$ -
3/4"	319	11.09	3,534	319	46.07	14,676	319	-	-
1"	176	22.46	3,946	176	98.07	17,233	176	-	-
1 1/2"	-	43.83	-	-	-	-	-	-	-
2"	-	72.29	-	-	-	-	-	-	-
Unmetered	12	11.09	133	12	60.15	722	12	39.36	472
<i>Subtotal: Residential - CAP-BDP</i>	35,454		\$ 245,866	35,454		\$ 971,028	35,454		\$ 472
Commercial									
5/8"	31,327	\$ 27.27	\$ 854,287	31,327	\$ 26.85	\$ 841,184	31,327	\$ 29.81	\$ 933,858
3/4"	7,879	44.37	349,591	7,879	46.07	362,964	7,879	50.50	397,890
1"	15,750	89.82	1,414,665	15,750	98.07	1,544,673	15,750	105.46	1,660,995
1 1/2"	10,149	175.30	1,779,120	10,149	194.15	1,970,453	10,149	208.92	2,120,329
2"	9,412	289.14	2,721,386	9,412	323.02	3,040,282	9,412	346.65	3,262,670
3"	2,930	641.48	1,879,536	2,930	725.50	2,125,724	2,930	772.76	2,264,187
4"	2,189	1,084.28	2,373,489	2,189	1,234.30	2,701,873	2,189	1,308.14	2,863,518
6"	1,014	2,558.16	2,593,974	1,014	2,941.75	2,982,938	1,014	3,089.43	3,132,682
8"	93	4,596.96	427,517	93	5,316.53	494,437	93	5,552.80	516,410
10" & Above	-	7,515.81	-	-	8,738.74	-	-	9,078.39	-
Unmetered	24	88.26	2,118	24	71.53	1,717	24	81.05	1,945
<i>Subtotal: Commercial</i>	80,767		\$ 14,395,684	80,767		\$ 16,066,244	80,767		\$ 17,154,484
Industrial									
5/8"	257	\$ 27.27	\$ 7,008	257	\$ 26.85	\$ 6,901	257	\$ 29.81	\$ 7,661
3/4"	161	44.37	7,144	161	46.07	7,417	161	50.50	8,131
1"	300	89.82	26,946	300	98.07	29,422	300	105.46	31,638
1 1/2"	72	175.30	12,622	72	194.15	13,979	72	208.92	15,042
2"	172	289.14	49,732	172	323.02	55,560	172	346.65	59,624
3"	24	641.48	15,396	24	725.50	17,412	24	772.76	18,546
4"	100	1,084.28	108,428	100	1,234.30	123,430	100	1,308.14	130,814
6"	24	2,558.16	61,396	24	2,941.75	70,602	24	3,089.43	74,146
8"	48	4,596.96	220,654	48	5,316.53	255,193	48	5,552.80	266,534
10" & Above	-	7,515.81	-	-	8,738.74	-	-	9,078.39	-
<i>Subtotal: Industrial</i>	1,158		\$ 509,325	1,158		\$ 579,916	1,158		\$ 612,137
Health or Education									
5/8"	408	\$ 27.27	\$ 11,126	408	\$ 26.85	\$ 10,956	408	\$ 29.81	\$ 12,162
3/4"	101	44.37	4,481	101	46.07	4,653	101	50.50	5,101
1"	295	89.82	26,497	295	98.07	28,932	295	105.46	31,111
1 1/2"	773	175.30	135,507	773	194.15	150,080	773	208.92	161,495
2"	1,730	289.14	500,212	1,730	323.02	558,828	1,730	346.65	599,705
3"	1,156	641.48	741,551	1,156	725.50	838,682	1,156	772.76	893,311
4"	838	1,084.28	908,627	838	1,234.30	1,034,340	838	1,308.14	1,096,221
6"	444	2,558.16	1,135,823	444	2,941.75	1,306,138	444	3,089.43	1,371,707
8"	36	4,596.96	165,491	36	5,316.53	191,395	36	5,552.80	199,901
10" & Above	24	7,515.81	180,379	24	8,738.74	209,730	24	9,078.39	217,881
<i>Subtotal: Health or Education</i>	5,805		\$ 3,809,694	5,805		\$ 4,333,732	5,805		\$ 4,588,594
Municipal									
5/8"	180	\$ 10.91	\$ 1,963	180	\$ 26.85	\$ 4,833	180	\$ 11.93	\$ 2,147
3/4"	60	17.75	1,065	60	46.07	2,764	60	20.20	1,212
1"	84	35.93	3,018	84	98.07	8,238	84	42.19	3,544
1 1/2"	288	70.12	20,195	288	194.15	55,916	288	83.57	24,068
2"	252	115.66	29,145	252	323.02	81,402	252	138.66	34,942
3"	24	256.59	6,158	24	725.50	17,412	24	309.11	7,419
4"	24	433.71	10,409	24	1,234.30	29,623	24	523.26	12,558
6"	24	1,023.26	24,558	24	2,941.75	70,602	24	1,235.77	29,658
8"	-	1,838.78	-	-	5,316.53	-	-	2,221.12	-
10" & Above	-	3,006.32	-	-	8,738.74	-	-	3,631.36	-
<i>Subtotal: Municipal</i>	936		\$ 96,512	936		\$ 270,790	936		\$ 115,549
Municipal - Unmetered									
EMS / Fire / Police Station	108	\$ -	\$ -	108	\$ 149.65	\$ 16,162	108	\$ -	\$ -
Public Park or Playground	468	-	-	468	1,035.26	484,503	468	-	-
Swimming Pool	120	-	-	120	464.31	55,717	120	-	-
Municipal Building	48	-	-	48	51.41	2,468	48	-	-
Municipal Garage	48	-	-	48	88.25	4,236	48	-	-
Rec Center	24	-	-	24	2,017.66	48,424	24	-	-
Other	132	-	-	132	294.55	38,881	132	-	-
<i>Subtotal: Municipal - Unmetered</i>	948		\$ -	948		\$ 650,391	948		\$ -
<i>Subtotal: Minimum Charges</i>			\$ 42,286,335			\$ 46,154,591			\$ 48,216,752

	2021 Revenue @ Existing Rates			2021 Revenue @ COS Rates			2021 Revenue @ Proposed Rates		
	Units	Rates	Revenue	Units	Rates	Revenue	Units	Rates	Revenue
Fire Protection Charges									
Public (per Hydrant)	89,700	-	\$ -	89,700	60.87	\$ 5,460,052	89,700	6.09	\$ 546,273
Private									
1" or Less	14,343	\$ 31.60	\$ 453,239	14,343	\$ 33.24	\$ 476,735	14,343	\$ 33.24	\$ 476,761
1 1/2"-3"	644	83.30	53,645	644	101.97	65,669	644	101.97	65,669
4"	60	177.57	10,654	60	314.41	18,865	60	314.42	18,865
6" or Greater	175	507.98	88,897	175	626.83	109,695	175	626.83	109,695
<i>Subtotal: Fire Protection Charges</i>			\$ 606,435			\$ 6,131,015			\$ 1,217,263
Volume Charge									
Residential	1,923,025	\$ 11.04	\$ 21,230,193	1,923,025	\$ 10.64	\$ 20,460,983	1,923,025	\$ 13.12	\$ 25,230,085
Residential - CAP-BDP	90,411	11.04	998,133	90,411	11.10	1,003,558	90,411	13.12	1,186,187
Commercial	2,620,728	10.48	27,465,225	2,620,728	11.17	29,273,527	2,620,728	12.81	33,571,520
Industrial	187,994	8.81	1,656,226	187,994	14.10	2,650,714	187,994	11.45	2,152,530
Health or Education	1,022,005	14.32	14,635,107	1,022,005	12.64	12,918,139	1,022,005	14.16	14,471,586
Private Fire System	14,668	13.49	197,872	14,668	15.68	229,995	14,668	19.52	286,320
Municipal	221,594	4.19	928,920	221,594	11.89	2,634,747	221,594	5.12	1,135,445
<i>Subtotal: Volume Charge</i>	6,080,423		\$ 67,111,676			\$ 69,171,662			\$ 78,033,673
Total: Base Rate Revenues			\$ 110,004,446			\$ 121,457,269			\$ 127,467,689
DSIC Revenues									
Residential						\$ 4,374,347			\$ 5,097,560
Residential - CAP-BDP						197,459			118,666
Commercial						4,533,977			5,072,600
Industrial						323,063			276,467
Health or Education						1,725,187			1,906,018
Private Fire System						90,096			95,731
Municipal						355,593			125,099
Public Fire						-			-
Total: DSIC Revenues						\$ 11,599,722			\$ 12,692,142
Other Revenues									
Wholesale Revenues (Set by Contract)			\$ 2,911,475	803,729	\$ 9.87	\$ 7,932,805			\$ 3,271,034
Other Revenues			3,221,571			3,221,571			3,221,571
<i>Total: Other Revenues</i>			\$ 6,133,046			\$ 11,154,376			\$ 6,492,605
Total: System Revenues			\$ 116,137,492			\$ 144,211,366			\$ 146,652,435
FPFTY Water System Revenue Requirements						\$ 146,672,523	\$ 146,672,523		
Difference (1)						\$ (2,461,156)	\$ (20,088)		

(1) Note difference in COS rates is combination of bad debt and DSIC.

PWSA Exh. HJS-17W-R

Pittsburgh Water and Sewer Authority

HJS-17W-R

2021 COS & Rate Design

Projected Units of Service

	FY 2017 <i>Actual</i>	FY 2018 <i>Actual</i>	HTY FY 2019 <i>Actual</i>	FTY FY 2020 <i>Projected</i>	FPFTY FY 2021 <i>Projected</i>
Units of Service					
<u>Number of Bills</u>					
Residential	802,999	781,189	778,126	769,779	764,267
Residential - CAP	-	11,077	21,594	29,941	35,454
Commercial	82,317	80,365	80,767	80,767	80,767
Industrial	1,198	1,173	1,158	1,158	1,158
Health or Education	6,152	5,932	5,805	5,805	5,805
Fire System	14,563	14,673	15,222	15,222	15,222
Municipal	-	-	-	-	936
<i>Total</i>	907,229	894,409	902,672	902,672	903,609
<u>Billable Consumption (kgal)</u>					
Residential	2,091,836	2,041,350	1,874,792	1,937,089	1,923,025
Residential - CAP	-	31,049	55,055	76,347	90,411
Commercial	2,942,211	2,723,585	2,517,870	2,620,728	2,620,728
Industrial	161,491	183,343	192,645	187,994	187,994
Health or Education	1,258,763	1,068,428	975,581	1,022,005	1,022,005
Fire System	4,005	7,913	21,423	14,668	14,668
Municipal	-	-	-	221,594	221,594
<i>Total</i>	6,458,306	6,055,668	5,637,366	6,080,423	6,080,423
<u>Total Consumption (kgal) (1)</u>					
Residential	2,914,122	2,842,635	2,668,533	2,727,019	2,707,771
Residential - CAP	-	41,602	75,349	104,489	123,737
Commercial	3,587,585	3,363,268	3,163,601	3,263,435	3,263,435
Industrial	182,006	203,757	209,655	206,706	206,706
Health or Education	1,453,286	1,253,008	1,158,177	1,205,593	1,205,593
Fire System	5,001	8,887	22,506	15,697	15,697
Municipal	-	-	-	225,528	225,528
<i>Total</i>	8,142,000	7,713,157	7,297,821	7,748,466	7,748,466
<u>Wholesale & Contract Consumption</u>					
Allegheny	6,978	7,911	1,030	-	-
Aspinwall	94,552	81,386	59,842	70,614	70,616
Bay Valley Foods / Riverbend (2)	724,835	462,007	263,171	-	-
Fox Chapel	509,953	612,616	632,050	622,333	622,336
Hampton	11,023	3,607	2,997	-	-
PAWC	-	5,400	2,800	-	-
RSRV - 10"	30,678	97,405	95,941	96,673	96,676
RSRV - 6"	17,815	14,663	13,532	14,098	14,101
Sharpsburg	-	-	-	-	-
Westview	-	6,845	8,410	-	-
<i>Total</i>	1,395,834	1,291,840	1,079,773	803,718	803,729

(1) Total consumption represents actual customer usage including the usage captured in minimum allowance.

(2) Riverbend foods closed in July 2019.

PWSA Exh. HJS-18W-R

Pittsburgh Water and Sewer Authority

HJS-18W-R

2021 COS & Rate Design

2022 Water Revenue Requirements

	2022 Revenue Requirements
Water System Revenue Requirements	
<u>Operating Expenses</u>	
<i>Direct Operating Expenses</i>	
Administrative Division	
Executive Director	\$ 1,745,342
Customer Service	2,245,620
Management Information Systems	2,830,522
Finance	8,226,571
Procurement	-
Human Resources	974,759
Legal	3,298,273
Public Affairs	1,170,383
Operations Division	
Environmental Compliance	1,475,312
Ops Capital Assets	-
Warehouse	461,802
Water Treatment Plant	22,401,447
Water Quality (Lab)	1,765,712
Water Distribution	16,559,300
Sewer Operations	-
Engineering & Construction	
Engineering & Construction	19,622,967
<i>Other Operating Expenses</i>	
Loss / (Gain) on ALCOSAN Billings	-
Non-City Water Payments	475,975
<i>Total Operating Expenses</i>	<u>\$ 83,253,984</u>
<u>Debt Service</u>	
Existing Debt	\$ 32,948,192
Future Debt	19,570,912
<i>Subtotal: Debt Service</i>	<u>\$ 52,519,104</u>
<u>Capital Expenditures & Transfers</u>	
Internally Generated Funds / PAYGO	\$ 3,835,842
Internally Generated Funds / PAYGO (DSIC)	13,424,906
Other Transfers to Reserves	615,885
Reimbursements from Municipalities	-
Remarketing & Liquidity Charges	-
Bad Debt Expense	1,425,808
<i>Subtotal: Capital Expenditures & Transfers</i>	<u>\$ 19,302,440</u>
Total: Water System Revenue Requirements	\$ 155,075,528
<i>Capital Costs to be Recovered through DSIC</i>	\$ (13,424,906)
Total: Water System Base Rate Revenue Requirement	\$ 141,650,623

PWSA Exh. HJS-19W-R

	FPPTY 2021 Proposed Rates	2022 Proposed Rates	Percent Difference	Dollar Difference
Existing & Proposed Rates				
<u>Minimum Charge</u>				
5/8"	\$ 29.81	\$ 31.33	5.1%	\$ 1.52
3/4"	50.50	53.08	5.1%	2.58
1"	105.46	110.84	5.1%	5.38
1 1/2"	208.92	219.57	5.1%	10.65
2"	346.65	364.33	5.1%	17.68
3"	772.76	812.17	5.1%	39.41
4"	1,308.14	1,374.86	5.1%	66.72
6"	3,089.43	3,246.99	5.1%	157.56
8"	5,552.80	5,835.99	5.1%	283.19
10" & Above	9,078.39	9,541.39	5.1%	463.00
<u>Minimum Charge - CAP (1)</u>				
5/8"	\$ -	\$ -	0.0%	\$ -
3/4"	-	-	0.0%	-
1"	-	-	0.0%	-
<u>Minimum Charge - Municipal</u>				
5/8"	\$ 11.93	\$ 18.80	57.6%	\$ 6.87
3/4"	20.20	31.85	57.7%	11.65
1"	42.19	66.50	57.6%	24.31
1 1/2"	83.57	131.74	57.6%	48.17
2"	138.66	218.60	57.7%	79.94
3"	309.11	487.30	57.6%	178.19
4"	523.26	824.92	57.6%	301.66
6"	1,235.77	1,948.19	57.7%	712.42
8"	2,221.12	3,501.59	57.6%	1,280.47
10" & Above	3,631.36	5,724.83	57.6%	2,093.47
<u>Fire System Charges</u>				
Private				
1" or Less	\$ 33.24	\$ 34.94	5.1%	\$ 1.70
1 1/2"-3"	101.97	107.17	5.1%	5.20
4"	314.42	330.46	5.1%	16.04
6" or Greater	626.83	658.80	5.1%	31.97
Public				
Per Hydrant (2)	\$ 6.09	\$ 9.60	57.6%	\$ 3.51
<u>Volume Charge</u>				
Residential	\$ 13.12	\$ 13.79	5.1%	\$ 0.67
Residential - CAP	13.12	13.79	5.1%	0.67
Commercial	12.81	13.46	5.1%	0.65
Industrial	11.45	12.03	5.1%	0.58
Health or Education	14.16	14.88	5.1%	0.72
Municipal	5.12	8.08	57.7%	2.96
Fire System	19.52	20.52	5.1%	1.00
Wholesale	9.87	10.37	5.1%	0.50
<u>Unmetered Charges (per Unit)</u>				
Residential	\$ 69.17	\$ 72.70	5.1%	\$ 3.53
Residential - CAP	39.36	41.37	5.1%	2.01
Commercial	81.05	85.17	5.1%	4.12
<u>Unmetered - Municipal</u>				
EMS / Fire / Police Station	\$ -	\$ -	0.0%	\$ -
Public Park or Playground	-	-	0.0%	-
Swimming Pool	-	-	0.0%	-
Municipal Building	-	-	0.0%	-
Municipal Garage	-	-	0.0%	-
Rec Center	-	-	0.0%	-
Other	-	-	0.0%	-
DSIC (Applies to all retail customers)	10.0%	10.0%	n/a	n/a

(1) Proposed 100% discount on Minimum Charge for CAP-BDP customers in 2021 and 2022.
 (2) Public hydrant charges are phased-in at 40% and 60% in 2021 and 2022, respectively.

PWSA Exh. HJS-20W-R

	2022 Revenue @ 2021 Rates			2022 Revenue @ Proposed Rates		
	Units	Rates	Revenue	Units	Rates	Revenue
Base Rate Revenues						
<u>Minimum Charges</u>						
Residential						
5/8"	701,053	\$ 29.81	\$ 20,898,401	701,053	\$ 31.33	\$ 21,964,002
3/4"	30,650	50.50	1,547,804	30,650	53.08	1,626,880
1"	28,486	105.46	3,004,103	28,486	110.84	3,157,357
1 1/2"	70	208.92	14,624	70	219.57	15,370
2"	12	346.65	4,160	12	364.33	4,372
Unmetered	3,996	69.17	276,403	3,996	72.70	290,509
<i>Subtotal: Residential</i>	<u>764,267</u>		<u>\$ 25,745,496</u>	<u>764,267</u>		<u>\$ 27,058,489</u>
Residential - CAP-BDP						
5/8"	34,947	\$ -	\$ -	34,947	\$ -	\$ -
3/4"	319	-	-	319	-	-
1"	176	-	-	176	-	-
1 1/2"	-	-	-	-	-	-
2"	-	-	-	-	-	-
Unmetered	12	39.36	472	12	41.37	496
<i>Subtotal: Residential - CAP-BDP</i>	<u>35,454</u>		<u>\$ 472</u>	<u>35,454</u>		<u>\$ 496</u>
Commercial						
5/8"	31,327	\$ 29.81	\$ 933,858	31,327	\$ 31.33	\$ 981,475
3/4"	7,879	50.50	397,890	7,879	53.08	418,217
1"	15,750	105.46	1,660,995	15,750	110.84	1,745,730
1 1/2"	10,149	208.92	2,120,329	10,149	219.57	2,228,416
2"	9,412	346.65	3,262,670	9,412	364.33	3,429,074
3"	2,930	772.76	2,264,187	2,930	812.17	2,379,658
4"	2,189	1,308.14	2,863,518	2,189	1,374.86	3,009,569
6"	1,014	3,089.43	3,132,682	1,014	3,246.99	3,292,448
8"	93	5,552.80	516,410	93	5,835.99	542,747
10" & Above	-	9,078.39	-	-	9,541.39	-
Unmetered	24	81.05	1,945	24	85.17	2,044
<i>Subtotal: Commercial</i>	<u>80,767</u>		<u>\$ 17,154,484</u>	<u>80,767</u>		<u>\$ 18,029,378</u>
Industrial						
5/8"	257	\$ 29.81	\$ 7,661	257	\$ 31.33	\$ 8,052
3/4"	161	50.50	8,131	161	53.08	8,546
1"	300	105.46	31,638	300	110.84	33,252
1 1/2"	72	208.92	15,042	72	219.57	15,809
2"	172	346.65	59,624	172	364.33	62,665
3"	24	772.76	18,546	24	812.17	19,492
4"	100	1,308.14	130,814	100	1,374.86	137,486
6"	24	3,089.43	74,146	24	3,246.99	77,928
8"	48	5,552.80	266,534	48	5,835.99	280,128
10" & Above	-	9,078.39	-	-	9,541.39	-
<i>Subtotal: Industrial</i>	<u>1,158</u>		<u>\$ 612,137</u>	<u>1,158</u>		<u>\$ 643,357</u>
Health or Education						
5/8"	408	\$ 29.81	\$ 12,162	408	\$ 31.33	\$ 12,783
3/4"	101	50.50	5,101	101	53.08	5,361
1"	295	105.46	31,111	295	110.84	32,698
1 1/2"	773	208.92	161,495	773	219.57	169,728
2"	1,730	346.65	599,705	1,730	364.33	630,291
3"	1,156	772.76	893,311	1,156	812.17	938,869
4"	838	1,308.14	1,096,221	838	1,374.86	1,152,133
6"	444	3,089.43	1,371,707	444	3,246.99	1,441,664
8"	36	5,552.80	199,901	36	5,835.99	210,096
10" & Above	24	9,078.39	217,881	24	9,541.39	228,993
<i>Subtotal: Health or Education</i>	<u>5,805</u>		<u>\$ 4,588,594</u>	<u>5,805</u>		<u>\$ 4,822,614</u>
Municipal						
5/8"	180	\$ 17.89	\$ 3,219	180	\$ 18.80	\$ 3,384
3/4"	60	30.30	1,818	60	31.85	1,911
1"	84	63.28	5,315	84	66.50	5,586
1 1/2"	288	125.35	36,101	288	131.74	37,942
2"	252	207.99	52,413	252	218.60	55,087
3"	24	463.66	11,128	24	487.30	11,695
4"	24	784.88	18,837	24	824.92	19,798
6"	24	1,853.66	44,488	24	1,948.19	46,757
8"	-	3,331.68	-	-	3,501.59	-
10" & Above	-	5,447.03	-	-	5,724.83	-
<i>Subtotal: Municipal</i>	<u>936</u>		<u>\$ 173,320</u>	<u>936</u>		<u>\$ 182,159</u>

	2022 Revenue @ 2021 Rates			2022 Revenue @ Proposed Rates		
	Units	Rates	Revenue	Units	Rates	Revenue
Municipal - Unmetered						
EMS / Fire / Police Station	108	\$ -	\$ -	108	\$ -	\$ -
Public Park or Playground	468	-	-	468	-	-
Swimming Pool	120	-	-	120	-	-
Municipal Building	48	-	-	48	-	-
Municipal Garage	48	-	-	48	-	-
Rec Center	24	-	-	24	-	-
Other	132	-	-	132	-	-
<i>Subtotal: Municipal - Unmetered</i>	<u>948</u>		<u>\$ -</u>	<u>948</u>		<u>\$ -</u>
<i>Subtotal: Minimum Charges</i>			\$ 48,274,503			\$ 50,736,493
Fire Protection Charges						
Public (per Hydrant)	89,700	9.14	\$ 819,410	89,700	9.60	\$ 861,120
Private						
1" or Less	14,343	\$ 33.24	\$ 476,761	14,343	\$ 34.94	\$ 501,144
1 1/2"-3"	644	101.97	65,669	644	107.17	69,017
4"	60	314.42	18,865	60	330.46	19,828
6" or Greater	175	626.83	109,695	175	658.80	115,290
<i>Subtotal: Fire Protection Charges</i>			\$ 1,490,400			\$ 1,566,400
Volume Charge						
Residential	1,923,025	\$ 13.12	\$ 25,230,084	1,923,025	\$ 13.79	\$ 26,518,511
Residential - CAP-BDP	90,411	13.12	1,186,188	90,411	13.79	1,246,763
Commercial	2,620,728	12.81	33,571,520	2,620,728	13.46	35,274,993
Industrial	187,994	11.45	2,152,530	187,994	12.03	2,261,567
Health or Education	1,022,005	14.16	14,471,586	1,022,005	14.88	15,207,429
Private Fire System	14,668	19.52	286,320	14,668	20.52	300,988
Municipal	221,594	7.69	1,703,168	221,594	8.08	1,790,475
<i>Subtotal: Volume Charge</i>	<u>6,080,423</u>		<u>\$ 78,601,396</u>	<u>6,080,423</u>		<u>\$ 82,600,726</u>
Total: Base Rate Revenues			\$ 128,366,299			\$ 134,903,619
DSIC Revenues						
Residential			\$ 5,097,558			\$ 5,357,700
Residential - CAP-BDP			118,666			124,726
Commercial			5,072,600			5,330,437
Industrial			276,467			290,492
Health or Education			1,906,018			2,003,004
Private Fire System			95,731			100,627
Municipal			187,649			197,263
Public Fire			81,941			86,112
Total: DSIC Revenues			\$ 12,836,630			\$ 13,490,362
Other Revenues						
Wholesale Revenues (Set by Contract)			\$ 3,271,034			\$ 3,422,624
Other Revenues			3,286,002			3,286,002
<i>Total: Other Revenues</i>			\$ 6,557,036			\$ 6,708,626
Total: System Revenues			\$ 147,759,965			\$ 155,102,607
Water System Revenue Requirements						\$ 155,075,528
Difference						\$ 27,078
Determination of 2022 Required Rate Increase						
Total Water System Revenue Requirements			\$ 155,075,528			
Less:						
DSIC Expenses			\$ (13,424,906)			
Wholesale Revenues			(3,422,624)			
Other Revenues			(3,286,002)			
<i>Base Rates Net Revenue Requirement</i>			\$ 134,941,996			
Base Rate Revenue at 2021 Rates			\$ 128,366,299			
Required 2022 Rate Increase (Rounded)						5.2%

PWSA Exh. HJS-21W-R

Pittsburgh Water and Sewer Authority

2021 COS & Rate Design

Typical Bill Comparison

HJS-21W-R

	Customer Usage		FPFTY 2021 Proposed Rates		2022 Proposed Rates	Percent Difference		Dollar Difference
Customer Impacts (1)								
<u>Residential</u>								
	5/8"	1 kgal	\$ 32.79	\$	34.46	5.1%	\$	1.67
	5/8"	3 kgal	61.66		64.80	5.1%		3.15
	5/8"	5 kgal	90.52		95.14	5.1%		4.62
	5/8"	7 kgal	119.38		125.48	5.1%		6.09
	5/8"	12 kgal	191.54		201.32	5.1%		9.78
	1"	20 kgal	332.49		349.46	5.1%		16.97
<u>Commercial</u>								
	5/8"	3 kgal	\$ 60.97	\$	64.08	5.1%	\$	3.10
	5/8"	5 kgal	89.16		93.69	5.1%		4.53
	5/8"	12 kgal	187.79		197.33	5.1%		9.54
	1"	13 kgal	228.73		240.37	5.1%		11.64
	2"	80 kgal	1,269.05		1,333.54	5.1%		64.49
	4"	160 kgal	2,707.14		2,844.89	5.1%		137.74
<u>Industrial</u>								
	1"	30 kgal	\$ 430.88	\$	452.75	5.1%	\$	21.87
	1"	60 kgal	808.73		849.74	5.1%		41.01
	2"	100 kgal	1,426.70		1,499.10	5.1%		72.40
	4"	680 kgal	9,121.90		9,584.48	5.1%		462.57
	6"	400 kgal	6,232.25		6,549.11	5.1%		316.87
	8"	800 kgal	12,090.71		12,705.26	5.1%		614.56
<u>Health or Education</u>								
	5/8"	5 kgal	\$ 95.10	\$	99.94	5.1%	\$	4.84
	5/8"	10 kgal	172.98		181.78	5.1%		8.80
	1"	40 kgal	661.17		694.80	5.1%		33.64
	2"	50 kgal	895.32		940.91	5.1%		45.58
	4"	200 kgal	3,463.83		3,640.19	5.1%		176.35
	6"	650 kgal	10,796.97		11,346.49	5.1%		549.52

(1) 2021 and 2022 customer bills at proposed rates include a 10% DSIC.

PWSA Exh. HJS-22W-R

	FY 2017 <i>Actual</i>	FY 2018 <i>Actual</i>	HTY FY 2019 <i>Actual</i>	FTY FY 2020 <i>Projected</i>	FPFTY FY 2021 <i>Projected</i>	FY 2022 <i>Projected</i>
Units of Service						
<u>Number of Bills</u>						
Residential	802,999	781,189	778,126	769,779	764,267	764,267
Residential - CAP	-	11,077	21,594	29,941	35,454	35,454
Commercial	82,317	80,365	80,767	80,767	80,767	80,767
Industrial	1,198	1,173	1,158	1,158	1,158	1,158
Health or Education	6,152	5,932	5,805	5,805	5,805	5,805
Fire System	14,563	14,673	15,222	15,222	15,222	15,222
Municipal	-	-	-	-	936	936
<i>Total</i>	907,229	894,409	902,672	902,672	903,609	903,609
<u>Billable Consumption (kgal)</u>						
Residential	2,091,836	2,041,350	1,874,792	1,937,089	1,923,025	1,923,025
Residential - CAP	-	31,049	55,055	76,347	90,411	90,411
Commercial	2,942,211	2,723,585	2,517,870	2,620,728	2,620,728	2,620,728
Industrial	161,491	183,343	192,645	187,994	187,994	187,994
Health or Education	1,258,763	1,068,428	975,581	1,022,005	1,022,005	1,022,005
Fire System	4,005	7,913	21,423	14,668	14,668	14,668
Municipal	-	-	-	221,594	221,594	221,594
<i>Total</i>	6,458,306	6,055,668	5,637,366	6,080,423	6,080,423	6,080,423
<u>Total Consumption (kgal) (1)</u>						
Residential	2,914,122	2,842,635	2,668,533	2,727,019	2,707,771	2,707,770
Residential - CAP	-	41,602	75,349	104,489	123,737	123,739
Commercial	3,587,585	3,363,268	3,163,601	3,263,435	3,263,435	3,263,435
Industrial	182,006	203,757	209,655	206,706	206,706	206,706
Health or Education	1,453,286	1,253,008	1,158,177	1,205,593	1,205,593	1,205,593
Fire System	5,001	8,887	22,506	15,697	15,697	15,697
Municipal	-	-	-	225,528	225,528	225,528
<i>Total</i>	8,142,000	7,713,157	7,297,821	7,748,466	7,748,466	7,748,466
<u>Wholesale & Contract Consumption</u>						
Allegheny	6,978	7,911	1,030	-	-	-
Aspinwall	94,552	81,386	59,842	70,614	70,616	70,616
Bay Valley Foods / Riverbend (2)	724,835	462,007	263,171	-	-	-
Fox Chapel	509,953	612,616	632,050	622,333	622,336	622,336
Hampton	11,023	3,607	2,997	-	-	-
PAWC	-	5,400	2,800	-	-	-
RSRV - 10"	30,678	97,405	95,941	96,673	96,676	96,676
RSRV - 6"	17,815	14,663	13,532	14,098	14,101	14,101
Sharpsburg	-	-	-	-	-	-
Westview	-	6,845	8,410	-	-	-
<i>Total</i>	1,395,834	1,291,840	1,079,773	803,718	803,729	803,729

(1) Total consumption represents actual customer usage including the usage captured in minimum allowance.

(2) Riverbend foods closed in July 2019.

PWSA Exh. HJS-1WW-R

Pittsburgh Water and Sewer Authority
 2021 COS & Rate Design
 FPFTY Wastewater Conveyance Revenue Requirements

HJS-1WW-R

	2021 FPFTY Revenue Requirements
Revenue Requirements	
<u>Operating Expenses</u>	
<i>Direct Operating Expenses</i>	
Administrative Division	
Executive Director	\$ 278,444
Customer Service	2,633,718
Management Information Systems	466,959
Finance	1,356,774
Procurement	-
Human Resources	157,121
Legal	564,014
Public Affairs	185,435
Operations Division	
Environmental Compliance	1,333,624
Ops Capital Assets	-
Warehouse	75,727
Water Treatment Plant	-
Water Quality (Lab)	-
Water Distribution	-
Sewer Operations	2,732,628
Engineering & Construction	
Engineering & Construction	6,843,154
<i>Other Operating Expenses</i>	
Loss / (Gain) on ALCOSAN Billings	770,497
Non-City Water Payments	-
<i>Total Operating Expenses</i>	<u>\$ 17,398,095</u>
<u>Debt Service</u>	
Existing Debt	\$ 27,873,845
Future Debt	2,889,724
<i>Subtotal: Debt Service</i>	<u>\$ 30,763,569</u>
<u>Capital Expenditures & Transfers</u>	
Internally Generated Funds / PAYGO	\$ 1,250,031
Internally Generated Funds / PAYGO (DSIC)	6,939,959
Other Transfers to Reserves	384,115
Reimbursements from Municipalities	-
Remarketing & Liquidity Charges	-
Bad Debt Expense	830,849
City Bad Debt Expense	-
<i>Subtotal: Capital Expenditures & Transfers</i>	<u>\$ 9,404,955</u>
Stormwater	21,551,125
Total: Wastewater Conveyance System Revenue Requirements	\$ 79,117,744
<i>Capital Costs to be Recovered through DSIC</i>	\$ (6,939,959)
Total: Wastewater Conveyance System Base Rate Revenue Requirement	\$ 72,177,784

PWSA Exh. HJS-2WW-R

	FY 2021	Allocation	Wastewater Conveyance Functional Categories			
			<i>Collection & Conveyance</i>	<i>Meters</i>	<i>Billing</i>	<i>Admin Support</i>
Wastewater Conveyance Operating Costs						
<u>Operating Expenses</u>						
<i>Direct Operating Expenses</i>						
Administrative Division						
Executive Director	\$ 278,444	WW-D			100.0%	
Customer Service	2,633,718	WW-E	29.3%	70.7%		
Management Information Systems	466,959	WW-D			100.0%	
Finance	1,356,774	WW-D			100.0%	
Procurement	-	WW-D			100.0%	
Human Resources	157,121	WW-D			100.0%	
Legal	564,014	WW-D			100.0%	
Public Affairs	185,435	WW-D			100.0%	
Operations Division						
Environmental Compliance	1,333,624	WW-D			100.0%	
Warehouse	-	WW-D			100.0%	
Ops Capital Assets	75,727	WW-D			100.0%	
Water Treatment Plant	-	n/a				
Water Quality (Lab)	-	n/a				
Water Distribution	-	n/a				
Sewer Operations	2,732,628	WW-A	100.0%			
Engineering & Construction Division						
Engineering & Construction	6,843,154	WW-A	100.0%			
<i>Subtotal: Direct Operating Expenses</i>	\$ 16,627,598					
<i>Other Operating Expenses</i>						
Loss / (Gain) on ALCOSAN Billings	770,497	WW-D			100.0%	
Non-City Water Payments	-	WW-D			100.0%	
<i>Subtotal: Other Operating Expenses</i>	\$ 770,497					
Total: Operating Expenses	\$ 17,398,095					

	FY 2021	Allocation	Wastewater Conveyance Functional Categories			
			<i>Collection & Conveyance</i>	<i>Meters</i>	<i>Billing</i>	<i>Admin Support</i>
Wastewater Conveyance Operating Costs						
<u>Operating Expenses</u>	<i>FPFTY</i>					
<i>Direct Operating Expenses</i>						
Administrative Division						
Executive Director	\$ 278,444	WW-D	\$ -	\$ -	\$ -	\$ 278,444
Customer Service	2,633,718	WW-E	-	771,624	1,862,095	-
Management Information Systems	466,959	WW-D	-	-	-	466,959
Finance	1,356,774	WW-D	-	-	-	1,356,774
Procurement	-	WW-D	-	-	-	-
Human Resources	157,121	WW-D	-	-	-	157,121
Legal	564,014	WW-D	-	-	-	564,014
Public Affairs	185,435	WW-D	-	-	-	185,435
Operations Division						
Environmental Compliance	1,333,624	WW-D	-	-	-	1,333,624
Warehouse	-	WW-D	-	-	-	-
Ops Capital Assets	75,727	WW-D	-	-	-	75,727
Water Treatment Plant	-	n/a	-	-	-	-
Water Quality (Lab)	-	n/a	-	-	-	-
Water Distribution	-	n/a	-	-	-	-
Sewer Operations	2,732,628	WW-A	2,732,628	-	-	-
Engineering & Construction Division						
Engineering & Construction	6,843,154	WW-A	6,843,154	-	-	-
<i>Subtotal: Direct Operating Expenses</i>	\$ 16,627,598		\$ 2,732,628	\$ 771,624	\$ 1,862,095	\$ 4,418,098
<i>Other Operating Expenses</i>						
Loss / (Gain) on ALCOSAN Billings	770,497	WW-D	-	-	-	770,497
Non-City Water Payments	-	WW-D	-	-	-	-
<i>Subtotal: Other Operating Expenses</i>	\$ 770,497		\$ 9,575,782	\$ -	\$ -	\$ 2,179,849
Total: Wastewater Conveyance Operating Costs	\$ 17,398,095		\$ 9,575,782	\$ 771,624	\$ 1,862,095	\$ 5,188,595
<i>Allocation Percentage</i>			55.04%	4.44%	10.70%	29.82%

Allocated Wastewater Conveyance Assets					Wastewater Conveyance Functional Categories				
System Fixed Assets	Acquisition Cost	Allocated to Wastewater	Allocated Costs	Allocation	<i>Collection & Conveyance</i>	<i>Meters</i>	<i>Billing</i>	<i>Admin Support</i>	<i>Readiness-to-Serve</i>
Customer Service	3,404,918	70.38%	2,396,275	WW-E		29.30%	70.70%		
Distribution	268,054,032	0.00%	-	n/a				100.00%	
Engineering	2,235,799	35.39%	791,232	WW-A	100.00%				
Executive Director	969,720	25.72%	249,460	WW-D				100.00%	
Finance	79,614	25.72%	20,481	WW-D				100.00%	
Fire	14,942,263	0.00%	-	n/a					
Membrane Plant	20,355,348	0.00%	-	n/a					
Meters	31,890,342	0.00%	-	n/a					
Mgt Info Systems	12,589,169	25.72%	3,238,559	WW-D				100.00%	
Plant Operations	64,260,881	0.00%	-	n/a					
Pumping	25,727,651	0.00%	-	n/a					
Sewer Operations	397,654,629	100.00%	397,654,629	WW-A	100.00%				
Stormwater	26,127,083	100.00%	26,127,083	WW-A	100.00%				
Supply	920,461	0.00%	-	n/a				100.00%	
Warehouse	4,180,082	25.72%	1,075,325	WW-D				100.00%	
Water Quality	1,477,505	0.00%	-	n/a					
Water Storage	67,450,916	0.00%	-	n/a					
Total	942,320,412		431,553,043		\$ 424,572,944	\$ 702,058	\$ 1,694,217	\$ 4,583,824	\$ -

Allocation Factors for Capital Costs	98.38%	0.16%	0.39%	1.06%	0.00%
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Allocation of Capital Costs	<i>Readiness-to-Serve</i>		<i>Collection & Conveyance</i>	<i>Meters</i>	<i>Billing</i>	<i>Admin Support</i>	<i>Readiness-to-Serve</i>
Debt Service	0.0%	\$ 30,763,569	\$ 30,265,987	\$ 50,047	\$ 120,774	\$ 326,761	\$ -
Rate-Funded Capital	0.0%	1,250,031	1,229,812	2,034	4,907	13,277	-
Other Transfers to Reserves	0.0%	384,115	377,902	625	1,508	4,080	-
Reimbursements from Municipalities	0.0%	-	-	-	-	-	-
Remarketing & Liquidity Charges	0.0%	-	-	-	-	-	-
Bad Debt Expense	0.0%	-	-	-	-	-	-
Total: Allocated Capital Costs		\$ 32,397,715	\$ 31,873,702	\$ 52,705	\$ 127,189	\$ 344,119	\$ -

PWSA Exh. HJS-3WW-R

			Wastewater Conveyance Cost Drivers				
	FY 2021	Allocation	<i>Volume</i>	<i>Meter</i>	<i>Billing</i>	<i>Readiness-to-Serve</i>	<i>Stormwater</i>
			<i>FPPTY</i>				
Wastewater Conveyance Revenue Requirements							
<u>Functional Categories</u>							
Collection & Conveyance	\$ 41,449,484	WW-AA	100.00%				
Meters	824,329	WW-BB		100.00%			
Billing	1,989,284	WW-CC			100.00%		
Admin Support	5,532,713	WW-DD	93.64%	1.86%	4.49%		
Readiness-to-Serve (Debt)	-	WW-EE				100.00%	
Stormwater	21,551,125		100.00%		0.00%	0.00%	0.00%
<i>Total: Wastewater Conveyance Revenue Requirements</i>	\$ 71,346,935						
	FY 2021	Allocation	<i>Volume</i>	<i>Meter</i>	<i>Billing</i>	<i>Readiness-to-Serve</i>	<i>Stormwater</i>
			<i>FPPTY</i>				
Wastewater Conveyance Revenue Requirements							
<u>Functional Categories</u>							
Collection & Conveyance	\$ 41,449,484	WW-AA	\$ 41,449,484	\$ -	\$ -	\$ -	\$ -
Meters	824,329	WW-BB	-	824,329	-	-	-
Billing	1,989,284	WW-CC	-	-	1,989,284	-	-
Admin Support	5,532,713	WW-DD	5,181,023	103,038	248,653	-	-
Readiness-to-Serve (Debt)	-	WW-EE	-	-	-	-	-
Stormwater	21,551,125		21,551,125	-	-	-	-
<i>Total: Wastewater Conveyance Revenue Requirements</i>	\$ 71,346,935		\$ 68,181,632	\$ 927,367	\$ 2,237,936	\$ -	\$ -
Costs to Recover from Wastewater Conveyance Charges	\$ 71,346,935		\$ 68,181,632	\$ 927,367	\$ 2,237,936	\$ -	\$ -
			95.6%	1.3%	3.1%	0.0%	

PWSA Exh. HJS-4WW-R

Cost Functionalization: Wastewater Conveyance					
<i>Code</i>	<i>Description</i>	<i>Coll. & Convey.</i>	<i>Meters</i>	<i>Billing</i>	<i>Admin Support</i>
WW-A	Collection & Conveyance Only	100.00%			
WW-B	Meters Only		100.00%		
WW-C	Billing Only			100.00%	
WW-D	Admin Support Only				100.00%
WW-E	Customer Service		29.30%	70.70%	

Allocation to Cost Drivers: Wastewater Conveyance					
<i>Code</i>	<i>Description</i>	<i>Volume</i>	<i>Meter</i>	<i>Billing</i>	<i>Readiness-to-Serve</i>
WW-AA	Volume	100.00%			
WW-BB	Customer - Meters		100.00%		
WW-CC	Customer - Billing			100.00%	
WW-DD	Admin Support (Composite)	93.64%	1.86%	4.49%	
WW-EE	Readiness-to-Serve				100.00%

PWSA Exh. HJS-5W-R

and

PWSA Exh. HJS-5WW-R

Factor Derivations - Allocation to Functional Categories & Cost Components					
<i>Code(s)</i>	<i>Description</i>	<i>Calculations</i>			
W-I	Customer Service	<u>2021 Customer Service Budget</u>			
WW-E	- This factor allocates the 2021 customer service budget between meter- and billing-related costs.	Salaries	FPPTY	Meter	Billing
		Benefits	\$ 3,105,381	28.60%	71.40%
		Computer & Peripherals	866,363	28.60%	71.40%
		Customer CC Fees	10,000	100.00%	0.00%
		Postage	378,396	0.00%	100.00%
		Billing Contract	257,500	0.00%	100.00%
		Consultants	618,000	0.00%	100.00%
		Meter Services	26,400	100.00%	0.00%
		Prof Service Other	824,000	100.00%	0.00%
		Office Supplies	678,856	20.00%	80.00%
		TE Airfare	6,000	50.00%	50.00%
		TE Lodging	2,800	50.00%	50.00%
		TE Seminars/Conferences	2,800	50.00%	50.00%
		TE Training	5,400	50.00%	50.00%
		TE Travel Misc	15,000	50.00%	50.00%
		Customer Refund AP	100	0.00%	100.00%
		One Call	504,000	0.00%	100.00%
			30,900	0.00%	100.00%
		Total	\$ 7,331,896	\$2,148,090	\$5,183,806
		<i>Allocation Factors</i>		29.30%	70.70%

W-D Water Pipe Inventory

- Allocate costs between transmission and distribution functional categories. Assumes Pipes less than or equal to 16" are Distribution-related.

Breakdown		
Distribution	34,244,035	62.2%
Transmission	20,825,193	37.8%
Total	55,069,228	100.0%

Inch-Foot Analysis		
<i>Diameter (in)</i>	<i>Linear Feet</i>	<i>Inch-Feet</i>
0.75	799	599
1	1,292	1,292
1.5	575	862
2	11,495	22,989
2.5	16	39
3	837	2,511
4	140,568	562,273
6	2,052,282	12,313,692
8	1,112,168	8,897,342
10	85,574	855,742
12	598,051	7,176,608
14	1,296	18,147
15	15,566	233,483
16	259,903	4,158,456
18	277	4,991
20	209,650	4,192,996
24	85,178	2,044,268
28	104	2,911
30	116,321	3,489,627
36	83,070	2,990,503
42	11,253	472,624
42.5	12,606	535,735
48	16,545	794,162
50	23,682	1,184,096
50.25	12,005	603,231
60	55,175	3,310,514
66	1,492	98,501
72	3,697	266,159
84	3,979	334,248
96	4,560	437,764
120	524	62,860
NULL	172	n/a
	4,920,710	55,069,228

Factor Derivations - Allocation to Functional Categories & Cost Components

Code(s)	Description	Calculations		
W-J	Engineering & Construction	<u>2021 Water CIP Costs</u>	<u>\$\$ Amount</u>	<u>Allocation</u>
		Treatment	\$ 31,260,131	18.22%
	- This factor uses the 2021 Water CIP	Storage	71,377,720	41.60%
	costs to allocate Engineering & Construction	Trans. & Distr.	63,277,796	36.88%
	costs to the various functional categories.	Admin	<u>5,670,528</u>	3.30%
		Total Water CIP	\$ 171,586,175	100.00%

W-BB Maximum Day

- Maximum day costs are allocated using a peak day determined using system daily production records. In addition, 0.25% is allocated to fire protection service.

Plant Production Data	
2017-2019 Avg Plant Production	70.26 mgd
2017-2019 Avg. Peak Day	90.90 mgd
Peak Hour Factor (1.6)	112.42 mgd

Base	69.04%
Maximum Day	29.38%
Fire Protection	1.58%

W-CC Peak Hour

- Peak hour costs are allocated using an estimated peak hour compared to system average and maximum day processed. In addition, 0.25% is allocated to fire protection service.

Plant Production Data	
2017 Average Processed	70.26 mgd
Peak Day	90.90 mgd
Peak Hour Factor (1.6)	112.42 mgd

Peak Hour / Avg	54.81%
Max Day (Plug)	18.36%
Peak Hr / Peak Day	19.14%
Fire Protection	7.69%

Equivalency Flow Ratios

- Used to escalate metering and readiness-to-serve costs, these ratios are industry standard and obtained from the American Waterworks Association

- Fire ratios are pegged to a 1" meter.

Equivalency Ratios			
	<i>Flow</i>		<i>Fire</i>
5/8"	1.00	1" or Less	2.50
3/4"	1.50	1 1/2"-3"	8.00
1"	2.50	4"	25.00
1 1/2"	5.00	6" or Greater	50.00
2"	8.00		
3"	16.00		
4"	25.00		
6"	50.00		
8"	80.00		
10"	115.00		
Unmetered	1.00		

PWSA Exh. HJS-6WW-R

Pittsburgh Water and Sewer Authority

HJS-6WW-R

2021 COS & Rate Design

Wastewater Conveyance Units of Service

	<u>Collection Factor</u>	FY 2021 Consumption	Allocated Consumption	Average Day	Equivalent Meters	Total Bills
Retail Units of Service						
Residential	100.0%	2,765,452	2,765,452	7,577	1,085,301	1,026,360
Residential - CAP	100.0%	129,124	129,124	354	54,455	54,000
Commercial	100.0%	3,316,847	3,316,847	9,087	416,167	99,228
Industrial	100.0%	207,621	207,621	569	11,371	1,170
Health or Education	100.0%	1,205,877	1,205,877	3,304	86,288	5,805
Municipal - Metered	100.0%	226,195	226,195	620	6,192	1,008
Municipal - Unmetered	100.0%	47,052	47,052	129	5,070	948
Total: Wastewater Conveyance Units of Service		7,898,166	7,898,166	21,639	1,664,842	1,188,519

PWSA Exh. HJS-7WW-R

Pittsburgh Water and Sewer Authority
 2021 COS & Rate Design
 Wastewater Conveyance Unit Cost of Service

HJS-7WW-R

	FY 2021	Unit Costs					Total
		<i>Volume</i>	<i>Meter</i>	<i>Billing</i>	<i>Readiness-to-Serve</i>	<i>Stormwater</i>	
Development of Unit Costs of Service	<i>FPPTY</i>						
<u>Units of Service</u>							
Total System Units		7,898,166	1,664,842	1,188,519	1,664,842	1,664,842	
Units		<i>kgal</i>	<i>Eq. Cost Meters</i>	<i>Total Bills</i>	<i>Eq. Flow Meters</i>	<i>Eq. Flow Meters</i>	
<u>Revenue Requirements</u>							
Collection & Conveyance	\$ 41,449,484	\$ 41,449,484	\$ -	\$ -	\$ -	\$ -	\$ 41,449,484
Meters	824,329	-	824,329	-	-	-	824,329
Billing	1,989,284	-	-	1,989,284	-	-	1,989,284
Admin Support	5,532,713	5,181,023	103,038	248,653	-	-	5,532,713
Readiness-to-Serve (Debt)	-	-	-	-	-	-	-
Stormwater	21,551,125	21,551,125	-	-	-	-	21,551,125
<i>Total: Revenue Requirements</i>	\$ 71,346,935	\$ 68,181,632	\$ 927,367	\$ 2,237,936	\$ -	\$ -	\$ 71,346,935
Revenue Requirement Unit Costs (\$/unit)		\$ 8.6326	\$ 0.5570	\$ 1.8830	\$ -	\$ -	
<u>Revenue Offsets</u>							
Wastewater Miscellaneous Revenue	(2,342,350)	(2,238,432)	(30,446)	(73,472)	-	-	(2,342,350)
Stormwater Miscellaneous Revenue	(616,178)	(588,841)	(8,009)	(19,328)	-	-	(616,178)
<i>Total: Revenue Offsets</i>	\$ (2,958,528)	\$ (2,827,273)	\$ (38,455)	\$ (92,800)	\$ -	\$ -	\$ (2,958,528)
Offset Unit Costs (\$/unit)		\$ (0.3580)	\$ (0.0231)	\$ (0.0781)	\$ -	\$ -	
Total Unit Costs (\$/unit)		\$ 8.27	\$ 0.53	\$ 1.80	\$ -	\$ -	
Total: Costs of Service		\$ 65,354,359	\$ 888,912	\$ 2,145,136	\$ -	\$ -	\$ 68,388,407

PWSA Exh. HJS-8WW-R

Pittsburgh Water and Sewer Authority

HJS-8WW-R

2021 COS & Rate Design

Cost Distribution to Customer Classes

Customer Class Cost of Service

Residential

	Unit Costs					Total
	Volume	Meter	Billing	Readiness-to-Serve	Stormwater	
Unit Costs (\$/unit)	\$ 8.275	\$ 0.534	\$ 1.805	\$ -	\$ -	
Units of Service	2,765,452	1,085,301	1,026,360	1,085,301	1,085,301	
Cost of Service	\$ 22,883,076	\$ 579,476	\$ 1,852,458	\$ -	\$ -	\$ 25,315,010

Residential - CAP

Unit Costs (\$/unit)	\$ 8.275	\$ 0.534	\$ 1.805	\$ -	\$ -	
Units of Service	129,124	54,455	54,000	54,455	54,455	
Cost of Service	\$ 1,068,450	\$ 29,075	\$ 97,464	\$ -	\$ -	\$ 1,194,988

Commercial

Unit Costs (\$/unit)	\$ 8.275	\$ 0.534	\$ 1.805	\$ -	\$ -	
Units of Service	3,316,847	416,167	99,228	416,167	416,167	
Cost of Service	\$ 27,445,663	\$ 222,204	\$ 179,095	\$ -	\$ -	\$ 27,846,962

Industrial

Unit Costs (\$/unit)	\$ 8.275	\$ 0.534	\$ 1.805	\$ -	\$ -	
Units of Service	207,621	11,371	1,170	11,371	11,371	
Cost of Service	\$ 1,717,982	\$ 6,071	\$ 2,112	\$ -	\$ -	\$ 1,726,165

Health or Education

Unit Costs (\$/unit)	\$ 8.275	\$ 0.534	\$ 1.805	\$ -	\$ -	
Units of Service	1,205,877	86,288	5,805	86,288	86,288	
Cost of Service	\$ 9,978,176	\$ 46,072	\$ 10,477	\$ -	\$ -	\$ 10,034,725

Municipal - Metered

Unit Costs (\$/unit)	\$ 8.275	\$ 0.534	\$ 1.805	\$ -	\$ -	
Units of Service	226,195	6,192	1,008	6,192	6,192	
Cost of Service	\$ 1,871,675	\$ 3,306	\$ 1,819	\$ -	\$ -	\$ 1,876,800

Municipal - Unmetered

Unit Costs (\$/unit)	\$ 8.275	\$ 0.534	\$ 1.805	\$ -	\$ -	
Units of Service	47,052	5,070	948	5,070	5,070	
Cost of Service	\$ 389,338	\$ 2,707	\$ 1,711	\$ -	\$ -	\$ 393,756

Total: Wastewater Cost of Service

	\$ 65,354,359	\$ 888,912	\$ 2,145,136	\$ -	\$ -	\$ 68,388,407
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PWSA Exh. HJS-9WW-R

Pittsburgh Water and Sewer Authority

HJS-9WW-R

2021 COS & Rate Design

Adjustments to Cost of Service - Water

Cost of Service by Class	Allocation Method	Residential	Residential - CAP	Commercial	Industrial	Health or Education	Municipal - Metered	Municipal - Unmetered	Total	
	Allocated Cost of Service (Unadjusted)		\$ 25,315,010	\$ 1,194,988	\$ 27,846,962	\$ 1,726,165	\$ 10,034,725	\$ 1,876,800	\$ 393,756	\$ 68,388,407
% of COS		37.0%	1.7%	40.7%	2.5%	14.7%	2.7%	0.6%	100.0%	
	Billing	RTS	Volume							
Adjustments to Cost of Service										
Add: Bad Debt Expense	0.0%	0.0%	0.0%	625,157	21,059	153,861	-	30,772	-	830,849
Total: Adjusted Cost of Service (Before CAP & City Adjustment)		\$ 25,940,168	\$ 1,216,047	\$ 28,000,823	\$ 1,726,165	\$ 10,065,497	\$ 1,876,800	\$ 393,756	\$ 69,219,256	
% of COS		37.5%	1.8%	40.5%	2.5%	14.5%	2.7%	0.6%	100.0%	

Cost of Service Comparison	Revenue Under Existing Rates	Unadjusted COS	Adjusted COS	Impacts	
				% Increase Unadjusted	% Increase Adjusted
All User Charge Revenue					
Residential	\$ 24,283,064	\$ 25,315,010	\$ 25,940,168	4.25%	6.82%
Residential - CAP	817,978	1,194,988	1,216,047	46.09%	48.67%
Commercial	25,111,606	27,846,962	28,000,823	10.89%	11.51%
Industrial	1,391,598	1,726,165	1,726,165	24.04%	24.04%
Health or Education	10,291,786	10,034,725	10,065,497	-2.50%	-2.20%
Municipal - Metered	629,985	1,876,800	1,876,800	100.00%	100.00%
Municipal - Unmetered	-	393,756	393,756	100.00%	100.00%
Subtotal: All User Charge Revenue	\$ 62,526,017	\$ 68,388,407	\$ 69,219,256	9.38%	10.70%

PWSA Exh. HJS-10WW-R

Pittsburgh Water and Sewer Authority
 2021 COS & Rate Design
 Minimum Charge Calculation

HJS-10WW-R

		COS Rate Build-Up - Test Year: 2021										
Wastewater Conveyance	Min. Usage	<i>Meter</i>	<i>Billing</i>	<i>R.T.S.</i>	<i>Stormwater</i>	<i>Usage</i>	<i>Total COS Rates</i>	<i>Adjustments</i>			<i>Proposed Rates</i>	
	<i>Existing</i>							Wholesale	City	CAP-BDP		
Minimum Charge												
5/8"	1	\$ 0.53	\$ 1.80	\$ -	\$ -	\$ 7.51	\$ 9.85	\$ -	\$ -	\$ -	\$ 9.85	
3/4"	2	0.80	1.80	-	-	15.02	17.63	-	-	-	17.63	
1"	5	1.33	1.80	-	-	37.56	40.70	-	-	-	40.70	
1 1/2"	10	2.67	1.80	-	-	75.11	79.59	-	-	-	79.59	
2"	17	4.27	1.80	-	-	127.69	133.77	-	-	-	133.77	
3"	40	8.54	1.80	-	-	300.45	310.79	-	-	-	310.80	
4"	70	13.35	1.80	-	-	525.78	540.93	-	-	-	540.94	
6"	175	26.70	1.80	-	-	1,314.45	1,342.95	-	-	-	1,342.96	
8"	325	42.71	1.80	-	-	2,441.13	2,485.65	-	-	-	2,485.65	
10" & Above	548	61.40	1.80	-	-	4,116.11	4,179.32	-	-	-	4,179.33	
Unmetered	1	0.53	1.80	-	-	7.51	9.85	-	-	-	9.85	
Municipal Minimum Charge												
5/8"		\$ 0.53	\$ 1.80	\$ -	\$ -	\$ 7.51	\$ 9.85	\$ -	\$ (5.91)	\$ -	\$ 3.94	
3/4"		0.80	1.80	-	-	15.02	17.63	-	(10.58)	-	7.06	
1"		1.33	1.80	-	-	37.56	40.70	-	(24.42)	-	16.28	
1 1/2"		2.67	1.80	-	-	75.11	79.59	-	(47.75)	-	31.84	
2"		4.27	1.80	-	-	127.69	133.77	-	(80.26)	-	53.51	
3"		8.54	1.80	-	-	300.45	310.79	-	(186.48)	-	124.32	
4"		13.35	1.80	-	-	525.78	540.93	-	(324.56)	-	216.38	
6"		26.70	1.80	-	-	1,314.45	1,342.95	-	(805.77)	-	537.19	
8"		42.71	1.80	-	-	2,441.13	2,485.65	-	(1,491.39)	-	994.26	
10" & Above		61.40	1.80	-	-	4,116.11	4,179.32	-	(2,507.59)	-	1,671.73	
Unmetered City												
EMS / Fire / Police Station	5/8"	\$ 0.53	\$ 1.80	\$ -	\$ -	\$ 7.51	\$ 9.85	\$ -	\$ (9.85)	\$ -	\$ -	
Public Park or Playground	2"	4.27	1.80	-	-	127.69	133.77	-	(133.77)	-	-	
Swimming Pool	1 1/2"	2.67	1.80	-	-	75.11	79.59	-	(79.59)	-	-	
Municipal Building	5/8"	0.53	1.80	-	-	7.51	9.85	-	(9.85)	-	-	
Municipal Garage	5/8"	0.53	1.80	-	-	7.51	9.85	-	(9.85)	-	-	
Rec Center	2"	4.27	1.80	-	-	127.69	133.77	-	(133.77)	-	-	
Other	1"	1.33	1.80	-	-	37.56	40.70	-	(40.70)	-	-	
Minimum Charge - CAP-BDP												
5/8"	1	\$ 0.53	\$ 1.80	\$ -	\$ -	\$ 7.51	\$ 9.85	\$ -	\$ -	\$ (9.85)	\$ -	
3/4"	2	0.80	1.80	-	-	15.02	17.63	-	-	(17.63)	-	
1"	5	1.33	1.80	-	-	37.56	40.70	-	-	(40.70)	-	
Unmetered	1	0.53	1.80	-	-	7.51	9.85	-	-	(9.85)	-	

Pittsburgh Water and Sewer Authority
 2021 COS & Rate Design
 Volume Charge Calculation

HJS-10WW-R

	Fixed Charge Revenue	Net Volumetric Rev. Req	Billed Volume	COS Rates by Class
<u>Volume Charge (per kgal)</u>				
Residential	\$11,242,989	\$14,072,022	1,968,688	\$ 7.15
Residential - CAP	540,221	654,767	94,784	6.91
Commercial	7,675,202	20,171,760	2,664,576	7.57
Industrial	268,782	1,457,383	188,789	7.72
Health or Education	1,909,379	8,125,346	1,022,145	7.95
Municipal - Metered	116,261	1,760,540	222,232	7.92
Municipal - Unmetered	82,744	311,011	36,624	8.49
<i>Total: User Charge Revenue</i>	<u>\$21,835,578</u>	<u>\$46,552,828</u>	<u>6,197,838</u>	<u>7.51</u>

Rates Under Full Municipal Rates							
Adjusted COS	Fixed Charge Revenue + CAP	CAP BDP Cost (Forgone Revenue)	CAP BDP Adjustment	Total Volume Rev Req	Billed Volume	Proposed Rates	
<u>Volume Charge (per kgal)</u>							
Residential + CAP	\$27,156,215	\$11,243,205	\$ (540,224)	211,942	\$15,584,727	2,063,472	\$ 7.55
Commercial	28,000,823	7,675,427		218,533	20,543,929	2,664,576	7.71
Industrial	1,726,165	268,786		13,472	1,470,851	188,789	7.79
Health or Education	10,065,497	1,909,405		78,557	8,234,649	1,022,145	8.06
Municipal (Metered)	1,876,800	116,264		14,648	1,775,184	222,232	7.71
Municipal (Unmetered)	393,756	82,744		3,073	314,084	36,624	7.71
<i>Total: User Charge Revenue</i>	<u>\$69,219,256</u>	<u>\$21,295,831</u>	<u>\$ (540,224)</u>	<u>\$ 540,224</u>	<u>47,923,425</u>	<u>6,197,838</u>	<u>7.74</u>

Proposed Adjustments for Gradualism								
Adjusted Revenue Requirement	Fixed Charge Revenue	Gradualism Adjustment (Municipal)	Gradualism Adjustment (All Other)	Reallocation of Costs	Total Volumetric Rev Req	Billed Volume	Proposed Rates	
<u>Volume Charge (per kgal)</u>								
Residential + CAP	\$26,827,932	\$11,243,205	\$ -	\$ 663,483	\$16,248,211	2,063,472	\$ 7.87	
Commercial	28,219,356	7,675,427	-	684,119	21,228,048	2,664,576	7.97	
Industrial	1,739,637	268,786	-	(104,000)	1,409,025	188,789	7.46	
Health or Education	10,144,054	1,909,405	-	245,921	8,480,570	1,022,145	8.30	
Municipal (Metered)	1,891,448	46,508	(1,134,869)	-	710,071	222,232	3.19	
Municipal (Unmetered)	396,829	-	(396,829)	-	-	36,624	-	
<i>Total: User Charge Revenue</i>	<u>\$69,219,256</u>	<u>\$21,143,331</u>	<u>\$ (1,531,697)</u>	<u>\$ (104,000)</u>	<u>\$ 1,635,697</u>	<u>48,075,925</u>	<u>6,197,838</u>	<u>7.76</u>

PWSA Exh. HJS-11WW-R

Pittsburgh Water and Sewer Authority

HJS-11WW-R

2021 COS & Rate Design

Proposed Rates

	FTY Prior Tariff Rates	FPFTY Proposed Rates	Percent Difference	Dollar Difference
Existing & Proposed Rates				
<u>Minimum Charge</u>				
5/8"	\$ 8.28	\$ 9.85	19.0%	\$ 1.57
3/4"	16.77	17.63	5.1%	0.86
1"	39.82	40.70	2.2%	0.88
1 1/2"	82.24	79.59	-3.2%	(2.65)
2"	139.23	133.77	-3.9%	(5.46)
3"	317.57	310.80	-2.1%	(6.77)
4"	543.31	540.94	-0.4%	(2.37)
6"	1,302.21	1,342.96	3.1%	40.75
8"	2,358.93	2,485.65	5.4%	126.72
10" & Above	3,883.88	4,179.33	7.6%	295.45
<u>Minimum Charge - CAP (1)</u>				
5/8"	\$ 2.07	\$ -	-100.0%	\$ (2.07)
3/4"	4.19	-	-100.0%	(4.19)
1"	9.96	-	-100.0%	(9.96)
<u>Minimum Charge - Municipal</u>				
5/8"	\$ -	\$ 3.94	100.0%	\$ 3.94
3/4"	-	7.06	100.0%	7.06
1"	-	16.28	100.0%	16.28
1 1/2"	-	31.84	100.0%	31.84
2"	-	53.51	100.0%	53.51
3"	-	124.32	100.0%	124.32
4"	-	216.38	100.0%	216.38
6"	-	537.19	100.0%	537.19
8"	-	994.26	100.0%	994.26
10" & Above	-	1,671.73	100.0%	1,671.73
<u>Volume Charge</u>				
Residential	\$ 7.43	\$ 7.87	5.9%	\$ 0.44
Residential - CAP	7.43	7.87	5.9%	0.44
Commercial	6.56	7.97	21.5%	1.41
Industrial	5.98	7.46	24.7%	1.48
Health or Education	8.21	8.30	1.1%	0.09
Municipal	-	3.19	100.0%	3.19
<u>Unmetered Charges (per Unit)</u>				
Residential	\$ 25.99	33.46	28.7%	\$ 7.47
Residential - CAP	19.78	23.61	19.4%	3.83
Commercial	52.47	41.73	-20.5%	(10.74)
<u>Unmetered - Municipal</u>				
EMS / Fire / Police Station	\$ -	-	0.0%	\$ -
Public Park or Playground	-	-	0.0%	-
Swimming Pool	-	-	0.0%	-
Municipal Building	-	-	0.0%	-
Municipal Garage	-	-	0.0%	-
Rec Center	-	-	0.0%	-
Other	-	-	0.0%	-
DSIC (Applies to all retail customers)	0.0%	10.0%	n/a	n/a

(1) Proposed 100% discount on Minimum Charge for CAP-BDP customers in 2021.

PWSA Exh. HJS-12WW-R

Comparison of Base Rate Revenues by Customer Class

	FPFTY Revenue at Existing Rates	FPFTY Indicated COS by Customer Class	Percent Difference	Dollar Difference
User Charge Revenue				
Residential	\$ 24,283,064	\$ 25,315,010	4.2%	\$ 1,031,946
Residential - CAP	817,978	1,194,988	46.1%	377,010
Commercial	25,111,606	27,846,962	10.9%	2,735,356
Industrial	1,391,598	1,726,165	24.0%	334,567
Health or Education	10,291,786	10,034,725	-2.5%	(257,061)
Municipal (Metered & Unmetered)	629,985	2,270,556	260.4%	1,640,571
Total: Base Rate Revenues	\$ 62,526,017	\$ 68,388,407	9.4%	\$ 5,862,389

	FPFTY Indicated COS by Customer Class	FPFTY Adjusted COS by Customer Class	Percent Difference	Dollar Difference
User Charge Revenue				
Residential	\$ 25,315,010	\$ 26,081,985	3.0%	\$ 766,975
Residential - CAP	1,194,988	745,947	-37.6%	(449,042)
Commercial	27,846,962	28,219,356	1.3%	372,394
Industrial	1,726,165	1,739,637	0.8%	13,472
Health or Education	10,034,725	10,144,054	1.1%	109,329
Municipal (Metered & Unmetered)	2,270,556	1,891,448	-16.7%	(379,108)
Total: Base Rate Revenues	\$ 68,388,407	\$ 68,822,427	0.6%	\$ 434,020

	FPFTY Revenue at Existing Rates	FPFTY Adjusted COS by Customer Class	Percent Difference	Dollar Difference
User Charge Revenue				
Residential	\$ 24,283,064	\$ 26,081,985	7.4%	\$ 1,798,921
Residential - CAP	817,978	745,947	-8.8%	(72,031)
Commercial	25,111,606	28,219,356	12.4%	3,107,750
Industrial	1,391,598	1,739,637	25.0%	348,039
Health or Education	10,291,786	10,144,054	-1.4%	(147,733)
Municipal (Metered & Unmetered)	629,985	1,891,448	200.2%	1,261,463
Total: Base Rate Revenues	\$ 62,526,017	\$ 68,822,427	10.1%	\$ 6,296,410

	FPFTY Revenue at Existing Rates	FPFTY Revenue at Proposed Rates	Percent Difference	Dollar Difference
User Charge Revenue				
Residential	\$ 24,283,064	\$ 26,736,782	10.1%	\$ 2,453,718
Residential - CAP	817,978	745,947	-8.8%	(72,031)
Commercial	25,111,606	28,912,101	15.1%	3,800,495
Industrial	1,391,598	1,677,155	20.5%	285,557
Health or Education	10,291,786	10,393,206	1.0%	101,419
Municipal (Metered & Unmetered)	629,985	754,982	19.8%	124,997
Total: Base Rate Revenues	\$ 62,526,017	\$ 69,220,172	10.7%	\$ 6,694,155

PWSA Exh. HJS-13WW-R

Pittsburgh Water and Sewer Authority

HJS-13WW-R

2021 COS & Rate Design

FPPTY CCOS Comparison - Wastewater Conveyance

	Adjusted COS		Revenue at Existing Rates		Revenue at Proposed Rates		Proposed Increase	
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
Base Rate Revenues								
Residential	\$ 26,081,985	37.9%	\$ 24,283,064	38.8%	\$ 26,736,782	38.6%	\$ 2,453,718	10.1%
Residential - CAP	745,947	1.1%	817,978	1.3%	745,947	1.1%	(72,031)	-8.8%
Commercial	28,219,356	41.0%	25,111,606	40.2%	28,912,101	41.8%	3,800,495	15.1%
Industrial	1,739,637	2.5%	1,391,598	2.2%	1,677,155	2.4%	285,557	20.5%
Health or Education	10,144,054	14.7%	10,291,786	16.5%	10,393,206	15.0%	101,419	1.0%
Municipal (Metered & Unmetered)	1,891,448	2.7%	629,985	1.0%	754,982	1.1%	124,997	19.8%
Subtotal: Base Rate Revenues	\$ 68,822,427	100.0%	\$ 62,526,017	100.0%	\$ 69,220,172	100.0%	\$ 6,694,155	10.7%
DSIC Revenues								
Residential	n/a	n/a	\$ -	0.0%	\$ 2,673,678	38.6%	\$ 2,673,678	
Residential - CAP	n/a	n/a	-	0.0%	74,595	1.1%	74,595	
Commercial	n/a	n/a	-	0.0%	2,891,210	41.8%	2,891,210	
Industrial	n/a	n/a	-	0.0%	167,715	2.4%	167,715	
Health or Education	n/a	n/a	-	0.0%	1,039,321	15.0%	1,039,321	
Municipal (Metered & Unmetered)	n/a	n/a	-	0.0%	75,498	1.1%	75,498	
Subtotal: DSIC Revenues	n/a	n/a	\$ -	100.0%	\$ 6,922,017	100.0%	\$ 6,922,017	
Total: User Charge Revenues	\$ 68,822,427		\$ 62,526,017		\$ 76,142,190		\$ 13,616,172	21.8%
Other Revenues								
Miscellaneous Revenues	2,958,528		2,958,528		2,958,528		-	0.0%
Total: Wastewater Conveyance Revenues	\$ 71,780,955		\$ 65,484,545		\$ 79,100,718		\$ 13,616,172	20.8%

PWSA Exh. HJS-14WW-R

Pittsburgh Water and Sewer Authority

HJS-14WW-R

2021 COS & Rate Design

Typical Bill Comparison

	Customer Usage		FTY Existing Rates		FPFTY Proposed Rates	Percent Difference	Dollar Difference
Customer Impacts (1)							
<u>Residential</u>							
	5/8"	1 kgal	\$ 8.28	\$	10.84	30.9%	\$ 2.56
	5/8"	3 kgal	23.14		28.15	21.6%	5.01
	5/8"	5 kgal	38.00		45.46	19.6%	7.46
	5/8"	7 kgal	52.86		62.78	18.8%	9.92
	5/8"	12 kgal	90.01		106.06	17.8%	16.05
	1"	20 kgal	151.27		174.63	15.4%	23.36
<u>Commercial</u>							
	5/8"	3 kgal	\$ 21.40	\$	28.37	32.6%	\$ 6.97
	5/8"	5 kgal	34.52		45.90	33.0%	11.38
	5/8"	12 kgal	80.44		107.27	33.4%	26.83
	1"	13 kgal	92.30		114.91	24.5%	22.61
	2"	80 kgal	552.51		699.47	26.6%	146.96
	4"	160 kgal	1,133.71		1,384.06	22.1%	250.35
<u>Industrial</u>							
	1"	30 kgal	\$ 189.32	\$	249.92	32.0%	\$ 60.60
	1"	60 kgal	368.72		496.10	34.5%	127.38
	2"	100 kgal	635.57		828.25	30.3%	192.68
	4"	680 kgal	4,191.11		5,600.69	33.6%	1,409.58
	6"	400 kgal	2,647.71		3,323.61	25.5%	675.90
	8"	800 kgal	5,199.43		6,632.07	27.6%	1,432.64
<u>Health or Education</u>							
	5/8"	5 kgal	\$ 41.12	\$	47.36	15.2%	\$ 6.24
	5/8"	10 kgal	82.17		93.01	13.2%	10.84
	1"	40 kgal	327.17		364.32	11.4%	37.15
	2"	50 kgal	410.16		448.44	9.3%	38.28
	4"	200 kgal	1,610.61		1,781.93	10.6%	171.32
	6"	650 kgal	5,201.96		5,814.01	11.8%	612.05

(1) FPFTY customer bills at proposed rates include a 10% DSIC.

PWSA Exh. HJS-15WW-R

	2021 Revenue @ Existing Rates			2021 Revenue @ COS Rates			2021 Revenue @ Proposed Rates		
	Units	Rates	Revenue	Units	Rates	Revenue	Units	Rates	Revenue
Base Rate Revenues									
Minimum Charges									
Residential									
5/8"	962,582	\$ 8.28	\$ 7,970,179	962,582	\$ 9.85	\$ 9,481,405	962,582	\$ 9.85	\$ 9,481,433
3/4"	30,973	16.77	519,422	30,973	17.63	546,000	30,973	17.63	546,059
1"	28,727	39.82	1,143,896	28,727	40.70	1,169,046	28,727	40.70	1,169,175
1 1/2"	70	82.24	5,757	70	79.59	5,571	70	79.59	5,571
2"	12	139.23	1,671	12	133.77	1,605	12	133.77	1,605
Unmetered	3,996	25.99	103,856	3,996	31.30	125,075	3,996	33.46	133,706
<i>Subtotal: Residential</i>	1,026,360		\$ 9,744,781	1,026,360		\$ 11,328,703	1,026,360		\$ 11,337,550
Residential - CAP-BDP									
5/8"	53,466	\$ 2.07	\$ 110,675	53,466	\$ 9.85	\$ 526,641	53,466	\$ -	\$ -
3/4"	358	4.19	1,501	358	17.63	6,311	358	-	-
1"	176	9.96	1,749	176	40.70	7,151	176	-	-
1 1/2"	-	20.56	-	-	-	-	-	-	-
2"	-	34.81	-	-	-	-	-	-	-
Unmetered	12	6.50	78	12	30.58	367	12	23.61	283
<i>Subtotal: Residential - CAP-BDP</i>	54,012		\$ 114,003	54,012		\$ 540,470	54,012		\$ 283
Commercial									
5/8"	43,455	\$ 8.28	\$ 359,807	43,455	\$ 9.85	\$ 428,031	43,455	\$ 9.85	\$ 428,032
3/4"	9,293	16.77	155,844	9,293	17.63	163,818	9,293	17.63	163,836
1"	18,706	39.82	744,873	18,706	40.70	761,250	18,706	40.70	761,334
1 1/2"	10,614	82.24	872,895	10,614	79.59	844,727	10,614	79.59	844,768
2"	10,534	139.23	1,466,649	10,534	133.77	1,409,091	10,534	133.77	1,409,133
3"	2,911	317.57	924,446	2,911	310.79	904,722	2,911	310.80	904,739
4"	2,383	543.31	1,294,708	2,383	540.93	1,289,046	2,383	540.94	1,289,060
6"	1,205	1,302.21	1,569,163	1,205	1,342.95	1,618,260	1,205	1,342.96	1,618,267
8"	103	2,358.93	242,970	103	2,485.65	256,022	103	2,485.65	256,022
10" & Above	-	3,883.88	-	-	4,179.32	-	-	4,179.33	-
Unmetered	24	52.47	1,259	24	40.13	963	24	41.73	1,002
<i>Subtotal: Commercial</i>	99,228		\$ 7,632,614	99,228		\$ 7,675,929	99,228		\$ 7,676,192
Industrial									
5/8"	245	\$ 8.28	\$ 2,029	245	\$ 9.85	\$ 2,413	245	\$ 9.85	\$ 2,413
3/4"	149	16.77	2,499	149	17.63	2,627	149	17.63	2,627
1"	300	39.82	11,946	300	40.70	12,209	300	40.70	12,210
1 1/2"	72	82.24	5,921	72	79.59	5,730	72	79.59	5,730
2"	196	139.23	27,289	196	133.77	26,218	196	133.77	26,219
3"	24	317.57	7,622	24	310.79	7,459	24	310.80	7,459
4"	112	543.31	60,851	112	540.93	60,585	112	540.94	60,585
6"	24	1,302.21	31,253	24	1,342.95	32,231	24	1,342.96	32,231
8"	48	2,358.93	113,229	48	2,485.65	119,311	48	2,485.65	119,311
10" & Above	-	3,883.88	-	-	4,179.32	-	-	4,179.33	-
<i>Subtotal: Industrial</i>	1,170		\$ 262,638	1,170		\$ 268,782	1,170		\$ 268,786
Health or Education									
5/8"	408	\$ 8.28	\$ 3,378	408	\$ 9.85	\$ 4,019	408	\$ 9.85	\$ 4,019
3/4"	101	16.77	1,694	101	17.63	1,780	101	17.63	1,781
1"	295	39.82	11,747	295	40.70	12,005	295	40.70	12,007
1 1/2"	773	82.24	63,572	773	79.59	61,520	773	79.59	61,523
2"	1,730	139.23	240,868	1,730	133.77	231,415	1,730	133.77	231,422
3"	1,156	317.57	367,111	1,156	310.79	359,278	1,156	310.80	359,285
4"	838	543.31	455,294	838	540.93	453,303	838	540.94	453,308
6"	444	1,302.21	578,181	444	1,342.95	596,272	444	1,342.96	596,274
8"	36	2,358.93	84,921	36	2,485.65	89,483	36	2,485.65	89,483
10" & Above	24	3,883.88	93,213	24	4,179.32	100,304	24	4,179.33	100,304
<i>Subtotal: Health or Education</i>	5,805		\$ 1,899,979	5,805		\$ 1,909,379	5,805		\$ 1,909,405
Municipal									
5/8"	252	\$ 3.31	\$ 835	252	\$ 9.85	\$ 2,482	252	\$ 3.94	\$ 993
3/4"	60	6.71	402	60	17.63	1,058	60	7.06	424
1"	84	15.93	1,338	84	40.70	3,418	84	16.28	1,368
1 1/2"	288	32.90	9,474	288	79.59	22,921	288	31.84	9,170
2"	252	55.69	14,034	252	133.77	33,709	252	53.51	13,485
3"	24	127.03	3,049	24	310.79	7,459	24	124.32	2,984
4"	24	217.32	5,216	24	540.93	12,982	24	216.38	5,193
6"	24	520.88	12,501	24	1,342.95	32,231	24	537.19	12,893
8"	-	943.57	-	-	2,485.65	-	-	994.26	-
10" & Above	-	1,553.55	-	-	4,179.32	-	-	1,671.73	-
<i>Subtotal: Municipal</i>	1,008		\$ 46,849	1,008		\$ 116,261	1,008		\$ 46,508
Municipal - Unmetered									
EMS / Fire / Police Station	108	\$ -	\$ -	108	\$ 94.75	\$ 10,233	108	\$ -	\$ -
Public Park or Playground	468	-	-	468	626.19	293,055	468	-	-
Swimming Pool	120	-	-	120	266.37	31,964	120	-	-
Municipal Building	48	-	-	48	26.83	1,288	48	-	-
Municipal Garage	48	-	-	48	52.30	2,510	48	-	-
Rec Center	24	-	-	24	1,305.39	31,329	24	-	-
Other	132	-	-	132	176.54	23,303	132	-	-
<i>Subtotal: Municipal - Unmetered</i>	948		\$ -	948		\$ 393,682	948		\$ -
<i>Subtotal: Minimum Charges</i>			\$ 19,700,864			\$ 22,233,206			\$ 21,238,725

	2021 Revenue @ Existing Rates			2021 Revenue @ COS Rates			2021 Revenue @ Proposed Rates		
	Units	Rates	Revenue	Units	Rates	Revenue	Units	Rates	Revenue
Volume Charge									
Residential	1,956,700	\$ 7.43	\$ 14,538,283	1,956,700	\$ 7.15	\$ 13,990,407	1,956,700	\$ 7.87	\$ 15,399,231
Residential - CAP	94,748	7.43	703,975	94,748	6.91	654,706	94,748	7.87	745,663
Commercial	2,664,480	6.56	17,478,992	2,664,480	7.57	20,170,117	2,664,480	7.97	21,235,909
Industrial	188,789	5.98	1,128,960	188,789	7.72	1,457,454	188,789	7.46	1,408,368
Health or Education	1,022,145	8.21	8,391,808	1,022,145	7.95	8,126,050	1,022,145	8.30	8,483,801
Municipal	222,232	2.62	583,136	222,232	7.92	1,760,074	222,232	3.19	708,474
<i>Subtotal: Volume Charge</i>			\$ 42,825,153			\$ 46,158,808			\$ 47,981,447
Total: Base Rate Revenues			\$ 62,526,017			\$ 68,392,014			\$ 69,220,172
DSIC Revenues									
Residential					\$ 2,531,911			\$ 2,673,678	
Residential - CAP-BDP					119,518			74,595	
Commercial					2,784,605			2,891,210	
Industrial					172,624			167,715	
Health or Education					1,003,543			1,039,321	
Municipal					227,002			75,498	
Total: DSIC Revenues					\$ 6,839,201			\$ 6,922,017	
Other Revenues									
Wholesale and Contract Revenues			\$ -		\$ -			\$ -	
Other Revenues			2,958,528		2,958,528			2,958,528	
<i>Total: Other Revenues</i>			\$ 2,958,528		\$ 2,958,528			\$ 2,958,528	
Total: System Revenues			\$ 65,484,545		\$ 78,189,743			\$ 79,100,718	
FPPTY Wastewater Conveyance Revenue Requirements					\$ 79,117,744			\$ 79,117,744	
Difference					\$ (928,000)			\$ (17,026)	

(1) Note difference in COS rates is combination of bad debt and DSIC.

PWSA Exh. HJS-16WW-R

Pittsburgh Water and Sewer Authority

HJS-16WW-R

2021 COS & Rate Design

Projected Units of Service

	FY 2017 <i>Actual</i>	FY 2018 <i>Actual</i>	HTY FY 2019 <i>Actual</i>	FTY FY 2020 <i>Projected</i>	FPFTY FY 2021 <i>Projected</i>
Units of Service					
<u>Number of Bills</u>					
Residential	1,095,920	1,057,206	1,047,476	1,034,759	1,026,360
Residential - CAP	-	20,369	32,883	45,600	54,000
Commercial	100,291	99,177	99,228	99,228	99,228
Industrial	1,205	1,181	1,170	1,170	1,170
Health or Education	6,141	5,932	5,805	5,805	5,805
Municipal	-	-	-	-	1,008
<i>Total</i>	<u>1,203,557</u>	<u>1,183,865</u>	<u>1,186,562</u>	<u>1,186,562</u>	<u>1,187,571</u>
<u>Billable Consumption (kgal)</u>					
Residential	2,121,585	2,079,046	1,907,840	1,971,439	1,956,700
Residential - CAP	-	33,580	57,696	80,009	94,748
Commercial	3,003,282	2,769,596	2,559,365	2,664,480	2,664,480
Industrial	162,184	184,208	193,370	188,789	188,789
Health or Education	1,257,865	1,068,859	975,430	1,022,145	1,022,145
Municipal	-	-	-	222,232	222,232
<i>Total</i>	<u>6,544,915</u>	<u>6,135,290</u>	<u>5,693,701</u>	<u>6,149,094</u>	<u>6,149,094</u>
<u>Total Consumption (kgal) (1)</u>					
Residential	2,959,361	2,892,984	2,713,748	2,773,544	2,753,464
Residential - CAP	-	44,701	78,607	109,007	129,088
Commercial	3,673,542	3,419,287	3,214,214	3,316,751	3,316,751
Industrial	182,821	204,745	210,497	207,621	207,621
Health or Education	1,451,777	1,253,574	1,158,179	1,205,877	1,205,877
Municipal	-	-	-	226,195	226,195
<i>Total</i>	<u>8,267,500</u>	<u>7,815,291</u>	<u>7,375,245</u>	<u>7,838,994</u>	<u>7,838,994</u>
<u>Wholesale & Contract Consumption</u>					
Bay Valley Foods / Riverbend (2)	180,000	180,000	90,000	-	-

(1) Total consumption represents actual customer usage including the usage captured in minimum allowance.

(2) Riverbend foods closed in July 2019.

PWSA Exh. HJS-17WW-R

Pittsburgh Water and Sewer Authority
 2021 COS & Rate Design
 2022 Wastewater Conveyance Revenue Requirements

HJS-17WW-R

	2022 Revenue Requirements
Revenue Requirements	
<u>Operating Expenses</u>	
<i>Direct Operating Expenses</i>	
Administrative Division	
Executive Director	\$ 293,301
Customer Service	2,791,584
Management Information Systems	475,663
Finance	1,382,457
Procurement	-
Human Resources	163,806
Legal	554,268
Public Affairs	196,680
Operations Division	
Environmental Compliance	1,369,932
Ops Capital Assets	-
Warehouse	77,605
Water Treatment Plant	-
Water Quality (Lab)	-
Water Distribution	-
Sewer Operations	2,864,899
Engineering & Construction	
Engineering & Construction	7,167,645
<i>Other Operating Expenses</i>	
Loss / (Gain) on ALCOSAN Billings	778,202
Non-City Water Payments	-
<i>Total Operating Expenses</i>	<u>\$ 18,116,043</u>
<u>Debt Service</u>	
Existing Debt	\$ 27,838,295
Future Debt	6,019,314
<i>Subtotal: Debt Service</i>	<u>\$ 33,857,608</u>
<u>Capital Expenditures & Transfers</u>	
Internally Generated Funds / PAYGO	\$ 694,957
Internally Generated Funds / PAYGO (DSIC)	7,575,094
Other Transfers to Reserves	384,115
Reimbursements from Municipalities	-
Remarketing & Liquidity Charges	-
Bad Debt Expense	889,249
<i>Subtotal: Capital Expenditures & Transfers</i>	<u>\$ 9,543,415</u>
Stormwater	24,743,738
Total: Wastewater Conveyance System Revenue Requirements	\$ 86,260,805
<i>Capital Costs to be Recovered through DSIC</i>	\$ (7,575,094)
Total: Wastewater Conveyance System Base Rate Revenue Requirement	\$ 78,685,710

PWSA Exh. HJS-18WW-R

	FPFTY 2021 Proposed Rates	2022 Proposed Rates	Percent Difference	Dollar Difference
Existing & Proposed Rates				
<u>Minimum Charge</u>				
5/8"	\$ 9.85	\$ 10.71	8.7%	\$ 0.86
3/4"	17.63	19.16	8.7%	1.53
1"	40.70	44.24	8.7%	3.54
1 1/2"	79.59	86.51	8.7%	6.92
2"	133.77	145.41	8.7%	11.64
3"	310.80	337.84	8.7%	27.04
4"	540.94	588.00	8.7%	47.06
6"	1,342.96	1,459.80	8.7%	116.84
8"	2,485.65	2,701.90	8.7%	216.25
10" & Above	4,179.33	4,542.93	8.7%	363.60
<u>Minimum Charge - CAP (1)</u>				
5/8"	\$ -	\$ -	0.0%	\$ -
3/4"	-	-	0.0%	-
1"	-	-	0.0%	-
<u>Minimum Charge - Municipal</u>				
5/8"	\$ 3.94	\$ 6.43	63.1%	\$ 2.49
3/4"	7.06	11.50	62.8%	4.44
1"	16.28	26.54	63.0%	10.26
1 1/2"	31.84	51.91	63.0%	20.07
2"	53.51	87.25	63.0%	33.74
3"	124.32	202.70	63.1%	78.38
4"	216.38	352.80	63.0%	136.42
6"	537.19	875.88	63.0%	338.69
8"	994.26	1,621.14	63.0%	626.88
10" & Above	1,671.73	2,725.76	63.1%	1,054.03
<u>Volume Charge</u>				
Residential	\$ 7.87	\$ 8.55	8.6%	\$ 0.68
Residential - CAP	7.87	8.55	8.6%	0.68
Commercial	7.97	8.66	8.7%	0.69
Industrial	7.46	8.11	8.7%	0.65
Health or Education	8.30	9.02	8.7%	0.72
Municipal	3.19	5.20	63.0%	2.01
<u>Unmetered Charges (per Unit)</u>				
Residential	\$ 33.46	\$ 36.36	8.7%	\$ 2.90
Residential - CAP	23.61	25.65	8.6%	2.04
Commercial	41.73	45.35	8.7%	3.62
<u>Unmetered - Municipal</u>				
EMS / Fire / Police Station	\$ -	\$ -	0.0%	\$ -
Public Park or Playground	-	-	0.0%	-
Swimming Pool	-	-	0.0%	-
Municipal Building	-	-	0.0%	-
Municipal Garage	-	-	0.0%	-
Rec Center	-	-	0.0%	-
Other	-	-	0.0%	-
DSIC (Applies to all retail customers)	10.0%	10.0%	n/a	n/a

(1) Proposed 100% discount on Minimum Charge for CAP-BDP customers in 2021 and 2022.

PWSA Exh. HJS-19WW-R

	2022 Revenue @ 2021 Rates			2022 Revenue @ Proposed Rates		
	Units	Rates	Revenue	Units	Rates	Revenue
Base Rate Revenues						
<u>Minimum Charges</u>						
Residential						
5/8"	962,582	\$ 9.85	\$ 9,481,436	962,582	\$ 10.71	\$ 10,309,256
3/4"	30,973	17.63	546,054	30,973	19.16	593,443
1"	28,727	40.70	1,169,177	28,727	44.24	1,270,870
1 1/2"	70	79.59	5,571	70	86.51	6,056
2"	12	133.77	1,605	12	145.41	1,745
Unmetered	3,996	33.46	133,706	3,996	36.36	145,295
<i>Subtotal: Residential</i>	1,026,360		\$ 11,337,549	1,026,360		\$ 12,326,664
Residential - CAP-BDP						
5/8"	53,466	\$ -	\$ -	53,466	\$ -	\$ -
3/4"	358	-	-	358	-	-
1"	176	-	-	176	-	-
1 1/2"	-	-	-	-	-	-
2"	-	-	-	-	-	-
Unmetered	12	23.61	283	12	25.65	308
<i>Subtotal: Residential - CAP-BDP</i>	54,012		\$ 283	54,012		\$ 308
Commercial						
5/8"	43,455	\$ 9.85	\$ 428,032	43,455	\$ 10.71	\$ 465,403
3/4"	9,293	17.63	163,836	9,293	19.16	178,054
1"	18,706	40.70	761,334	18,706	44.24	827,553
1 1/2"	10,614	79.59	844,768	10,614	86.51	918,217
2"	10,534	133.77	1,409,133	10,534	145.41	1,531,749
3"	2,911	310.80	904,739	2,911	337.84	983,452
4"	2,383	540.94	1,289,060	2,383	588.00	1,401,204
6"	1,205	1,342.96	1,618,267	1,205	1,459.80	1,759,059
8"	103	2,485.65	256,022	103	2,701.90	278,296
10" & Above	-	4,179.33	-	-	4,542.93	-
Unmetered	24	41.73	1,002	24	45.35	1,088
<i>Subtotal: Commercial</i>	99,228		\$ 7,676,192	99,228		\$ 8,344,076
Industrial						
5/8"	245	\$ 9.85	\$ 2,413	245	\$ 10.71	\$ 2,624
3/4"	149	17.63	2,627	149	19.16	2,855
1"	300	40.70	12,210	300	44.24	13,272
1 1/2"	72	79.59	5,730	72	86.51	6,229
2"	196	133.77	26,219	196	145.41	28,500
3"	24	310.80	7,459	24	337.84	8,108
4"	112	540.94	60,585	112	588.00	65,856
6"	24	1,342.96	32,231	24	1,459.80	35,035
8"	48	2,485.65	119,311	48	2,701.90	129,691
10" & Above	-	4,179.33	-	-	4,542.93	-
<i>Subtotal: Industrial</i>	1,170		\$ 268,786	1,170		\$ 292,170
Health or Education						
5/8"	408	\$ 9.85	\$ 4,019	408	\$ 10.71	\$ 4,370
3/4"	101	17.63	1,781	101	19.16	1,935
1"	295	40.70	12,007	295	44.24	13,051
1 1/2"	773	79.59	61,523	773	86.51	66,872
2"	1,730	133.77	231,422	1,730	145.41	251,559
3"	1,156	310.80	359,285	1,156	337.84	390,543
4"	838	540.94	453,308	838	588.00	492,744
6"	444	1,342.96	596,274	444	1,459.80	648,151
8"	36	2,485.65	89,483	36	2,701.90	97,268
10" & Above	24	4,179.33	100,304	24	4,542.93	109,030
<i>Subtotal: Health or Education</i>	5,805		\$ 1,909,405	5,805		\$ 2,075,524
Municipal						
5/8"	252	\$ 5.91	\$ 1,489	252	\$ 6.43	\$ 1,619
3/4"	60	10.58	635	60	11.50	690
1"	84	24.42	2,051	84	26.54	2,230
1 1/2"	288	47.75	13,753	288	51.91	14,949
2"	252	80.26	20,226	252	87.25	21,986
3"	24	186.48	4,476	24	202.70	4,865
4"	24	324.56	7,790	24	352.80	8,467
6"	24	805.78	19,339	24	875.88	21,021
8"	-	1,491.39	-	-	1,621.14	-
10" & Above	-	2,507.60	-	-	2,725.76	-
<i>Subtotal: Municipal</i>	1,008		\$ 69,758	1,008		\$ 75,827

	2022 Revenue @ 2021 Rates			2022 Revenue @ Proposed Rates		
	Units	Rates	Revenue	Units	Rates	Revenue
Municipal - Unmetered						
EMS / Fire / Police Station	108	\$ -	\$ -	108	\$ -	\$ -
Public Park or Playground	468	-	-	468	-	-
Swimming Pool	120	-	-	120	-	-
Municipal Building	48	-	-	48	-	-
Municipal Garage	48	-	-	48	-	-
Rec Center	24	-	-	24	-	-
Other	132	-	-	132	-	-
<i>Subtotal: Municipal - Unmetered</i>	948		\$ -	948		\$ -
<i>Subtotal: Minimum Charges</i>			\$ 21,261,974			\$ 23,114,569
Volume Charge						
Residential	1,956,700	\$ 7.87	\$ 15,399,233	1,956,700	\$ 8.55	\$ 16,729,789
Residential - CAP	94,747	7.87	745,662	94,747	8.55	810,091
Commercial	2,664,480	7.97	21,235,909	2,664,480	8.66	23,074,401
Industrial	188,789	7.46	1,408,368	188,789	8.11	1,531,081
Health or Education	1,022,145	8.30	8,483,801	1,022,145	9.02	9,219,745
Municipal	222,232	4.78	1,062,712	222,232	5.20	1,154,715
<i>Subtotal: Volume Charge</i>			\$ 48,335,684			\$ 52,519,822
Total: Base Rate Revenues			\$ 69,597,659			\$ 75,634,391
DSIC Revenues						
Residential			\$ 1,539,923			\$ 2,905,645
Residential - CAP-BDP			74,566			81,040
Commercial			2,123,591			3,141,848
Industrial			166,439			182,325
Health or Education			851,603			1,129,527
Municipal			113,247			123,054
Total: DSIC Revenues			\$ 4,869,370			\$ 7,563,439
Other Revenues						
Wholesale and Contract Revenues			\$ -			\$ -
Other Revenues			3,017,699			3,017,699
<i>Total: Other Revenues</i>			\$ 3,017,699			\$ 3,017,699
Total: System Revenues			\$ 77,484,727			\$ 86,215,528
Wastewater Conveyance Revenue Requirements						\$ 86,260,805
Difference						\$ (45,276)

Determination of 2022 Required Rate Increase	
Total Wastewater System Revenue Requirements	\$ 86,260,805
Less:	
DSIC Expenses	\$ (7,575,094)
Other Revenues	(3,017,699)
<i>Base Rates Net Revenue Requirement</i>	\$ 75,668,012
Base Rate Revenue at 2021 Rates	\$ 69,597,659
Required 2022 Rate Increase (Rounded)	8.8%

PWSA Exh. HJS-20WW-R

Pittsburgh Water and Sewer Authority

HJS-20WW-R

2021 COS & Rate Design

Typical Bill Comparison

	Customer Usage	FPFTY 2021 Existing Rates	2022 Proposed Rates	Percent Difference	Dollar Difference	
Customer Impacts (1)						
<u>Residential</u>						
	5/8"	1 kgal	\$ 10.84	\$ 11.78	8.7%	\$ 0.95
	5/8"	3 kgal	28.15	30.59	8.7%	2.44
	5/8"	5 kgal	45.46	49.40	8.7%	3.94
	5/8"	7 kgal	62.78	68.21	8.7%	5.43
	5/8"	12 kgal	106.06	115.24	8.6%	9.17
	1"	20 kgal	174.63	189.74	8.7%	15.11
<u>Commercial</u>						
	5/8"	3 kgal	\$ 28.37	\$ 30.83	8.7%	\$ 2.46
	5/8"	5 kgal	45.90	49.89	8.7%	3.98
	5/8"	12 kgal	107.27	116.57	8.7%	9.30
	1"	13 kgal	114.91	124.87	8.7%	9.97
	2"	80 kgal	699.47	760.09	8.7%	60.62
	4"	160 kgal	1,384.06	1,504.14	8.7%	120.08
<u>Industrial</u>						
	1"	30 kgal	\$ 249.92	\$ 271.69	8.7%	\$ 21.77
	1"	60 kgal	496.10	539.32	8.7%	43.22
	2"	100 kgal	828.25	900.39	8.7%	72.15
	4"	680 kgal	5,600.69	6,088.61	8.7%	487.92
	6"	400 kgal	3,323.61	3,613.01	8.7%	289.40
	8"	800 kgal	6,632.07	7,209.57	8.7%	577.50
<u>Health or Education</u>						
	5/8"	5 kgal	\$ 47.36	\$ 51.47	8.7%	\$ 4.11
	5/8"	10 kgal	93.01	101.08	8.7%	8.07
	1"	40 kgal	364.32	395.93	8.7%	31.61
	2"	50 kgal	448.44	487.38	8.7%	38.94
	4"	200 kgal	1,781.93	1,936.66	8.7%	154.73
	6"	650 kgal	5,814.01	6,318.73	8.7%	504.72

(1) 2021 and 2022 customer bills at proposed rates include a 10% DSIC.

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	FY 2017 <i>Actual</i>	FY 2018 <i>Actual</i>	HTY FY 2019 <i>Actual</i>	FTY FY 2020 <i>Projected</i>	FPFTY FY 2021 <i>Projected</i>	FY 2022 <i>Projected</i>
Units of Service						
<u>Number of Bills</u>						
Residential	1,095,920	1,057,206	1,047,476	1,034,759	1,026,360	1,026,360
Residential - CAP	-	20,369	32,883	45,600	54,000	54,000
Commercial	100,291	99,177	99,228	99,228	99,228	99,228
Industrial	1,205	1,181	1,170	1,170	1,170	1,170
Health or Education	6,141	5,932	5,805	5,805	5,805	5,805
Municipal	-	-	-	-	1,008	1,008
<i>Total</i>	<u>1,203,557</u>	<u>1,183,865</u>	<u>1,186,562</u>	<u>1,186,562</u>	<u>1,187,571</u>	<u>1,187,571</u>
<u>Billable Consumption (kgal)</u>						
Residential	2,121,585	2,079,046	1,907,840	1,971,439	1,956,700	1,956,700
Residential - CAP	-	33,580	57,696	80,009	94,748	94,747
Commercial	3,003,282	2,769,596	2,559,365	2,664,480	2,664,480	2,664,480
Industrial	162,184	184,208	193,370	188,789	188,789	188,789
Health or Education	1,257,865	1,068,859	975,430	1,022,145	1,022,145	1,022,145
Municipal	-	-	-	222,232	222,232	222,232
<i>Total</i>	<u>6,544,915</u>	<u>6,135,290</u>	<u>5,693,701</u>	<u>6,149,094</u>	<u>6,149,094</u>	<u>6,149,094</u>
<u>Total Consumption (kgal) (1)</u>						
Residential	2,959,361	2,892,984	2,713,748	2,773,544	2,753,464	2,753,463
Residential - CAP	-	44,701	78,607	109,007	129,088	129,088
Commercial	3,673,542	3,419,287	3,214,214	3,316,751	3,316,751	3,316,751
Industrial	182,821	204,745	210,497	207,621	207,621	207,621
Health or Education	1,451,777	1,253,574	1,158,179	1,205,877	1,205,877	1,205,877
Municipal	-	-	-	226,195	226,195	226,195
<i>Total</i>	<u>8,267,500</u>	<u>7,815,291</u>	<u>7,375,245</u>	<u>7,838,994</u>	<u>7,838,994</u>	<u>7,838,994</u>
<u>Wholesale & Contract Consumption</u>						
Bay Valley Foods / Riverbend (2)	180,000	180,000	90,000	-	-	-

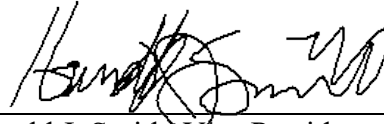
(1) Total consumption represents actual customer usage including the usage captured in minimum allowance.

(2) Riverbend foods closed in July 2019.

VERIFICATION

I, Harold J. Smith, hereby state that: (1) I am a Vice President of Raftelis Financial Consultants, Inc.; (2) I have been retained by The Pittsburgh Water and Sewer Authority (“PWSA”) and am authorized to present testimony on its behalf; (3) the facts set forth in my testimony are true and correct (or are true and correct to the best of my knowledge, information and belief); and, (4) I expect to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa. C.S. § 4904 (relating to unsworn falsification to authorities).

Dated: August 18, 2020



Harold J. Smith, Vice President
Raftelis Financial Consultants, Inc.