

BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION

VOLUME I

**INDEX TO RATE FILING PACKAGE  
FILING REQUIREMENTS**

PITTSBURGH WATER AND SEWER AUTHORITY  
RATE FILING

Docket Nos. R-2020-3017951 (water)  
R-2020-3017970 (wastewater)

March 6, 2020

**THE PITTSBURGH WATER AND SEWER AUTHORITY**  
Docket Nos. R-2020-3017951 (Water) and R-2020-3017970 (Wastewater)

**INDEX TO RATE FILING PACKAGE**

**Prior Related Filings:**

<b>Petition</b>	Waiver Of Provisions Of Act 11 To Increase The DSIC Cap, To Permit Levelization Of DSIC Charges, And To Authorize The Pay-As-You-Go Method Of Financing	Docket No. P-2020-3019019
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**Filings Simultaneous With This Filing Package:**

<b>Petition</b>	Consolidation Of Water and Wastewater Rate Proceedings And For Authorization To Use Combined Water And Wastewater Revenue Requirements	
<b>Petition</b>	Consolidation of DSIC Waiver Petition and Rate Proceedings	

**Included With This Filing Package:**

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<b>Volume II</b>	<b>Testimony</b>	St. No. 1	Robert A. Weimar	
		St. No. 2	Debbie M. Lestitian	Exh. DML-1
		St. No. 3	Jennifer Presutti	Exhs. JP-1 to JP-5
		St. No. 4	Barry King	Exhs. BK-1 to BK-3
		St. No. 5	Edward Barca	Exhs. EB-1 to EB-3
		St. No. 6	Thomas F. Huestis	Exhs. TFH-1 to TFH-2
		St. No. 7	Harold J. Smith	Exhs. HJS-1 to HJS-3 Exhs. HJS-1W to HJS-22W Exhs. HJS-1WW to HJS-21WW
		St. No. 8	Julie A. Quigley	Exh. JAQ-1 Water Tariff Supp. No. 1 (clean) Exh. JAQ-2 Water Tariff Supp. No. 1 (red-lined) Exh. JAQ-3 Wastewater Tariff Supp. No. 1 (clean) Exh. JAQ-4 Wastewater Tariff Supp. No. 1 (red-lined) Exh. JAQ-5 to JAQ-6
		St. No. 9	Beth Dutton	Exh. BD-1 to BD-4

**Pittsburgh Water and Sewer Authority  
2020 Rate Filing**

**Docket Nos.  
R-2020-3017951 (water)  
R-2020-3017970 (wastewater)**

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**TAB**

**1**



# **THE PITTSBURGH WATER AND SEWER AUTHORITY**

## **Tariff Filings and Rate Requests**

**Docket Nos. R-2019-3017951 (water) and R-2019-3017970 (wastewater)**

### **STATEMENT OF REASONS**

The Pittsburgh Water and Sewer Authority (“PWSA”) has asked the Pennsylvania Public Utility Commission (“Commission”) for approval of a multiyear rate plan to increase its rates for 2021 by \$43.4 million and \$12.6 million for 2022. The rate increase request includes a Distribution System Improvement Charge (“DSIC”) assessed at 10% of the base rates. Although the new rates are proposed to become effective on May 5, 2020, PWSA expects that the proposed rates will be suspended for investigation by the Commission until approximately December 7, 2020. The proposed increase in revenues is the minimum necessary to enable PWSA to appropriately invest in the infrastructure needed to maintain and improve its safety, reliability and customer service levels. The main reasons PWSA is asking for an increase in rates are:

- While PWSA is taking every reasonable step to operate efficiently and keep costs down, its extensive Capital Improvement Program (“CIP”) simply cannot be accomplished without additional rate relief. Working through the projects of the CIP is important because it includes refurbishment and replacement of a significant portion of PWSA’s water supply system to include projects that have been mandated by state agencies (including the Pennsylvania Department of Environmental Protection, “DEP”) and continuing to replace all lead service lines as well as ones necessary to ensure PWSA is able to meet the expectations of the Commission as part of its Compliance Plan proceeding at Docket Nos. M-2018-2640802 and M-2018-2640803.
- PWSA’s direct operating expenses are also increasing as a result of the need to add necessary personnel, pay increased salaries and associated benefits, enter into large operating contracts (including contracts dealing with emergency issues, information technology and non-capital facility upgrades). PWSA is also experiencing increases in the cost of debt service driven by PWSA’s on-going efforts to upgrade systems to meet the regulatory obligations.
- In addition to available state and/or federal loans and “PAYGO”/DSIC financing produced from rates, PWSA must be able to raise capital on reasonable terms to fund its CIP projects. To ensure continued access to the bond market, PWSA needs to increase its rates to cover the additional debt service and debt service coverage required for additional bond issuances. Approval of PWSA’s proposed rate increase will enable it to implement a more balanced financing strategy whereby it will be able to utilize all available funding sources to their full advantage rather than being overly reliant on any one source (such as debt).
- PWSA’s request to approve a multiyear rate plan is intended to provide transparency for customers while reducing the time and expense of seeking approval for a rate increase in year 2022 that can be determined now while permitting PWSA to maintain adequate financial metrics and have the money needed to continue to upgrade its infrastructure and make other necessary improvements.

**TAB**

**2**

## NOTICE OF PROPOSED RATE CHANGES

To Our Customers:

The Pittsburgh Water and Sewer Authority (PWSA) has filed a request with the Pennsylvania Public Utility Commission (PUC) on March 6, 2020, to increase your water and wastewater conveyance rates. This notice describes the Authority's rate request, the PUC's role, and what actions you can take.

If the Authority's entire request and the multi-year rate plan is approved as filed, the total bill for water and wastewater conveyance service for a typical Residential customer using 3,000 gallons per month would increase from \$72.49 to \$86.31 per month or by 19.1% in 2021.

### RATE REQUEST

PWSA has requested an overall rate increase of 25.4%, or \$43.8 million, beginning in 2021, and 6.4%, or \$12.6 million, beginning in 2022 for its water and wastewater conveyance operations. This filing includes a request for approval of a multi-year rate plan in accordance with 66 Pa. C.S. § 1330 (relating to alternative ratemaking for utilities), which would allow for a rate increase to go into effect in 2021 and a second rate increase to go into effect in 2022. This filing also requests approval of a Distribution System Improvement Charge (DSIC), which will enable PWSA to make additional upgrades to aging infrastructure. The DSIC is calculated into the rates below.

For a typical Residential customer using 3,000 gallons per month with a 5/8-inch meter, the total bill would increase from \$72.49 to \$86.31 per month or by 19.1% in 2021, as shown in the table below:

<b>Residential</b>	<b>Current Rates</b>	<b>2021 Rates</b>	<b>2022 Rates</b>
Water	49.35	58.15	61.11
Wastewater	23.14	28.16	30.60
<b>Total</b>	<b>72.49</b>	<b>86.31</b>	<b>91.71</b>

For a typical Commercial customer using 13,000 gallons per month with a 1-inch meter, the total bill would increase from \$265.96 to \$344.73 per month or by 29.6% in 2021, as shown in the table below:

<b>Commercial</b>	<b>Current Rates</b>	<b>2021 Rates</b>	<b>2022 Rates</b>
Water	173.66	229.99	241.68
Wastewater	92.30	114.74	124.71
<b>Total</b>	<b>265.96</b>	<b>344.73</b>	<b>366.39</b>

For an Industrial customer using 680,000 gallons per month with a 4-inch meter, the total bill would increase from \$10,649.49 to \$15,548.09 per month or by 46% in 2021, as shown in the table below:

<b>Industrial</b>	<b>Current Rates</b>	<b>2021 Rates</b>	<b>2022 Rates</b>
Water	6,458.38	9,598.30	10,089.63
Wastewater	4,191.11	5,949.79	6,464.57
<b>Total</b>	<b>10,649.49</b>	<b>15,548.09</b>	<b>16,554.20</b>

For a Health and Education customer using 50,000 gallons per month with a 2-inch meter, the total bill would increase from \$1,171.86 to \$1,342.29 per month or by 14.5% in 2021, as shown in the table below:

<b>Health/Education</b>	<b>Current Rates</b>	<b>2021 Rates</b>	<b>2022 Rates</b>
Water	761.70	895.26	940.78
Wastewater	410.16	447.03	485.97
<b>Total</b>	<b>1,171.86</b>	<b>1,342.29</b>	<b>1,426.74</b>

PWSA's rate request is scheduled to go into effect on May 5, 2020; however, in most cases, the PUC

suspends the increase for up to an additional seven (7) months.

In the past two years, PWSA has invested approximately \$176 million in capital improvements, including necessary upgrades to water and wastewater treatment facilities, storage tanks, wells and pumping stations to ensure that its systems meet all regulatory standards. A total of approximately \$204 million is budgeted for 2020 to ensure that your rate dollars are going towards much needed upgrades to your critical water and sewer infrastructure.

To find out your customer class or how the requested increase may affect your water and wastewater conveyance bill, contact PWSA at 412-255-2423. The rates requested by the Authority may be found in the Tariff Water – PA. P.U.C. No.1 Supp. No. 1 and Tariff Wastewater – PA. P.U.C. No.1 Supp. No. 1. You may also examine the material filed with the PUC, which explains the requested increase and the reasons for it. A copy of this material is kept at PWSA's office. Upon request, the Authority will send you the Statement of Reasons for these Tariffs, explaining why the rate increase has been requested.

### **PUC ROLE**

The state agency which now approves rates for PWSA is the PUC. The PUC will examine the requested rate increase and can prevent existing rates from changing until it investigates and/or holds hearings on the request. The Authority must prove that the requested rates are reasonable. After examining the evidence, the PUC may grant all, some, or none of the request or may reduce existing rates.

The PUC may change the amount of the rate increase or decrease requested by the utility for each customer class. As a result, the rate charged to you may be different than the rate requested by the utility as shown above.

### **ACTIONS YOU CAN TAKE**

There are three ways to challenge PWSA's request to change its rates:

1. You can be a witness at a public input hearing. Public input hearings are held if the PUC opens an investigation of the utility's rate increase request and if there is a large number of customers interested in the case. At these hearings, you have the opportunity to present your views in person to the PUC judge hearing the case and to the PWSA representatives. All testimony given "under oath" becomes part of the official rate case record. These hearings are held in the service area of the utility.
2. You can send the PUC a letter telling why you object to the requested rate increase. At times there is information in these letters that makes the PUC aware of problems with the utility's service or management. This information can be helpful when the PUC investigates the rate request.
3. You can file a formal complaint. If you want a hearing before a judge, you must file a formal complaint. By filing a formal complaint, you assure yourself the opportunity to take part in hearings about the rate increase request. All complaints should be filed with the PUC before May 5, 2020. If no formal complaints are filed, the Commission may grant all, some or none of the request without holding a hearing before a judge. Send your letter or request for a formal complaint form to the Pennsylvania Public Utility Commission, Post Office Box 3265, Harrisburg, PA 17105-3265.

For more information, call the PUC's Bureau of Consumer Services at 1-800-692-7380. You may leave your name and address so you can be notified of any public input hearings that may be scheduled in this case. You may also contact the Pennsylvania Office of Consumer Advocate (OCA). The OCA represents the interests of consumers in cases before the PUC. You may contact the OCA with questions or requests for public input hearings at 1-800-684-6560 or by email at [consumer@paoca.org](mailto:consumer@paoca.org).

The Pittsburgh Water and Sewer Authority  
1200 Penn Avenue  
Pittsburgh, PA 15222  
412-255-2423

**TAB**

**3**

# PITTSBURGH WATER AND SEWER AUTHORITY

## STATEMENTS OF REVENUES, EXPENSES, AND CHANGES IN NET POSITION

*(Dollars expressed in thousands)*

YEARS ENDED DECEMBER 31, 2018 AND 2017

	2018	2017
<b>Operating Revenues:</b>		
Residential, commercial, and industrial water sales	\$ 159,506	\$ 128,488
Wastewater treatment	67,261	68,935
Other	4,967	5,573
Total operating revenues	231,734	202,996
<b>Operating Expenses:</b>		
Direct operating expenses	72,633	71,156
Wastewater treatment	71,822	75,107
Reimbursement for City of Pittsburgh services	4,911	5,363
Expense of water provided by other entities:		
Subsidy of customers located in the City	3,814	5,594
Depreciation	16,894	16,172
Total operating expenses	170,074	173,392
<b>Operating Income</b>	61,660	29,604
<b>Non-operating Revenues (Expenses):</b>		
Donated property	13,649	1,595
Interest revenue	469	460
Investment income (loss) - change in fair value of swap	2,542	835
Interest and amortization	(34,365)	(34,913)
Bond issuance costs	-	(3,894)
Total non-operating revenues (expenses)	(17,705)	(35,917)
<b>Special Item:</b>		
Private lead line replacement	(4,478)	-
<b>Net Income (Loss)</b>	39,477	(6,313)
<b>Net Position:</b>		
Beginning of year	(43,836)	(37,523)
End of year	\$ (4,359)	\$ (43,836)

The notes to financial statements are an integral part of this statement.

# PITTSBURGH WATER AND SEWER AUTHORITY

## STATEMENTS OF NET POSITION

*(Dollars expressed in thousands)*

DECEMBER 31, 2018 AND 2017

<b>Assets</b>	2018	2017
Current assets:		
Cash and cash equivalents	\$ 46,920	\$ 11,076
Accounts receivable, net:		
Water:		
Billed	8,537	9,335
Unbilled	8,583	6,760
Total water	17,120	16,095
Wastewater treatment:		
Billed	7,014	9,975
Unbilled	3,719	3,746
Total wastewater treatment	10,733	13,721
Other receivables	1,510	1,074
Total accounts receivable, net	29,363	30,890
Prepaid expenses	520	674
Inventory	1,984	3,777
Total current assets	78,787	46,417
Noncurrent assets:		
Restricted assets:		
Cash and cash equivalents	13,970	18,264
Investments	9,356	11,684
Total restricted assets	23,326	29,948
Hedging derivative - interest rate swap	4,750	-
Capital assets, not being depreciated	139,303	100,240
Capital assets, net of accumulated depreciation	618,177	589,567
Total noncurrent assets	785,556	719,755
<b>Total Assets</b>	<b>864,343</b>	<b>766,172</b>
<b>Deferred Outflows of Resources</b>		
Deferred charge on refunding	102,534	110,326
Accumulated decrease in fair value of hedging derivatives	757	3,279
<b>Total Deferred Outflows of Resources</b>	<b>103,291</b>	<b>113,605</b>

(Continued)

The notes to financial statements are an integral part of this statement.

# PITTSBURGH WATER AND SEWER AUTHORITY

## STATEMENTS OF NET POSITION

*(Dollars expressed in thousands)*

DECEMBER 31, 2018 AND 2017

(Continued)

	2018	2017
<b>Liabilities</b>		
<b>Current liabilities:</b>		
Bonds and loans payable	23,400	24,603
Accrued payroll and related obligations	1,373	1,217
Accounts payable wastewater treatment	19,349	17,863
Accounts payable and other accrued expenses	20,911	15,506
Accrued interest payable from restricted assets	4,629	3,773
Total current liabilities	69,662	62,962
<b>Noncurrent liabilities:</b>		
Unearned revenue	143	164
Accrued payroll and related obligations	558	594
Swap liability	13,254	18,319
Bonds and loans payable, net	883,626	841,574
Total noncurrent liabilities	897,581	860,651
<b>Total Liabilities</b>	967,243	923,613
<b>Deferred Inflows of Resources</b>		
Accumulated increase in fair value of hedging derivatives	4,750	~
<b>Net Position</b>		
Net investment in capital assets	(14,892)	(29,609)
Restricted	16,388	13,240
Unrestricted	(5,855)	(27,467)
<b>Total Net Position</b>	\$ (4,359)	\$ (43,836)

(Concluded)

The notes to financial statements are an integral part of this statement.



**Pittsburgh Water & Sewer Authority  
Rate Case 2020  
FPFTY Pro Forma Revenue at Current Rates**

	FY 2021			PUC Approved Prior Tariff Rates		FY 2021			
	Number of Meters	Number of Annual Bills	Billable Usage (Kgal) (1)	Monthly Min. Charge	Volume Charge (Kgal)	Min. Charge Revenue	Vol. Charge Revenue	DSIC (0%)	Total Rate Revenue
<b>1 Water Revenues</b>									
<b>2 Residential</b>									
3 5/8"	58,421	701,053	1,674,932	\$ 27.27	\$ 11.04	\$ 19,117,708	\$ 18,491,247	\$ -	\$ 37,608,955
4 3/4"	2,554	30,650	117,652	44.37	11.04	1,359,960	1,298,880	-	2,658,840
5 1"	2,374	28,486	129,813	89.82	11.04	2,558,583	1,433,131	-	3,991,714
6 1 1/2"	6	70	357	175.30	11.04	12,271	3,941	-	16,212
7 2"	1	12	271	289.14	11.04	3,470	2,994	-	6,464
8 Unmetered	333	3,996	-	44.36	-	177,263	-	-	177,263
9 <b>Total: Residential</b>	<b>63,689</b>	<b>764,267</b>	<b>1,923,025</b>			<b>\$ 23,229,254</b>	<b>\$ 21,230,193</b>	<b>\$ -</b>	<b>\$ 44,459,448</b>
<b>10 Residential - CAP</b>									
11 5/8"	2,912	34,947	89,721	\$ 6.82	\$ 11.04	\$ 238,254	\$ 990,519	\$ -	\$ 1,228,772
12 3/4"	27	319	471	11.09	11.04	3,534	5,203	-	8,737
14 1"	15	176	218	22.46	11.04	3,946	2,411	-	6,357
15 1 1/2"	-	-	-	43.83	11.04	-	-	-	-
16 Unmetered	1	12	-	11.09	-	133	-	-	133
17 <b>Total: Residential - CAP</b>	<b>2,954</b>	<b>35,454</b>	<b>90,411</b>			<b>\$ 245,866</b>	<b>\$ 998,133</b>	<b>\$ -</b>	<b>\$ 1,243,999</b>
<b>18 Commercial</b>									
19 5/8"	2,611	31,327	134,205	\$ 27.27	\$ 10.48	\$ 854,287	\$ 1,406,468	\$ -	\$ 2,260,755
20 3/4"	657	7,879	46,456	44.37	10.48	349,591	486,863	-	836,454
21 1"	1,313	15,750	145,255	89.82	10.48	1,414,665	1,522,272	-	2,936,937
22 1 1/2"	846	10,149	255,700	175.30	10.48	1,779,120	2,679,736	-	4,458,856
23 2"	784	9,412	445,159	289.14	10.48	2,721,386	4,665,269	-	7,386,654
24 3"	244	2,930	376,799	641.48	10.48	1,879,536	3,948,857	-	5,828,393
25 4"	182	2,189	619,597	1,084.28	10.48	2,373,489	6,493,373	-	8,866,862
26 6"	85	1,014	432,728	2,558.16	10.48	2,593,974	4,534,990	-	7,128,965
27 8"	8	93	164,828	4,596.96	10.48	427,517	1,727,397	-	2,154,915
28 10" & Above	-	-	-	7,515.81	10.48	-	-	-	-
29 Unmetered	2	24	-	88.26	-	2,118	-	-	2,118
30 <b>Total: Commercial</b>	<b>6,731</b>	<b>80,767</b>	<b>2,620,728</b>			<b>\$ 14,395,684</b>	<b>\$ 27,465,225</b>	<b>\$ -</b>	<b>\$ 41,860,908</b>
<b>31 Industrial</b>									
32 5/8"	21	257	1,630	\$ 27.27	\$ 8.81	\$ 7,008	\$ 14,360	\$ -	\$ 21,369
33 3/4"	13	161	335	44.37	8.81	7,144	2,947	-	10,091
34 1"	25	300	3,473	89.82	8.81	26,946	30,593	-	57,539
35 1 1/2"	6	72	295	175.30	8.81	12,622	2,595	-	15,216
36 2"	14	172	19,378	289.14	8.81	49,732	170,720	-	220,452
37 3"	2	24	17,070	641.48	8.81	15,396	150,382	-	165,778
38 4"	8	100	70,169	1,084.28	8.81	108,428	618,192	-	726,620
39 6"	2	24	43,986	2,558.16	8.81	61,396	387,512	-	448,908
40 8"	4	48	31,660	4,596.96	8.81	220,654	278,925	-	499,579
41 10" & Above	-	-	-	7,515.81	8.81	-	-	-	-
42 <b>Total: Industrial</b>	<b>97</b>	<b>1,158</b>	<b>187,994</b>			<b>\$ 509,325</b>	<b>\$ 1,656,226</b>	<b>\$ -</b>	<b>\$ 2,165,551</b>
<b>43 Health or Education</b>									
44 5/8"	34	408	1,496	\$ 27.27	\$ 14.32	\$ 11,126	\$ 21,424	\$ -	\$ 32,550
45 3/4"	8	101	526	44.37	14.32	4,481	7,525	-	12,007
46 1"	25	295	1,839	89.82	14.32	26,497	26,334	-	52,831
47 1 1/2"	64	773	8,033	175.30	14.32	135,507	115,030	-	250,537
48 2"	144	1,730	71,337	289.14	14.32	500,212	1,021,544	-	1,521,756
49 3"	96	1,156	150,774	641.48	14.32	741,551	2,159,079	-	2,900,630
50 4"	70	838	274,318	1,084.28	14.32	908,627	3,928,227	-	4,836,853
51 6"	37	444	412,589	2,558.16	14.32	1,135,823	5,908,277	-	7,044,100
52 8"	3	36	58,427	4,596.96	14.32	165,491	836,675	-	1,002,165
53 10" & Above	2	24	42,667	7,515.81	14.32	180,379	610,991	-	791,371
54 <b>Total: Health or Education</b>	<b>484</b>	<b>5,805</b>	<b>1,022,005</b>			<b>\$ 3,809,694</b>	<b>\$ 14,635,107</b>	<b>\$ -</b>	<b>\$ 18,444,801</b>
<b>55 Municipal</b>									
56 5/8"	15	180	1,057	\$ 10.91	\$ 4.19	\$ 1,963	\$ 4,429	\$ -	\$ 6,392
57 3/4"	5	60	193	17.75	4.19	1,065	809	-	1,874
58 1"	7	84	1,387	35.93	4.19	3,018	5,814	-	8,832
59 1 1/2"	24	288	1,464	70.12	4.19	20,195	6,135	-	26,330
60 2"	21	252	21,192	115.66	4.19	29,145	88,837	-	117,982
61 3"	2	24	666	256.59	4.19	6,158	2,790	-	8,948
62 4"	2	24	10,831	433.71	4.19	10,409	45,401	-	55,811
63 6"	2	24	184,806	1,023.26	4.19	24,558	774,705	-	799,263
64 8"	-	-	-	1,838.78	4.19	-	-	-	-
65 10" & Above	-	-	-	3,006.32	4.19	-	-	-	-
66 <b>Total: Municipal</b>	<b>78</b>	<b>936</b>	<b>221,594</b>			<b>\$ 96,512</b>	<b>\$ 928,920</b>	<b>\$ -</b>	<b>\$ 1,025,432</b>
<b>67 Private Fire System</b>									
68 1" or Less	1,195	14,343	5,789	\$ 31.60	\$ 13.49	\$ 453,239	\$ 78,094	\$ -	\$ 531,333
69 1 1/2"-3"	54	644	7,404	83.30	13.49	53,645	99,880	-	153,525
70 4"	5	60	80	177.57	13.49	10,654	1,079	-	11,733
71 6" or Greater	15	175	1,395	507.98	13.49	88,897	18,819	-	107,715
72 <b>Total: Private Fire System</b>	<b>1,269</b>	<b>15,222</b>	<b>14,668</b>			<b>\$ 606,435</b>	<b>\$ 197,872</b>	<b>\$ -</b>	<b>\$ 804,307</b>
<b>73 Public Fire (Hydrants)</b>	<b>7,475</b>	<b>89,700</b>	<b>-</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>
<b>74 Total: Water (Units &amp; Sales)</b>	<b>82,776</b>	<b>993,309</b>	<b>6,080,423</b>			<b>\$42,892,770</b>	<b>\$67,111,676</b>	<b>\$ -</b>	<b>\$110,004,446</b>

(1) Represents billable customer usage above minimum allowance included in minimum charge

**Pittsburgh Water & Sewer Authority  
Rate Case 2020  
Rate Revenue at Proposed Rates**

	FY 2021		Proposed Rates			FY 2021			
	Number of Meters	Number of Annual Bills	Billable Usage (Kgal) (1)	Monthly Min. Charge	Volume Charge (Kgal)	Min. Charge Revenue	Vol. Charge Revenue	DSIC (10%)	Total Rate Revenue
<b>1 Water Revenues</b>									
<b>2 Residential</b>									
3 5/8"	58,421	701,053	1,674,932	\$ 26.46	\$ 13.20	\$ 18,549,856	\$ 22,109,100	\$ 4,065,896	\$ 44,724,851
4 3/4"	2,554	30,650	117,652	45.46	13.20	1,393,369	1,553,009	294,638	3,241,015
5 1"	2,374	28,486	129,813	97.00	13.20	2,763,110	1,713,526	447,664	4,924,299
6 1 1/2"	6	70	357	191.99	13.20	13,439	4,712	1,815	19,967
7 2"	1	12	271	319.53	13.20	3,834	3,580	741	8,156
8 Unmetered	333	3,996	-	66.06	-	263,976	-	26,398	290,373
9 <b>Total: Residential</b>	<b>63,689</b>	<b>764,267</b>	<b>1,923,025</b>			<b>\$ 22,987,584</b>	<b>\$ 25,383,927</b>	<b>\$ 4,837,151</b>	<b>\$ 53,208,662</b>
<b>11 Residential - CAP</b>									
12 5/8"	2,912	34,947	89,721	\$ -	\$ 13.20	\$ -	\$ 1,184,316	\$ 118,432	\$ 1,302,747
13 3/4"	27	319	471	-	13.20	-	6,221	622	6,843
14 1"	15	176	218	-	13.20	-	2,883	288	3,171
15 1 1/2"	-	-	-	-	13.20	-	-	-	-
16 Unmetered	1	12	-	26.40	-	317	-	32	348
17 <b>Total: Residential - CAP</b>	<b>2,954</b>	<b>35,454</b>	<b>90,411</b>			<b>\$ 317</b>	<b>\$ 1,193,420</b>	<b>\$ 119,374</b>	<b>\$ 1,313,110</b>
<b>19 Commercial</b>									
20 5/8"	2,611	31,327	134,205	\$ 26.46	\$ 14.01	\$ 828,912	\$ 1,880,211	\$ 270,912	\$ 2,980,036
21 3/4"	657	7,879	46,456	45.46	14.01	358,179	650,854	100,903	1,109,936
22 1"	1,313	15,750	145,255	97.00	14.01	1,527,750	2,035,021	356,277	3,919,049
23 1 1/2"	846	10,149	255,700	191.99	14.01	1,948,507	3,582,357	553,086	6,083,950
24 2"	784	9,412	445,159	319.53	14.01	3,007,416	6,236,681	924,410	10,168,507
25 3"	244	2,930	376,799	718.29	14.01	2,104,590	5,278,959	738,355	8,121,903
26 4"	182	2,189	619,597	1,222.73	14.01	2,676,556	8,680,549	1,135,711	12,492,816
27 6"	85	1,014	432,728	2,917.29	14.01	2,958,132	6,062,520	902,065	9,922,718
28 8"	8	93	164,828	5,275.69	14.01	490,639	2,309,240	279,988	3,079,867
29 10" & Above	-	-	-	8,676.97	14.01	-	-	-	-
30 Unmetered	2	24	-	82.50	14.01	1,980	-	198	2,178
31 <b>Total: Commercial</b>	<b>6,731</b>	<b>80,767</b>	<b>2,620,728</b>			<b>\$ 15,902,662</b>	<b>\$ 36,716,393</b>	<b>\$ 5,261,905</b>	<b>\$ 57,880,960</b>
<b>33 Industrial</b>									
34 5/8"	21	257	1,630	\$ 26.46	\$ 12.30	\$ 6,800	\$ 20,049	\$ 2,685	\$ 29,534
35 3/4"	13	161	335	45.46	12.30	7,319	4,114	1,143	12,577
36 1"	25	300	3,473	97.00	12.30	29,100	42,713	7,181	78,994
37 1 1/2"	6	72	295	191.99	12.30	13,823	3,622	1,745	19,190
38 2"	14	172	19,378	319.53	12.30	54,959	238,349	29,331	322,639
39 3"	2	24	17,070	718.29	12.30	17,239	209,955	22,719	249,913
40 4"	8	100	70,169	1,222.73	12.30	122,273	863,083	98,536	1,083,891
41 6"	2	24	43,986	2,917.29	12.30	70,015	541,022	61,104	672,140
42 8"	4	48	31,660	5,275.69	12.30	253,233	389,418	64,265	706,916
43 10" & Above	-	-	-	8,676.97	12.30	-	-	-	-
44 <b>Total: Industrial</b>	<b>97</b>	<b>1,158</b>	<b>187,994</b>			<b>\$ 574,762</b>	<b>\$ 2,312,325</b>	<b>\$ 288,709</b>	<b>\$ 3,175,796</b>
<b>46 Health or Education</b>									
47 5/8"	34	408	1,496	\$ 26.46	\$ 14.98	\$ 10,796	\$ 22,412	\$ 3,321	\$ 36,528
48 3/4"	8	101	526	45.46	14.98	4,591	7,872	1,246	13,710
49 1"	25	295	1,839	97.00	14.98	28,615	27,548	5,616	61,780
50 1 1/2"	64	773	8,033	191.99	14.98	148,408	120,332	26,874	295,614
51 2"	144	1,730	71,337	319.53	14.98	552,787	1,068,626	162,141	1,783,555
52 3"	96	1,156	150,774	718.29	14.98	830,343	2,258,590	308,893	3,397,826
53 4"	70	838	274,318	1,222.73	14.98	1,024,648	4,109,276	513,392	5,647,316
54 6"	37	444	412,589	2,917.29	14.98	1,295,277	6,180,586	747,586	8,223,449
55 8"	3	36	58,427	5,275.69	14.98	189,925	875,236	106,516	1,171,677
56 10" & Above	2	24	42,667	8,676.97	14.98	208,247	639,152	84,740	932,139
57 <b>Total: Health or Education</b>	<b>484</b>	<b>5,805</b>	<b>1,022,005</b>			<b>\$ 4,293,637</b>	<b>\$ 15,309,630</b>	<b>\$ 1,960,327</b>	<b>\$ 21,563,594</b>
<b>59 Municipal</b>									
60 5/8"	15	180	1,057	\$ 10.58	\$ 5.60	\$ 1,905	\$ 5,921	\$ 783	\$ 8,608
61 3/4"	5	60	193	18.18	5.60	1,091	1,082	217	2,390
62 1"	7	84	1,387	38.80	5.60	3,259	7,773	1,103	12,135
63 1 1/2"	24	288	1,464	76.80	5.60	22,117	8,201	3,032	33,351
64 2"	21	252	21,192	127.81	5.60	32,209	118,760	15,097	166,065
65 3"	2	24	666	287.32	5.60	6,896	3,729	1,063	11,688
66 4"	2	24	10,831	489.09	5.60	11,738	60,694	7,243	79,676
67 6"	2	24	184,806	1,166.92	5.60	28,006	1,035,650	106,366	1,170,022
68 8"	-	-	-	2,110.28	5.60	-	-	-	-
69 10" & Above	-	-	-	3,470.79	5.60	-	-	-	-
70 <b>Total: Municipal</b>	<b>78</b>	<b>936</b>	<b>221,594</b>			<b>\$ 107,221</b>	<b>\$ 1,241,810</b>	<b>\$ 134,903</b>	<b>\$ 1,483,934</b>
<b>72 Private Fire System</b>									
73 1" or Less	1,195	14,343	5,789	\$ 32.35	\$ 19.77	\$ 463,996	\$ 114,449	\$ 57,844	\$ 636,289
74 1 1/2"-3"	54	644	7,404	99.12	19.77	63,833	146,377	21,021	231,231
75 4"	5	60	80	305.51	19.77	18,331	1,582	1,991	21,903
76 6" or Greater	15	175	1,395	609.02	19.77	106,579	27,580	13,416	147,574
77 <b>Total: Private Fire System</b>	<b>1,269</b>	<b>15,222</b>	<b>14,668</b>			<b>\$ 652,738</b>	<b>\$ 289,987</b>	<b>\$ 94,273</b>	<b>\$ 1,036,998</b>
78 Public Fire (Hydrants)	7,475	89,700	-	\$ 6.09	\$ -	\$ 546,273	\$ -	\$ -	\$ 546,273
<b>81 Total: Water (Units &amp; Sales)</b>	<b>82,776</b>	<b>993,309</b>	<b>6,080,423</b>			<b>\$45,065,194</b>	<b>\$82,447,491</b>	<b>\$12,696,641</b>	<b>\$140,209,326</b>

(1) Represents billable customer usage above minimum allowance included in minimum charge

**Pittsburgh Water & Sewer Authority  
Rate Case 2020  
Rate Revenue at Current Rates**

	FY 2021			PUC Approved Prior Tariff Rates		FY 2021			
	Number of Meters	Number of Annual Bills	Billable Usage (Kgal) (1)	Monthly Min. Charge	Volume Charge (Kgal)	Min. Charge Revenue	Vol. Charge Revenue	DSIC (0%)	Total Rate Revenue
<b>1 Wastewater Revenues</b>									
<b>2 Residential</b>									
3 5/8"	80,215	962,582	1,708,112	\$ 8.28	\$ 7.43	\$ 7,970,179	\$ 12,691,275	\$ -	\$ 20,661,454
4 3/4"	2,581	30,973	117,594	16.77	7.43	519,422	873,727	-	1,393,149
5 1"	2,394	28,727	130,365	39.82	7.43	1,143,896	968,614	-	2,112,510
6 1 1/2"	6	70	357	82.24	7.43	5,757	2,653	-	8,409
7 2"	1	12	271	139.23	7.43	1,671	2,015	-	3,686
8 Unmetered	333	3,996	-	25.99	-	103,856	-	-	103,856
9 <b>Total: Residential</b>	<b>85,530</b>	<b>1,026,360</b>	<b>1,956,700</b>			<b>\$ 9,744,781</b>	<b>\$ 14,538,283</b>	<b>\$ -</b>	<b>\$ 24,283,064</b>
<b>10 Residential - CAP</b>									
12 5/8"	4,456	53,466	93,943	\$ 2.07	\$ 7.43	\$ 110,675	\$ 697,995	\$ -	\$ 808,671
13 3/4"	30	358	586	4.19	7.43	1,501	4,356	-	5,857
14 1"	15	176	218	9.96	7.43	1,749	1,623	-	3,372
15 Unmetered	1	12	-	6.50	-	78	-	-	78
16 <b>Total: Residential - CAP</b>	<b>4,501</b>	<b>54,012</b>	<b>94,748</b>			<b>\$ 114,003</b>	<b>\$ 703,975</b>	<b>\$ -</b>	<b>\$ 817,978</b>
<b>17 Commercial</b>									
19 5/8"	3,621	43,455	133,806	\$ 8.28	\$ 6.56	\$ 359,807	\$ 877,770	\$ -	\$ 1,237,577
20 3/4"	774	9,293	47,643	16.77	6.56	155,844	312,538	-	468,382
21 1"	1,559	18,706	151,552	39.82	6.56	744,873	994,179	-	1,739,052
22 1 1/2"	885	10,614	258,739	82.24	6.56	872,895	1,697,326	-	2,570,221
23 2"	878	10,534	462,397	139.23	6.56	1,466,649	3,033,321	-	4,499,970
24 3"	243	2,911	376,242	317.57	6.56	924,446	2,468,144	-	3,392,591
25 4"	199	2,383	627,358	543.31	6.56	1,294,708	4,115,466	-	5,410,174
26 6"	100	1,205	435,244	1,302.21	6.56	1,569,163	2,855,200	-	4,424,363
27 8"	9	103	171,501	2,358.93	6.56	242,970	1,125,047	-	1,368,016
28 10" & Above	-	-	-	3,883.88	6.56	-	-	-	-
29 Unmetered	2	24	-	52.47	-	1,259	-	-	1,259
30 <b>Total: Commercial</b>	<b>8,269</b>	<b>99,228</b>	<b>2,664,480</b>			<b>\$ 7,632,614</b>	<b>\$ 17,478,992</b>	<b>\$ -</b>	<b>\$ 25,111,606</b>
<b>31 Industrial</b>									
33 5/8"	20	245	1,626	\$ 8.28	\$ 5.98	\$ 2,029	\$ 9,720	\$ -	\$ 11,749
34 3/4"	12	149	335	16.77	5.98	2,499	2,000	-	4,499
35 1"	25	300	3,473	39.82	5.98	11,946	20,766	-	32,712
36 1 1/2"	6	72	295	82.24	5.98	5,921	1,761	-	7,682
37 2"	16	196	19,704	139.23	5.98	27,289	117,828	-	145,118
38 3"	2	24	17,070	317.57	5.98	7,622	102,076	-	109,697
39 4"	9	112	70,643	543.31	5.98	60,851	422,448	-	483,299
40 6"	2	24	43,986	1,302.21	5.98	31,253	263,033	-	294,286
41 8"	4	48	31,660	2,358.93	5.98	113,229	189,327	-	302,555
42 10" & Above	-	-	-	3,883.88	5.98	-	-	-	-
43 <b>Total: Industrial</b>	<b>98</b>	<b>1,170</b>	<b>188,789</b>			<b>\$ 262,638</b>	<b>\$ 1,128,960</b>	<b>\$ -</b>	<b>\$ 1,391,598</b>
<b>44 Health or Education</b>									
46 5/8"	34	408	1,496	\$ 8.28	\$ 8.21	\$ 3,378	\$ 12,283	\$ -	\$ 15,661
47 3/4"	8	101	526	16.77	8.21	1,694	4,314	-	6,008
48 1"	25	295	1,839	39.82	8.21	11,747	15,098	-	26,845
49 1 1/2"	64	773	8,033	82.24	8.21	63,572	65,950	-	129,521
50 2"	144	1,730	71,337	139.23	8.21	240,868	585,676	-	826,544
51 3"	96	1,156	150,768	317.57	8.21	367,111	1,237,803	-	1,604,913
52 4"	70	838	274,318	543.31	8.21	455,294	2,252,147	-	2,707,440
53 6"	37	444	412,735	1,302.21	8.21	578,181	3,388,556	-	3,966,737
54 8"	3	36	58,427	2,358.93	8.21	84,921	479,686	-	564,607
55 10" & Above	2	24	42,667	3,883.88	8.21	93,213	350,296	-	443,509
56 <b>Total: Health or Education</b>	<b>484</b>	<b>5,805</b>	<b>1,022,145</b>			<b>\$ 1,899,979</b>	<b>\$ 8,391,808</b>	<b>\$ -</b>	<b>\$ 10,291,786</b>
<b>57 Municipal</b>									
59 5/8"	21	252	1,695	\$ 3.31	\$ 2.62	\$ 835	\$ 4,447	\$ -	\$ 5,281
60 3/4"	5	60	193	6.71	2.62	402	506	-	909
61 1"	7	84	1,387	15.93	2.62	1,338	3,639	-	4,977
62 1 1/2"	24	288	1,464	32.90	2.62	9,474	3,840	-	13,314
63 2"	21	252	21,192	55.69	2.62	14,034	55,608	-	69,642
64 3"	2	24	666	127.03	2.62	3,049	1,746	-	4,795
65 4"	2	24	10,831	217.32	2.62	5,216	28,419	-	33,635
66 6"	2	24	184,806	520.88	2.62	12,501	484,930	-	497,431
67 8"	-	-	-	943.57	2.62	-	-	-	-
68 10" & Above	-	-	-	1,553.55	2.62	-	-	-	-
69 <b>Total: Municipal</b>	<b>84</b>	<b>1,008</b>	<b>222,232</b>			<b>\$ 46,849</b>	<b>\$ 583,136</b>	<b>\$ -</b>	<b>\$ 629,985</b>
<b>70 Total: Wastewater (Units &amp; Sales)</b>	<b>98,965</b>	<b>1,187,583</b>	<b>6,149,094</b>			<b>\$19,700,864</b>	<b>\$42,825,153</b>	<b>\$ -</b>	<b>\$ 62,526,017</b>

(1) Represents billable customer usage above minimum allowance included in minimum charge

**Pittsburgh Water & Sewer Authority  
Rate Case 2020  
Rate Revenue at Proposed Rates**

	FY 2021			Proposed Rates		FY 2021			
	Number of Meters	Number of Annual Bills	Billable Usage (Kgal) (1)	Monthly Min. Charge	Volume Charge (Kgal)	Min. Charge Revenue	Vol. Charge Revenue	DSIC (10%)	Total Rate Revenue
<b>1 Wastewater Revenues</b>									
<b>2 Residential</b>									
3 5/8"	80,215	962,582	1,708,112	\$ 9.86	\$ 7.87	\$ 9,491,059	\$ 13,442,844	\$ 2,293,390	\$ 25,227,293
4 3/4"	2,581	30,973	117,594	17.64	7.87	546,369	925,469	147,184	1,619,022
5 1"	2,394	28,727	130,365	40.71	7.87	1,169,463	1,025,975	219,544	2,414,981
6 1 1/2"	6	70	357	79.62	7.87	5,573	2,810	838	9,221
7 2"	1	12	271	133.81	7.87	1,606	2,134	374	4,114
8 Unmetered	333	3,996	-	33.47	-	133,746	-	13,375	147,121
9 <b>Total: Residential</b>	<b>85,530</b>	<b>1,026,360</b>	<b>1,956,700</b>			<b>\$ 11,347,816</b>	<b>\$ 15,399,231</b>	<b>\$ 2,674,705</b>	<b>\$ 29,421,752</b>
10									
<b>11 Residential - CAP</b>									
12 5/8"	4,456	53,466	93,943	\$ -	\$ 7.87	\$ -	\$ 739,330	\$ 73,933	\$ 813,263
13 3/4"	30	358	586	-	7.87	-	4,614	461	5,076
14 1"	15	176	218	-	7.87	-	1,719	172	1,891
15 Unmetered	1	12	-	15.74	-	189	-	19	208
16 <b>Total: Residential - CAP</b>	<b>4,501</b>	<b>54,012</b>	<b>94,748</b>			<b>\$ 189</b>	<b>\$ 745,663</b>	<b>\$ 74,585</b>	<b>\$ 820,438</b>
17									
<b>18 Commercial</b>									
19 5/8"	3,621	43,455	133,806	\$ 9.86	\$ 7.95	\$ 428,466	\$ 1,063,761	\$ 149,223	\$ 1,641,450
20 3/4"	774	9,293	47,643	17.64	7.95	163,929	378,762	54,269	596,960
21 1"	1,559	18,706	151,552	40.71	7.95	761,521	1,204,836	196,636	2,162,993
22 1 1/2"	885	10,614	258,739	79.62	7.95	845,087	2,056,972	290,206	3,192,265
23 2"	878	10,534	462,397	133.81	7.95	1,409,555	3,676,052	508,561	5,594,168
24 3"	243	2,911	376,242	310.89	7.95	905,001	2,991,120	389,612	4,285,733
25 4"	199	2,383	627,358	541.10	7.95	1,289,441	4,987,493	627,693	6,904,628
26 6"	100	1,205	435,244	1,343.35	7.95	1,618,737	3,460,189	507,893	5,586,818
27 8"	9	103	171,501	2,486.36	7.95	256,095	1,363,433	161,953	1,781,481
28 10" & Above	-	-	-	4,180.49	7.95	-	-	-	-
29 Unmetered	2	24	-	41.66	7.95	1,000	-	100	1,100
30 <b>Total: Commercial</b>	<b>8,269</b>	<b>99,228</b>	<b>2,664,480</b>			<b>\$ 7,678,831</b>	<b>\$ 21,182,619</b>	<b>\$ 2,886,145</b>	<b>\$ 31,747,596</b>
31									
<b>32 Industrial</b>									
33 5/8"	20	245	1,626	\$ 9.86	\$ 7.98	\$ 2,416	\$ 12,971	\$ 1,539	\$ 16,926
34 3/4"	12	149	335	17.64	7.98	2,628	2,669	530	5,827
35 1"	25	300	3,473	40.71	7.98	12,213	27,711	3,992	43,917
36 1 1/2"	6	72	295	79.62	7.98	5,733	2,350	808	8,891
37 2"	16	196	19,704	133.81	7.98	26,227	157,236	18,346	201,809
38 3"	2	24	17,070	310.89	7.98	7,461	136,215	14,368	158,044
39 4"	9	112	70,643	541.10	7.98	60,603	563,735	62,434	686,772
40 6"	2	24	43,986	1,343.35	7.98	32,240	351,004	38,324	421,569
41 8"	4	48	31,660	2,486.36	7.98	119,345	252,647	37,199	409,191
42 10" & Above	-	-	-	4,180.49	7.98	-	-	-	-
43 <b>Total: Industrial</b>	<b>98</b>	<b>1,170</b>	<b>188,789</b>			<b>\$ 268,867</b>	<b>\$ 1,506,539</b>	<b>\$ 177,541</b>	<b>\$ 1,952,946</b>
44									
<b>45 Health or Education</b>									
46 5/8"	34	408	1,496	\$ 9.86	\$ 8.26	\$ 4,023	\$ 12,358	\$ 1,638	\$ 18,019
47 3/4"	8	101	526	17.64	8.26	1,782	4,341	612	6,734
48 1"	25	295	1,839	40.71	8.26	12,009	15,190	2,720	29,920
49 1 1/2"	64	773	8,033	79.62	8.26	61,546	66,351	12,790	140,687
50 2"	144	1,730	71,337	133.81	8.26	231,491	589,243	82,073	902,807
51 3"	96	1,156	150,768	310.89	8.26	359,389	1,245,341	160,473	1,765,203
52 4"	70	838	274,318	541.10	8.26	453,442	2,265,863	271,930	2,991,235
53 6"	37	444	412,735	1,343.35	8.26	596,447	3,409,193	400,564	4,406,204
54 8"	3	36	58,427	2,486.36	8.26	89,509	482,607	57,212	629,328
55 10" & Above	2	24	42,667	4,180.49	8.26	100,332	352,429	45,276	498,037
56 <b>Total: Health or Education</b>	<b>484</b>	<b>5,805</b>	<b>1,022,145</b>			<b>\$ 1,909,970</b>	<b>\$ 8,442,915</b>	<b>\$ 1,035,289</b>	<b>\$ 11,388,174</b>
57									
<b>58 Municipal</b>									
59 5/8"	21	252	1,695	\$ 3.94	\$ 3.18	\$ 994	\$ 5,389	\$ 638	\$ 7,021
60 3/4"	5	60	193	7.06	3.18	423	614	104	1,141
61 1"	7	84	1,387	16.28	3.18	1,368	4,411	578	6,356
62 1 1/2"	24	288	1,464	31.85	3.18	9,172	4,654	1,383	15,209
63 2"	21	252	21,192	53.52	3.18	13,488	67,391	8,088	88,966
64 3"	2	24	666	124.36	3.18	2,985	2,116	510	5,611
65 4"	2	24	10,831	216.44	3.18	5,195	34,441	3,964	43,599
66 6"	2	24	184,806	537.34	3.18	12,896	587,681	60,058	660,635
67 8"	-	-	-	994.54	3.18	-	-	-	-
68 10" & Above	-	-	-	1,672.20	3.18	-	-	-	-
69 <b>Total: Municipal</b>	<b>84</b>	<b>1,008</b>	<b>222,232</b>			<b>\$ 46,521</b>	<b>\$ 706,697</b>	<b>\$ 75,322</b>	<b>\$ 828,539</b>
70									
<b>71 Total: Wastewater (Units &amp; Sales)</b>	<b>98,965</b>	<b>1,187,583</b>	<b>6,149,094</b>			<b>\$21,252,193</b>	<b>\$47,983,664</b>	<b>\$ 6,923,586</b>	<b>\$ 76,159,444</b>

(1) Represents billable customer usage above minimum allowance included in minimum charge

**Pittsburgh Water & Sewer Authority**  
**Utility Plant in Service**  
**As of December 31, 2018**

<u>Description</u>	<u>Department</u>	<u>GL Account</u>	<u>2018</u> <i>Beginning</i> <i>Balance</i>	<i>Additions</i>	<u>2018</u> <i>Ending</i> <i>Balance</i>
<b>General Water</b>					
Utility - Machine - Equipment	300	1803	\$ 3,354,458	\$ -	\$ 3,354,458
<b>Water Quality</b>					
Utility - Building	321	1802	644,181	-	644,181
Utility - Machine - Equipment	321	1803	610,423	-	610,423
Utility - Computer Equipment	321	1805	8,817	-	8,817
Utility - Vehicles	321	1806	12,030	48,400	60,430
Utility - Miscellaneous	321	1807	145,378	-	145,378
<i>Subtotal: Water Quality</i>			1,420,829	48,400	1,469,229
<b>Water Quality</b>					
Utility - Building	322	1802	1,493,548	-	1,493,548
Utility - Machine - Equipment	322	1803	52,907,822	-	52,907,822
Utility - Computer Equipment	322	1805	2,693,415	93,191	2,786,606
Utility - Vehicles	322	1806	1,107,667	248,889	1,356,556
Utility - Miscellaneous	322	1807	7,723,900	-	7,723,900
<i>Subtotal: Water Quality</i>			65,926,352	342,079	66,268,431
<b>Pumping</b>					
Utility - Building	323	1802	90,054,199	-	90,054,199
Utility - Computer Equipment	323	1805	49,092	-	49,092
Utility - Miscellaneous	323	1807	21,899	-	21,899
<i>Subtotal: Pumping</i>			90,125,190	-	90,125,190
<b>Membrane Plant</b>					
Utility - Building	324	1802	20,355,348	-	20,355,348
<b>Distribution</b>					
Utility - Building	325	1802	238,896,289	20,709,945	259,606,235
Utility - Machine - Equipment	325	1803	39,602,868	257,600	39,860,467
Utility - Furniture - Fixtures	325	1804	7,500	-	7,500
Utility - Vehicles	325	1806	2,649,435	525,214	3,174,648
Utility - Miscellaneous	325	1807	12,311,149	-	12,311,149
Non-Utility - Building	325	1822	2,950	-	2,950
<i>Subtotal: Distribution</i>			293,470,190	21,492,759	314,962,949
<b>Sewer Operations</b>					
Utility - Building	424	1802	349,750,317	21,766,851	371,517,169
Utility - Machine - Equipment	424	1803	41,803,114	-	41,803,114
Utility - Furniture - Fixtures	424	1804	757	-	757
Utility - Computer Equipment	424	1805	980,644	-	980,644
Utility - Vehicles	424	1806	3,390,646	752,060	4,142,706
Utility - Miscellaneous	424	1807	4,986,808	-	4,986,808
<i>Subtotal: Sewer Operations</i>			400,912,287	22,518,912	423,431,199
<b>Sewer Miscellaneous</b>					
Utility - Miscellaneous	425	1807	30,744	-	30,744

**Pittsburgh Water & Sewer Authority**  
**Utility Plant in Service**  
**As of December 31, 2018**

<u>Description</u>	<u>Department</u>	<u>GL Account</u>	<u>2018</u> <i>Beginning</i> <i>Balance</i>	<i>Additions</i>	<u>2018</u> <i>Ending</i> <i>Balance</i>
<b>Other Miscellaneous</b>					
Non-Utility - Furniture - Fixtures	800	1824	30	-	30
Utility - Computer Equipment	900	1805	3,477	-	3,477
Non-Utility - Computer Equipment	900	1825	935,436	-	935,436
<i>Subtotal: Other Miscellaneous</i>			938,942	-	938,942
<b>Executive Director</b>					
Non-Utility - Building	910	1822	853,138	-	853,138
Non-Utility - Furniture - Fixtures	910	1824	74,490	-	74,490
Non-Utility - Vehicles	910	1826	25,864	-	25,864
<i>Subtotal: Executive Director</i>			953,493	-	953,493
<b>Customer Service</b>					
Non-Utility - Furniture - Fixtures	911	1824	165,426	-	165,426
Non-Utility - Computer Equipment	911	1825	2,615,144	614,876	3,230,020
Non-Utility - Miscellaneous	911	1827	9,472	-	9,472
<i>Subtotal: Customer Service</i>			2,790,042	614,876	3,404,918
<b>Management Information Systems</b>					
Non-Utility - Furniture - Fixtures	912	1824	8,773	-	8,773
Non-Utility - Computer Equipment	912	1825	11,479,797	347,096	11,826,893
Non-Utility - Miscellaneous	912	1827	63,345	-	63,345
<i>Subtotal: Management Information Systems</i>			11,551,915	347,096	11,899,011
<b>Finance</b>					
Non-Utility - Furniture - Fixtures	913	1824	50,129	23,343	73,472
Non-Utility - Computer Equipment	913	1825	6,142	-	6,142
<i>Subtotal: Finance</i>			56,271	23,343	79,614
<b>Warehouse</b>					
Utility - Machine - Equipment	918	1803	1,115	-	1,115
Non-Utility - Furniture - Fixtures	918	1824	35,332	-	35,332
Non-Utility - Computer Equipment	918	1825	33,455	-	33,455
Non-Utility - Vehicles	918	1826	173,808	-	173,808
Non-Utility - Miscellaneous	918	1827	3,937,558	-	3,937,558
<i>Subtotal: Warehouse</i>			4,181,267	-	4,181,267
<b>Engineering</b>					
Non-Utility - Building	930	1822	367,490	-	367,490
Non-Utility - Furniture - Fixtures	930	1824	207,933	116,569	324,502
Non-Utility - Computer Equipment	930	1825	1,397,849	-	1,397,849
Non-Utility - Vehicles	930	1826	53,895	-	53,895
Non-Utility - Miscellaneous	930	1827	218,241	-	218,241
<i>Subtotal: Engineering</i>			2,245,408	116,569	2,361,976
<i>Total: Fixed Assets</i>			\$ 898,312,735	\$ 45,504,033	\$ 943,816,768
<b>Other Assets</b>					
Construction in Progress		1840	\$ 91,503,027	\$ 36,128,959	\$ 127,631,985
Capitalized Interest		1841	7,429,145	(8,052)	7,421,093
CIP Accrual		1842	4,870,954	3,003,980	7,874,934
<b>Total Utility Plant</b>			<b>\$ 1,002,115,861</b>	<b>\$ 84,628,920</b>	<b>\$ 1,086,744,780</b>

**Pittsburgh Water & Sewer Authority**  
**Depreciation by PWSA Department & Code**  
**As of December 31, 2018**

<u>Description</u>	<u>Department</u>	<u>GL Account</u>	<u>2018</u> <i>Beginning</i> <i>Balance</i>	<i>Depreciation</i>	<u>2018</u> <i>Ending</i> <i>Balance</i>
<b><u>General Water</u></b>					
Utility - Machine - Equipment	300	1813	\$ -	\$ -	\$ -
<b><u>Water Quality</u></b>					
Utility - Building	321	1812	(644,181)	-	(644,181)
Utility - Machine - Equipment	321	1813	(462,442)	(18,896)	(481,338)
Utility - Computer Equipment	321	1815	(8,857)	(240)	(9,097)
Utility - Vehicles	321	1816	(12,030)	(13)	(12,043)
Utility - Miscellaneous	321	1817	(35,465)	(13,923)	(49,389)
<i>Subtotal: Water Quality</i>			(1,162,975)	(33,072)	(1,196,048)
<b><u>Water Quality</u></b>					
Utility - Building	322	1812	(559,174)	(27,348)	(586,522)
Utility - Machine - Equipment	322	1813	(23,233,896)	(1,120,922)	(24,354,818)
Utility - Computer Equipment	322	1815	(437,724)	(451,068)	(888,792)
Utility - Vehicles	322	1816	(1,107,667)	(68)	(1,107,735)
Utility - Miscellaneous	322	1817	(2,745,927)	(181,886)	(2,927,813)
<i>Subtotal: Water Quality</i>			(28,084,389)	(1,781,292)	(29,865,680)
<b><u>Pumping</u></b>					
Utility - Building	323	1812	(41,815,482)	(1,942,719)	(43,758,201)
Utility - Computer Equipment	323	1815	(16,718)	(2,293)	(19,012)
Utility - Miscellaneous	323	1817	(21,899)	-	(21,899)
<i>Subtotal: Pumping</i>			(41,854,099)	(1,945,012)	(43,799,111)
<b><u>Membrane Plant</u></b>					
Utility - Building	324	1812	(6,347,713)	(380,172)	(6,727,885)
<b><u>Distribution</u></b>					
Utility - Building	325	1812	(64,738,753)	(3,574,563)	(68,313,315)
Utility - Machine - Equipment	325	1813	(21,064,425)	(1,406,098)	(22,470,522)
Utility - Furniture - Fixtures	325	1814	(7,500)	-	(7,500)
Utility - Vehicles	325	1816	(1,801,720)	(123,231)	(1,924,951)
Utility - Miscellaneous	325	1817	(5,624,747)	(220,462)	(5,845,208)
Non-Utility - Building	325	1832	-	-	-
<i>Subtotal: Distribution</i>			(93,237,144)	(5,324,353)	(98,561,497)
<b><u>Sewer Operations</u></b>					
Utility - Building	424	1812	(95,677,680)	(5,973,369)	(101,651,050)
Utility - Machine - Equipment	424	1813	(19,167,644)	(647,530)	(19,815,174)
Utility - Furniture - Fixtures	424	1814	(757)	-	(757)
Utility - Computer Equipment	424	1815	(978,693)	(74)	(978,767)
Utility - Vehicles	424	1816	(2,658,791)	(133,427)	(2,792,219)
Utility - Miscellaneous	424	1817	(2,335,111)	(185,456)	(2,520,568)
<i>Subtotal: Sewer Operations</i>			(120,818,677)	(6,939,857)	(127,758,534)
<b><u>Sewer Miscellaneous</u></b>					
Utility - Miscellaneous	425	1817	(30,744)	-	(30,744)
<b><u>Other Miscellaneous</u></b>					
Non-Utility - Furniture - Fixtures	800	1834	-	-	-
Utility - Computer Equipment	900	1815	-	-	-

**Pittsburgh Water & Sewer Authority**  
**Depreciation by PWSA Department & Code**  
**As of December 31, 2018**

<u>Description</u>	<u>Department</u>	<u>GL Account</u>	<u>2018</u> <i>Beginning</i> <i>Balance</i>	<i>Depreciation</i>	<u>2018</u> <i>Ending</i> <i>Balance</i>
Non-Utility - Computer Equipment	900	1835	-	-	-
<i>Subtotal: Other Miscellaneous</i>			-	-	-
<b><u>Executive Director</u></b>					
Non-Utility - Building	910	1832	(217,738)	(19,695)	(237,434)
Non-Utility - Furniture - Fixtures	910	1834	(74,490)	-	(74,490)
Non-Utility - Vehicles	910	1836	(25,864)	-	(25,864)
<i>Subtotal: Executive Director</i>			(318,093)	(19,695)	(337,788)
<b><u>Customer Service</u></b>					
Non-Utility - Furniture - Fixtures	911	1834	(136,641)	(4,797)	(141,439)
Non-Utility - Computer Equipment	911	1835	(2,454,507)	(21,733)	(2,476,240)
Non-Utility - Miscellaneous	911	1837	(9,472)	-	(9,472)
<i>Subtotal: Customer Service</i>			(2,600,620)	(26,531)	(2,627,151)
<b><u>Management Information Systems</u></b>					
Non-Utility - Furniture - Fixtures	912	1834	(8,773)	-	(8,773)
Non-Utility - Computer Equipment	912	1835	(9,803,425)	(274,048)	(10,077,473)
Non-Utility - Miscellaneous	912	1837	(54,956)	(2,097)	(57,053)
<i>Subtotal: Management Information Systems</i>			(9,867,154)	(276,145)	(10,143,299)
<b><u>Finance</u></b>					
Non-Utility - Furniture - Fixtures	913	1834	(50,129)	(9)	(50,139)
Non-Utility - Computer Equipment	913	1835	(6,142)	-	(6,142)
<i>Subtotal: Finance</i>			(56,271)	(9)	(56,280)
<b><u>Warehouse</u></b>					
Utility - Machine - Equipment	918	1813	-	-	-
Non-Utility - Furniture - Fixtures	918	1834	(35,062)	(270)	(35,332)
Non-Utility - Computer Equipment	918	1835	(33,455)	-	(33,455)
Non-Utility - Vehicles	918	1836	(173,808)	-	(173,808)
Non-Utility - Miscellaneous	918	1837	(2,239,489)	(72,829)	(2,312,318)
<i>Subtotal: Warehouse</i>			(2,481,814)	(73,099)	(2,554,912)
<b><u>Engineering</u></b>					
Non-Utility - Building	930	1832	(205,106)	(6,468)	(211,574)
Non-Utility - Furniture - Fixtures	930	1834	(173,467)	(5,633)	(179,100)
Non-Utility - Computer Equipment	930	1835	(959,629)	(29,619)	(989,248)
Non-Utility - Vehicles	930	1836	(452,068)	(25,453)	(477,520)
Non-Utility - Miscellaneous	930	1837	(96,584)	(27,855)	(124,439)
<i>Subtotal: Engineering</i>			(1,886,855)	(95,028)	(1,981,882)
<b><i>Total: Accumulated Depreciation</i></b>			<b>\$ (308,746,547)</b>	<b>\$ (16,894,264)</b>	<b>\$ (325,640,812)</b>



**Pittsburgh Water & Sewer Authority**  
**Comparative Income Statements**  
**As of December 31, 2019**

<b>System Operating Statement</b>	<b>HTY Per Books 12/31/2019</b>
<b><u>System Revenues</u></b>	
Water Sales	\$ 108,229,249
Wastewater Sales	\$ 59,913,839
Wastewater Treatment	73,522,941
Sale for Resale & Contract Sales	3,040,794
Miscellaneous Revenues and Fees	5,867,458
	<u>\$ -</u>
<i>System Operating Revenues</i>	\$ 250,574,281
<b><u>Operating Expenses</u></b>	
<i>Direct Operating Expenses</i>	
Administrative Division	
Executive Director	\$ 3,479,233
Customer Service	7,457,579
Management Information Systems	2,301,283
Finance	3,186,898
Procurement	370,556
Human Resources	951,558
Legal	3,616,831
Community Outreach / Public Affairs	1,080,407
Operations Division	
Environmental Compliance	1,491,438
Warehouse	663,281
Ops Capital Assets	24,939
Water Quality (Lab)	2,254,974
Water Treatment Plant	17,099,660
Sewer Operations	11,487,340
Water Distribution	25,251,612
Engineering & Construction Division	
Engineering & Construction	8,824,994
	<u>-</u>
<i>Subtotal: Direct Operating Expenses</i>	\$ 89,542,583
<i>Other Operating Expenses</i>	
ALCOSAN	\$ 71,397,509
Co-Op Agreement Op. Expenses - Water	2,300,237
Co-Op Agreement Op. Expenses - Sewer	2,300,237
Non-City Water Payments	1,404,861
Affordability Program Placeholder	-
	<u>-</u>
<i>Subtotal: Other Operating Expenses</i>	\$ 77,402,843
<i>Subtotal: Operating Expenses</i>	\$ 166,945,426
<b><i>Operating Income</i></b>	<b>\$ 83,628,855</b>
<b><u>Debt Service</u></b>	
Senior and Subordinate Debt	\$ 56,554,366
Revolving Line of Credit Interest	2,725,400
	<u>-</u>
<i>Subtotal: Debt Service</i>	\$ 59,279,766
<b><u>Capital Expenditures &amp; Transfers</u></b>	
Transfers to Reserves	2,510,983
	<u>-</u>
<i>Subtotal: Capital Expenditures &amp; Transfers</i>	\$ 2,510,983
<b><i>Revenue Surplus/(Deficit)</i></b>	<b>\$ 21,838,106</b>

## Pittsburgh Water and Sewer Authority Base Rate Filing

**52 Pa. Code § 53.52****§ 53.52. Applicability; public utilities other than canal, turnpike, tunnel, bridge and wharf companies.**

(a) Whenever a public utility, other than a canal, turnpike, tunnel, bridge or wharf company files a tariff, revision or supplement effecting changes in the terms and conditions of service rendered or to be rendered, it shall submit to the Commission, with the tariff, revision or supplement, statements showing all of the following:

- (1) The specific reasons for each change.

**RESPONSE:**

Please see Statement of Reasons and testimony of PWSA witnesses Weimer, Lestitian, Presutti, Barca, Huestis, King, Dutton, and Smith for additional information. PWSA is proposing an increase in minimum charges and volumetric charges for all customer classes (Residential, Commercial, Industrial, Health & Education, Municipal, and Private Fire) while maintaining the existing rate structure. Please see the testimony of PWSA witness Smith for an explanation of the minimum charge and volumetric charge increases/decreases in each customer rate class.

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- (2) The total number of customers served by the utility.

**RESPONSE:**

Please see the schedules attached to response § 53.52(b).

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- (3) A calculation of the number of customers, by tariff subdivision, whose bills will be affected by the change.

**RESPONSE:**

Please see the schedules attached to response § 53.52(b).

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- (4) The effect of the change on the utility's customers.

**RESPONSE:**

Please see the schedules attached to response § 53.52(b).

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## Pittsburgh Water and Sewer Authority Base Rate Filing

**52 Pa. Code § 53.52**

(5) The direct or indirect effect of the proposed change on the utility's revenue and expenses.

**RESPONSE:**

Please see PWSA Statement No. 2 – Jennifer Presutti and accompanying schedules.

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(6) The effect of the change on the service rendered by the utility.

**RESPONSE:**

The changes will have no effect on the service rendered by the utility.

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(7) A list of factors considered by the utility in its determination to make the change. The list shall include a comprehensive statement about why these factors were chosen and the relative importance of each. This subsection does not apply to a portion of a tariff change seeking a general rate increase as defined in 66 Pa.C.S. § 1308 (relating to voluntary changes in rates).

**RESPONSE:** Not applicable.

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(8) Studies undertaken by the utility in order to draft its proposed change. This paragraph does not apply to a portion of a tariff change seeking a general rate increase as defined in 66 Pa.C.S. § 1308.

**RESPONSE:** Not applicable.

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(9) Customer polls taken and other documents which indicate customer acceptance and desire for the proposed change. If the poll or other documents reveal discernible public opposition, an explanation of why the change is in the public interest shall be provided.

**RESPONSE:**

No customer polls or other documentation regarding customer acceptance and desire for the proposed change exists.

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Pittsburgh Water and Sewer Authority Base Rate Filing

**52 Pa. Code § 53.52**

(10) Plans the utility has for introducing or implementing the changes with respect to its ratepayers.

**RESPONSE:**

The Company is notifying customers of the proposed changes as required by 53 Pa. Code § 53.45.

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(11) FCC, FERC or Commission orders or rulings applicable to the filing.

**RESPONSE:**

There are no FCC, FERC, or Commission orders or rulings applicable to this filing.

## Pittsburgh Water and Sewer Authority Base Rate Filing

**52 Pa. Code § 53.52**

(b) Whenever a public utility other than a canal, turnpike, tunnel, bridge or wharf company files a tariff, revision or supplement which will increase or decrease the bills to its customers, it shall submit in addition to the requirements of subsection (a), to the Commission, with the tariff, revision or supplement, statements showing the following:

- (1) The specific reasons for each increase or decrease.

**RESPONSE:**

Please see Statement of Reasons and testimony of PWSA witnesses Weimer, Lestitian, Presutti, Barca, Huestis, King, Dutton, and Smith for additional information. PWSA is proposing an increase in minimum charges and volumetric charges for all customer classes (Residential, Commercial, Industrial, Health & Education, Municipal, and Private Fire) while maintaining the existing rate structure. Please see the testimony of PWSA witness Smith for an explanation of the minimum charge and volumetric charge increases/decreases in each customer rate class.

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- (2) The operating income statement of the utility for a 12-month period, the end of which may not be more than 120 days prior to the filing. Water and wastewater utilities with annual revenues under \$100,000 and municipal corporations subject to Commission jurisdiction may provide operating income statements for a 12-month period, the end of which may not be more than 180 days prior to the filing.

**RESPONSE:**

Please see attached.

PWSA notes that the information provided by PWSA covers a 12-month time period, the end of which is not more than 180 days prior to the filing. This information, however, is the most-recent audited information available that covers a 12-month period. PWSA can provide the Commission additional information upon request.

- 
- (3) A calculation of the number of customers, by tariff subdivision, whose bills will be increased.

**RESPONSE:**

Please see the response to § 53.52(b).

Pittsburgh Water and Sewer Authority Base Rate Filing

**52 Pa. Code § 53.52**

(4) A calculation of the total increases, in dollars, by tariff subdivision, projected to an annual basis.

**RESPONSE:**

Please see the response to § 53.52(b).

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(5) A calculation of the number of customers, by tariff subdivision, whose bills will be decreased.

**RESPONSE:**

Please see the response to § 53.52(b).

---

(6) A calculation of the total decreases, in dollars, by tariff subdivision, projected to an annual basis.

**RESPONSE:**

Please see the response to § 53.52(b).

## Pittsburgh Water and Sewer Authority Base Rate Filing

## 52 Pa. Code § 53.52

(c) If a public utility files a tariff, revision or supplement which it is calculated will increase the bills of a customer or a group of customers by an amount, when projected to an annual basis, exceeding 3% of the operating revenues of the utility—subsection (b)(4) divided by the operating revenues of the utility for a 12-month period as defined in subsection (b)(2)—or which it is calculated will increase the bills of 5% or more of the number of customers served by the utility—subsection (b)(3) divided by subsection (a)(2)—it shall submit to the Commission with the tariff, revision or supplement, in addition to the statements required by subsections (a) and (b), all of the following information:

(1) A statement showing the utility's calculation of the rate of return or operating ratio (if the utility qualifies to use an operating ratio under § 53.54 (relating to small water and wastewater utilities)) earned in the 12-month period referred to in subsection (b)(2), and the anticipated rate of return or operating ratio to be earned when the tariff, revision or supplement becomes effective. The rate base used in this calculation shall be supported by summaries of original cost for the rate of return calculation. When an operating ratio is used in this calculation, it shall be supported by studies of margin above operation and maintenance expense plus depreciation as referred to in § 53.54(b)(2)(B).

**RESPONSE:** Not applicable

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(2) A detailed balance sheet of the utility as of the close of the period referred to in subsection (b)(2).

**RESPONSE:**

Please see attached.

As mentioned previously, PWSA notes that the information provided by PWSA covers a 12-month time period, the end of which is more than 120 days prior to the filing. This information, however, is the most-recent audited information available that covers a 12-month period. PWSA can provide the Commission additional information upon request.

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(3) A summary, by detailed plant accounts, of the book value of the property of the utility at the date of the balance sheet required by paragraph (2).

**RESPONSE:**

Please see attached.

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## Pittsburgh Water and Sewer Authority Base Rate Filing

**52 Pa. Code § 53.52**

(4) A statement showing the amount of the depreciation reserve, at the date of the balance sheet required by paragraph (2), applicable to the property, summarized as required by paragraph (3).

**RESPONSE:**

Please see attached.

---

(5) A statement of operating income, setting forth the operating revenues and expenses by detailed accounts for the 12-month period ending on the date of the balance sheet required by paragraph (2).

**RESPONSE:**

Please see attached.

---

(6) A brief description of a major change in the operating or financial condition of the utility occurring between the date of the balance sheet required by paragraph (2) and the date of transmittal of the tariff, revision or supplement. As used in this paragraph, a major change is one which materially alters the operating or financial condition of the utility from that reflected in paragraphs (1)—(5).

**RESPONSE:**

There has not been any major change in the operating or financial condition of the utility since the balance sheet dated December 31, 2018.

It is important to note that PWSA is operating under two major orders: the Consent Order and Agreement dated November 17, 2017 on lead and an Administrative Order dated October 25, 2017 on water treatment. Both of these occurred before December 31, 2017 and are disclosed in PWSA's audited financial statements. The 2019 financials are relied on as the Historical Test Year for the purposes of this rate case filing.



## Pittsburgh Water and Sewer Authority Base Rate Filing

**52 Pa. Code § 53.52**

(d) If a utility renders more than one type of public service, such as electric and gas, information required by §§ 53.51—53.53 (relating to information furnished with the filing of rate changes), except subsection (c)(2), relates solely to the kind of service to which the tariff or tariff supplement is applicable. In subsection (c)(2), the book value of property used in furnishing each type of public service, as well as the depreciation reserve applicable to the property, shall be shown separately.

**RESPONSE:** Not applicable.

**TAB**

**4**

## I. STATEMENT OF INCOME

### Exhibit D – Water and Wastewater Utilities

I.1. Provide comparative operating statements for the historic test year and the immediately preceding 12 months showing increases and decreases between the two periods. These statements should supply detailed explanation of the causes of the major (greater than 15%) variances between the historic test year and preceding year by detailed account number. Limit the explanation to differences of \$10,000 or greater.

#### **RESPONSE:**

Please see the attached schedule (Descriptions on schedule).

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**I. STATEMENT OF INCOME**

I.2. Prepare an income statement for the various time frames of the rate proceeding including:

Col. 1—Book recorded income statement for the test year.

Col. 2—Adjustments to book recorded income statement to annualize and normalize under present rates.

Col. 3—Income statement under present rates after adjustments in Col. 2.

Col. 4—Adjustments to Col. 3 for revenue increase requested.

Col. 5—Income statement under proposed rates.

**RESPONSE:**

Please see the attached schedule.

Pittsburgh Water and Sewer Authority's Base Rate Filing

**I. STATEMENT OF INCOME**

I.3. If a company has separate operating divisions, an income statement must be shown for each division, plus an income statement for the company as a whole.

**RESPONSE:**

Please see the response to I.2.

**I. STATEMENT OF INCOME**

I.4. Provide operating income claims under:

- a. Present rates.
- b. Pro forma present rates (annualized & normalized).
- c. Proposed rates (annualized & normalized).

**RESPONSE:**

Please see the response provided to I.2.

Pittsburgh Water and Sewer Authority's Base Rate Filing

**I. STATEMENT OF INCOME**

I.5. Provide rate of return on original cost under:

- a. Present rates.
- b. Pro forma present rates.
- c. Proposed rates.

**RESPONSE:** Not Applicable.

**Pittsburgh Water & Sewer Authority**  
**Statement of Projected Income at Present and Proposed Rates**  
**Twelve Months Ending December 31, 2021**

<b>System Operating Statement</b>	<b>(1)</b> <b>Annualized</b> <b>12 Months</b> <b>Ended</b> <b>12/31/2021</b>	<b>(2)</b> <b>Adjustments</b> <b>Under</b> <b>Annualized</b> <b>Rates</b>	<b>(3)</b> <b>Annualized</b> <b>12 Months</b> <b>Ended</b> <b>12/31/2021</b>	<b>(4)</b> <b>Adjustments</b> <b>Under</b> <b>Proposed</b> <b>Rates</b>	<b>(5)</b> <b>Adjustments</b> <b>Under</b> <b>12 Months</b> <b>Ended</b> <b>12/31/2021</b>
<u>Operating Revenues</u>					
Water Sales	\$ 110,004,446	\$ -	\$ 110,004,446	\$ 30,204,880	\$ 140,209,326
Wastewater Sales	62,526,017	-	62,526,017	13,633,426	76,159,444
Sale for Resale & Contract Sales	2,911,475	-	2,911,475	359,559	3,271,034
Other Revenues	6,180,099	-	6,180,099	-	6,180,099
<i>System Operating Revenues</i>	<u>\$ 181,622,037</u>	<u>\$ -</u>	<u>\$ 181,622,037</u>	<u>\$ 44,197,865</u>	<u>\$ 225,819,903</u>
<u>Operating Expenses</u>					
<i>Direct Operating Expenses</i>					
Administrative Divisions	\$ 31,273,394	\$ -	\$ 31,273,394	\$ -	\$ 31,273,394
Operations Divisions	55,084,516	-	55,084,516	-	55,084,516
Engineering & Construction Division	32,925,052	-	32,925,052	-	32,925,052
<i>Direct Operating Expenses</i>	<u>\$ 119,282,962</u>	<u>\$ -</u>	<u>\$ 119,282,962</u>	<u>\$ -</u>	<u>\$ 119,282,962</u>
<i>Other Operating Expenses</i>					
Loss on ALCOSAN Billings	\$ 770,497	\$ -	\$ 770,497	\$ -	\$ 770,497
City Services	-	-	-	-	-
Non-City Water Payments	475,975	-	475,975	-	475,975
<i>Other Operating Expenses</i>	<u>\$ 1,246,472</u>	<u>\$ -</u>	<u>\$ 1,246,472</u>	<u>\$ -</u>	<u>\$ 1,246,472</u>
<i>Subtotal: Operating Expenses</i>	<u>\$ 120,529,434</u>	<u>\$ -</u>	<u>\$ 120,529,434</u>	<u>\$ -</u>	<u>\$ 120,529,434</u>
<b><i>Operating Income</i></b>	<b>\$ 61,092,603</b>	<b>\$ -</b>	<b>\$ 61,092,603</b>	<b>\$44,197,865</b>	<b>\$105,290,469</b>
<u>Debt Service</u>					
Existing Debt	\$ (60,864,113)	\$ -	\$ (60,864,113)	\$ -	\$ (60,864,113)
Proposed Debt	(14,500,052)	-	(14,500,052)	-	(14,500,052)
<i>Subtotal: Debt Service</i>	<u>\$ (75,364,165)</u>	<u>\$ -</u>	<u>\$ (75,364,165)</u>	<u>\$ -</u>	<u>\$ (75,364,165)</u>
<u>Capital Expenditures &amp; Transfers</u>					
Internally Generated Funds / PAYGO	\$ (7,113,647)	\$ -	\$ (7,113,647)	\$ -	\$ (7,113,647)
Internally Generated Funds / PAYGO (DSIC)	(19,620,000)	-	(19,620,000)	-	(19,620,000)
Other Transfers to Reserves	(1,000,000)	-	(1,000,000)	-	(1,000,000)
Reimbursements (Municipalities & Pennvest)	-	-	-	-	-
Remarketing & Liquidity Charges	-	-	-	-	-
Bad Debt Expense	(2,162,861)	-	(2,162,861)	-	(2,162,861)
<i>Subtotal: Capital Expenditures &amp; Transfers</i>	<u>\$ (29,896,508)</u>	<u>\$ -</u>	<u>\$ (29,896,508)</u>	<u>\$ -</u>	<u>\$ (29,896,508)</u>
<b><i>Revenue Surplus/(Deficit)</i></b>	<b>\$ (44,168,070)</b>	<b>\$ -</b>	<b>\$ (44,168,070)</b>	<b>\$ 44,197,865</b>	<b>\$ 29,796</b>



**Pittsburgh Water & Sewer Authority**  
**Comparative Income Statements**  
**Twelve Months Ended December 31, 2018 & 2019**

System Operating Statement	HTY		Variance	% Variance	Explanation of Variance (15% and \$10K)
	Per Books 12/31/2018	Per Books 12/31/2019			
<b>System Revenues</b>					
Water Sales	\$ 103,580,052	\$ 108,229,249	\$ 4,649,198	4.49%	
Wastewater Sales	\$ 57,306,572	\$ 59,913,839	2,607,267	4.55%	
Wastewater Treatment	69,376,086	73,522,941	4,146,855	5.98%	
Sale for Resale & Contract Sales	2,834,981	3,040,794	205,813	7.26%	
Miscellaneous Revenues and Fees	4,523,428	5,867,458	1,344,030	29.71%	Tap fee collections were significantly higher in 2019
	\$ -	\$ -	\$ -		
<b>System Operating Revenues</b>	<b>\$ 237,621,119</b>	<b>\$ 250,574,281</b>	<b>\$ 12,953,162</b>		
<b>Operating Expenses</b>					
<i>Direct Operating Expenses</i>					
Administrative Division					
Executive Director	\$ 2,226,219	\$ 3,479,233	\$ 1,253,014	56.28%	Costs increased due to PUC Assessment fees
Customer Service	7,782,837	7,457,579	(325,258)	-4.18%	
Management Information Systems	2,180,850	2,301,283	120,433	5.52%	
Finance	3,811,480	3,186,898	(624,582)	-16.39%	Costs decreased due to decreased professional services spending
Procurement	293,718	370,556	76,838	26.16%	Increased staffing
Human Resources	402,156	951,558	549,402	136.61%	Increased staffing and professional services spending
Legal	3,244,746	3,616,831	372,085	11.47%	
Community Outreach / Public Affairs	521,885	1,080,407	558,522	107.02%	Increased staffing and professional services spending
Operations Division					
Warehouse	2,861,999	663,281	(2,198,718)	-76.82%	Inventory was better allocated to department level in 2019
Ops Capital Assets	34,045	24,939	(9,106)	-26.75%	Ops Capital Assets reflects increases in freight shipping spending
Water Quality (Lab)	2,173,206	2,254,974	81,768	3.76%	
Environmental Compliance	971,713	1,491,438	519,725	53.49%	
Water Treatment Plant	16,839,719	17,099,660	259,941	1.54%	
Sewer Operations	10,171,195	11,487,340	1,316,145	12.94%	
Water Distribution	18,733,620	25,251,612	6,517,992	34.79%	Increased staffing and equipment spending
Engineering & Construction Division					
Engineering & Construction	7,040,127	8,824,994	1,784,867	25.35%	Increased staffing and professional services spending
	-	-	-		
<b>Subtotal: Direct Operating Expenses</b>	<b>\$ 79,289,515</b>	<b>\$ 89,542,583</b>	<b>\$ 10,253,068</b>		
<i>Other Operating Expenses</i>					
ALCOSAN	\$ 70,310,473	\$ 71,397,509	\$ 1,087,036	1.55%	
Co-Op Agreement Op. Expenses - Water	893,750	2,300,237	1,406,487	157.37%	
Co-Op Agreement Op. Expenses - Sewer	893,750	2,300,237	1,406,487	157.37%	
Non-City Water Payments	4,131,689	1,404,861	(2,726,828)	-66.00%	PWSA rate increases decreased subsidy cost
Affordability Program Placeholder	-	-	-	0.00%	
	-	-	-		
<b>Subtotal: Other Operating Expenses</b>	<b>\$ 76,229,862</b>	<b>\$ 77,402,843</b>	<b>\$ 1,173,181</b>		
<b>Subtotal: Operating Expenses</b>	<b>\$ 155,519,177</b>	<b>\$ 166,945,426</b>	<b>\$ 11,426,249</b>		
<b>Operating Income</b>	<b>\$ 82,101,942</b>	<b>\$ 83,628,855</b>	<b>\$ 1,526,913</b>		
<b>Debt Service</b>					
Senior and Subordinate Debt	\$ 42,096,642	\$ 56,554,366	\$ 14,457,724	34.34%	2019 costs increased over 2018 due to funds remaining from 2017 going towards 2018 Interest payments, and 2019 included swap termination cash contribution
Revolving Line of Credit Interest	1,680,964	2,725,400	1,044,436	62.13%	Interest costs increased due to increased draws
	-	-	-		
<b>Subtotal: Debt Service</b>	<b>\$ 43,777,607</b>	<b>\$ 59,279,766</b>	<b>\$ 15,502,160</b>		
<b>Capital Expenditures &amp; Transfers</b>					
Transfers to Reserves	2,933,112	2,510,983	(422,129)	-14.39%	Required transfer decreased due to combination of reserve balance and budgeted expenses
	-	-	-		
<b>Subtotal: Capital Expenditures &amp; Transfers</b>	<b>\$ 2,933,112</b>	<b>\$ 2,510,983</b>	<b>\$ (422,129)</b>		
<b>Revenue Surplus/(Deficit)</b>	<b>\$ 35,391,223</b>	<b>\$ 21,838,106</b>	<b>\$ (13,553,118)</b>		

**TAB**

**5**

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**II. OPERATING REVENUES**

II.1. Prepare a summary of operating revenues for the historic test year and the year preceding the historic test year, providing the following information:

a. For each classification of customers:

(i) Number of customers as of year-end.

(ii) Gallons sold.

(iii) Revenues.

b. Customers' penalties and miscellaneous water revenues.

**RESPONSE:**

Please see the attached schedule.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**II. OPERATING REVENUES**

II.2. Prepare a summary of operating revenues for the historic test year, providing the following information:

a. For each classification of customers and for customers' penalties and miscellaneous water or wastewater revenues:

(i) Revenues.

(ii) Annualizing and normalizing adjustments to arrive at adjusted operating revenues for ratemaking.

(iii) Proposed increase in operating revenues.

(iv) Percent increase in operating revenues.

(v) Operating revenues under proposed rates.

**RESPONSE:**

Please see the attached schedule.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**II. OPERATING REVENUES**

II.3. Provide a schedule of present and proposed tariff rates showing dollar change and percent of change by block. Provide increases to customers at various monthly uses (each 5,000 gallon consumption increment) showing billings at existing and proposed rates. Provide also an explanation of any change in block structure and the reason therefore. Provide a copy of the proposed tariff or tariff supplement on a red line basis, to easily identify any changes.

**RESPONSE:**

Please refer to the Cost of Service analysis and the testimony of Harold J. Smith.

Pittsburgh Water and Sewer Authority's Base Rate Filing

**II. OPERATING REVENUES**

II.4. Provide for the future test year a detailed customer consumption analysis and the application of rates to support present and proposed revenues by customer classification and tariff rate schedule.

**RESPONSE:**

Please see the attached schedules.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**II. OPERATING REVENUES**

II.5. Provide detailed computations of the determination of accrued revenues as of historic test year-end and year-end immediately preceding the historic test year, together with a detailed explanation of the procedures and methods used in developing accrued revenues.

**RESPONSE:**

PWSA's audited financial statements are prepared using the economic resources measurement focus and the accrual basis of accounting in accordance with accounting principles generally accepted in the United States of America, as prescribed by the Governmental Accounting Standards Board (GASB). Revenues are recorded when earned, regardless of the timing of related cash flows.

For the purpose of this rate filing, PWSA is utilizing a cash basis and therefore there are no adjustments for accrued revenues. Revenues for each year of this filing are calculated using actual or projected customer units and the effective, or for the FPFTY, proposed, rates for the appropriate year. A collection factor is then applied to the system revenues to reflect actual cash collections for each year. More information and detailed calculations are available upon request.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**II. OPERATING REVENUES**

II.6. Provide a detailed breakdown of miscellaneous water revenues for the historic test year and the two years immediately preceding the historic test year. For the historic test year, provide a monthly breakdown and an explanation of monthly variances greater than 15%.

**RESPONSE:**

Please see attached schedule.

**Explanations of Miscellaneous Revenues Variances**

Variances of 15% or more occur almost every month across many accounts. A generic explanation is provided below for all material accounts.

**Dye Testing**

PWSA charges dye testing fees under City Ordinance No. 3 of 2006, adopted March 28, 2006, effective July 5, 2006, as codified in Title Four, Public Places and Property, Article III Sewers, Chapter 433, Illegal Storm Water Connections, of the Pittsburgh Code, and includes any amendments thereto. Dye testing refers to commonly accepted plumbing test whereby a nontoxic, non-staining dye is introduced into the surface Storm Water collection system of real property to determine if any surface Storm Water is entering the Sanitary Sewer system. PWSA collects application and inspection fees that fluctuate monthly.

**Fire Hydrant Line Use**

All water used through the fire system except during fires is metered, and the associated sized meter will be installed for the requested line size for each line used. Customers using hydrants for non-firefighting purposes are assessed a monthly minimum charge and metered usage charge. These charges fluctuate based on customer needs.

**Backflow Fees**

Business Use Properties are required to be equipped with an approved Backflow prevention device per section 608 of the Health Department's Plumbing Code. Backflow refers to the flow of water and other liquids, mixtures, and substances into the Authority's Water Mains, or into other lines carrying domestic water, from any sources other than those intended by the Authority. PWSA collects various charges related to backflow prevention including application and administration fees as well as inspection fees. These collections fluctuate monthly based on demand.



## II. OPERATING REVENUES

### **Meter Sales**

PWSA previously charged associated costs with meters, remote reading devices, meter replacement charges, and their installation. Based on PA PUC regulation, PWSA may not be able to collect these charges, however, these revenues have been included in the FPFTY.

### **Non-Sufficient Funds Fees**

PWSA collects non-sufficient funds fees based on returned checks and insufficient payments. These charges are based on customer payment patterns and fluctuate monthly.

### **Shut Fees**

Customers are assessed shut off service fees when discontinuing service, whether voluntarily or involuntary. Shut fees fluctuate with service discontinuance patterns.

### **Tap Fees**

PWSA charges tap fees to customers connecting to the system. These charges, which increase by meter size, recover both a share of the operating cost associated with connection to the system as well as a capital component of system "buy-in". These fees also fluctuate significantly based on a number of external factors. Large jumps typically indicate a tap fee assessed for a large meter (or meters) or a development paying a large number of tap fees.

### **Miscellaneous Fees (300)**

The Miscellaneous Fees 300 account includes water miscellaneous revenues largely of immaterial amounts. Examples of these revenues include, tower rental payments from Verizon, scrap metal sales, immaterial reimbursements from vendors, ALCOSAN incidentals such as paper, ink, and materials for billing, past due reimbursements, occasional water billing adjustments, and other miscellaneous sources. These amounts fluctuate monthly based on various activity.

### **Miscellaneous Fees (400)**

The Miscellaneous Fees 400 account includes sewer billing adjustments largely of immaterial amounts. These adjustments occur infrequently and at varying amounts.

### **Penalties & Interest**

If current water and sewer bills are not paid in full by their due dates, interest of .0083 percent per month is applied to the outstanding balance. Unpaid water and sewer charges are a

## Pittsburgh Water and Sewer Authority's Base Rate Filing

### **II. OPERATING REVENUES**

lien on the property and any resulting fines or penalties are the responsibility of the customer. These charges are based on customer payment patterns and fluctuate monthly.

## **II. OPERATING REVENUES**

II.7. Provide a monthly summary of customers added and lost by customer classification for the historic test year and the current year-to-date.

**RESPONSE:**

Please see the attached schedule.

## **II. OPERATING REVENUES**

II.8. Provide for the historic test year and the current year-to-date, the number of customers and monthly consumption for each classification of customers.

### **RESPONSE:**

Please see the attached schedule for the customer billing information for the HTY (Jan-Dec 2019) and the FTY YTD (Jan-Feb 2020). The attached billing information was used for the customer billing analysis as a part of the Cost of Service Study and the direct testimony of Harold J. Smith. Additional year-to-date information is available upon request.

Pittsburgh Water and Sewer Authority's Base Rate Filing

**II. OPERATING REVENUES**

II.9. Provide by customer classification for the historic test year and for the 2 prior years the number of customers and consumption, and projected number of customers and consumption for the 2 subsequent years.

**RESPONSE:**

Please see the attached schedule.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**II. OPERATING REVENUES**

II.10. Provide a breakdown of the number and size of private fire services according to the general water service class of customers.

- a. Provide a listing of all public fire protection customers at historic test year-end and the pro forma billing of current rates for each customer.

**RESPONSE:**

Please see the table below. Private fire protection customers have been grouped by their existing rate classifications.

Line Size	HTY 2019 Actual	FTY 2020 Projected	FPFTY 2021 Projected
1" or Less	1,130	1,130	1,195
1 1/2"-3"	64	64	54
4"	6	6	5
6" or Greater	15	15	15

- a. PWSA currently does not charge for public fire protection services. PWSA looks to implement a public fire protection charge for the City of Pittsburgh and those proposed charges are part of this rate case filing.

**II. OPERATING REVENUES**

II.11. Provide a detailed schedule of sales for resale revenues for the historic test year and 2 preceding years showing revenues and units sold by customer.

**RESPONSE:**

Please see the attached schedule.

Pittsburgh Water and Sewer Authority's Base Rate Filing

**II. OPERATING REVENUES**

II.12. Provide for the historic test year and the 2 prior years consumption and billings for the ten largest customers at current rates. Provide the historic and future test year consumption priced at proposed rates.

**RESPONSE:**

Please see the attached schedule.



Pittsburgh Water and Sewer Authority's Base Rate Filing

**II. OPERATING REVENUES**

II.13. Provide for the historic test year and the 2 prior years consumption and billings for the ten largest sales for resale customers if such sales are not included in sales to the ten largest customers requested in Part II.12.

**RESPONSE:**

Please refer to schedule II.11.

**Pittsburgh Water & Sewer Authority**  
**Water Sales for Resale**

	<b>12 Months Ended 12/31/2017</b>	<b>12 Months Ended 12/31/2018</b>	<b>HTY 12 Months Ended 12/31/2019</b>
<b>Resale Customer Units (Kgal)</b>			
Allegheny	6,978	7,911	1,030
Aspinwall	94,552	81,386	59,842
Fox Chapel	509,953	612,616	632,050
Hampton	11,023	3,607	2,997
PAWC	-	5,400	2,800
RSRV - 10"	30,678	97,405	95,941
RSRV - 6"	17,815	14,663	13,532
Sharpsburg	-	-	-
Westview	-	6,845	8,410
<i>Total Units</i>	<u>670,999</u>	<u>829,833</u>	<u>816,602</u>
<b>Resale Customer Water Billings</b>			
Allegheny	\$ 39,110	\$ 56,723	\$ 15,191
Aspinwall	312,967	269,388	201,668
Fox Chapel	1,087,495	1,657,652	1,992,893
Hampton	33,230	48,089	19,930
PAWC	66,107	96,887	96,087
RSRV - 10"	121,355	398,741	413,470
RSRV - 6"	73,907	65,994	64,947
Sharpsburg	-	-	-
Westview	80,531	153,391	191,516
<i>Total Billings</i>	<u>\$ 1,814,702</u>	<u>\$ 2,746,864</u>	<u>\$ 2,995,702</u>



**Pittsburgh Water & Sewer Authority**  
**Miscellaneous Utility Revenues**

	<b>Actual</b>	<b>Actual</b>	<b>HTY</b>
	<b>12 Months</b>	<b>12 Months</b>	<b>12 Months</b>
	<b>Ended</b>	<b>Ended</b>	<b>Ended</b>
	<b>12/31/2017</b>	<b>12/31/2018</b>	<b>12/31/2019</b>
<b>Misc Utility Revenue</b>			
Dye Testing	\$ 168,010	\$ 170,137	\$ 169,710
Fire Hydrant Line Use	105,996	120,267	135,567
Fire Hydrant Sales	5,500	5,579	1,000
Map Fees	40	55	55
Backflow Fee	26,573	39,466	85,048
Meter Sales	73,955	107,549	85,500
Meter Test Fees	4,949	3,841	4,400
Non-Sufficient Funds Fees	27,053	37,435	39,463
Shut Fees	526,320	357,700	149,963
Tap Fees	1,907,576	2,858,351	4,774,236
Lien Satisfaction Fees	646	262	343
Miscellaneous Fees (300)	946,011	1,250,103	927,674
Miscellaneous Fees (400)	13,717	16,829	15,817
Penalties & Interest	895,970	1,281,726	278,546
<b>Total: Misc. Utility Revenue</b>	<b>\$ 4,702,316</b>	<b>\$ 6,249,298</b>	<b>\$ 6,667,322</b>

	<b>HTY</b>	<b>HTY</b>	<b>HTY</b>	<b>HTY</b>	<b>HTY</b>	<b>HTY</b>	<b>HTY</b>	<b>HTY</b>	<b>HTY</b>	<b>HTY</b>	<b>HTY</b>	<b>HTY</b>
	<b>ACTUAL</b>	<b>ACTUAL</b>	<b>ACTUAL</b>	<b>ACTUAL</b>	<b>ACTUAL</b>	<b>ACTUAL</b>	<b>ACTUAL</b>	<b>ACTUAL</b>	<b>ACTUAL</b>	<b>ACTUAL</b>	<b>ACTUAL</b>	<b>ACTUAL</b>
	<b>Jan-19</b>	<b>Feb-19</b>	<b>Mar-19</b>	<b>Apr-19</b>	<b>May-19</b>	<b>Jun-19</b>	<b>Jul-19</b>	<b>Aug-19</b>	<b>Sep-19</b>	<b>Oct-19</b>	<b>Nov-19</b>	<b>Dec-19</b>
<b>Monthly Totals for HTY</b>												
Dye Testing	\$ 13,150	\$ 13,700	\$ 13,025	\$ 13,775	\$ 19,225	\$ 16,025	\$ 17,015	\$ 12,875	\$ 13,320	\$ 8,925	\$ 16,200	\$ 12,475
Fire Hydrant Line Use	3,000	5,000	8,500	8,579	19,878	13,579	13,759	13,658	13,799	10,579	16,237	9,000
Fire Hydrant Sales	-	-	-	500	-	-	-	500	-	-	-	-
Map Fees	30	-	15	-	-	10	-	-	-	-	-	-
Backflow Fee	11,446	6,066	12,817	14,390	3,350	1,167	5,457	4,188	1,193	6,700	11,776	6,497
Meter Sales	6,970	11,590	6,964	4,499	7,813	11,215	7,558	6,431	4,210	6,129	8,043	4,079
Meter Test Fees	-	350	730	100	430	420	360	480	360	390	510	270
Non-Sufficient Funds Fees	3,289	4,172	3,654	3,471	3,410	3,745	2,253	2,832	3,136	2,954	3,806	2,741
Shut Fees	10,922	5,178	13,799	9,608	10,684	26,316	12,518	18,500	15,330	12,450	13,128	1,530
Tap Fees	576,817	26,439	212,547	459,756	421,641	317,580	274,684	153,946	64,850	100,685	1,797,604	367,687
Lien Satisfaction Fees	-	-	-	59	345	170	(251)	-	-	20	-	-
Miscellaneous Fees (300)	62,425	(4,497)	370,005	49,148	104,277	36,755	46,152	50,801	45,045	52,634	40,911	74,018
Miscellaneous Fees (400)	2,252	58	990	1,643	3,270	664	-	5,935	906	-	100	-
Penalties & Interest	88,084	80,471	85,565	(436,180)	(77,694)	72,005	62,680	62,450	83,570	71,310	92,883	93,402
<b>Total: Misc. Utility Revenue</b>	<b>\$ 778,385</b>	<b>\$ 148,527</b>	<b>\$ 728,611</b>	<b>\$ 129,348</b>	<b>\$ 516,629</b>	<b>\$ 499,652</b>	<b>\$ 442,184</b>	<b>\$ 332,595</b>	<b>\$ 245,719</b>	<b>\$ 272,775</b>	<b>\$ 2,001,198</b>	<b>\$ 571,699</b>

**Pittsburgh Water & Sewer Authority  
Summary of Operating Revenues**

	Water					Wastewater Conveyance				
	12 Months Ended 12/31/2017	12 Months Ended 12/31/2018	12 Months Ended 12/31/2019	12 Months Ended 12/31/2020	12 Months Ended 12/31/2021	12 Months Ended 12/31/2017	12 Months Ended 12/31/2018	12 Months Ended 12/31/2019	12 Months Ended 12/31/2020	12 Months Ended 12/31/2021
<b>a. Operating Revenues</b>										
<b>(i) Number of Customers</b>										
Residential	66,917	65,099	64,844	64,148	63,689	91,327	88,101	87,290	86,230	85,530
Residential - CAP	-	923	1,800	2,495	2,954	-	1,697	2,740	3,800	4,500
Commercial	6,860	6,697	6,731	6,731	6,731	8,358	8,265	8,269	8,269	8,269
Industrial	100	98	97	97	97	100	98	98	98	98
Health or Education	513	494	484	484	484	512	494	484	484	484
Municipal	-	-	-	-	-	-	-	-	-	84
Fire System	1,214	1,223	1,269	1,269	1,269	-	-	-	-	-
Wholesale and Contract	9	9	8	7	7	1	1	-	-	-
<b>Total</b>	<b>75,611</b>	<b>74,543</b>	<b>75,231</b>	<b>75,230</b>	<b>75,308</b>	<b>100,297</b>	<b>98,656</b>	<b>98,880</b>	<b>98,880</b>	<b>98,964</b>
<b>(ii) Gallons Billed (kgals)</b>										
Residential	2,091,836	2,041,350	1,874,792	1,937,089	1,923,025	2,121,585	2,079,046	1,907,840	1,971,439	1,956,700
Residential - CAP	-	31,049	55,055	76,347	90,411	-	33,580	57,696	80,009	94,748
Commercial	2,942,211	2,723,585	2,517,870	2,620,728	2,620,728	3,003,282	2,769,596	2,559,365	2,664,480	2,664,480
Industrial	161,491	183,343	192,645	187,994	187,994	162,184	184,208	193,370	188,789	188,789
Health or Education	1,258,763	1,068,428	975,581	1,022,005	1,022,005	1,257,865	1,068,859	975,430	1,022,145	1,022,145
Municipal	-	-	-	221,594	221,594	-	-	-	222,232	222,232
Fire System	4,005	7,913	21,423	14,668	14,668	-	-	-	-	-
Wholesale and Contract	1,395,834	1,291,840	1,079,773	803,718	803,729	-	-	-	-	-
<b>Total</b>	<b>7,854,140</b>	<b>7,347,508</b>	<b>6,717,139</b>	<b>6,884,140</b>	<b>6,884,152</b>	<b>6,544,915</b>	<b>6,135,290</b>	<b>5,693,701</b>	<b>6,149,094</b>	<b>6,149,094</b>
<b>(iii) Revenues</b>										
Residential	\$ 32,033,370	\$ 38,579,097	\$ 43,651,617	\$ 44,772,621	\$ 53,208,662	\$ 15,873,150	\$ 23,197,041	\$ 24,051,763	\$ 24,466,193	\$ 29,421,752
Residential - CAP	-	414,004	768,005	1,050,627	1,313,110	-	305,458	508,098	690,827	820,438
Commercial	31,314,485	36,325,976	40,180,051	41,865,626	57,880,960	16,386,065	23,929,097	24,375,941	25,114,436	31,747,596
Industrial	1,408,682	1,808,653	2,174,321	2,165,795	3,175,796	742,806	1,269,353	1,416,420	1,391,755	1,952,946
Health or Education	16,606,515	16,305,136	17,521,352	18,446,879	21,563,594	8,329,501	9,940,680	9,889,164	10,292,946	11,388,174
Municipal	-	-	-	-	1,483,934	-	-	-	-	828,539
Private Fire Systems	443,307	592,251	881,854	804,397	1,036,998	-	-	-	-	-
Wholesale and Contract	3,454,879	3,675,106	3,057,435	2,911,475	3,271,034	464,052	464,052	233,190	-	-
<b>Total Water Sales</b>	<b>\$ 85,261,237</b>	<b>\$ 97,700,222</b>	<b>\$ 108,234,635</b>	<b>\$ 112,017,422</b>	<b>\$ 142,934,087</b>	<b>\$ 41,795,574</b>	<b>\$ 59,105,681</b>	<b>\$ 60,474,577</b>	<b>\$ 61,956,157</b>	<b>\$ 76,159,444</b>

**Pittsburgh Water & Sewer Authority  
Summary of Operating Revenues**

	<b>12 Months Ended 12/31/2018</b>	<b>12 Months Ended 12/31/2019</b>	<b>12 Months Ended 12/31/2020</b>	<b>12 Months Ended 12/31/2021</b>	<b>12 Months Ended 12/31/2021</b>
<b>b. Customer Penalties &amp; Misc. Revenues</b>					
Dye Testing	\$ 170,137	\$ 169,710	\$ 176,842	\$ 180,379	\$ 183,987
Fire Hydrant Line Use	120,267	135,567	146,104	149,026	152,007
Fire Hydrant Sales	5,579	1,000	6,000	6,120	6,242
Map Fees	55	-	360	367	375
Backflow Fee	39,466	85,048	79,753	81,349	82,976
Meter Sales	107,549	85,500	89,736	91,530	93,361
Meter Test Fees	3,841	4,400	5,144	5,247	5,352
Non-Sufficient Funds Fees	37,435	39,463	39,882	40,680	41,493
Shut Fees	357,700	149,963	172,581	176,033	179,554
Tap Fees	2,858,351	4,774,236	3,389,900	3,457,698	3,526,852
Bid Fees	-	343	-	-	-
Lien Satisfaction Fees	262	4,134	1,800	1,836	1,873
Miscellaneous Fees (300)	1,250,103	927,674	1,118,000	1,140,360	1,163,167
Miscellaneous Fees (400)	16,829	15,817	16,817	17,153	17,496
Penalties & Interest	1,281,726	278,546	816,000	832,320	848,966
<b>Total</b>	<b>6,249,299</b>	<b>6,671,401</b>	<b>6,058,920</b>	<b>6,180,099</b>	<b>6,303,701</b>

**Pittsburgh Water & Sewer Authority**  
**Statement of Actual and Projected Revenues at Present and Proposed Rates**  
**Twelve Months Ending December 31, 2019, 2020, & 2021**

	HTY 12 Months Ended 12/31/2019	FTY 12 Months Ended 12/31/2020	FPFTY Revenues at Present Rates 12/31/2021	Proposed Increase	Percent Increase	FPFTY Revenues at Proposed Rates 12/31/2021
<b>Water</b>						
<u>Customer Class</u>						
Residential	\$ 43,651,617	\$ 44,772,621	\$ 44,459,448	\$ 8,749,214	19.7%	\$ 53,208,662
Residential - CAP	768,005	1,050,627	1,243,999	69,111	5.6%	1,313,110
Commercial	40,180,051	41,865,626	41,860,908	16,020,051	38.3%	57,880,960
Industrial	2,174,321	2,165,795	2,165,551	1,010,244	46.7%	3,175,796
Health or Education	17,521,352	18,446,879	18,444,801	3,118,793	16.9%	21,563,594
Municipal	-	-	1,025,432	458,502	44.7%	1,483,934
Private Fire System	881,854	804,397	804,307	232,692	28.9%	1,036,998
Public Fire Charges	-	-	-	546,273	100.0%	546,273
<b>Total Water Revenues</b>	<b>105,177,200</b>	<b>109,105,947</b>	<b>110,004,446</b>	<b>30,204,880</b>	<b>27.5%</b>	<b>140,209,326</b>
<b>Wastewater</b>						
<u>Customer Class</u>						
Residential	24,051,763	24,466,193	24,283,064	5,138,688	21.2%	29,421,752
Residential - CAP	508,098	690,827	817,978	2,460	0.3%	820,438
Commercial	24,375,941	25,114,436	25,111,606	6,635,990	26.4%	31,747,596
Industrial	1,416,420	1,391,755	1,391,598	561,348	40.3%	1,952,946
Health or Education	9,889,164	10,292,946	10,291,786	1,096,387	10.7%	11,388,174
Municipal	-	-	629,985	198,554	31.5%	828,539
<b>Total Wastewater Revenues</b>	<b>60,241,387</b>	<b>61,956,157</b>	<b>62,526,017</b>	<b>13,633,426</b>	<b>21.8%</b>	<b>76,159,444</b>
<b>Wholesale &amp; Contracts</b>						
Allegheny	7,506	-	-	-	#DIV/0!	-
Aspinwall	201,095	240,088	240,088	2,125	0.9%	242,213
Bay Valley / Riverbend (Water)	123,113	-	-	-	0.0%	-
Fox Chapel	1,945,786	1,966,755	1,966,755	312,370	15.9%	2,279,125
Hampton	19,772	-	-	-	0.0%	-
PAWC	94,203	78,185	78,185	782	1.0%	78,967
RSRV - 10"	413,150	436,698	436,698	21,461	4.9%	458,159
RSRV - 6"	64,277	67,147	67,147	3,327	5.0%	70,474
Sharpsburg	-	-	-	-	0.0%	-
Westview	188,532	122,603	122,603	19,494	15.9%	142,097
Bay Valley / Riverbend (Sewer)	233,190	-	-	-	0.0%	-
<b>Total Wholesale &amp; Contract Revenues</b>	<b>3,057,435</b>	<b>2,911,475</b>	<b>2,911,475</b>	<b>359,559</b>	<b>12.3%</b>	<b>3,271,034</b>
<b>Other Operating Revenue</b>						
Dye Testing	\$ 169,710	\$ 176,842	\$ 180,379	\$ -	0.0%	\$ 180,379
Fire Hydrant Line Use	135,567	146,104	149,026	-	0.0%	149,026
Fire Hydrant Sales	1,000	6,000	6,120	-	0.0%	6,120
Map Fees	-	360	367	-	0.0%	367
Backflow Fee	85,048	79,753	81,349	-	0.0%	81,349
Meter Sales	85,500	89,736	91,530	-	0.0%	91,530
Meter Test Fees	4,400	5,144	5,247	-	0.0%	5,247
Non-Sufficient Funds Fees	39,463	39,882	40,680	-	0.0%	40,680
Shut Fees	149,963	172,581	176,033	-	0.0%	176,033
Tap Fees	4,774,236	3,389,900	3,457,698	-	0.0%	3,457,698
Bid Fees	343	-	-	-	0.0%	-
Lien Satisfaction Fees	4,134	1,800	1,836	-	0.0%	1,836
Miscellaneous Fees (300)	927,674	1,118,000	1,140,360	-	0.0%	1,140,360
Miscellaneous Fees (400)	15,817	16,817	17,153	-	0.0%	17,153
Penalties & Interest	278,546	816,000	832,320	-	0.0%	832,320
Prior-Year Collections	1,670,728	-	-	-	0.0%	-
<b>Total Other Operating Revenues</b>	<b>8,342,129</b>	<b>6,058,920</b>	<b>6,180,099</b>	<b>-</b>	<b>0.0%</b>	<b>6,180,099</b>
<b>Total Operating Revenues</b>	<b>177,051,340</b>	<b>180,032,499</b>	<b>181,622,037</b>	<b>44,197,865</b>	<b>24.3%</b>	<b>225,819,903</b>

**Pittsburgh Water & Sewer Authority  
Rate Case 2020  
FPFTY Pro Forma Revenue at Current Rates**

	FY 2021			PUC Approved Prior Tariff Rates		FY 2021			
	Number of Meters	Number of Annual Bills	Billable Usage (Kgal) (1)	Monthly Min. Charge	Volume Charge (Kgal)	Min. Charge Revenue	Vol. Charge Revenue	DSIC (0%)	Total Rate Revenue
<b>1 Water Revenues</b>									
<b>2 Residential</b>									
3 5/8"	58,421	701,053	1,674,932	\$ 27.27	\$ 11.04	\$ 19,117,708	\$ 18,491,247	\$ -	\$ 37,608,955
4 3/4"	2,554	30,650	117,652	44.37	11.04	1,359,960	1,298,880	-	2,658,840
5 1"	2,374	28,486	129,813	89.82	11.04	2,558,583	1,433,131	-	3,991,714
6 1 1/2"	6	70	357	175.30	11.04	12,271	3,941	-	16,212
7 2"	1	12	271	289.14	11.04	3,470	2,994	-	6,464
8 Unmetered	333	3,996	-	44.36	-	177,263	-	-	177,263
9 <b>Total: Residential</b>	<b>63,689</b>	<b>764,267</b>	<b>1,923,025</b>			<b>\$ 23,229,254</b>	<b>\$ 21,230,193</b>	<b>\$ -</b>	<b>\$ 44,459,448</b>
<b>10 Residential - CAP</b>									
11 5/8"	2,912	34,947	89,721	\$ 6.82	\$ 11.04	\$ 238,254	\$ 990,519	\$ -	\$ 1,228,772
12 3/4"	27	319	471	11.09	11.04	3,534	5,203	-	8,737
14 1"	15	176	218	22.46	11.04	3,946	2,411	-	6,357
15 1 1/2"	-	-	-	43.83	11.04	-	-	-	-
16 Unmetered	1	12	-	11.09	-	133	-	-	133
17 <b>Total: Residential - CAP</b>	<b>2,954</b>	<b>35,454</b>	<b>90,411</b>			<b>\$ 245,866</b>	<b>\$ 998,133</b>	<b>\$ -</b>	<b>\$ 1,243,999</b>
<b>18 Commercial</b>									
19 5/8"	2,611	31,327	134,205	\$ 27.27	\$ 10.48	\$ 854,287	\$ 1,406,468	\$ -	\$ 2,260,755
20 3/4"	657	7,879	46,456	44.37	10.48	349,591	486,863	-	836,454
22 1"	1,313	15,750	145,255	89.82	10.48	1,414,665	1,522,272	-	2,936,937
23 1 1/2"	846	10,149	255,700	175.30	10.48	1,779,120	2,679,736	-	4,458,856
24 2"	784	9,412	445,159	289.14	10.48	2,721,386	4,665,269	-	7,386,654
25 3"	244	2,930	376,799	641.48	10.48	1,879,536	3,948,857	-	5,828,393
26 4"	182	2,189	619,597	1,084.28	10.48	2,373,489	6,493,373	-	8,866,862
27 6"	85	1,014	432,728	2,558.16	10.48	2,593,974	4,534,990	-	7,128,965
28 8"	8	93	164,828	4,596.96	10.48	427,517	1,727,397	-	2,154,915
29 10" & Above	-	-	-	7,515.81	10.48	-	-	-	-
30 Unmetered	2	24	-	88.26	-	2,118	-	-	2,118
31 <b>Total: Commercial</b>	<b>6,731</b>	<b>80,767</b>	<b>2,620,728</b>			<b>\$ 14,395,684</b>	<b>\$ 27,465,225</b>	<b>\$ -</b>	<b>\$ 41,860,908</b>
<b>32 Industrial</b>									
33 5/8"	21	257	1,630	\$ 27.27	\$ 8.81	\$ 7,008	\$ 14,360	\$ -	\$ 21,369
35 3/4"	13	161	335	44.37	8.81	7,144	2,947	-	10,091
36 1"	25	300	3,473	89.82	8.81	26,946	30,593	-	57,539
37 1 1/2"	6	72	295	175.30	8.81	12,622	2,595	-	15,216
38 2"	14	172	19,378	289.14	8.81	49,732	170,720	-	220,452
39 3"	2	24	17,070	641.48	8.81	15,396	150,382	-	165,778
40 4"	8	100	70,169	1,084.28	8.81	108,428	618,192	-	726,620
41 6"	2	24	43,986	2,558.16	8.81	61,396	387,512	-	448,908
42 8"	4	48	31,660	4,596.96	8.81	220,654	278,925	-	499,579
43 10" & Above	-	-	-	7,515.81	8.81	-	-	-	-
44 <b>Total: Industrial</b>	<b>97</b>	<b>1,158</b>	<b>187,994</b>			<b>\$ 509,325</b>	<b>\$ 1,656,226</b>	<b>\$ -</b>	<b>\$ 2,165,551</b>
<b>45 Health or Education</b>									
46 5/8"	34	408	1,496	\$ 27.27	\$ 14.32	\$ 11,126	\$ 21,424	\$ -	\$ 32,550
48 3/4"	8	101	526	44.37	14.32	4,481	7,525	-	12,007
49 1"	25	295	1,839	89.82	14.32	26,497	26,334	-	52,831
50 1 1/2"	64	773	8,033	175.30	14.32	135,507	115,030	-	250,537
51 2"	144	1,730	71,337	289.14	14.32	500,212	1,021,544	-	1,521,756
52 3"	96	1,156	150,774	641.48	14.32	741,551	2,159,079	-	2,900,630
53 4"	70	838	274,318	1,084.28	14.32	908,627	3,928,227	-	4,836,853
54 6"	37	444	412,589	2,558.16	14.32	1,135,823	5,908,277	-	7,044,100
55 8"	3	36	58,427	4,596.96	14.32	165,491	836,675	-	1,002,165
56 10" & Above	2	24	42,667	7,515.81	14.32	180,379	610,991	-	791,371
57 <b>Total: Health or Education</b>	<b>484</b>	<b>5,805</b>	<b>1,022,005</b>			<b>\$ 3,809,694</b>	<b>\$ 14,635,107</b>	<b>\$ -</b>	<b>\$ 18,444,801</b>
<b>58 Municipal</b>									
59 5/8"	15	180	1,057	\$ 10.91	\$ 4.19	\$ 1,963	\$ 4,429	\$ -	\$ 6,392
61 3/4"	5	60	193	17.75	4.19	1,065	809	-	1,874
62 1"	7	84	1,387	35.93	4.19	3,018	5,814	-	8,832
63 1 1/2"	24	288	1,464	70.12	4.19	20,195	6,135	-	26,330
64 2"	21	252	21,192	115.66	4.19	29,145	88,837	-	117,982
65 3"	2	24	666	256.59	4.19	6,158	2,790	-	8,948
66 4"	2	24	10,831	433.71	4.19	10,409	45,401	-	55,811
67 6"	2	24	184,806	1,023.26	4.19	24,558	774,705	-	799,263
68 8"	-	-	-	1,838.78	4.19	-	-	-	-
69 10" & Above	-	-	-	3,006.32	4.19	-	-	-	-
70 <b>Total: Municipal</b>	<b>78</b>	<b>936</b>	<b>221,594</b>			<b>\$ 96,512</b>	<b>\$ 928,920</b>	<b>\$ -</b>	<b>\$ 1,025,432</b>
<b>71 Private Fire System</b>									
72 1" or Less	1,195	14,343	5,789	\$ 31.60	\$ 13.49	\$ 453,239	\$ 78,094	\$ -	\$ 531,333
74 1 1/2"-3"	54	644	7,404	83.30	13.49	53,645	99,880	-	153,525
75 4"	5	60	80	177.57	13.49	10,654	1,079	-	11,733
76 6" or Greater	15	175	1,395	507.98	13.49	88,897	18,819	-	107,715
77 <b>Total: Private Fire System</b>	<b>1,269</b>	<b>15,222</b>	<b>14,668</b>			<b>\$ 606,435</b>	<b>\$ 197,872</b>	<b>\$ -</b>	<b>\$ 804,307</b>
78 Public Fire (Hydrants)	7,475	89,700	-	-	-	-	-	-	-
80 <b>Total: Water (Units &amp; Sales)</b>	<b>82,776</b>	<b>993,309</b>	<b>6,080,423</b>			<b>\$42,892,770</b>	<b>\$67,111,676</b>	<b>\$ -</b>	<b>\$110,004,446</b>

(1) Represents billable customer usage above minimum allowance included in minimum charge



**Pittsburgh Water & Sewer Authority  
Rate Case 2020  
Rate Revenue at Proposed Rates**

	FY 2021		Proposed Rates			FY 2021			
	Number of Meters	Number of Annual Bills	Billable Usage (Kgal) (1)	Monthly Min. Charge	Volume Charge (Kgal)	Min. Charge Revenue	Vol. Charge Revenue	DSIC (10%)	Total Rate Revenue
<b>1 Water Revenues</b>									
<b>2 Residential</b>									
3 5/8"	58,421	701,053	1,674,932	\$ 26.46	\$ 13.20	\$ 18,549,856	\$ 22,109,100	\$ 4,065,896	\$ 44,724,851
4 3/4"	2,554	30,650	117,652	45.46	13.20	1,393,369	1,553,009	294,638	3,241,015
5 1"	2,374	28,486	129,813	97.00	13.20	2,763,110	1,713,526	447,664	4,924,299
6 1 1/2"	6	70	357	191.99	13.20	13,439	4,712	1,815	19,967
7 2"	1	12	271	319.53	13.20	3,834	3,580	741	8,156
8 Unmetered	333	3,996	-	66.06	-	263,976	-	26,398	290,373
9 <b>Total: Residential</b>	<b>63,689</b>	<b>764,267</b>	<b>1,923,025</b>			<b>\$ 22,987,584</b>	<b>\$ 25,383,927</b>	<b>\$ 4,837,151</b>	<b>\$ 53,208,662</b>
<b>11 Residential - CAP</b>									
12 5/8"	2,912	34,947	89,721	\$ -	\$ 13.20	\$ -	\$ 1,184,316	\$ 118,432	\$ 1,302,747
13 3/4"	27	319	471	-	13.20	-	6,221	622	6,843
14 1"	15	176	218	-	13.20	-	2,883	288	3,171
15 1 1/2"	-	-	-	-	13.20	-	-	-	-
16 Unmetered	1	12	-	26.40	-	317	-	32	348
17 <b>Total: Residential - CAP</b>	<b>2,954</b>	<b>35,454</b>	<b>90,411</b>			<b>\$ 317</b>	<b>\$ 1,193,420</b>	<b>\$ 119,374</b>	<b>\$ 1,313,110</b>
<b>19 Commercial</b>									
20 5/8"	2,611	31,327	134,205	\$ 26.46	\$ 14.01	\$ 828,912	\$ 1,880,211	\$ 270,912	\$ 2,980,036
21 3/4"	657	7,879	46,456	45.46	14.01	358,179	650,854	100,903	1,109,936
22 1"	1,313	15,750	145,255	97.00	14.01	1,527,750	2,035,021	356,277	3,919,049
23 1 1/2"	846	10,149	255,700	191.99	14.01	1,948,507	3,582,357	553,086	6,083,950
24 2"	784	9,412	445,159	319.53	14.01	3,007,416	6,236,681	924,410	10,168,507
25 3"	244	2,930	376,799	718.29	14.01	2,104,590	5,278,959	738,355	8,121,903
26 4"	182	2,189	619,597	1,222.73	14.01	2,676,556	8,680,549	1,135,711	12,492,816
27 6"	85	1,014	432,728	2,917.29	14.01	2,958,132	6,062,520	902,065	9,922,718
28 8"	8	93	164,828	5,275.69	14.01	490,639	2,309,240	279,988	3,079,867
29 10" & Above	-	-	-	8,676.97	14.01	-	-	-	-
30 Unmetered	2	24	-	82.50	14.01	1,980	-	198	2,178
31 <b>Total: Commercial</b>	<b>6,731</b>	<b>80,767</b>	<b>2,620,728</b>			<b>\$ 15,902,662</b>	<b>\$ 36,716,393</b>	<b>\$ 5,261,905</b>	<b>\$ 57,880,960</b>
<b>33 Industrial</b>									
34 5/8"	21	257	1,630	\$ 26.46	\$ 12.30	\$ 6,800	\$ 20,049	\$ 2,685	\$ 29,534
35 3/4"	13	161	335	45.46	12.30	7,319	4,114	1,143	12,577
36 1"	25	300	3,473	97.00	12.30	29,100	42,713	7,181	78,994
37 1 1/2"	6	72	295	191.99	12.30	13,823	3,622	1,745	19,190
38 2"	14	172	19,378	319.53	12.30	54,959	238,349	29,331	322,639
39 3"	2	24	17,070	718.29	12.30	17,239	209,955	22,719	249,913
40 4"	8	100	70,169	1,222.73	12.30	122,273	863,083	98,536	1,083,891
41 6"	2	24	43,986	2,917.29	12.30	70,015	541,022	61,104	672,140
42 8"	4	48	31,660	5,275.69	12.30	253,233	389,418	64,265	706,916
43 10" & Above	-	-	-	8,676.97	12.30	-	-	-	-
44 <b>Total: Industrial</b>	<b>97</b>	<b>1,158</b>	<b>187,994</b>			<b>\$ 574,762</b>	<b>\$ 2,312,325</b>	<b>\$ 288,709</b>	<b>\$ 3,175,796</b>
<b>46 Health or Education</b>									
47 5/8"	34	408	1,496	\$ 26.46	\$ 14.98	\$ 10,796	\$ 22,412	\$ 3,321	\$ 36,528
48 3/4"	8	101	526	45.46	14.98	4,591	7,872	1,246	13,710
49 1"	25	295	1,839	97.00	14.98	28,615	27,548	5,616	61,780
50 1 1/2"	64	773	8,033	191.99	14.98	148,408	120,332	26,874	295,614
51 2"	144	1,730	71,337	319.53	14.98	552,787	1,068,626	162,141	1,783,555
52 3"	96	1,156	150,774	718.29	14.98	830,343	2,258,590	308,893	3,397,826
53 4"	70	838	274,318	1,222.73	14.98	1,024,648	4,109,276	513,392	5,647,316
54 6"	37	444	412,589	2,917.29	14.98	1,295,277	6,180,586	747,586	8,223,449
55 8"	3	36	58,427	5,275.69	14.98	189,925	875,236	106,516	1,171,677
56 10" & Above	2	24	42,667	8,676.97	14.98	208,247	639,152	84,740	932,139
57 <b>Total: Health or Education</b>	<b>484</b>	<b>5,805</b>	<b>1,022,005</b>			<b>\$ 4,293,637</b>	<b>\$ 15,309,630</b>	<b>\$ 1,960,327</b>	<b>\$ 21,563,594</b>
<b>59 Municipal</b>									
60 5/8"	15	180	1,057	\$ 10.58	\$ 5.60	\$ 1,905	\$ 5,921	\$ 783	\$ 8,608
61 3/4"	5	60	193	18.18	5.60	1,091	1,082	217	2,390
62 1"	7	84	1,387	38.80	5.60	3,259	7,773	1,103	12,135
63 1 1/2"	24	288	1,464	76.80	5.60	22,117	8,201	3,032	33,351
64 2"	21	252	21,192	127.81	5.60	32,209	118,760	15,097	166,065
65 3"	2	24	666	287.32	5.60	6,896	3,729	1,063	11,688
66 4"	2	24	10,831	489.09	5.60	11,738	60,694	7,243	79,676
67 6"	2	24	184,806	1,166.92	5.60	28,006	1,035,650	106,366	1,170,022
68 8"	-	-	-	2,110.28	5.60	-	-	-	-
69 10" & Above	-	-	-	3,470.79	5.60	-	-	-	-
70 <b>Total: Municipal</b>	<b>78</b>	<b>936</b>	<b>221,594</b>			<b>\$ 107,221</b>	<b>\$ 1,241,810</b>	<b>\$ 134,903</b>	<b>\$ 1,483,934</b>
<b>72 Private Fire System</b>									
73 1" or Less	1,195	14,343	5,789	\$ 32.35	\$ 19.77	\$ 463,996	\$ 114,449	\$ 57,844	\$ 636,289
74 1 1/2"-3"	54	644	7,404	99.12	19.77	63,833	146,377	21,021	231,231
75 4"	5	60	80	305.51	19.77	18,331	1,582	1,991	21,903
76 6" or Greater	15	175	1,395	609.02	19.77	106,579	27,580	13,416	147,574
77 <b>Total: Private Fire System</b>	<b>1,269</b>	<b>15,222</b>	<b>14,668</b>			<b>\$ 652,738</b>	<b>\$ 289,987</b>	<b>\$ 94,273</b>	<b>\$ 1,036,998</b>
78									
79 Public Fire (Hydrants)	7,475	89,700	-	\$ 6.09	\$ -	\$ 546,273	\$ -	\$ -	\$ 546,273
80									
<b>81 Total: Water (Units &amp; Sales)</b>	<b>82,776</b>	<b>993,309</b>	<b>6,080,423</b>			<b>\$45,065,194</b>	<b>\$82,447,491</b>	<b>\$12,696,641</b>	<b>\$140,209,326</b>

(1) Represents billable customer usage above minimum allowance included in minimum charge

**Pittsburgh Water & Sewer Authority  
Rate Case 2020  
Rate Revenue at Current Rates**

	FY 2021		PUC Approved Prior Tariff Rates		FY 2021				
	Number of Meters	Number of Annual Bills	Billable Usage (Kgal) (1)	Monthly Min. Charge	Volume Charge (Kgal)	Min. Charge Revenue	Vol. Charge Revenue	DSIC (0%)	Total Rate Revenue
<b>1 Wastewater Revenues</b>									
<b>2 Residential</b>									
3 5/8"	80,215	962,582	1,708,112	\$ 8.28	\$ 7.43	\$ 7,970,179	\$ 12,691,275	\$ -	\$ 20,661,454
4 3/4"	2,581	30,973	117,594	16.77	7.43	519,422	873,727	-	1,393,149
5 1"	2,394	28,727	130,365	39.82	7.43	1,143,896	968,614	-	2,112,510
6 1 1/2"	6	70	357	82.24	7.43	5,757	2,653	-	8,409
7 2"	1	12	271	139.23	7.43	1,671	2,015	-	3,686
8 Unmetered	333	3,996	-	25.99	-	103,856	-	-	103,856
9 <b>Total: Residential</b>	<b>85,530</b>	<b>1,026,360</b>	<b>1,956,700</b>			<b>\$ 9,744,781</b>	<b>\$ 14,538,283</b>	<b>\$ -</b>	<b>\$ 24,283,064</b>
<b>10 Residential - CAP</b>									
11 5/8"	4,456	53,466	93,943	\$ 2.07	\$ 7.43	\$ 110,675	\$ 697,995	\$ -	\$ 808,671
12 3/4"	30	358	586	4.19	7.43	1,501	4,356	-	5,857
13 1"	15	176	218	9.96	7.43	1,749	1,623	-	3,372
14 Unmetered	1	12	-	6.50	-	78	-	-	78
15 <b>Total: Residential - CAP</b>	<b>4,501</b>	<b>54,012</b>	<b>94,748</b>			<b>\$ 114,003</b>	<b>\$ 703,975</b>	<b>\$ -</b>	<b>\$ 817,978</b>
<b>16 Commercial</b>									
17 5/8"	3,621	43,455	133,806	\$ 8.28	\$ 6.56	\$ 359,807	\$ 877,770	\$ -	\$ 1,237,577
18 3/4"	774	9,293	47,643	16.77	6.56	155,844	312,538	-	468,382
19 1"	1,559	18,706	151,552	39.82	6.56	744,873	994,179	-	1,739,052
20 1 1/2"	885	10,614	258,739	82.24	6.56	872,895	1,697,326	-	2,570,221
21 2"	878	10,534	462,397	139.23	6.56	1,466,649	3,033,321	-	4,499,970
22 3"	243	2,911	376,242	317.57	6.56	924,446	2,468,144	-	3,392,591
23 4"	199	2,383	627,358	543.31	6.56	1,294,708	4,115,466	-	5,410,174
24 6"	100	1,205	435,244	1,302.21	6.56	1,569,163	2,855,200	-	4,424,363
25 8"	9	103	171,501	2,358.93	6.56	242,970	1,125,047	-	1,368,016
26 10" & Above	-	-	-	3,883.88	6.56	-	-	-	-
27 Unmetered	2	24	-	52.47	-	1,259	-	-	1,259
28 <b>Total: Commercial</b>	<b>8,269</b>	<b>99,228</b>	<b>2,664,480</b>			<b>\$ 7,632,614</b>	<b>\$ 17,478,992</b>	<b>\$ -</b>	<b>\$ 25,111,606</b>
<b>29 Industrial</b>									
30 5/8"	20	245	1,626	\$ 8.28	\$ 5.98	\$ 2,029	\$ 9,720	\$ -	\$ 11,749
31 3/4"	12	149	335	16.77	5.98	2,499	2,000	-	4,499
32 1"	25	300	3,473	39.82	5.98	11,946	20,766	-	32,712
33 1 1/2"	6	72	295	82.24	5.98	5,921	1,761	-	7,682
34 2"	16	196	19,704	139.23	5.98	27,289	117,828	-	145,118
35 3"	2	24	17,070	317.57	5.98	7,622	102,076	-	109,697
36 4"	9	112	70,643	543.31	5.98	60,851	422,448	-	483,299
37 6"	2	24	43,986	1,302.21	5.98	31,253	263,033	-	294,286
38 8"	4	48	31,660	2,358.93	5.98	113,229	189,327	-	302,555
39 10" & Above	-	-	-	3,883.88	5.98	-	-	-	-
40 <b>Total: Industrial</b>	<b>98</b>	<b>1,170</b>	<b>188,789</b>			<b>\$ 262,638</b>	<b>\$ 1,128,960</b>	<b>\$ -</b>	<b>\$ 1,391,598</b>
<b>41 Health or Education</b>									
42 5/8"	34	408	1,496	\$ 8.28	\$ 8.21	\$ 3,378	\$ 12,283	\$ -	\$ 15,661
43 3/4"	8	101	526	16.77	8.21	1,694	4,314	-	6,008
44 1"	25	295	1,839	39.82	8.21	11,747	15,098	-	26,845
45 1 1/2"	64	773	8,033	82.24	8.21	63,572	65,950	-	129,521
46 2"	144	1,730	71,337	139.23	8.21	240,868	585,676	-	826,544
47 3"	96	1,156	150,768	317.57	8.21	367,111	1,237,803	-	1,604,913
48 4"	70	838	274,318	543.31	8.21	455,294	2,252,147	-	2,707,440
49 6"	37	444	412,735	1,302.21	8.21	578,181	3,388,556	-	3,966,737
50 8"	3	36	58,427	2,358.93	8.21	84,921	479,686	-	564,607
51 10" & Above	2	24	42,667	3,883.88	8.21	93,213	350,296	-	443,509
52 <b>Total: Health or Education</b>	<b>484</b>	<b>5,805</b>	<b>1,022,145</b>			<b>\$ 1,899,979</b>	<b>\$ 8,391,808</b>	<b>\$ -</b>	<b>\$ 10,291,786</b>
<b>53 Municipal</b>									
54 5/8"	21	252	1,695	\$ 3.31	\$ 2.62	\$ 835	\$ 4,447	\$ -	\$ 5,281
55 3/4"	5	60	193	6.71	2.62	402	506	-	909
56 1"	7	84	1,387	15.93	2.62	1,338	3,639	-	4,977
57 1 1/2"	24	288	1,464	32.90	2.62	9,474	3,840	-	13,314
58 2"	21	252	21,192	55.69	2.62	14,034	55,608	-	69,642
59 3"	2	24	666	127.03	2.62	3,049	1,746	-	4,795
60 4"	2	24	10,831	217.32	2.62	5,216	28,419	-	33,635
61 6"	2	24	184,806	520.88	2.62	12,501	484,930	-	497,431
62 8"	-	-	-	943.57	2.62	-	-	-	-
63 10" & Above	-	-	-	1,553.55	2.62	-	-	-	-
64 <b>Total: Municipal</b>	<b>84</b>	<b>1,008</b>	<b>222,232</b>			<b>\$ 46,849</b>	<b>\$ 583,136</b>	<b>\$ -</b>	<b>\$ 629,985</b>
<b>65 Total: Wastewater (Units &amp; Sales)</b>	<b>98,965</b>	<b>1,187,583</b>	<b>6,149,094</b>			<b>\$19,700,864</b>	<b>\$42,825,153</b>	<b>\$ -</b>	<b>\$ 62,526,017</b>

(1) Represents billable customer usage above minimum allowance included in minimum charge

**Pittsburgh Water & Sewer Authority  
Rate Case 2020  
Rate Revenue at Proposed Rates**

	FY 2021			Proposed Rates		FY 2021			
	Number of Meters	Number of Annual Bills	Billable Usage (Kgal) (1)	Monthly Min. Charge	Volume Charge (Kgal)	Min. Charge Revenue	Vol. Charge Revenue	DSIC (10%)	Total Rate Revenue
<b>1 Wastewater Revenues</b>									
<b>2 Residential</b>									
3 5/8"	80,215	962,582	1,708,112	\$ 9.86	\$ 7.87	\$ 9,491,059	\$ 13,442,844	\$ 2,293,390	\$ 25,227,293
4 3/4"	2,581	30,973	117,594	17.64	7.87	546,369	925,469	147,184	1,619,022
5 1"	2,394	28,727	130,365	40.71	7.87	1,169,463	1,025,975	219,544	2,414,981
6 1 1/2"	6	70	357	79.62	7.87	5,573	2,810	838	9,221
7 2"	1	12	271	133.81	7.87	1,606	2,134	374	4,114
8 Unmetered	333	3,996	-	33.47	-	133,746	-	13,375	147,121
9 <b>Total: Residential</b>	<b>85,530</b>	<b>1,026,360</b>	<b>1,956,700</b>			<b>\$ 11,347,816</b>	<b>\$ 15,399,231</b>	<b>\$ 2,674,705</b>	<b>\$ 29,421,752</b>
10									
<b>11 Residential - CAP</b>									
12 5/8"	4,456	53,466	93,943	\$ -	\$ 7.87	\$ -	\$ 739,330	\$ 73,933	\$ 813,263
13 3/4"	30	358	586	-	7.87	-	4,614	461	5,076
14 1"	15	176	218	-	7.87	-	1,719	172	1,891
15 Unmetered	1	12	-	15.74	-	189	-	19	208
16 <b>Total: Residential - CAP</b>	<b>4,501</b>	<b>54,012</b>	<b>94,748</b>			<b>\$ 189</b>	<b>\$ 745,663</b>	<b>\$ 74,585</b>	<b>\$ 820,438</b>
17									
<b>18 Commercial</b>									
19 5/8"	3,621	43,455	133,806	\$ 9.86	\$ 7.95	\$ 428,466	\$ 1,063,761	\$ 149,223	\$ 1,641,450
20 3/4"	774	9,293	47,643	17.64	7.95	163,929	378,762	54,269	596,960
21 1"	1,559	18,706	151,552	40.71	7.95	761,521	1,204,836	196,636	2,162,993
22 1 1/2"	885	10,614	258,739	79.62	7.95	845,087	2,056,972	290,206	3,192,265
23 2"	878	10,534	462,397	133.81	7.95	1,409,555	3,676,052	508,561	5,594,168
24 3"	243	2,911	376,242	310.89	7.95	905,001	2,991,120	389,612	4,285,733
25 4"	199	2,383	627,358	541.10	7.95	1,289,441	4,987,493	627,693	6,904,628
26 6"	100	1,205	435,244	1,343.35	7.95	1,618,737	3,460,189	507,893	5,586,818
27 8"	9	103	171,501	2,486.36	7.95	256,095	1,363,433	161,953	1,781,481
28 10" & Above	-	-	-	4,180.49	7.95	-	-	-	-
29 Unmetered	2	24	-	41.66	7.95	1,000	-	100	1,100
30 <b>Total: Commercial</b>	<b>8,269</b>	<b>99,228</b>	<b>2,664,480</b>			<b>\$ 7,678,831</b>	<b>\$ 21,182,619</b>	<b>\$ 2,886,145</b>	<b>\$ 31,747,596</b>
31									
<b>32 Industrial</b>									
33 5/8"	20	245	1,626	\$ 9.86	\$ 7.98	\$ 2,416	\$ 12,971	\$ 1,539	\$ 16,926
34 3/4"	12	149	335	17.64	7.98	2,628	2,669	530	5,827
35 1"	25	300	3,473	40.71	7.98	12,213	27,711	3,992	43,917
36 1 1/2"	6	72	295	79.62	7.98	5,733	2,350	808	8,891
37 2"	16	196	19,704	133.81	7.98	26,227	157,236	18,346	201,809
38 3"	2	24	17,070	310.89	7.98	7,461	136,215	14,368	158,044
39 4"	9	112	70,643	541.10	7.98	60,603	563,735	62,434	686,772
40 6"	2	24	43,986	1,343.35	7.98	32,240	351,004	38,324	421,569
41 8"	4	48	31,660	2,486.36	7.98	119,345	252,647	37,199	409,191
42 10" & Above	-	-	-	4,180.49	7.98	-	-	-	-
43 <b>Total: Industrial</b>	<b>98</b>	<b>1,170</b>	<b>188,789</b>			<b>\$ 268,867</b>	<b>\$ 1,506,539</b>	<b>\$ 177,541</b>	<b>\$ 1,952,946</b>
44									
<b>45 Health or Education</b>									
46 5/8"	34	408	1,496	\$ 9.86	\$ 8.26	\$ 4,023	\$ 12,358	\$ 1,638	\$ 18,019
47 3/4"	8	101	526	17.64	8.26	1,782	4,341	612	6,734
48 1"	25	295	1,839	40.71	8.26	12,009	15,190	2,720	29,920
49 1 1/2"	64	773	8,033	79.62	8.26	61,546	66,351	12,790	140,687
50 2"	144	1,730	71,337	133.81	8.26	231,491	589,243	82,073	902,807
51 3"	96	1,156	150,768	310.89	8.26	359,389	1,245,341	160,473	1,765,203
52 4"	70	838	274,318	541.10	8.26	453,442	2,265,863	271,930	2,991,235
53 6"	37	444	412,735	1,343.35	8.26	596,447	3,409,193	400,564	4,406,204
54 8"	3	36	58,427	2,486.36	8.26	89,509	482,607	57,212	629,328
55 10" & Above	2	24	42,667	4,180.49	8.26	100,332	352,429	45,276	498,037
56 <b>Total: Health or Education</b>	<b>484</b>	<b>5,805</b>	<b>1,022,145</b>			<b>\$ 1,909,970</b>	<b>\$ 8,442,915</b>	<b>\$ 1,035,289</b>	<b>\$ 11,388,174</b>
57									
<b>58 Municipal</b>									
59 5/8"	21	252	1,695	\$ 3.94	\$ 3.18	\$ 994	\$ 5,389	\$ 638	\$ 7,021
60 3/4"	5	60	193	7.06	3.18	423	614	104	1,141
61 1"	7	84	1,387	16.28	3.18	1,368	4,411	578	6,356
62 1 1/2"	24	288	1,464	31.85	3.18	9,172	4,654	1,383	15,209
63 2"	21	252	21,192	53.52	3.18	13,488	67,391	8,088	88,966
64 3"	2	24	666	124.36	3.18	2,985	2,116	510	5,611
65 4"	2	24	10,831	216.44	3.18	5,195	34,441	3,964	43,599
66 6"	2	24	184,806	537.34	3.18	12,896	587,681	60,058	660,635
67 8"	-	-	-	994.54	3.18	-	-	-	-
68 10" & Above	-	-	-	1,672.20	3.18	-	-	-	-
69 <b>Total: Municipal</b>	<b>84</b>	<b>1,008</b>	<b>222,232</b>			<b>\$ 46,521</b>	<b>\$ 706,697</b>	<b>\$ 75,322</b>	<b>\$ 828,539</b>
70									
<b>71 Total: Wastewater (Units &amp; Sales)</b>	<b>98,965</b>	<b>1,187,583</b>	<b>6,149,094</b>			<b>\$21,252,193</b>	<b>\$47,983,664</b>	<b>\$ 6,923,586</b>	<b>\$ 76,159,444</b>

(1) Represents billable customer usage above minimum allowance included in minimum charge

**Pittsburgh Water & Sewer Authority**  
**HTY & YTD Customers and Consumption**

**Summary of Customers and Consumption - Water**  
 HTY 2019 Summary of Customers and Consumption

CLASS	Historical Test Year Ended Dec. 31											
	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Residential												
Number of Accounts Billed	66,271	66,203	66,273	66,344	66,281	66,356	66,400	66,281	66,277	66,282	66,251	66,510
Total Consumption	226,576	255,686	228,830	225,368	215,998	238,207	227,067	216,262	237,437	230,393	232,833	209,189
Billable Consumption	158,931	187,526	161,713	158,096	148,470	169,704	159,026	148,769	169,060	162,252	164,611	141,683
Commercial												
Number of Accounts Billed	7,183	7,155	7,177	7,183	7,139	7,095	7,081	7,057	7,066	7,068	7,041	7,106
Total Consumption	243,779	258,094	229,764	237,646	247,283	280,440	298,154	288,679	314,773	283,984	250,343	230,702
Billable Consumption	191,730	204,443	177,250	184,288	192,707	226,151	243,327	234,392	259,733	229,931	196,611	177,311
Industrial												
Number of Accounts Billed	96	96	96	96	96	95	97	96	97	99	97	97
Total Consumption	9,685	9,734	13,706	13,563	15,239	16,587	18,307	24,107	26,292	29,191	17,841	15,403
Billable Consumption	8,152	8,060	12,083	11,749	13,537	15,021	17,018	23,056	25,187	27,959	16,779	14,043
Health or Education												
Number of Accounts Billed	491	489	492	484	482	478	489	481	483	479	477	480
Total Consumption	71,998	90,723	80,291	97,482	92,147	97,096	110,145	107,012	122,967	119,888	90,355	78,073
Billable Consumption	56,735	74,739	64,651	81,854	76,998	82,704	96,008	92,428	107,289	104,097	74,894	63,184
Fire System												
Number of Accounts Billed	1,245	1,244	1,248	1,289	1,254	1,279	1,268	1,264	1,268	1,266	1,278	1,299
Total Consumption	586	589	8,259	799	768	871	1,308	654	6,417	1,047	604	604
Billable Consumption	508	503	8,175	711	680	782	1,207	567	6,306	951	515	518
<b>TOTAL</b>												
NUMBER OF ACCOUNTS BILLED	75,286	75,187	75,286	75,396	75,252	75,303	75,335	75,179	75,191	75,194	75,144	75,492
TOTAL CONSUMPTION	552,624	614,826	560,850	574,858	571,435	633,201	654,981	636,714	707,886	664,503	591,976	533,971
BILLABLE CONSUMPTION	416,056	475,271	423,872	436,698	432,393	494,361	516,586	499,212	567,575	525,190	453,411	396,739



**Pittsburgh Water & Sewer Authority  
Historical & Projected Billing Units**

	12 Months Ended 12/31/2017	12 Months Ended 12/31/2018	HTY 12 Months Ended 12/31/2019	FTY 12 Months Ended 12/31/2020	FPFTY 12 Months Ended 12/31/2021	12 Months Ended 12/31/2022
<b>Water</b>						
<u>Billed Accounts</u>						
Residential	66,917	65,099	64,844	64,148	63,689	63,689
Residential - CAP	-	923	1,800	2,495	2,954	2,955
Commercial	6,860	6,697	6,731	6,731	6,731	6,731
Industrial	100	98	97	97	97	97
Health or Education	513	494	484	484	484	484
Fire System	1,214	1,223	1,269	1,269	1,269	1,269
Municipal	-	-	-	78	78	78
<b>Total</b>	<b>75,602</b>	<b>74,534</b>	<b>75,223</b>	<b>75,301</b>	<b>75,301</b>	<b>75,301</b>
<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	936
<b>Total</b>	<b>907,229</b>	<b>894,409</b>	<b>902,672</b>	<b>903,608</b>	<b>903,609</b>	<b>903,609</b>
<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
<b>Total</b>	<b>6,458,306</b>	<b>6,055,668</b>	<b>5,637,366</b>	<b>6,080,423</b>	<b>6,080,423</b>	<b>6,080,423</b>
<b>Wastewater</b>						
<u>Billed Accounts</u>						
Residential	91,327	88,101	87,290	86,230	85,530	85,530
Residential - CAP	-	1,697	2,740	3,800	4,500	4,500
Commercial	8,358	8,265	8,269	8,269	8,269	8,269
Industrial	100	98	98	98	98	98
Health or Education	512	494	484	484	484	484
Municipal	-	-	-	84	84	84
<b>Total</b>	<b>100,296</b>	<b>98,655</b>	<b>98,880</b>	<b>98,964</b>	<b>98,964</b>	<b>98,964</b>
<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	1,008
<b>Total</b>	<b>1,203,557</b>	<b>1,183,865</b>	<b>1,186,562</b>	<b>1,187,570</b>	<b>1,187,571</b>	<b>1,187,571</b>
<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
<b>Total</b>	<b>6,544,915</b>	<b>6,135,290</b>	<b>5,693,701</b>	<b>6,149,094</b>	<b>6,149,094</b>	<b>6,149,094</b>

**Pittsburgh Water & Sewer Authority**  
**Billings for 10 Largest Customers**

	<b>Actual 12 Months Ended 12/31/2017</b>	<b>Actual 12 Months Ended 12/31/2018</b>	<b>HTY Actual 12 Months Ended 12/31/2019</b>	<b>FTY Proposed 12 Months Ended 12/31/2020</b>	<b>FPFTY Proposed 12 Months Ended 12/31/2021</b>
<b>Top 10 Customers - Usage</b>					
Fox Chapel Water Authority	509,953	612,616	632,050	622,333	622,336
University Of Pittsburgh	414,995	433,302	443,101	438,202	438,202
HACP	343,249	142,109	139,261	140,685	140,685
Riverbend Properties, LLC	724,835	462,007	263,171	-	-
Allegheny County Sites	145,855	130,795	134,909	132,852	132,852
Reserve Water Dept	48,493	112,068	109,473	110,771	110,777
Borough Of Aspinwall	94,552	81,386	59,842	70,614	70,616
Carnegie Mellon University	83,933	122,259	101,674	111,967	111,967
Allegheny Health Network	63,216	62,539	67,192	64,866	64,866
Veterans Affairs	67,328	81,794	62,366	72,080	72,080
<i>Total Units</i>	2,496,409	2,240,875	2,013,039	1,764,368	1,764,380
<b>Top 10 Customers - Billings</b>					
Fox Chapel Water Authority	\$ 1,087,495	\$ 1,657,652	\$ 1,945,786	\$ 1,966,755	\$ 2,279,125
University Of Pittsburgh	4,531,142	5,340,383	6,119,064	6,119,064	7,018,567
HACP	2,833,543	1,475,641	1,663,480	1,663,480	1,663,480
Riverbend Properties, LLC	2,104,228	1,392,294	356,303	-	-
Allegheny County Sites	890,878	1,180,811	1,415,590	1,415,590	1,736,928
Reserve Water Dept	195,262	464,735	477,428	503,845	528,633
Borough Of Aspinwall	312,967	269,388	201,095	240,088	242,213
Carnegie Mellon University	933,057	1,622,512	1,569,773	1,569,773	1,800,530
Allegheny Health Network	747,753	806,839	969,555	969,555	1,112,080
Veterans Affairs	794,801	1,063,118	940,618	940,618	1,154,138
<i>Total Charges</i>	\$ 14,431,128	\$ 15,273,373	\$ 15,658,690	\$ 15,388,766	\$ 17,535,692

**TAB**

**6**



**III. OPERATING EXPENSE**

III.1. Prepare a summary of operating expenses by operating expense account for the historic test year and the 2 years preceding the test year.

**RESPONSE:**

Please see the attached schedule.

**III. OPERATING EXPENSE**

III.2. Prepare a summary of operating expenses for the historic test year providing annualizing and normalizing adjustments to arrive at adjusted future operating expenses for ratemaking, including supporting data.

**RESPONSE:**

Please see the attached schedule.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**III. OPERATING EXPENSE**

III.3. List extraordinary property losses as a separate item, not included in operating expenses or depreciation and amortization. Sufficient supporting data must be provided, such as explanation and breakdown of costs.

**RESPONSE:** Not applicable.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**III. OPERATING EXPENSE**

III.4. Supply detailed calculations of normalization of rate case expense, including supporting data for outside services rendered. Provide the items comprising the rate case expense claim (include the actual billings or invoices in support of each kind of rate case expense) and the items comprising the actual expenses of the prior rate cases.

**RESPONSE:****Rate Case & DSIC Expenses**

	<b>FTY 2020 Rate Case</b>	<b>FPFTY 2021 Rate Case</b>
Legal Counsel Costs	\$ 900,000	\$ 300,000
Other Consultant	900,000	342,000
<b>Total</b>	<b>\$ 1,800,000</b>	<b>\$ 642,000</b>

The aforementioned projected rate case and DSIC petition costs are expected to be incurred by PWSA in 2020 and 2021 as a result of the base rate case and proposed DSIC proceedings. These costs are anticipated to be expensed as incurred with the full amount of the 2020 costs recognized in the FTY and the full amount of the 2021 costs recognized in the FPFTY.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**III. OPERATING EXPENSE**

III.5. Submit detailed computation of adjustments to operating expenses for salary, wage and fringe benefit increases (union and nonunion merit, progression, promotion and general) granted during the historic test year and during the 12 months subsequent to the historic test year. Supply data for the historic test year showing:

- a. Actual payroll expense (regular and overtime separately) by categories of operating expenses, i.e., maintenance, operating transmission, distribution, other.
- b. Date, percentage increase and annual amount of each general payroll increase during the historic test year and future test year.
- c. Dates and annual amounts of merit increases or management salary adjustments.
- d. Total annual payroll increases in the historic and future test years.
- e. Proof that the actual payroll plus the increases equal the payroll expense claimed in the supporting data by categories of expenses.
- f. Detailed list of employee benefits and cost thereof for union and nonunion personnel. Specific benefits for executives and officers should be included, and costs thereof.
- g. Support the annualized pension cost figures by providing the following:
  - (i) State whether these figures include any unfunded pension costs. Explain.
  - (ii) Provide latest actuarial study used for determining pension accrual rates.
- h. Submit a schedule showing any deferred income and consultant fee, paid to both, corporate officers and employees in historic and future test years.

**RESPONSE:**

**III.5a** Please see the attached schedule.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**III. OPERATING EXPENSE****III.5b** See below.

	Date Effective	Percent Increase	Estimated FY 2020 Impact
Pittsburgh Joint Collective Bargaining Committee	2019 / 2020	3% / 3%	\$1,616,200
District Council 84 AFSCME Local 2719 & Local 2037	2019 / 2020	3% / 3%	257,014
Non-Union	2019 / 2020	3% / 3%	1,917,109

**III.5c** See below.

	Date Effective	Percent Increase	Estimated Annual Amount
Supervisory / Management	Mar-19	39.56%	\$32,600.26
Supervisory / Management	Apr-19	14.37%	\$18,128.45
Supervisory / Management	Apr-19	39.57%	\$22,967.98
Supervisory / Management	Apr-19	5.00%	\$4,969.54
Supervisory / Management	May-19	5.51%	\$5,000.11
Supervisory / Management	Jul-19	1.73%	\$2,499.95
Supervisory / Management	Jul-19	8.73%	\$11,250.10
Supervisory / Management	Jul-19	6.80%	\$10,000.02
Supervisory / Management	Jul-19	9.81%	\$10,000.01
Supervisory / Management	Jul-19	4.99%	\$7,209.91
Supervisory / Management	Jul-19	4.96%	\$4,410.02
Supervisory / Management	Jul-19	5.01%	\$6,200.06
Supervisory / Management	Jul-19	3.27%	\$2,499.96
Supervisory / Management	Jul-19	4.79%	\$4,118.81
Supervisory / Management	Jul-19	5.18%	\$3,546.81
Supervisory / Management	Jul-19	3.87%	\$2,499.95
Supervisory / Management	Jul-19	5.01%	\$6,200.06
Supervisory / Management	Aug-19	26.07%	\$15,407.18
Supervisory / Management	Sep-19	11.52%	\$5,683.81
Supervisory / Management	Oct-19	32.64%	\$15,995.20

**III.5d** See below.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**III. OPERATING EXPENSE**

	Estimated Annual Amount
2018 – 2019 Increase in Salaries, Wages, & Benefits	\$ 4,664,723
2019 – 2020 Increase in Salaries, Wages, & Benefits	\$ 5,428,095

**III.5e** See the attached schedule.

**III.5f** See below.

	<b>HTY</b>	<b>FTY</b>	<b>FPFTY</b>	<b>Forecast</b>
<b>Twelve Months Ended:</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>
4110 Fed Insurance Contract Tax	\$1,383,592	\$1,512,574	\$1,785,480	\$1,924,000
4115 Medicare	330,624	336,783	421,782	454,177
4120 Fed Unemployment Tax	2,448,720	0	0	0
4125 State Unemployment Tax	1590.58	50,000	57,000	60,000
4130 Workers Comp Insurance	305,362	0	0	0
4135 Med Health Insurance	3,889,851	4,201,263	4,497,030	4,906,066
4140 Med Health Insurance Waiver	74,132	78,368	83,833	95,424
4145 Short Term Disability	179,003	169,260	191,541	215,772
4150 Long Term Disability	33,438	55,870	70,375	90,235
4155 Life Ins <50k	34,307	41,688	44,945	51,164
4160 Accidental Death/Dismemberment	4,901	5,930	6,483	6,970
4165 Dental Insurance	148,800	147,859	169,353	192,435
4170 Vision Insurance	13,237	17,034	19,044	21,193
4174 Customer Service Week	3000	12,075	12,075	13,350
4175 Uniforms	192,070	223,227	217,680	230,560
4180 Tuition Reimbursement	101,687	223,289	229,805	275,105
4185 Retirement Benefit	0	875	340	0
4195 Misc. Benefits	-31,597	-35,332	-53,016	-62,111
4199 Payroll Upload Except	-4	2,886	277	-3,013
<b>Total Employee Benefits</b>	<b>\$6,663,993</b>	<b>\$7,043,650</b>	<b>\$7,754,027</b>	<b>\$8,471,329</b>

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**III. OPERATING EXPENSE****III.5g** Support the annualized pension cost figures

- (i) Not applicable. Please see response to III.14 for additional information.
- (ii) Please see response to III.14 for additional information.

**III.5h.** Submit a schedule showing any deferred income and consultant fee to corporate officers or employees.

On April 30, 2018, Robert Weimar became Executive Director of PWSA. Weimar was previously a contractor of the Authority and, under that contract, was owed an expense report reimbursement prior to becoming a PWSA employee. That amount of \$39,116 was paid to Weimar in June 2018. Aside from that payment, PWSA has not paid any deferred income and consultant fee to corporate officers or employees.



## Pittsburgh Water and Sewer Authority's Base Rate Filing

**III. OPERATING EXPENSE**

III.6. Supply an exhibit showing an analysis, by functional accounts, of the charges by affiliates (service corporations, etc.) for services rendered included in the operating expenses of the filing company for the historic and future test years and for the 12-month period ended prior to the historic test year:

- a. Supply a copy of contracts, if applicable.
- b. Explain the nature of the services provided.
- c. Explain the basis on which charges are made.
- d. If charges are allocated, identify allocation factors used.
- e. Supply the components and amounts comprising the expense in this account.
- f. Provide details of initial source of charge and reason thereof.

**RESPONSE:** Not applicable.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**III. OPERATING EXPENSE**

III.7. Describe costs relative to leasing equipment, computer rentals, and office space, including terms and conditions of the lease. Explain the method of calculating monthly or annual payments. If allocated from the parent company, provide the method of allocation.

**RESPONSE:**

PWSA has leasing arrangements with various companies for the leasing of office and equipment and technology. The following table identifies the long-term leases with an explanation for the method used for calculating the monthly or annual payments.

	<b><u>Annual Payment</u></b>
<b>Name: <u>The Buncher Company</u></b>	\$864,031
Under this agreement, PWSA leases office space of 45,618 square feet for the main administrative, field ops and engineering offices. Additionally, PWSA leases outdoor space of 196 square feet for a backup generator. Payments are made at a rental rate using a predetermined rental rate equation throughout the term of 243 months of the lease agreement.	
<b>Name: <u>Sharp</u></b>	\$90,649
Under this agreement, PWSA leases fifteen multi-functional printers related to management information systems. Payments are made at a predetermined rental rate constant throughout the term (5 years) of the lease agreement.	
<b>Name: <u>Ceridian</u></b>	\$17,594
Under this agreement, PWSA leases time clocking equipment used at the water treatment plant. Payments are made at a predetermined rental rate constant throughout the term of the lease agreement.	
<b>Name: <u>Pittsburgh National Bank</u></b>	\$1,800
Under this agreement, PWSA leases a credit card machine used in the customer service department for customer payments. Payments are made at a predetermined rental rate constant for the life of the lease agreement.	
<b>Name: <u>Sensus USA, Inc.</u></b>	\$636,000

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**III. OPERATING EXPENSE**

This agreement is for an advanced metering infrastructure lease that is overseen by the customer service. Payments are made at a predetermined rate constant through June 2029, of the lease agreement.

**III. OPERATING EXPENSE**

III.8. Submit detailed calculations (or best estimates) of the cost resulting from storm damage.

**RESPONSE:**

There are no costs for storm damage included in the HTY, FTY, or FPFTY.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**III. OPERATING EXPENSE**

III.9. Submit details of expenditures for advertising (national, institutional and local media). Provide a schedule of advertising expense by media categories for the historic test year and the prior two comparable years with respect to:

- a. Public health and safety.
- b. Conservation of energy.
- c. Explanation of billing practices, rates, rules and regulations.
- d. Provision of factual and objective data programs in educational institutions.
- e. Other advertising programs.
- f. Total advertising expense.

**RESPONSE:**

Despite "advertising" line items within PWSA's budget, the Authority does not advertise on national, institutional, or local media. The Advertising account (7305) includes costs such as: Board of Directors meeting solicitations and job postings which mostly represent payments to the New Pittsburgh Courier and the Pittsburgh Post-Gazette. The Advertising Marketing account (7307) largely consists of payments to local businesses for staff business cards, website design and support, banners, and other printed material needs. Education and Outreach (7742) consists of payments to Dollar Energy Fund for CAP costs, sponsorships, brochures, and other materials.

Public Affairs costs have been included in the HTY, FTY, and FPFTY but these costs largely include salaries for External Affairs staff and professional services costs. Advertising-Marketing and Education & Outreach include budgeted amounts for minimal advertising. These costs are identified below.

	<b>FTY 2020</b>	<b>FPFTY 2021</b>
Print Ads	\$ 6,000	\$ 25,000
Digital Media / TV	2,000	7,500
Educational Campaigns	120,000	120,000
<b>Total</b>	<b>\$ 128,000</b>	<b>\$ 152,500</b>

**III. OPERATING EXPENSE**

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**III. OPERATING EXPENSE**

III.10. Prepare a detailed schedule for the historic test year showing types of social and service organization memberships paid for by the company and the cost thereof.

**RESPONSE:**

PWSA pays membership fees to water industry organizations and other industry-related associations. The payments for 2019 are included in III.24. There were no social and/or service memberships paid during the test year by PWSA.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**III. OPERATING EXPENSE**

III.11. Submit a schedule showing a breakdown by the expenditures associated with outside services employed, regulatory commission expenses, showing expenses relating to rate cases separately, and miscellaneous general expenses, for the historic test year and prior 2 comparable years.

**RESPONSE:****7300: Professional Services**

	<b>Actual</b>	<b>Actual</b>	<b>HTY</b>
<b>Twelve Months Ended:</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
7305 Advertising	\$29,088	\$28,962	\$66,514
7306 Annual Report	-	-	-
7307 Advertising - Marketing	18,465	29,427	20,068
7310 Annual Audit	59,170	64,308	49,683
7315 Billing Contract	486,391	832,775	509,742
7321 Coll Agency Sewage	44,313	-	-
7323 Consultants	1,087,403	1,161,923	342,885
7325 Consumer Confidence Report	-	1707	2171.14
7328 Contingencies	22,111	11,766	29,000
7332 Consulting Engineers	238,347	147,182	25,472
7335 Misc. Services – Non-Capital	7,314,114	3,583,069	2,548,654
7345 Auto Insurance	169,393	29,307	170,745
7348 Commercial Prop Insurance	210,767	215,532	226,172
7353 Gen Liability Insurance	5,308	20,798	21,637
7359 Officers Director Insurance	63,812	74,349	74,528
7365 WorkersComp Insurance	-	-	-
7366 WorkersComp City Insurance	18,120	33,352	33,656
7368 Internet Connection Server Insurance	44,508	66,656	59,147
7370 Legal (1)	1,838,942	2,894,513	2,614,338
7375 Meter Services	910,908	879,344	904,938
7382 Payroll Services	54,044	72,899	54,024
7383 Prof Service - Other (1)	1,427,969	5,307,167	7,085,103
7389 Trust Admin	76,940	71,235	101,911
7390 Water Liens	-	-	8,000
<b>Total Professional Services</b>	<b>\$14,120,113</b>	<b>\$15,526,273</b>	<b>\$14,948,387</b>

Includes PUC Assessments, Rate Case, and Compliance Plan costs.



## Pittsburgh Water and Sewer Authority's Base Rate Filing

**III. OPERATING EXPENSE****Regulatory Commission Expenses (7370 & 7383)**

	<b>Actual 2017</b>	<b>Actual 2018</b>	<b>HTY 2019</b>
<b>Twelve Months Ended:</b>			
PUC Assessments (910)	\$0	\$836,801	\$953,170
PUC Support			
Finance (913)	\$224,497	\$2,245,865	\$1,463,403
Legal (916)	\$0	\$774,002	\$1,224,401
<b>Total Regulatory &amp; Rate Case Expenses</b>	<b>\$224,497</b>	<b>\$3,856,668</b>	<b>\$3,640,974</b>

**7700: Miscellaneous Admin**

	<b>Actual 2017</b>	<b>Actual 2018</b>	<b>HTY 2019</b>
<b>Twelve Months Ended:</b>			
7712 Cash Discount Taken	(\$321)	(\$523)	(\$641)
7715 Claims Deductibles	229,858	353,049	618,641
7721 Customer Refund. AP	331,386	881,565	485,309
7730 Fines Penalties	600,603	15,372	20,000
7742 Education & Outreach	270,044	50,512	58,547
7743 Employee Fund	54,722	-	-
7750 Inventory Adjustments	224,243	1,373,808	-
7760 Misc. General Admin Expense	14	-	99.98
7765 One Call	13,589	14,921	21,125
7770 Publication Subscription	5,555	4,288	12,384
7799 Grants Awarded by PWSA	51,504	95,000	64,852
<b>Total Miscellaneous Admin</b>	<b>\$1,781,197</b>	<b>\$2,787,991</b>	<b>\$1,280,314</b>

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**III. OPERATING EXPENSE**

III. 12. Submit details of information covering research and development expenditures, by project, within the company and note forecasted company programs.

**RESPONSE:**

No research and development expenditures were incurred during the HTY nor are any expected to be incurred in the FTY and FPFTY.

**III. OPERATING EXPENSE**

III.13. Provide a detailed schedule of all charitable and civic contributions by recipient and amount for the historic test year.

**RESPONSE:**

There were no charitable and civic contributions paid during the historic test year by PWSA.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**III. OPERATING EXPENSE**

III.14. Provide the two most recent actuarial studies for both pension expense and postretirement benefits other than pensions (OPEBs).

**RESPONSE:**

PWSA employees hired prior to March 1, 2019 participate in the City of Pittsburgh Municipal Pension Fund Plan (Plan). Employees who became members of the Plan prior to January 1, 1988 are required to contribute 5% of pre-tax pay. Those joining thereafter are required to contribute 4%. The City's obligations relative to the Plan are determined in accordance with various Pennsylvania statutes. The extent of the Authority's participation in such obligations with respect to those former City employees whose membership continued upon becoming employees of the Authority is determined by the shared interpretation of the City and Authority of the intent of the Cooperation Agreement.

The Plan has not reported or attributed measurements of assets or the net pension liability on the basis of the group of members who are Authority employees. As of the date of this filing, the amount of the assets and liabilities of the Plan that is attributable to PWSA participants (both employees and retirees) is unknown as a detailed study has not been performed to separate the plan between the City and the Authority. As such, this information is unavailable at this time.

Eligibility for ongoing employee participation in the City's Plan ended on March 1, 2019, as the Authority has introduced another retirement plan. At this time, all new employees of the Authority may elect to contribute to an established 401a plan with the benefit of an employer match once vested. No new employees hired after March 1, 2019 are eligible for participation in the City of Pittsburgh Municipal Pension Fund Plan.

### **III. OPERATING EXPENSE**

III.15. Identify the total pension expense under statement of accounting standards (SFAS 87) for the historic test year and the portion charged to operation and maintenance (O & M). Include an analysis showing the contribution to the pension plan and the amount deferred or expensed for each of the past 2 years and the historic test year. Also provide any estimates for the future year.

**RESPONSE:**

Please see the response to III.14.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**III. OPERATING EXPENSE**

III.16. Provide an analysis of OPEBs showing the accrual amount under SFAS 106 and the pay-as-you-go expense.

**RESPONSE:**

Not applicable. PWSA does not offer other post-employment benefits.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**III. OPERATING EXPENSE**

III.17. Reconcile the historic and future test year SFAS No. 106 expense levels with the amount identified in the actuarial report.

**RESPONSE:**

Not applicable. PWSA does not offer other post-employment benefits.

**III. OPERATING EXPENSE**

III.18. Identify the actual or projected amounts contributed to SFAS No. 106 funds for the historic and future test years. Identify the actual or projected dates and amounts of the contributions.

**RESPONSE:**

Not applicable. PWSA does not offer other post-employment benefits.



## Pittsburgh Water and Sewer Authority's Base Rate Filing

**III. OPERATING EXPENSE**

III.19. Explain the funding options or plans which are being used for SFAS No. 106 costs. Identify the portion of costs which are eligible for tax preferred funding.

**RESPONSE:**

Not applicable. PWSA does not offer other post-employment benefits.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**III. OPERATING EXPENSE**

III.20. State whether the company is studying or anticipating any changes to its postretirement benefits offered to employees as a result of SFAS No. 106 or for other reasons. If yes, provide the study and explain the anticipated change.

**RESPONSE:**

We do not anticipate any changes in postretirement benefits during the FTY or FPFTY and therefore have not included any cost for such changes.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**III. OPERATING EXPENSE**

III.21. State whether the historic test year expenses reflect any accruals for postemployment benefits under SFAS 112. If yes, provide complete details including supporting documentation, assumptions, and funding mechanisms.

**RESPONSE:**

The historic test year is presented on a cash basis and, therefore, reflects actual cash disbursements as opposed to accruals. In 2015, PWSA enacted a Voluntary Severance Plan (VSP) which allowed eligible employees to take a lump sum of 80% of their current salary or 100% of their salary spread through payments over two years. In 2017, PWSA made payments of \$487,524. The last of those payments were made in 2018 in the amount of \$101,055. No costs for severance pay have been included in 2021 (FPFTY).

### **III. OPERATING EXPENSE**

III.22. Provide a copy of all incentive compensation and bonus plans and provide the level of related bonus payments included in the cost of service. Provide information for the preceding 2 years and any changes since the last rate case.

#### **RESPONSE:**

In 2018, PWSA extended an offer to Bob Weimar to officially become Executive Director. Per Weimar's contract, he is eligible for semi-annual bonuses of up to \$13,000. This bonus is based on performance metrics and the amount is determined at the sole discretion of the PWSA Board of Directors. There were no bonus or incentive compensation costs paid in HTY.

There are no bonus or incentive compensation costs included in the FTY and FPFTY.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**III. OPERATING EXPENSE**

III.23. Provide the most recent insurance premiums for each type of insurance coverage, both employee benefit and those purchased for the company, reflected in the company's filing. If available, provide estimated premiums for the subsequent calendar year.

**RESPONSE:**

Please see the tables below.

**4100: Employee Benefits - Insurance**

		<b>HTY</b>	<b>FTY</b>	<b>FPFTY</b>	<b>Forecast</b>
	<b>Twelve Months Ended:</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>
4110	Fed Insurance Contract Act Tax	1,383,592	1,512,574	1,818,054	1,924,719
4130	Workers Comp Insurance (7365)	305,362	-	-	-
4135	Med Health Insurance	3,889,851	4,201,263	4,583,069	4,907,892
4140	Med Health Insurance Waiver	74,132	78,368	83,833	95,430
4145	Short Term Disability	179,003	169,260	197,120	215,900
4150	Long Term Disability	33,438	55,870	74,229	90,331
4155	Life Ins <50k	34,307	41,688	45,820	51,188
4160	Accidental Death/Dismember	4,901	5,930	6,594	6,978
4165	Dental Insurance	148,800	147,859	171,402	192,527
4170	Vision Insurance	13,237	17,034	19,579	21,212
	<b>Total Employee Benefit – Insurance</b>	<b>\$6,066,620</b>	<b>\$6,639,131</b>	<b>\$7,414,699</b>	<b>\$7,923,176</b>

**7300: Professional Services - Insurance**

		<b>HTY</b>	<b>FTY</b>	<b>FPFTY</b>	<b>Forecast</b>
	<b>Twelve Months Ended:</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>
7345	Auto Insurance	170,745	109,411	111,000	112,000
7348	Commercial Prop Insurance	226,172	233,828	235,000	237,000
7353	Gen Liability Insurance	21,637	22,502	23,403	24,000
7359	Officers Director Insurance	74,528	76,019	78,299	79,000
7365	WorkersComp Insurance	-	409,284	415,000	417,000
7366	WorkersComp City Insurance	33,656	32,000	32,000	32,000
7368	Internet Connection Server Insurance	59,147	-	-	-
	<b>Total Professional Svcs. Insurance</b>	<b>\$585,885</b>	<b>\$883,043</b>	<b>\$894,702</b>	<b>\$901,000</b>

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**III. OPERATING EXPENSE**

III.24. Provide the level of payments made to industry organizations included in the cost of service along with a description of each payee organization.

**RESPONSE:**

Please see below.

Organization	Per Books 12/31/2019	Description
AFRICAN AMERICAN CHAMBER OF COMMERCE OF WESTERN PA	500.00	ASSOCIATE MEMBERSHIP RENEWAL
ALLEGHENY CONFERENCE ON COMMUNITY DEVELOPMENT	3,500.00	2019 PLEDGE MEMBERSHIP
ALLEGHENY LEAGUE OF MUNICIPALITIES	440.00	YEARLY DUES
AMERICAN WATER WORKS ASSOCIATN	15,020.00	AWWA ANNUAL MEMBERSHIP
ASSOCIATION OF METROPOLITAN WATER AGENCIES	8,731.00	2019 and 2020 AMWA MEMBERSHIP
INTERNATIONAL CODE COUNCIL	890.00	GOVERNMENTAL MEMBER 3 YEARS
NACWA	13,690.00	2019 NACWA MEMBERSHIP
NFPA INTERNATIONAL	445.00	MEMBERSHIP RENEWAL
PA MUNICIPAL LEAGUE	65.00	L3P MEMBERSHIP
PA RURAL WATER ASSOCIATION	1,039.00	RENEWAL MEMBERSHIP DUAL SYSTEM
PAWARN	1,250.00	PA WAREN ANNUAL DUES
PENNSYLVANIA ASSOCIATION OF NOTARIES	696.00	MEMBERSHIP - 2 Paralegals
PENNSYLVANIA MUNICIPAL AUTH. ASSOC.	2,600.00	2019 MEMBERSHIP DUES

**III. OPERATING EXPENSE**

III.25. If the company has included any costs associated with canceled construction projects or obsolete inventory in requested rates, separately identify the items, provide the related amounts and explain the reason for the cancellation or obsolescence.

**RESPONSE:**

PWSA has not included any costs associated with cancelled construction or obsolete inventory.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**III. OPERATING EXPENSE**

III.26. Explain how the company accounts for vacation pay for book and ratemaking purposes.

**RESPONSE:**

For accrual-basis financial reporting (PWSA Audit), a liability for vacation, personal, and sick days is accrued when related benefits are attributable to services rendered and to the extent it is probable that the Authority will ultimately compensate employees.

PWSA is filing this rate case on a cash-basis and, accordingly, PWSA has made no claim for vacation pay for ratemaking purposes since a full cash salary and wage costs for each employee has been included in PWSA's Revenue Requirement.



## Pittsburgh Water and Sewer Authority's Base Rate Filing

**III. OPERATING EXPENSE**

III.27. Indicate whether any employee positions have been eliminated since the commencement of the historic test year or are expected to be eliminated during the future test year.

**RESPONSE:**

<b><u>Job Title</u></b>	<b><u>Vacancy</u></b>	<b><u>Department</u></b>	<b><u>Date</u></b>
Clerk II	Vacant	Sewer Ops	1/1/2020
Sample Collector	Vacant	Sewer Ops	1/1/2020
Utility Worker	Vacant	Water Ops	1/1/2020
Senior Manager, Field Operations	Vacant	Water Ops	1/1/2020
Senior Manager, Field Operations	Vacant	Water Ops	1/1/2020
Water Quality Data Manager	Filled	Lab	1/1/2020
Communications Assistant (SW/GSI - Edu/Outreach Coord.)	Vacant	Engineering	1/1/2020
Appeals and Credits Specialist (SW/GSI)	Vacant	Engineering	1/1/2020
Administrative Assistant II (B)- SW/GSI Edu/Outreach Coord	Vacant	Engineering	1/1/2020
Administrative Assistant-II SW	Vacant	Engineering	1/1/2020
Lead Program Intern	Vacant	Engineering	1/1/2020

The above list represents positions that had remained vacant through 2019 and were eliminated from the 2020 budget. The employee in the one filled position was retained and moved into another Lab position.

**III. OPERATING EXPENSE**

III.28. Furnish the name of each supplier, gallonage and expense for water purchased as recorded in Water Purchased for Resale-Account 706 for the historic test year and two preceding years.

**RESPONSE:**

PWSA has not purchased water for resale in the HTY nor the two preceding years.

**Pittsburgh Water & Sewer Authority**  
**Operating Expenses by Account**

	<b>12 Months Ended 12/31/2017</b>	<b>12 Months Ended 12/31/2018</b>	<b>HTY 12 Months Ended 12/31/2019</b>
<b>Direct Operating Expenses</b>			
<u>Wages &amp; Salaries</u>			
4001 Salary.Wages	\$ 11,942,744	\$ 14,013,848	17,415,267
4005 OT Premium Pay	1,504,742	1,814,309	2,001,622
4010 Shift Differential	5,988	6,887	6,905
4015 Semi Skill	6,907	7,129	6,525
4020 Pay Adjustments	-	-	-
4025 Bonus	-	5,500	-
4030 Holiday Pay	579,017	631,308	827,894
4035 Vacation Pay	952,563	1,065,930	1,207,626
4040 Other	16,230	29,800	100
4045 Sick Pay	9,602	16,316	10,748
4050 Personal Time Pay	450,532	558,981	618,417
4055 Comp Time Taken	14,634	-	-
4060 Comp Time Earned	-	-	-
4065 Jury Duty	2,051	2,725	6,563
4070 Military Leave	-	-	2,885
4075 Supper Pay	20,783	33,051	32,728
4080 Bereavement	17,987	27,723	35,046
4081 Paid Parental Leave	-	-	16,600
4085 Special	52,369	60,207	72,484
4090 Admin Leave	7,838	2,060	445
4095 Severence	487,524	152,174	-
Total Wages & Salaries	\$ 16,071,511	\$ 18,427,947	\$ 22,261,855
<u>Employee Benefits</u>			
4110 Fed Ins Contr Act Tx	990,699	1,125,583	1,343,682
4115 Medicare	232,506	265,323	319,884
4120 Fed Unemploy Tax	4	-	(1)
4125 State Unemploy Tax	-	34,478	8,846
4130 Workers Comp Insur	561,969	(3,305)	305,362
4135 Med Health Ins	3,089,588	3,527,693	3,962,528
4140 Med Hlth Ins Waiver	22,183	57,239	83,892
4145 Short Term Disability	161,659	154,581	177,013
4150 Long Term Disability	31,318	349,248	28,738
4155 Life Ins <50k	25,687	27,504	33,419
4160 Accident.Death.Dismember	3,274	3,742	4,519
4165 Dental Ins	132,857	135,371	146,934
4170 Vision Insur	9,512	10,141	12,688
4174 Cust Serv Week	550	457	1,195
4175 Uniforms	164,450	167,162	209,599
4180 Tuition Reimburse	35,873	68,156	104,366
4185 Retirement Benefit	-	-	10,688
4195 Misc Benefits	(22,584)	(22,029)	(22,632)
4199 Payroll Upload Except	(14)	(1,456)	(21)
Total Employee Benefits	\$ 5,439,531	\$ 5,899,887	\$ 6,730,702

**Pittsburgh Water & Sewer Authority**  
**Operating Expenses by Account**

	<b>12 Months Ended 12/31/2017</b>	<b>12 Months Ended 12/31/2018</b>	<b>HTY 12 Months Ended 12/31/2019</b>
<b>Direct Operating Expenses</b>			
TOTAL SALARIES & BENEFITS	\$ 21,511,042	\$ 24,327,834	\$ 28,992,557

**Pittsburgh Water & Sewer Authority**  
**Operating Expenses by Account**

	<b>12 Months Ended 12/31/2017</b>	<b>12 Months Ended 12/31/2018</b>	<b>HTY 12 Months Ended 12/31/2019</b>
<b>Direct Operating Expenses</b>			
<u>Chemicals</u>			
5005 Alum (Orthophosphate)	-	-	211,788
5010 Boiler Chemicals	5,331	12,340	25,983
5015 Calcium Hypochlorite	1,320	-	-
5020 Cat Flocculant	57,540	60,505	108,736
5025 Caustic Soda	592,052	799,616	225,780
5030 Chlorine Cylinders	-	-	-
5035 Chlorine Rail Car	-	-	-
5040 Citric Acid	1,670	-	-
5045 Copper Sulphate	46,882	-	-
5050 Ferric Chloride	1,149,441	1,411,090	1,823,669
5055 Hydrofluorosilicic Acid	132,717	177,308	140,479
5060 Lime	213,807	70,890	462,458
5065 Potassium Permanganate	332,733	109,855	247,338
5070 Powdered Active Carbon	-	(0)	-
5075 Soda Ash	879,172	986,761	820,686
5080 Sodium Hypochlorite	349,780	320,130	433,004
5085 Sodium Carbonate Peroxyhy	12,720	16,960	-
Chemicals	\$ 3,775,165	\$ 3,965,455	\$ 4,499,921
<u>Equipment</u>			
5120 Computer & Peripherals	295,065	890,562	688,714
5125 Computers/Networking	336,517	378,556	20,577
5140 Furniture/Fixture	39,955	149,446	82,981
5145 Grounds/Maint	25,505	28,500	67,378
5147 Lab Equip	18,841	47,424	150,360
5150 Machinery	98,202	233,740	2,543,899
5160 Office Equipment	3,892	1,306	4,930
5190 Vehicles	614,171	1,570,946	2,341,473
Equipment	\$ 1,432,148	\$ 3,300,481	\$ 5,900,312
<u>Materials</u>			
5205 Asphalt Cold Patch	22,994	94,307	88,631
5210 Asphalt Cold-City	45,669	-	-
5215 Asphalt Hot-City	-	-	-
5220 Asphalt Hotmix	-	-	-
5225 Asphalt Patch Bit Sealer	-	-	-
5227 Brick	320	240	543
5230 Cement Bagged	5,217	1,747	1,243
5235 Gravel	8,933	1,325	-
5240 Iron Steel Brass	7,945	2,002	7,047
5245 Lumber	20,206	13,177	21,886
5250 Sand	47,087	13,072	9,971
5255 Slag	304,607	364,671	383,089
5260 Stone	-	-	8,142
5265 Top Soil	1,800	5,296	3,450

**Pittsburgh Water & Sewer Authority**  
**Operating Expenses by Account**

	<b>12 Months Ended 12/31/2017</b>	<b>12 Months Ended 12/31/2018</b>	<b>HTY 12 Months Ended 12/31/2019</b>
<b>Direct Operating Expenses</b>			
Materials	\$ 464,778	\$ 495,837	\$ 524,002

**Pittsburgh Water & Sewer Authority**  
**Operating Expenses by Account**

	<b>12 Months Ended 12/31/2017</b>	<b>12 Months Ended 12/31/2018</b>	<b>HTY 12 Months Ended 12/31/2019</b>
<b>Direct Operating Expenses</b>			
<u>Operating Contracts</u>			
5305 Annual Sewer Contract	2,879,646	3,127,669	6,631,750
5310 Boiler Compressr Elevtr	9,504	53,336	17,963
5315 CB Cleaning	917,968	707,837	732,709
5316 CB Repairs	-	-	48,514
5328 Curb Box Repair	-	-	-
5330 Debris Removal	159,486	198,360	271,258
5335 Drag Bucket	-	-	-
5340 Dumpster	26,168	32,518	37,574
5341 Vactor Debris Remove Cont	55,796	61,556	111,326
5342 Emergency WaterLine Repair	2,186,565	3,864,918	5,777,901
5345 Inspection	(268,857)	1,313,960	1,117,628
5347 Inspection.Field	1,088,490	793,856	698,229
5350 Key.Lock Serv	524	1,363	11
5355 Landscape (Grounds)	86,046	87,840	90,869
5360 Meters	-	-	-
5370 Operating Contract.Other	2,250,760	1,996,527	1,816,157
5375 Radionuclides	-	-	-
5380 Intr-Gov Proj Panther Hollow	-	-	-
5383 Sewage Treatment	-	-	-
5385 Temporary Help	1,445,888	254,245	206
5390 Welding	-	-	360
5395 Water Relay.DISC	2,800	-	-
5396 Sewer Relay.DISC	-	-	-
Operating Contracts	\$ 10,840,784	\$ 12,493,984	\$ 17,352,454
<u>Repairs &amp; Maintenance</u>			
5402 Annual Software Support	931,829	678,146	916,955
5405 Bldg.Property Repairs	390,277	224,243	188,512
5408 Computer Hardware	19,505	30,592	17,862
5411 Computer Software Support	-	-	-
5413 Concrete Repairs	3,973,696	6,929,924	6,318,850
5415 Cranes Repairs	8,405	-	18,029
5417 Electrical Repairs	58,471	143,886	269,525
5420 Fence Repairs	-	1,990	2,914
5422 Fence Installation	1,541	6,292	1,966
5427 GIS Hardware.Software	42,419	10,758	151,652
5432 Hardware Repairs	-	-	-
5437 Heavy Equip Repair	2,135	2,781	38,853
5439 HVAC.Plumbing	16,389	64,351	64,111
5444 Hydrant. A Section	-	-	-
5445 Hydrant Misc Parts	-	-	-
5447 Hydrant Repair Parts	-	-	-
5452 Machinery Repairs	6,365	139,483	60,591
5457 Office Equip Repairs	-	-	100
5462 Plant Repairs	-	-	136,910

**Pittsburgh Water & Sewer Authority**  
**Operating Expenses by Account**

	<b>12 Months Ended 12/31/2017</b>	<b>12 Months Ended 12/31/2018</b>	<b>HTY 12 Months Ended 12/31/2019</b>
<b>Direct Operating Expenses</b>			
5467 Power Tool Repairs	8,525	1,506	5,948
5472 Road Repair.Plant	-	-	-
5475 Scanner	-	-	-
5482 Tool Repairs	4,475	7,653	3,269
5484 Hand Tool Repairs	1,870	165	1,688
5486 Misc Tool Repairs	500	5,470	467
5488 CC TV Repairs	85,556	144,253	223,473
5490 Vactor Repairs	4,838	22,104	13,409
5491 Vehicle Repairs	79,124	6,630	22,476
5496 Repair.Maint Other	<u>138,395</u>	<u>399,058</u>	<u>618,629</u>
Repairs & Maintenance	\$ 5,774,315	\$ 8,819,285	\$ 9,076,188



**Pittsburgh Water & Sewer Authority**  
**Operating Expenses by Account**

<b>Direct Operating Expenses</b>	<b>12 Months Ended 12/31/2017</b>	<b>12 Months Ended 12/31/2018</b>	<b>HTY 12 Months Ended 12/31/2019</b>
<u>Misc. Operating</u>			
5570 Testing Misc	847,210	805,853	1,025,998
Misc. Operating	\$ 847,210	\$ 805,853	\$ 1,025,998
<u>Inventory - Castings</u>			
6015 Casting Manhole.CBasin	107,127	27,186	151,212
6025 Casting Risers.Lids	-	-	15,707
6035 Casting Sewer Inlet	3,273	490	3,220
6060 Casting Water Valve Box	39,613	-	49,426
Inventory - Castings	\$ 150,013	\$ 27,675	\$ 219,564
<u>Inventory - Clarifier</u>			
6115 Clarifier Part Floc	-	-	-
6120 Clarifier Part Screw	-	-	-
6125 Clarifier Part Sludge	19,987	-	-
Inventory - Clarifier	\$ 19,987	\$ -	\$ -
<u>Inventory - Equipment</u>			
6200 Inventory-Equip	-	2	2
6220 Fire Extinguishers	-	-	-
6245 Materials.Handling	-	-	-
6260 Safety Equipment	40,994	71,687	122,056
6280 Vacuum Chlorinators	-	-	-
Inventory - Equipment	\$ 40,994	\$ 71,689	\$ 122,057
<u>Inventory - Hardware</u>			
6300 Inventory-Hardware	15,449	15,054	26,108
6315 Fittings	203,114	286,547	511,380
6320 Hardware Other	1,793	-	-
6325 Hose.Fitting	17,854	18,308	20,070
6330 Keys & Locks	-	-	-
6335 Lights	1,587	33,848	9,278
6340 Machinery Misc	490	-	-
6345 Meters	300,155	516,097	39,919
6350 Plumbing Inv Exp	97,393	45,848	95,194
6355 Power Tool Inv Exp	1,722	1,320	-
6360 Tools Inv Exp	75,078	108,192	185,629
6365 Hand Tools Inv Exp	3,461	-	-
Inventory - Hardware	\$ 718,096	\$ 1,025,215	\$ 887,578
<u>Inventory - Heavy Equipment</u>			
6420 Backhoe	1,393	1,217	3,861
Inventory - Heavy Equipment	\$ 1,393	\$ 1,217	\$ 3,861

**Pittsburgh Water & Sewer Authority**  
**Operating Expenses by Account**

	<b>12 Months Ended 12/31/2017</b>	<b>12 Months Ended 12/31/2018</b>	<b>HTY 12 Months Ended 12/31/2019</b>
<b>Direct Operating Expenses</b>			
<u>Inventory - Miscellaneous</u>			
6500 Inventory-Misc	48,866	43,346	29,421
6506 Batteries	-	-	210
6515 Cleaning	42,649	45,162	59,968
6518 Concrete Accessories	80	-	-
6520 Copier Paper	-	-	-
6525 Filters	1,308	-	193
6526 Filters HVAC	939	-	-
6530 FirstAid	26	(1,101)	14,526
6540 Lamps	2,477	118	-
6544 Lubricating Oil	8,169	4,371	20,102
6548 Paint Oils Putty Glass	7,466	7,455	11,533
6552 Paper Products	-	-	-
6555 Pump Oil	-	-	-
6565 Sewer Matls.Supplies	249	3,208	1,594
6570 Testing Dyes	-	-	2,023
6580 Vehicle Oil	-	-	-
6585 Welding Supplies-Inventory	15,339	(117)	562
Inventory - Miscellaneous	\$ 127,568	\$ 102,443	\$ 140,133
<u>Inventory - Parts</u>			
6645 Parts Other	160,899	152,786	136,633
6680 Yard	-	-	33,567
Inventory - Parts	\$ 160,899	\$ 152,786	\$ 170,199
<u>Inventory - Pipe</u>			
6705 Pipe	1,589	(6,767)	1,904
6710 Pipe Ductile	56,321	26,524	237,227
6755 Pipe Plastic	-	-	21
6765 Pipe Service Line	-	-	8,175
Inventory - Pipe	\$ 57,910	\$ 19,758	\$ 247,327
<u>Inventory - Valves</u>			
6805 Valves <12in	-	-	-
6810 Valves >16in	-	-	-
6820 Valves GA	-	-	-
6825 Valves Misc	148,286	81,812	258,003
Inventory - Valves	\$ 148,286	\$ 81,812	\$ 258,003
<b>INVENTORY TOTAL</b>	\$ 1,425,146	\$ 1,482,595	\$ 2,048,723
<b>DIRECT OPERATING TOTAL</b>	\$ 46,070,588	\$ 55,691,324	\$ 69,420,153
<u>Fees</u>			
7003 Bank Fees	289,314	278,243	263,420
7005 Certification Fees	11,423	3,319	2,718
7010 Membership Fees	40,483	35,381	68,104

**Pittsburgh Water & Sewer Authority**  
**Operating Expenses by Account**

	<b>12 Months Ended 12/31/2017</b>	<b>12 Months Ended 12/31/2018</b>	<b>HTY 12 Months Ended 12/31/2019</b>
<b>Direct Operating Expenses</b>			
7015 Permits	7,165	24,134	57,827
7020 Registration Fees	1,150	41	934
7030 Licenses	-	532	-
7035 Customer CC Fees	<u>240,363</u>	<u>424,117</u>	<u>543,823</u>
Total Fees	\$ 589,898	\$ 765,767	\$ 936,827
<u>Freight and Postage</u>			
7105 Freight.Hauling	-	-	-
7110 Freight.Shipping	29,611	50,990	63,490
7115 Postage	<u>455,890</u>	<u>508,325</u>	<u>731,843</u>
Total Freight and Postage	\$ 485,501	\$ 559,315	\$ 795,333

**Pittsburgh Water & Sewer Authority**  
**Operating Expenses by Account**

<b>Direct Operating Expenses</b>	<b>12 Months Ended 12/31/2017</b>	<b>12 Months Ended 12/31/2018</b>	<b>HTY 12 Months Ended 12/31/2019</b>
<u>Leases &amp; Rents</u>			
7210 Copier.Fax Machine	80,279	77,013	93,709
7215 Equip Rental	181,748	803,705	238,376
7255 Office Rent	682,316	707,415	912,335
7260 Pagers	-	-	-
7265 RadioLease(City)	-	-	-
Total Leases & Rents	\$ 944,343	\$ 1,588,133	\$ 1,244,419
<u>Professional Services</u>			
7305 Advertising	29,088	28,962	45,975
7306 Annual Report	-	-	-
7307 Advertising - Marketing	18,465	29,427	5,068
7310 Annual Audit	59,170	64,308	49,683
7315 Billing Contract	486,391	832,775	470,173
7321 Coll Agency.Sewage	44,313	-	-
7323 Consultants	1,087,403	1,161,923	502,507
7325 Consumer Confidence Rpt	-	1,707	2,171
7328 Contingencies	22,111	11,766	148,800
7332 Consulting Engineers	238,347	147,182	26,831
7335 Misc Serv.NonCapital	7,314,114	3,583,069	5,264,191
7345 Ins.Auto	169,393	29,307	74,044
7348 Ins.Commercial Prop	210,767	215,532	226,172
7353 Ins.Gen Liability	5,308	20,798	21,637
7359 Ins.Officers.Director	63,812	74,349	74,528
7365 Ins.WorkersComp	-	-	-
7366 Ins.WorkersComp.City	18,120	33,352	33,352
7368 Internet Connection.Serv	44,508	66,656	53,334
7370 Legal	1,838,942	2,894,513	2,388,647
7371 Legal Self Ins	-	-	-
7373 Minority.Women Bus Enter	-	-	-
7375 Meter Services	910,908	879,344	864,422
7382 Payroll Services	54,044	72,899	70,633
7383 Prof Service.Other	1,427,969	5,307,167	6,083,922
7389 Trust Admin	76,940	71,235	30,411
7390 Water Liens	-	-	8,000
Total Professional Services	\$ 14,120,113	\$ 15,526,273	\$ 16,444,502
<u>Supplies</u>			
7405 Computer Software Supplies	53,155	35,174	11,722
7422 Fuel-Gasses	3,457	4,845	153,209
7423 Fuel Kerosene	-	-	261
7424 Fuel Propane	226,871	174,824	18,670
7435 GIS Plotter.Xerox	855	-	-
7440 Grounds & Maint Supp	38,814	36,542	189,211
7443 ICE	-	-	-

**Pittsburgh Water & Sewer Authority**  
**Operating Expenses by Account**

	<b>12 Months Ended 12/31/2017</b>	<b>12 Months Ended 12/31/2018</b>	<b>HTY 12 Months Ended 12/31/2019</b>
<b>Direct Operating Expenses</b>			
7445 Lab Chemicals	60,981	4,219	9,561
7447 Lab Supplies	20,634	48,936	122,807
7450 Office Supplies	21,289	37,623	64,263
7490 Welding Supplies	<u>7,646</u>	<u>17,885</u>	<u>19,397</u>
Total Supplies	\$ 433,702	\$ 360,047	\$ 589,103

**Pittsburgh Water & Sewer Authority**  
**Operating Expenses by Account**

	<b>12 Months Ended 12/31/2017</b>	<b>12 Months Ended 12/31/2018</b>	<b>HTY 12 Months Ended 12/31/2019</b>
<b>Direct Operating Expenses</b>			
<u>Travel &amp; Entertainment</u>			
7505 TE.Airfare	1,084	6,706	11,968
7510 TE.Auto Rentals	-	197	-
7520 TE.Fuel	-	-	-
7540 TE.Lodging	11,522	11,411	14,151
7545 TE.Meals	3,375	4,428	4,884
7550 TE.Mileage	1,267	1,440	2,259
7555 TE.SeminarsConferences	12,053	12,255	18,457
7560 TE.Training	14,942	25,288	120,554
7575 TE.Travel Misc	7,986	20,799	24,324
7590 TE.Travel Purch Orders	-	-	-
Total Travel & Entertainment	\$ 52,229	\$ 82,523	\$ 196,597
<u>Utilities</u>			
7605 Electric	4,555,391	4,375,877	3,998,159
7650 Natural Gas.City	410,764	383,385	367,363
7675 Telemeter	56,417	54,631	53,542
7680 Cellular Phone	157,602	142,408	190,291
7681 Local Phones	172,383	150,377	156,337
7682 Long Distance	847	869	460
Total Utilities	\$ 5,353,404	\$ 5,107,547	\$ 4,766,152
<u>Miscellaneous Admin</u>			
7705 Bad Debt	-	-	-
7710 Capital Asset Reclass	-	(3,150,810)	(6,568,443)
7711 DISC Asset Reclass	-	-	-
7712 Cash Discount Taken	(321)	(523)	(623)
7715 Claims.Deductibles	229,858	353,049	587,017
7720 Customer Refund.CSM	-	-	-
7721 Customer Refund. AP	331,386	881,565	667,728
7730 Fines.Penalties	600,603	15,372	20,500
7735 LienBuyBkExp	-	-	-
7742 Education & Outreach	270,044	50,512	41,116
7743 Employee Fund	54,722	-	-
7750 Inv.Adjustments	224,243	1,373,808	240,929
7760 Misc Gen.Admin Exp	14	0	5,847
7765 One Call	13,589	14,921	18,195
7770 Publication.Subscription	5,555	4,288	24,884
7787 3rd Pty LW Exp	-	-	-
7789 3rd Pty Sew Trt Exp	-	-	-
7799 Grants Awarded by PWSA	51,504	95,000	112,352
Total Miscellaneous Admin	\$ 1,781,197	\$ (362,820)	\$ (4,850,498)
<b>GRAND TOTAL: DIRECT OPERATING EXPENSES</b>	<b>\$ 69,830,975</b>	<b>\$ 79,318,109</b>	<b>\$ 89,542,588</b>

**Pittsburgh Water & Sewer Authority**  
**Operating Expenses by Account**

<b>Direct Operating Expenses</b>	<b>12 Months Ended 12/31/2017</b>	<b>12 Months Ended 12/31/2018</b>	<b>HTY 12 Months Ended 12/31/2019</b>
<u>Wages &amp; Salaries</u>			
4001 Salary.Wages	\$ 11,942,744	\$ 14,013,848	17,415,267
4005 OT Premium Pay	1,504,742	1,814,309	2,001,622
4010 Shift Differential	5,988	6,887	6,905
4015 Semi Skill	6,907	7,129	6,525
4020 Pay Adjustments	-	-	-
4025 Bonus	-	5,500	-
4030 Holiday Pay	579,017	631,308	827,894
4035 Vacation Pay	952,563	1,065,930	1,207,626
4040 Other	16,230	29,800	100
4045 Sick Pay	9,602	16,316	10,748
4050 Personal Time Pay	450,532	558,981	618,417
4055 Comp Time Taken	14,634	-	-
4060 Comp Time Earned	-	-	-
4065 Jury Duty	2,051	2,725	6,563
4070 Military Leave	-	-	2,885
4075 Supper Pay	20,783	33,051	32,728
4080 Bereavement	17,987	27,723	35,046
4081 Paid Parental Leave	-	-	16,600
4085 Special	52,369	60,207	72,484
4090 Admin Leave	7,838	2,060	445
4095 Severence	487,524	152,174	-
Total Wages & Salaries	<u>\$ 16,071,511</u>	<u>\$ 18,427,947</u>	<u>\$ 22,261,855</u>
<u>Employee Benefits</u>			
4110 Fed Ins Contr Act X	990,699	1,125,583	1,343,682
4115 Medicare	232,506	265,323	319,884
4120 Fed Unemploy Tax	4	-	(1)
4125 State Unemploy Tax	-	34,478	8,846
4130 Workers Comp Insur	561,969	(3,305)	305,362
4135 Med Health Ins	3,089,588	3,527,693	3,962,528
4140 Med Hlth Ins Waiver	22,183	57,239	83,892
4145 Short Term Disability	161,659	154,581	177,013
4150 Long Term Disability	31,318	349,248	28,738
4155 Life Ins <50k	25,687	27,504	33,419
4160 Accident.Death.Dismember	3,274	3,742	4,519
4165 Dental Ins	132,857	135,371	146,934
4170 Vision Insur	9,512	10,141	12,688
4174 Cust Serv Week	550	457	1,195
4175 Uniforms	164,450	167,162	209,599
4180 Tuition Reimburse	35,873	68,156	104,366
4185 Retirement Benefit	-	-	10,688
4195 Misc Benefits	(22,584)	(22,029)	(22,632)
4199 Payroll Upload Except	(14)	(1,456)	(21)
Total Employee Benefits	<u>\$ 5,439,531</u>	<u>\$ 5,899,887</u>	<u>\$ 6,730,702</u>

**Pittsburgh Water & Sewer Authority**  
**Operating Expenses by Account**

	<b>12 Months Ended 12/31/2017</b>	<b>12 Months Ended 12/31/2018</b>	<b>HTY 12 Months Ended 12/31/2019</b>
<b>Direct Operating Expenses</b>			
TOTAL SALARIES & BENEFITS	\$ 21,511,042	\$ 24,327,834	\$ 28,992,557



**Pittsburgh Water & Sewer Authority**  
**Operating Expenses by Account**

	<b>12 Months Ended 12/31/2017</b>	<b>12 Months Ended 12/31/2018</b>	<b>HTY 12 Months Ended 12/31/2019</b>
<b>Direct Operating Expenses</b>			
<u>Chemicals</u>			
5005 Alum (Orthophosphate)	-	-	211,788
5010 Boiler Chemicals	5,331	12,340	25,983
5015 Calcium Hypochlorite	1,320	-	-
5020 Cat Flocc TL	57,540	60,505	108,736
5025 Caustic Soda	592,052	799,616	225,780
5030 Chlorine Cylinders	-	-	-
5035 Chlorine Rail Car	-	-	-
5040 Citric Acid	1,670	-	-
5045 Copper Sulphate	46,882	-	-
5050 Ferric Chloride	1,149,441	1,411,090	1,823,669
5055 Hydrofluorosilicic Acid	132,717	177,308	140,479
5060 Lime	213,807	70,890	462,458
5065 Potassium Permanganate	332,733	109,855	247,338
5070 Powdered Active Carbon	-	(0)	-
5075 Soda Ash	879,172	986,761	820,686
5080 Sodium Hypochlorite	349,780	320,130	433,004
5085 Sodium Carbonate Peroxyhy	12,720	16,960	-
Chemicals	\$ 3,775,165	\$ 3,965,455	\$ 4,499,921
<u>Equipment</u>			
5120 Computer & Peripherals	295,065	890,562	688,714
5125 Computers.Networking	336,517	378,556	20,577
5140 Furniture.Fixture	39,955	149,446	82,981
5145 Grounds.Maint	25,505	28,500	67,378
5147 Lab Equip	18,841	47,424	150,360
5150 Machinery	98,202	233,740	2,543,899
5160 Office Equipment	3,892	1,306	4,930
5190 Vehicles	614,171	1,570,946	2,341,473
Equipment	\$ 1,432,148	\$ 3,300,481	\$ 5,900,312
<u>Materials</u>			
5205 Asphalt Cold Patch	22,994	94,307	88,631
5210 Asphalt Cold-City	45,669	-	-
5215 Asphalt Hot-City	-	-	-
5220 Asphalt Hotmix	-	-	-
5225 Asphalt Patch Bit Sealer	-	-	-
5227 Brick	320	240	543
5230 Cement Bagged	5,217	1,747	1,243
5235 Gravel	8,933	1,325	-
5240 Iron Steel Brass	7,945	2,002	7,047
5245 Lumber	20,206	13,177	21,886
5250 Sand	47,087	13,072	9,971
5255 Slag	304,607	364,671	383,089
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**Pittsburgh Water & Sewer Authority**  
**Operating Expenses by Account**

	<b>12 Months Ended 12/31/2017</b>	<b>12 Months Ended 12/31/2018</b>	<b>HTY 12 Months Ended 12/31/2019</b>
<b>Direct Operating Expenses</b>			
Materials	\$ 464,778	\$ 495,837	\$ 524,002

**Pittsburgh Water & Sewer Authority**  
**Operating Expenses by Account**

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<b>Direct Operating Expenses</b>			
<u>Operating Contracts</u>			
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5396 Sewer Relay.DISC	-	-	-
Operating Contracts	\$ 10,840,784	\$ 12,493,984	\$ 17,352,454
<u>Repairs &amp; Maintenance</u>			
5402 Annual Software Support	931,829	678,146	916,955
5405 Bldg.Property Repairs	390,277	224,243	188,512
5408 Computer Hardware	19,505	30,592	17,862
5411 Computer Software Support	-	-	-
5413 Concrete Repairs	3,973,696	6,929,924	6,318,850
5415 Cranes Repairs	8,405	-	18,029
5417 Electrical Repairs	58,471	143,886	269,525
5420 Fence Repairs	-	1,990	2,914
5422 Fence Installation	1,541	6,292	1,966
5427 GIS Hardware.Software	42,419	10,758	151,652
5432 Hardware Repairs	-	-	-
5437 Heavy Equip Repair	2,135	2,781	38,853
5439 HVAC.Plumbing	16,389	64,351	64,111
5444 Hydrant. A Section	-	-	-
5445 Hydrant Misc Parts	-	-	-
5447 Hydrant Repair Parts	-	-	-
5452 Machinery Repairs	6,365	139,483	60,591
5457 Office Equip Repairs	-	-	100
5462 Plant Repairs	-	-	136,910

**Pittsburgh Water & Sewer Authority**  
**Operating Expenses by Account**

	<b>12 Months Ended 12/31/2017</b>	<b>12 Months Ended 12/31/2018</b>	<b>HTY 12 Months Ended 12/31/2019</b>
<b>Direct Operating Expenses</b>			
5467 Power Tool Repairs	8,525	1,506	5,948
5472 Road Repair.Plant	-	-	-
5475 Scanner	-	-	-
5482 Tool Repairs	4,475	7,653	3,269
5484 Hand Tool Repairs	1,870	165	1,688
5486 Misc Tool Repairs	500	5,470	467
5488 CC TV Repairs	85,556	144,253	223,473
5490 Vactor Repairs	4,838	22,104	13,409
5491 Vehicle Repairs	79,124	6,630	22,476
5496 Repair.Maint Other	<u>138,395</u>	<u>399,058</u>	<u>618,629</u>
Repairs & Maintenance	\$ 5,774,315	\$ 8,819,285	\$ 9,076,188

**Pittsburgh Water & Sewer Authority**  
**Operating Expenses by Account**

<b>Direct Operating Expenses</b>	<b>12 Months Ended 12/31/2017</b>	<b>12 Months Ended 12/31/2018</b>	<b>HTY 12 Months Ended 12/31/2019</b>
<u>Misc. Operating</u>			
5570 Testing Misc	847,210	805,853	1,025,998
Misc. Operating	\$ 847,210	\$ 805,853	\$ 1,025,998
<u>Inventory - Castings</u>			
6015 Casting Manhole.CBasin	107,127	27,186	151,212
6025 Casting Risers.Lids	-	-	15,707
6035 Casting Sewer Inlet	3,273	490	3,220
6060 Casting Water Valve Box	39,613	-	49,426
Inventory - Castings	\$ 150,013	\$ 27,675	\$ 219,564
<u>Inventory - Clarifier</u>			
6115 Clarifier Part Floc	-	-	-
6120 Clarifier Part Screw	-	-	-
6125 Clarifier Part Sludge	19,987	-	-
Inventory - Clarifier	\$ 19,987	\$ -	\$ -
<u>Inventory - Equipment</u>			
6200 Inventory-Equip	-	2	2
6220 Fire Extinguishers	-	-	-
6245 Materials.Handling	-	-	-
6260 Safety Equipment	40,994	71,687	122,056
6280 Vacuum Chlorinators	-	-	-
Inventory - Equipment	\$ 40,994	\$ 71,689	\$ 122,057
<u>Inventory - Hardware</u>			
6300 Inventory-Hardware	15,449	15,054	26,108
6315 Fittings	203,114	286,547	511,380
6320 Hardware Other	1,793	-	-
6325 Hose.Fitting	17,854	18,308	20,070
6330 Keys & Locks	-	-	-
6335 Lights	1,587	33,848	9,278
6340 Machinery Misc	490	-	-
6345 Meters	300,155	516,097	39,919
6350 Plumbing Inv Exp	97,393	45,848	95,194
6355 Power Tool Inv Exp	1,722	1,320	-
6360 Tools Inv Exp	75,078	108,192	185,629
6365 Hand Tools Inv Exp	3,461	-	-
Inventory - Hardware	\$ 718,096	\$ 1,025,215	\$ 887,578
<u>Inventory - Heavy Equipment</u>			
6420 Backhoe	1,393	1,217	3,861
Inventory - Heavy Equipment	\$ 1,393	\$ 1,217	\$ 3,861

**Pittsburgh Water & Sewer Authority**  
**Operating Expenses by Account**

	<b>12 Months Ended 12/31/2017</b>	<b>12 Months Ended 12/31/2018</b>	<b>HTY 12 Months Ended 12/31/2019</b>
<b>Direct Operating Expenses</b>			
<u>Inventory - Miscellaneous</u>			
6500 Inventory-Misc	48,866	43,346	29,421
6506 Batteries	-	-	210
6515 Cleaning	42,649	45,162	59,968
6518 Concrete Accessories	80	-	-
6520 Copier Paper	-	-	-
6525 Filters	1,308	-	193
6526 Filters HVAC	939	-	-
6530 FirstAid	26	(1,101)	14,526
6540 Lamps	2,477	118	-
6544 Lubricating Oil	8,169	4,371	20,102
6548 Paint Oils Putty Glass	7,466	7,455	11,533
6552 Paper Products	-	-	-
6555 Pump Oil	-	-	-
6565 Sewer Matls.Supplies	249	3,208	1,594
6570 Testing Dyes	-	-	2,023
6580 Vehicle Oil	-	-	-
6585 Welding Supplies-Inventory	15,339	(117)	562
Inventory - Miscellaneous	\$ 127,568	\$ 102,443	\$ 140,133
<u>Inventory - Parts</u>			
6645 Parts Other	160,899	152,786	136,633
6680 Yard	-	-	33,567
Inventory - Parts	\$ 160,899	\$ 152,786	\$ 170,199
<u>Inventory - Pipe</u>			
6705 Pipe	1,589	(6,767)	1,904
6710 Pipe Ductile	56,321	26,524	237,227
6755 Pipe Plastic	-	-	21
6765 Pipe Service Line	-	-	8,175
Inventory - Pipe	\$ 57,910	\$ 19,758	\$ 247,327
<u>Inventory - Valves</u>			
6805 Valves <12in	-	-	-
6810 Valves >16in	-	-	-
6820 Valves GA	-	-	-
6825 Valves Misc	148,286	81,812	258,003
Inventory - Valves	\$ 148,286	\$ 81,812	\$ 258,003
<b>INVENTORY TOTAL</b>	\$ 1,425,146	\$ 1,482,595	\$ 2,048,723
<b>DIRECT OPERATING TOTAL</b>	\$ 46,070,588	\$ 55,691,324	\$ 69,420,153
<u>Fees</u>			
7003 Bank Fees	289,314	278,243	263,420
7005 Certification Fees	11,423	3,319	2,718
7010 Membership Fees	40,483	35,381	68,104

**Pittsburgh Water & Sewer Authority**  
**Operating Expenses by Account**

	<b>12 Months Ended 12/31/2017</b>	<b>12 Months Ended 12/31/2018</b>	<b>HTY 12 Months Ended 12/31/2019</b>
<b>Direct Operating Expenses</b>			
7015 Permits	7,165	24,134	57,827
7020 Registration Fees	1,150	41	934
7030 Licenses	-	532	-
7035 Customer CC Fees	<u>240,363</u>	<u>424,117</u>	<u>543,823</u>
Total Fees	\$ 589,898	\$ 765,767	\$ 936,827
 <u>Freight and Postage</u>			
7105 Freight.Hauling	-	-	-
7110 Freight.Shipping	29,611	50,990	63,490
7115 Postage	<u>455,890</u>	<u>508,325</u>	<u>731,843</u>
Total Freight and Postage	\$ 485,501	\$ 559,315	\$ 795,333

**Pittsburgh Water & Sewer Authority**  
**Operating Expenses by Account**

	<b>12 Months Ended 12/31/2017</b>	<b>12 Months Ended 12/31/2018</b>	<b>HTY 12 Months Ended 12/31/2019</b>
<b>Direct Operating Expenses</b>			
<u>Leases &amp; Rents</u>			
7210 Copier.Fax Machine	80,279	77,013	93,709
7215 Equip Rental	181,748	803,705	238,376
7255 Office Rent	682,316	707,415	912,335
7260 Pagers	-	-	-
7265 RadioLease(City)	-	-	-
Total Leases & Rents	\$ 944,343	\$ 1,588,133	\$ 1,244,419
<u>Professional Services</u>			
7305 Advertising	29,088	28,962	45,975
7306 Annual Report	-	-	-
7307 Advertising - Marketing	18,465	29,427	5,068
7310 Annual Audit	59,170	64,308	49,683
7315 Billing Contract	486,391	832,775	470,173
7321 Coll Agency.Sewage	44,313	-	-
7323 Consultants	1,087,403	1,161,923	502,507
7325 Consumer Confidence Rpt	-	1,707	2,171
7328 Contingencies	22,111	11,766	148,800
7332 Consulting Engineers	238,347	147,182	26,831
7335 Misc Serv.NonCapital	7,314,114	3,583,069	5,264,191
7345 Ins.Auto	169,393	29,307	74,044
7348 Ins.Commercial Prop	210,767	215,532	226,172
7353 Ins.Gen Liability	5,308	20,798	21,637
7359 Ins.Officers.Director	63,812	74,349	74,528
7365 Ins.WorkersComp	-	-	-
7366 Ins.WorkersComp.City	18,120	33,352	33,352
7368 Internet Connection.Serv	44,508	66,656	53,334
7370 Legal	1,838,942	2,894,513	2,388,647
7371 Legal Self Ins	-	-	-
7373 Minority.Women Bus Enter	-	-	-
7375 Meter Services	910,908	879,344	864,422
7382 Payroll Services	54,044	72,899	70,633
7383 Prof Service.Other	1,427,969	5,307,167	6,083,922
7389 Trust Admin	76,940	71,235	30,411
7390 Water Liens	-	-	8,000
Total Professional Services	\$ 14,120,113	\$ 15,526,273	\$ 16,444,502
<u>Supplies</u>			
7405 Computer Software Supplies	53,155	35,174	11,722
7422 Fuel-Gasses	3,457	4,845	153,209
7423 Fuel Kerosene	-	-	261
7424 Fuel Propane	226,871	174,824	18,670
7435 GIS Plotter.Xerox	855	-	-
7440 Grounds & Maint Supp	38,814	36,542	189,211
7443 ICE	-	-	-



**Pittsburgh Water & Sewer Authority**  
**Operating Expenses by Account**

	<b>12 Months Ended 12/31/2017</b>	<b>12 Months Ended 12/31/2018</b>	<b>HTY 12 Months Ended 12/31/2019</b>
<b>Direct Operating Expenses</b>			
7445 Lab Chemicals	60,981	4,219	9,561
7447 Lab Supplies	20,634	48,936	122,807
7450 Office Supplies	21,289	37,623	64,263
7490 Welding Supplies	<u>7,646</u>	<u>17,885</u>	<u>19,397</u>
Total Supplies	\$ 433,702	\$ 360,047	\$ 589,103

**Pittsburgh Water & Sewer Authority**  
**Operating Expenses by Account**

	<b>12 Months Ended 12/31/2017</b>	<b>12 Months Ended 12/31/2018</b>	<b>HTY 12 Months Ended 12/31/2019</b>
<b>Direct Operating Expenses</b>			
<u>Travel &amp; Entertainment</u>			
7505 TE.Airfare	1,084	6,706	11,968
7510 TE.Auto Rentals	-	197	-
7520 TE.Fuel	-	-	-
7540 TE.Lodging	11,522	11,411	14,151
7545 TE.Meals	3,375	4,428	4,884
7550 TE.Mileage	1,267	1,440	2,259
7555 TE.SeminarsConferences	12,053	12,255	18,457
7560 TE.Training	14,942	25,288	120,554
7575 TE.Travel Misc	7,986	20,799	24,324
7590 TE.Travel Purch Orders	-	-	-
Total Travel & Entertainment	\$ 52,229	\$ 82,523	\$ 196,597
<u>Utilities</u>			
7605 Electric	4,555,391	4,375,877	3,998,159
7650 Natural Gas.City	410,764	383,385	367,363
7675 Telemeter	56,417	54,631	53,542
7680 Cellular Phone	157,602	142,408	190,291
7681 Local Phones	172,383	150,377	156,337
7682 Long Distance	847	869	460
Total Utilities	\$ 5,353,404	\$ 5,107,547	\$ 4,766,152
<u>Miscellaneous Admin</u>			
7705 Bad Debt	-	-	-
7710 Capital Asset Reclass	-	(3,150,810)	(6,568,443)
7711 DISC Asset Reclass	-	-	-
7712 Cash Discount Taken	(321)	(523)	(623)
7715 Claims.Deductibles	229,858	353,049	587,017
7720 Customer Refund.CSM	-	-	-
7721 Customer Refund. AP	331,386	881,565	667,728
7730 Fines.Penalties	600,603	15,372	20,500
7735 LienBuyBkExp	-	-	-
7742 Education & Outreach	270,044	50,512	41,116
7743 Employee Fund	54,722	-	-
7750 Inv.Adjustments	224,243	1,373,808	240,929
7760 Misc Gen.Admin Exp	14	0	5,847
7765 One Call	13,589	14,921	18,195
7770 Publication.Subscription	5,555	4,288	24,884
7787 3rd Pty LW Exp	-	-	-
7789 3rd Pty Sew Trt Exp	-	-	-
7799 Grants Awarded by PWSA	51,504	95,000	112,352
Total Miscellaneous Admin	\$ 1,781,197	\$ (362,820)	\$ (4,850,498)
<b>GRAND TOTAL: DIRECT OPERATING EXPENSES</b>	<b>\$ 69,830,975</b>	<b>\$ 79,318,109</b>	<b>\$ 89,542,588</b>

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**III. OPERATING EXPENSE**

III.11. Submit a schedule showing a breakdown by the expenditures associated with outside services employed, regulatory commission expenses, showing expenses relating to rate cases separately, and miscellaneous general expenses, for the historic test year and prior 2 comparable years.

**7300: Professional Services**

<b>Twelve Months Ended:</b>	<b>Actual 2017</b>	<b>Actual 2018</b>	<b>HTY 2019</b>
7305 Advertising	29,088	28,962	45,975
7306 Annual Report	-	-	-
7307 Advertising - Marketing	18,465	29,427	5,068
7310 Annual Audit	59,170	64,308	49,683
7315 Billing Contract	486,391	832,775	470,173
7321 Coll Agency.Sewage	44,313	-	-
7323 Consultants	1,087,403	1,161,923	502,507
7325 Consumer Confidence Rpt	-	1,707	2,171
7328 Contingencies	22,111	11,766	148,800
7332 Consulting Engineers	238,347	147,182	26,831
7335 Misc Serv.NonCapital	7,314,114	3,583,069	5,264,191
7345 Ins.Auto	169,393	29,307	74,044
7348 Ins.Commercial Prop	210,767	215,532	226,172
7353 Ins.Gen Liability	5,308	20,798	21,637
7359 Ins.Officers.Director	63,812	74,349	74,528
7365 Ins.WorkersComp	-	-	-
7366 Ins.WorkersComp.City	18,120	33,352	33,352
7368 Internet Connection.Serv	44,508	66,656	53,334
7370 Legal	1,838,942	2,894,513	2,388,647
7371 Legal Self Ins	-	-	-
7373 Minority.Women Bus Enter	-	-	-
7375 Meter Services	910,908	879,344	864,422
7382 Payroll Services	54,044	72,899	70,633
7383 Prof Service.Other	1,427,969	5,307,167	6,083,922
7389 Trust Admin	76,940	71,235	30,411
7390 Water Liens	-	-	8,000
<b>Total Professional Services</b>	<b>\$ 14,120,113</b>	<b>\$ 15,526,273</b>	<b>\$ 16,444,502</b>

(1) Includes PUC Assessments, Rate Case, and Compliance Plan costs

**7300: Professional Services**

	<b>Actual</b>	<b>Actual</b>	<b>HTY</b>
<b>Twelve Months Ended:</b>	<b>Actual</b>	<b>Actual</b>	<b>HTY</b>
	<b>2017</b>	<b>2018</b>	<b>2019</b>
PUC Assessments (916/910)	\$0	\$ 836,801	\$ 953,170
Rate Case & Compliance Plan Expenses			
Finance (913)	0	2,245,866	1,463,404
Legal (916)	0	774,002	1,224,402
<b>Total Regulatory &amp; Rate Case Expenses</b>	<b>\$0</b>	<b>\$3,856,669</b>	<b>\$3,640,976</b>

**7700: Miscellaneous Admin**

	<b>Actual</b>	<b>Actual</b>	<b>HTY</b>
<b>Twelve Months Ended:</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
7705 Bad Debt	-	-	-
7710 Capital Asset Reclass	-	(3,150,810)	(6,568,443)
7711 DISC Asset Reclass	-	-	-
7712 Cash Discount Taken	(321)	(523)	(623)
7715 Claims.Deductibles	229,858	353,049	587,017
7720 Customer Refund.CSM	-	-	-
7721 Customer Refund. AP	331,386	881,565	667,728
7730 Fines.Penalties	600,603	15,372	20,500
7735 LienBuyBkExp	-	-	-
7742 Education & Outreach	270,044	50,512	41,116
7743 Employee Fund	54,722	-	-
7750 Inv.Adjustments	224,243	1,373,808	240,929
7760 Misc Gen.Admin Exp	14	0	5,847
7765 One Call	13,589	14,921	18,195
7770 Publication.Subscription	5,555	4,288	24,884
7787 3rd Pty LW Exp	-	-	-
7789 3rd Pty Sew Trt Exp	-	-	-
7799 Grants Awarded by PWSA	51,504	95,000	112,352
<b>Total Miscellaneous Admin</b>	<b>\$ 1,781,197</b>	<b>\$ (362,820)</b>	<b>\$ (4,850,498)</b>

**Pittsburgh Water & Sewer Authority  
Operating Expenses for Ratemaking**

	<b>HTY</b>	<b>FTY</b>		<b>FPFTY</b>		<b>FPFTY</b>
	<b>12 Months</b>	<b>12 Months</b>		<b>12 Months</b>	<b>Annualizing</b>	<b>12 Months</b>
	<b>Ended</b>	<b>Ended</b>	<b>Adjustments</b>	<b>Ended</b>	<b>Adjustments</b>	<b>Ended</b>
<b>System Operating Expenses</b>	<b>12/31/2019</b>	<b>12/31/2020</b>		<b>12/31/2021</b>		<b>12/31/2021</b>
<u>Direct Operating Expenses</u>						
Administrative Division						
Executive Director	\$ 3,479,233	\$ 2,504,143	\$ (273,338)	\$ 2,230,804	\$ -	\$ 2,230,804
Customer Service	7,457,579	6,980,568	187,681	7,168,249	-	7,168,249
Management Information Systems	2,301,283	3,216,255	524,877	3,741,132	-	3,741,132
Finance	3,186,898	7,769,035	501,016	8,270,051	-	8,270,051
Procurement	370,556	-	-	-	-	-
Human Resources	951,558	1,150,036	108,773	1,258,809	-	1,258,809
Legal	3,616,831	4,751,354	(232,650)	4,518,704	-	4,518,704
Public Affairs	1,080,407	1,335,051	150,594	1,485,646	-	1,485,646
Operations Division						
Environmental Compliance	\$ 1,491,438	\$ 2,739,522	\$ 1,363,938	\$ 4,103,460	\$ -	\$ 4,103,460
Warehouse	663,281	572,896	33,808	606,703	-	606,703
Ops Capital Assets	24,939	-	-	-	-	-
Water Quality (Lab)	2,254,974	2,158,960	(519,012)	1,639,947	-	1,639,947
Water Treatment Plant	17,099,665	21,962,891	4,949,987	26,912,878	-	26,912,878
Sewer Operations	11,487,340	4,868,515	1,256,741	6,125,256	-	6,125,256
Water Distribution	25,251,612	14,477,335	1,218,936	15,696,271	-	15,696,271
Engineering & Construction Division						
Engineering & Construction	\$ 8,824,994	\$ 31,080,494	\$ 1,844,558	\$ 32,925,052	\$ -	\$ 32,925,052
<i>Subtotal: Direct Operating Expenses</i>	\$ 89,542,588	\$ 105,567,054	\$ 11,115,908	\$ 116,682,962	\$ -	\$ 116,682,962
<u>Indirect Operating Expenses</u>						
Loss / (Gain) on ALCOSAN Billings	\$ (2,125,432)	\$ 762,868	\$ 7,629	\$ 770,497	\$ -	\$ 770,497
City Services	4,600,474	4,015,531	(1,415,531)	2,600,000	-	2,600,000
Non-City Water Payments	<u>1,404,861</u>	<u>472,707</u>	<u>3,268</u>	<u>475,975</u>	-	<u>475,975</u>
<i>Subtotal: Other Operating Expenses</i>	\$ 3,879,903	\$ 5,251,106	\$ (1,404,634)	\$ 3,846,472	\$ -	\$ 3,846,472
<i>Total: System Operating Expenses</i>	\$ 93,422,491	\$ 110,818,161	\$ 9,711,274	\$ 120,529,434	\$ -	\$ 120,529,434

**Pittsburgh Water & Sewer Authority**  
**Operating Expenses for Rate-making**

Salary, Wage, & Fringe Benefits	HTY		FTY		FPFTY	
	Per Books 12/31/2019	Adjustments	12 Months Ended 12/31/2020	Adjustments	12 Months Ended 12/31/2021	
<b>Administrative Division</b>						
<i>Executive Director</i>						
Salary & Wages	\$ 361,186	\$ 366,461	\$ 727,647	\$ 21,837	\$ 749,483	
Overtime	5,853	(4,232)	1,621	49	1,670	
Other Compensation	51,498	59,487	110,985	3,331	114,316	
Benefits	77,409	90,456	167,865	31,720	199,585	
<i>Subtotal: Executive Director</i>	\$ 495,945	\$ 512,173	\$ 1,008,118	\$ 56,937	\$ 1,065,054	
<i>Customer Service</i>						
Salary & Wages	\$ 2,201,677	\$ 347,371	\$ 2,549,048	\$ 50,782	\$ 2,599,830	
Overtime	144,278	9,776	154,054	3,069	157,123	
Other Compensation	311,427	(616)	310,812	37,617	348,428	
Benefits	780,856	73,779	854,635	11,729	866,363	
<i>Subtotal: Customer Service</i>	\$ 3,438,239	\$ 430,310	\$ 3,868,548	\$ 103,196	\$ 3,971,744	
<i>Management Information Systems</i>						
Salary & Wages	\$ 484,879	\$ 380,306	\$ 865,185	\$ 153,144	\$ 1,018,328	
Overtime	793	7,485	8,278	1,465	9,743	
Other Compensation	63,137	9,405	72,542	35,173	107,715	
Benefits	134,685	41,651	176,336	24,700	201,035	
<i>Subtotal: Management Information Systems</i>	\$ 683,493	\$ 438,847	\$ 1,122,340	\$ 214,482	\$ 1,336,821	
<i>Finance</i>						
Salary & Wages	\$ 631,214	\$ 785,880	\$ 1,417,094	\$ 80,347	\$ 1,497,442	
Overtime	-	-	-	-	-	
Other Compensation	93,973	12,350	106,322	16,635	122,957	
Benefits	168,721	105,154	273,876	20,569	294,444	
<i>Subtotal: Finance</i>	\$ 893,908	\$ 903,384	\$ 1,797,292	\$ 117,551	\$ 1,914,844	
<i>Procurement</i>						
Salary & Wages	\$ 224,407	\$ (224,407)	\$ -	\$ -	\$ -	
Overtime	139	(139)	-	-	-	
Other Compensation	37,018	(37,018)	-	-	-	
Benefits	44,754	(44,754)	-	-	-	
<i>Subtotal: Procurement</i>	\$ 306,318	\$ (306,318)	\$ -	\$ -	\$ -	
<i>Human Resources</i>						
Salary & Wages	\$ 291,305	\$ 212,957	\$ 504,262	\$ 36,721	\$ 540,983	
Overtime	6,202	(1,511)	4,692	342	5,033	
Other Compensation	45,177	(1,140)	44,037	27,973	72,010	
Benefits	398,583	(253,051)	145,532	29,783	175,315	
<i>Subtotal: Human Resources</i>	\$ 741,268	\$ (42,745)	\$ 698,523	\$ 94,819	\$ 793,342	
<i>Legal</i>						
Salary & Wages	\$ 444,485	\$ 80,733	\$ 525,219	\$ 7,515	\$ 532,733	
Overtime	-	-	-	-	-	
Other Compensation	80,781	(3,262)	77,519	10,573	88,092	
Benefits	114,886	3,530	118,416	4,462	122,878	
<i>Subtotal: Legal</i>	\$ 640,153	\$ 81,001	\$ 721,154	\$ 22,550	\$ 743,704	
<i>Public Affairs</i>						
Salary & Wages	\$ 505,583	\$ 98,547	\$ 604,129	\$ 79,500	\$ 683,629	
Overtime	9,285	(384)	8,901	(5,543)	3,357	
Other Compensation	68,608	(10,883)	57,725	12,296	70,022	
Benefits	139,125	10,796	149,921	23,817	173,738	
<i>Subtotal: Public Affairs</i>	\$ 722,600	\$ 98,076	\$ 820,676	\$ 110,069	\$ 930,746	
<i>Total: Administration Division</i>	\$ 7,921,924	\$ 2,114,727	\$ 10,036,651	\$ 719,604	\$ 10,756,255	

**Pittsburgh Water & Sewer Authority  
Operating Expenses for Ratemaking**

	HTY Per Books 12/31/2019	Adjustments	FTY 12 Months Ended 12/31/2020	Adjustments	FPFTY 12 Months Ended 12/31/2021
<b>Salary, Wage, &amp; Fringe Benefits</b>					
<u>Operations Division</u>					
<i>Environmental Compliance</i>					
Salary & Wages	\$ 218,169	\$ 250,006	\$ 468,175	\$ 44,216	\$ 512,391
Overtime	305	(305)	-	-	-
Other Compensation	35,995	9,606	45,601	16,483	62,085
Benefits	81,947	54,564	136,510	32,143	168,654
<i>Subtotal: Environmental Compliance</i>	\$ 336,416	\$ 313,871	\$ 650,287	\$ 92,843	\$ 743,130
<i>Warehouse</i>					
Salary & Wages	\$ 210,924	\$ 100,603	\$ 311,527	\$ 22,333	\$ 333,860
Overtime	5,516	876	6,393	1,568	7,961
Other Compensation	35,609	(370)	35,239	9,377	44,617
Benefits	85,599	7,613	93,212	9,509	102,721
<i>Subtotal: Warehouse</i>	\$ 337,649	\$ 108,722	\$ 446,371	\$ 42,788	\$ 489,158
<i>Ops Capital Assets</i>					
Salary & Wages	\$ -	\$ -	\$ -	\$ -	\$ -
Overtime	-	-	-	-	-
Other Compensation	-	-	-	-	-
Benefits	-	-	-	-	-
<i>Subtotal: Ops Capital Assets</i>	\$ -	\$ -	\$ -	\$ -	\$ -
<i>Water Quality (Lab)</i>					
Salary & Wages	\$ 255,458	\$ 82,608	\$ 338,065	\$ 97,252	\$ 435,317
Overtime	34,393	2,159	36,552	6,765	43,317
Other Compensation	38,682	14,337	53,019	9,813	62,832
Benefits	112,798	16,447	129,244	32,336	161,581
<i>Subtotal: Water Quality (Lab)</i>	\$ 441,330	\$ 115,551	\$ 556,881	\$ 146,167	\$ 703,047
<i>Water Treatment Plant</i>					
Salary & Wages	\$ 2,284,164	\$ 704,891	\$ 2,989,056	\$ 98,936	\$ 3,087,992
Overtime	432,665	(199,914)	232,751	7,704	240,455
Other Compensation	412,743	53,031	465,774	55,484	521,257
Benefits	933,677	79,845	1,013,522	61,850	1,075,372
<i>Subtotal: Water Treatment Plant</i>	\$ 4,063,250	\$ 637,852	\$ 4,701,102	\$ 223,974	\$ 4,925,076
<i>Sewer Operations</i>					
Salary & Wages	\$ 1,462,649	\$ (62,516)	\$ 1,400,133	\$ 87,932	\$ 1,488,065
Overtime	125,385	36,991	162,376	10,198	172,574
Other Compensation	264,262	(18,605)	245,657	15,428	261,085
Benefits	605,414	23,175	628,589	15,705	644,293
<i>Subtotal: Sewer Operations</i>	\$ 2,457,710	\$ (20,955)	\$ 2,436,755	\$ 129,263	\$ 2,566,017
<i>Water Distribution</i>					
Salary & Wages	\$ 5,542,081	\$ 706,068	\$ 6,248,149	\$ 477,459	\$ 6,725,608
Overtime	1,179,167	(642,491)	536,676	89,151	625,827
Other Compensation	984,428	225,262	1,209,690	92,440	1,302,130
Benefits	2,287,939	23,878	2,311,817	217,944	2,529,761
<i>Subtotal: Water Distribution</i>	\$ 9,993,615	\$ 312,716	\$ 10,306,331	\$ 876,994	\$ 11,183,325
<i>Total: Operations Division</i>	\$ 17,629,969	\$ 1,467,757	\$ 19,097,726	\$ 1,512,029	\$ 20,609,755
<u>Engineering &amp; Construction Division</u>					
<i>Engineering &amp; Construction</i>					
Salary & Wages	\$ 2,297,087	\$ 1,766,746	\$ 4,063,833	\$ 197,302	\$ 4,261,136
Overtime	57,639	(265)	57,375	2,786	60,161
Other Compensation	321,628	(737)	320,891	375,188	696,079
Benefits	764,309	79,284	843,593	331,184	1,174,777
<i>Subtotal: Engineering &amp; Construction</i>	\$ 3,440,663	\$ 1,845,029	\$ 5,285,692	\$ 906,459	\$ 6,192,152
<b>Total: Systemwide Salary, Wage, &amp; Fringe Benefits</b>	<b>\$28,992,557</b>	<b>\$5,427,513</b>	<b>\$34,420,069</b>	<b>\$3,138,092</b>	<b>\$37,558,161</b>

**TAB**

**7**



Pittsburgh Water and Sewer Authority's Base Rate Filing

**IV. TAXES**

IV.1. Provide a copy of the latest Pennsylvania Corporate Tax report and the latest Pennsylvania Corporate Tax settlement.

**RESPONSE:**

Not applicable to PWSA as tax-exempt municipally-owned authority.

**IV. TAXES**

IV.2. Submit details of calculations for taxes, other than income, where a company is assessed taxes for doing business in another state, or on its property located in another state.

**RESPONSE:**

Not applicable to PWSA as tax-exempt municipally-owned authority.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**IV. TAXES**

IV.3. Submit a schedule showing for the last 3 years the Income Tax refunds, plus interest, net of taxes, received from the Federal government due to prior years' claims.

**RESPONSE:**

Not applicable to PWSA as tax-exempt municipally-owned authority.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**IV. TAXES**

IV.4. Provide detailed computations showing the deferred income taxes derived by using accelerated tax depreciation applicable to post-1969 utility property that increases productive capacity, and accelerated depreciation rate (ADR) rates on property (separate between State and Federal; also, rate used). If based on the historic test year, justify.

- a. State whether tax depreciation is based on all rate base items claimed as of the end of the future test year, and whether it is the annual tax depreciation at the end of the future test year.
- b. Reconcile any difference between the deferred tax balance, as shown as a reduction to measures of value (rate base), and the deferred tax balance as shown on the balance sheet.

**RESPONSE:**

Not applicable to PWSA as tax-exempt municipally-owned authority.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**IV. TAXES**

IV.5. Submit a schedule showing a breakdown of accumulated investment tax credits, (3%, 4%, 7%, 10% and 11%), together with details of methods used to write-off the unamortized balances.

**RESPONSE:**

Not applicable to PWSA as tax-exempt municipally-owned authority.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**IV. TAXES**

IV.6. Submit a schedule showing the adjustments for taxable net income per book, including below-the-line items, and pro-forma under existing rates, together with an explanation of any difference between the adjustments. Indicate charitable donations and contributions in the tax calculation for ratemaking purposes.

**RESPONSE:**

Not applicable to PWSA as tax-exempt municipally-owned authority.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**IV. TAXES**

IV.7. Submit detailed calculations supporting historic and future taxable income before State and Federal Income Taxes where the income tax is subject to allocation due to operations in another state, or due to operation of other taxable utility or nonutility business, or by operating divisions or areas.

**RESPONSE:**

Not applicable to PWSA as tax-exempt municipally-owned authority.

Pittsburgh Water and Sewer Authority's Base Rate Filing

**IV. TAXES**

IV.8. Furnish a breakdown of major items comprising prepaid and deferred Income Tax charges and other deferred income tax credits and reserves by accounting areas.

**RESPONSE:**

Not applicable to PWSA as tax-exempt municipally-owned authority.



## Pittsburgh Water and Sewer Authority's Base Rate Filing

**IV. TAXES**

IV.9. Explain the reason for the use of cost of removal of any retired plant figures in the Income Tax calculations.

**RESPONSE:**

Not applicable to PWSA as tax-exempt municipally-owned authority.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**IV. TAXES**

IV.10. State whether all tax savings due to accelerated depreciation on property installed prior to 1970 have been passed through to income. If not, explain.

**RESPONSE:**

Not applicable to PWSA as tax-exempt municipally-owned authority.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**IV. TAXES**

IV.11. Show any income tax loss/gain carryovers from previous years that may affect historic test year income taxes or future test year Income Taxes. Show loss or gain carryovers by years of origin and amounts remaining by years at the end of the historic test year.

**RESPONSE:**

Not applicable to PWSA as tax-exempt municipally-owned authority.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**IV. TAXES**

IV.12. Provide a detailed analysis of taxes accrued per books as of the historic and future test year date. Also supply the basis for the accrual and the amount of taxes accrued monthly.

**RESPONSE:**

Not applicable to PWSA as tax-exempt municipally-owned authority.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**IV. TAXES**

IV.13. Under Section 1552 of the Internal Revenue Code and Regulations at 1.1552-1 if applicable, a parent company, in filing a consolidated Income Tax return for the group, must choose one of four options by which it must allocate total income tax liability of the group to the participating members to determine each member's tax liability to the Federal government. If this request is not applicable, provide an explanation.

- a. State what option has been chosen by the group.
- b. Provide, in summary form, the amount of tax liability that has been allocated to each of the participating members in the consolidated Income Tax return.
- c. Provide a schedule, in summary form, of contributions, which were determined on the basis of separate tax return calculations, made by each of the participating members to the tax liability indicated in the consolidated group tax return. Provide total amounts of actual payments to the tax depository for the tax year, as computed on the basis of separate returns of members.
- d. Provide annual Income Tax return for group, and if Income Tax return shows net operating loss, provide details of amount of net operating loss allocated to the Income Tax returns of each of the members of the consolidated group.

**RESPONSE:**

Not applicable to PWSA as tax-exempt municipally-owned authority.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**IV. TAXES**

IV.14. Provide a copy of the Corporate Federal Tax Returns and supporting schedules for the preceding 3 years and, if applicable, a copy of the calculation workpapers for the company's consolidated tax savings adjustment.

**RESPONSE:**

Not applicable to PWSA as tax-exempt municipally-owned authority.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**IV. TAXES**

IV.15. Provide a schedule of Federal and Pennsylvania taxes, other than Income Taxes, calculated on the basis of test year per book, pro forma at present rates, and pro forma at proposed rates, to include the following categories:

- a. Social Security.
- b. Unemployment.
- c. Capital Stock.
- d. Public Utility Realty.
- e. PUC assessment.
- f. Other property.
- g. Any other appropriate categories.

**RESPONSE:****15.a. Social Security**

PWSA's employer share of Social Security and Medicare Taxes is as follows:

Fiscal Year Ending December 31, 2019	\$ 1,714,215
Fiscal Year Ending December 31, 2020	\$ 1,849,357
Fiscal Year Ending December 31, 2021	\$ 2,247,454

**15.b. Unemployment**

PWSA's employer Pennsylvania Unemployment Tax is as follows:

Fiscal Year Ending December 31, 2019	\$ 1,591
Fiscal Year Ending December 31, 2020	\$ 50,000
Fiscal Year Ending December 31, 2021	\$ 57,000

**15.c. Capital Stock**

Not applicable.

**IV. TAXES****15. Public Utility Realty**

Not applicable.

**15.e. PUC Assessment**

PWSA's PUC assessment is expensed as follows:

Fiscal Year Ending December 31, 2019	\$953,170
Fiscal Year Ending December 31, 2020	\$ 1,000,000
Fiscal Year Ending December 31, 2021	\$1,025,000

**15.f. Other Property**

Not applicable.

**15.g. Any Other Appropriate Categories**

Not applicable.



## Pittsburgh Water and Sewer Authority's Base Rate Filing

**IV. TAXES**

IV.16. Submit a schedule showing a breakdown of the deferred Income Taxes by State and Federal per book, pro forma, existing rates, and under proposed rates.

**RESPONSE:**

Not applicable to PWSA as tax-exempt municipally-owned authority.

**IV. TAXES**

IV.17. With respect to determination of income taxes, Federal and State:

- a. Show Income Tax results of the annualizing and normalizing adjustments to the historic test year before any rate increase.
- b. Show Income Taxes for the annualized and normalized test year.
- c. Show Income Tax effect of the rate increase requested.
- d. Show Income Taxes for the normalized and annualized test year after application of the full rate increase.

**RESPONSE:**

Not applicable to PWSA as tax-exempt municipally-owned authority.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**IV. TAXES**

IV.18. State amount of debt interest utilized for Income Tax calculations, and details of debt interest computations, under each of the following rate case bases:

- a. Actual per book test year.
- b. Annualized historic test year-end.
- c. Proposed future test year-end.

**RESPONSE:**

Not applicable to PWSA as tax-exempt municipally-owned authority.

**TAB**

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**V. RATE BASE**

V.1. Provide a schedule showing the measures of value and the rates of return at the original cost in the current case. All claims made on this exhibit should be cross-referenced to appropriate exhibits.

**RESPONSE:** Not applicable.

## V. RATE BASE

V.2. If a claim is made for construction work in progress, include, in the form of an exhibit, the summary page from all work orders, amount expended at the end of the historic and future test year and anticipated in-service dates. Indicate if any of the construction work in progress will result in insurance recoveries, reimbursements, or retirements of existing facilities. Describe in exact detail the necessity of each project claimed if not detailed on the summary page from the work order. Include final completion dates and estimated total amounts to be spent on each project. This exhibit should be updated at the conclusion of these proceedings.

**RESPONSE:** Not applicable.

## V. RATE BASE

V.3. If a claim is made for nonrevenue producing construction work in progress, include, in the form of an exhibit, the summary page from all work orders, amount expended at the end of the historic and future test year and anticipated in-service dates. Indicate if any of the construction work in progress will result in insurance recoveries, reimbursements, or retirements of existing facilities. Describe in exact detail the necessity of each project claimed if not detailed on the summary page from the work order. Include a list of items needed to complete each project, such as landscaping and fencing, and estimated total amounts to be spent to complete each project. These exhibits should be updated at the conclusion of these proceedings.

### **RESPONSE:**

Not applicable.

**V. RATE BASE**

V.4. If a claim is made for plant held for future use, supply the following:

- a. A brief description of the plant or land site and its original cost.
- b. expected date of use for each item claimed.
- c. Explanation as to why it is necessary to acquire each item in advance of its date of use.
- d. Date when each item was acquired.
- e. Date when each item was placed in the plant held for future use account.

**RESPONSE:** Not applicable.



**V. RATE BASE**

V.5. If fuel stocks comprise part of the cash working capital claim, provide an exhibit showing the actual book balances, noting quantity and price for the fuel inventories by type of fuel for the 13 months prior to the end of the historic test year by location, station, etc. Explain the method of determining the claim if other than that described above.

**RESPONSE:** Not applicable.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**V. RATE BASE**

V.6. Explain in detail by statement or exhibit the appropriateness of claiming any additional items, not previously mentioned, in the measures of value.

**RESPONSE:** Not applicable.

## V. RATE BASE

V.7. Provide schedules and data in support of the following working capital items:

- a. Prepayments—list and identify all items.
- b. Federal Income Tax accrued or prepaid.
- c. Pennsylvania State Income Tax accrued or prepaid.
- d. Pennsylvania Capital Stock Tax accrued or prepaid.
- e. Pennsylvania Public Utility Realty Tax accrued or prepaid.
- f. Payroll taxes accrued or prepaid.
- g. Any adjustments related to the above items for ratemaking purposes.

### RESPONSE:

- 7.a. Prepayments—list and identify all items – See the response to FR X.6.
- 7.b. Federal Income Tax accrued or prepaid - Not applicable.
- 7.c. Pennsylvania State Income Tax accrued or prepaid - Not applicable.
7. Pennsylvania Capital Stock Tax accrued or prepaid - Not applicable.
- 7.e. Pennsylvania Public Utility Realty Tax accrued or prepaid - Not applicable.
- 7.f. Payroll taxes accrued or prepaid – Not applicable.
- 7.g. Any adjustments related to the above items for ratemaking purposes - Not applicable.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**V. RATE BASE**

V.8. Supply an exhibit supporting the claim for cash working capital requirement based on the lead-lag method.

a. Pro forma expenses and revenues are to be used in lieu of book data for computing lead-lag days.

**RESPONSE:** Not applicable.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**V. RATE BASE**

V.9. Indicate if amortized expenses have been removed from the lead-lag study. If so, please provide documentation showing such removal. If not, provide a list of such amortization expenses included.

**RESPONSE:** Not applicable.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**V. RATE BASE**

V.10. Identify the funds availability arrangements or terms which the company has with its banks with respect to deposits of customer checks. For example, does the company have same day or next day access to funds deposited?

**RESPONSE:**

PWSA has a number of payment options for the collection of customer accounts receivables. Payments for PWSA service are accepted by customer check, ACH (electronic) transfer, in-person at 7-Eleven and Family Dollar stores, and, formerly, from collection agencies for past due accounts.

The following excerpt is from the PNC Bank, PWSA's primary checking and deposit account, Corporate Funds Availability Policy for PWSA regarding the availability of customer deposits.

Same Day Availability

Funds from the following deposits are available on the same business day as the day of their deposit:

- All cash deposits made to a PNC Bank teller
- Wire Transfers
- Electronic Deposits

Next Day Availability

If you make a deposit before the cut-off time on a business day that we are open, funds from deposits of checks or money orders identified below will be available on the first business day after the business day of your deposit for all purposes.

- Checks and money orders drawn on PNC Bank
- U.S. Treasury checks payable to you
- Federal Reserve Bank checks, Federal Home Loan Bank checks and U.S. Postal Service money orders payable to you
- State and local government checks that are payable to you, if you use a special deposit ticket available upon request at a PNC Bank branch office
- Non-PNC Bank cashier's, certified and teller's checks that are payable to you, if you use a special deposit ticket available upon request at a PNC Bank branch office

You are required to separate checks requiring special deposit tickets from other checks you are depositing.

## V. RATE BASE

### Longer Delays May Apply

Funds you deposit by check may be delayed for a longer period under the following circumstances:

- We believe a check you deposited will not be paid.
- You deposit checks in any one day totaling more than \$5,000.
- You redeposit a check that has been returned unpaid.
- You have overdrawn your account repeatedly in the last six months.
- There is an emergency such as a failure of communications or computer equipment.

We will notify you of the delay in your ability to withdraw funds for any of the reasons listed, and we will tell you when the funds will be available. In this case, funds from items deposited as set forth above under "Other Check Deposits" will usually be available no later than the fifth business day after the business day of your deposit for all purposes.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**V. RATE BASE**

V.11. In reference to materials and supplies:

- a. What method of inventory valuation was used to develop the claim for materials and supplies?
- b. Does the utility use a material and supply model to calculate needed material and supply levels?
- c. If so, provide the model. Supply an illustrative example of how the monthly balances are derived.
- d. Provide the actual monthly value for the inventory of materials and supplies for the past 12 months. Supply as of the end of the historic test year, a 13-month average, by month, for the material and supply account.
- e. Provide the monthly level of materials and supplies for 3 years prior to the conclusion of the historic test year.

**RESPONSE:**

- 11.a.** What method of inventory valuation was used to develop the claim for materials and supplies?

Not applicable to a cash-basis utility.

- 11.b.** Does the utility use a material and supply model to calculate needed material and supply levels?

No, it does not.

- 11.c.** If so, provide the model. Supply an illustrative example of how the monthly balances are derived.

Please refer to response to question 11b.



## Pittsburgh Water and Sewer Authority's Base Rate Filing

**V. RATE BASE**

- 11.d** Provide the actual monthly value for the inventory of materials and supplies for the past 12 months. Supply as of the end of the historic test year, a 13-month average, by month, for the material and supply account.

PWSA expenses materials and supplies as incurred and does not track materials and supplies in a balance sheet account. In addition, PWSA is filing on a cash basis and, therefore, is not making a claim for materials and supplies.

- 11.e.** Provide the monthly level of materials and supplies for 3 years prior to the conclusion of the historic test year.

Please see the response to 11d.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**V. RATE BASE**

V.12. For each nonblanket or projected plant addition to cost the greater of \$100,000 or 0.5% of current rate base, included in the future test year, please provide:

- a. Description of the project.
- b. Original budgeted cost broken down by allowance for funds used during construction (AFUDC) and non-AFUDC components.
- c. Current budgeted cost broken down by AFUDC and non-AFUDC components.
- d. Reason for change in budgeted cost.
- e. Original estimated date of completion and in service.
- f. Current estimated date of completion and in service.
- g. Reason for change in completion date.
- h. Anticipated retirement related to the plant addition.
- i. Starting date of project.
- j. Amount expended to date.
- k. Percent of project currently complete.
- l. The depreciation rate applicable.
- m. Identify which projects are due to a Pennsylvania Department of Environmental Protection (PA-DEP) or Federal Environmental Protection Agency (EPA) requirement.

**RESPONSE:**

PWSA's Capital Improvement's Plan (CIP) is addressed in the written testimony of Weimer, King, and Barca. The testimonies include summary level descriptions of the key projects as well as the CIP itself. A detailed listing of planned capital projects and information related to their intended use is included as part of the LTIP, which was filed September 28, 2018 with the PWSA Compliance Plan.

## V. RATE BASE

V.13. Explain how the future test year plant balances were projected and provide supporting workpapers and documentation.

### **RESPONSE:**

PWSA is filing on a cash-basis fully projected test year. Due to the nature of a cash basis filing, projected plant balances do not directly impact the revenue requirement and resulting rates. However, utilizing the five-year CIP, PWSA has projected future plant and fixed asset balances. The objective of this projection is to show the magnitude of the CIP and it's means for financing. For the CIP and projected plant balances, please refer to the written testimony of Robert Weimer, Barry King, Jennifer Presutti, and Ed Barca.

**V. RATE BASE**

V.14. Are all of the assets used in the plant-in-service claim used exclusively by the water or wastewater utility? If not, provide the estimated percentage that each shared asset is used by other entities.

**RESPONSE:**

All assets in the plant-in-service claim are used by the water or wastewater utility.

## V. RATE BASE

V.15. Is all plant included in rate base currently being used in providing water or wastewater service? If not, provide a schedule which presents those plant items which are not, and indicate the corresponding amounts and account numbers. Further, provide a detailed narrative explaining the reason why such plant is not being used and the anticipated future disposition of the plant.

### **RESPONSE:**

All plant in service included in the rate base is used and useful. All projected investments during 2021 will be placed in service by the end of 2021 and be used and useful. All projected investments during 2021 will be placed into service by the end of the FPFTY and will be used and useful.

## V. RATE BASE

V.16. Provide all workpapers and supporting documentation showing the derivation of the projected balances of contributions in aid of construction, customer advances for construction and company service line and customer deposits for the future test year.

### **RESPONSE:**

In 2019, PWSA received donated property, or contributions in aid of construction, of \$110,000 for wastewater. For the purposes of this rate filing and since PWSA is filing on a cash basis, PWSA has not projected balances contributions in aid of construction, customer advances for construction and company service line and customer deposits. Projects identified in the CIP are assumed to be funded through the issuance of debt or available utility cash from operations and reserve funds.

**TAB**

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## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VI. DEPRECIATION**

If any of the following questions under this section have been previously answered pursuant to 52 Pa. Code Chapter 73, please note in your response. It is not necessary to provide responses to questions previously answered.

VI.1. Provide a description of the depreciation methods used to calculate annual depreciation amounts and depreciation reserves, together with a discussion of the factors which were considered in arriving at estimates of service life and dispersion by account. Supply a comprehensive statement of any changes made in method of depreciation. Provide dates of all field inspections and facilities visited.

**RESPONSE:**

Depreciation of capital assets owned by the Authority is provided on the straight-line method based on the estimated useful lives of the various classes of assets with no salvage value. Utility assets (such as treatment plant and distribution fixed assets) have estimated useful lives ranging from 30 to 70 years. Non-utility assets (such as administration fixtures) have estimated useful lives ranging from five to 10 years.

The Authority also receives donated property relating mostly to dedicated water and sewer lines. These assets are capitalized at acquisition value at the date of the donation and depreciated in accordance with the estimated useful lives noted above.

The water and sewer system represents assets leased from the City. Amortization of capital lease assets is provided on the straight-line basis applying an estimated average remaining useful life from the inception of the lease.



## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VI. DEPRECIATION**

VI.2. Set forth, in exhibit form, charts depicting the original and estimated survivor curves and a tabular presentation of the original life table plotted on the chart for each account where the retirement rate method of analysis is utilized.

**RESPONSE:**

Not applicable.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VI. DEPRECIATION**

VI.3. Provide the surviving original cost at historic test year-end by vintage by account and include applicable depreciation reserves and accruals. These calculations should be provided for plant in service as well as other categories of plant, including contributions in aid of construction and customers' advances for construction.

**RESPONSE:**

Please see attached schedule.

**VI. DEPRECIATION**

VI.4. Provide a comparison of the calculated depreciation reserve used for ratemaking purposes v. the book reserve by account at the end of the test year, if they differ.

**RESPONSE:**

Not applicable.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VI. DEPRECIATION**

VI.5. Supply a schedule by account and depreciable group showing the survivor curve and annual accrual rate estimated to be appropriate:

- a. For the purposes of this filing.
- b. For the purposes of the most recent rate increase filing prior to the current proceedings.

**RESPONSE:**

**5.a.** For the purposes of this filing.

Please see response for VI.3.

**5.b.** For the purposes of the most recent rate increase filing prior to the current proceedings.

Not applicable.

**VI. DEPRECIATION**

VI.6. Provide an exhibit showing gross salvage, cost of removal, and net salvage for the 5 most recent calendar or fiscal years by account.

**RESPONSE:**

Not applicable.

**Pittsburgh Water & Sewer Authority**  
**Utility Plant in Service Net of Accumulated Depreciation**  
**As of December 31, 2018**

Description	Department	GL Account	ACTUAL 2018 Beginning Plant Balance	Additions	ACTUAL 2018 Ending Plant Balance	ACTUAL 2018 Accumulated Depreciation	ACTUAL 2018 Net Plant In Service
<b>General Water</b>							
Utility - Machine - Equipment	300	1803	\$ 3,354,458	\$ -	\$ 3,354,458	\$ -	\$ 3,354,458
<b>Water Quality</b>							
Utility - Building	321	1802	644,181	-	644,181	(644,181)	-
Utility - Machine - Equipment	321	1803	610,423	-	610,423	(481,338)	129,085
Utility - Computer Equipment	321	1805	8,817	-	8,817	(9,097)	-
Utility - Vehicles	321	1806	12,030	48,400	60,430	(12,043)	48,387
Utility - Miscellaneous	321	1807	145,378	-	145,378	(49,389)	95,989
<i>Subtotal: Water Quality</i>			1,420,829	48,400	1,469,229	(1,196,048)	273,461
<b>Water Quality</b>							
Utility - Building	322	1802	1,493,548	-	1,493,548	(586,522)	907,025
Utility - Machine - Equipment	322	1803	52,907,822	-	52,907,822	(24,354,818)	28,553,004
Utility - Computer Equipment	322	1805	2,693,415	93,191	2,786,606	(888,792)	1,897,814
Utility - Vehicles	322	1806	1,107,667	248,889	1,356,556	(1,107,735)	248,821
Utility - Miscellaneous	322	1807	7,723,900	-	7,723,900	(2,927,813)	4,796,086
<i>Subtotal: Water Quality</i>			65,926,352	342,079	66,268,431	(29,865,680)	36,402,751
<b>Pumping</b>							
Utility - Building	323	1802	90,054,199	-	90,054,199	(43,758,201)	46,295,998
Utility - Computer Equipment	323	1805	49,092	-	49,092	(19,012)	30,080
Utility - Miscellaneous	323	1807	21,899	-	21,899	(21,899)	-
<i>Subtotal: Pumping</i>			90,125,190	-	90,125,190	(43,799,111)	46,326,078
<b>Membrane Plant</b>							
Utility - Building	324	1802	20,355,348	-	20,355,348	(6,727,885)	13,627,463
<b>Distribution</b>							
Utility - Building	325	1802	238,896,289	20,709,945	259,606,235	(68,313,315)	191,292,919
Utility - Machine - Equipment	325	1803	39,602,868	257,600	39,860,467	(22,470,522)	17,389,945
Utility - Furniture - Fixtures	325	1804	7,500	-	7,500	(7,500)	-
Utility - Vehicles	325	1806	2,649,435	525,214	3,174,648	(1,924,951)	1,249,697
Utility - Miscellaneous	325	1807	12,311,149	-	12,311,149	(5,845,208)	6,465,940
Non-Utility - Building	325	1822	2,950	-	2,950	-	2,950
<i>Subtotal: Distribution</i>			293,470,190	21,492,759	314,962,949	(98,561,497)	216,401,452
<b>Sewer Operations</b>							
Utility - Building	424	1802	349,750,317	21,766,851	371,517,169	(101,651,050)	269,866,119
Utility - Machine - Equipment	424	1803	41,803,114	-	41,803,114	(19,815,174)	21,987,940
Utility - Furniture - Fixtures	424	1804	757	-	757	(757)	-
Utility - Computer Equipment	424	1805	980,644	-	980,644	(978,767)	1,877
Utility - Vehicles	424	1806	3,390,646	752,060	4,142,706	(2,792,219)	1,350,488
Utility - Miscellaneous	424	1807	4,986,808	-	4,986,808	(2,520,568)	2,466,241
<i>Subtotal: Sewer Operations</i>			400,912,287	22,518,912	423,431,199	(127,758,534)	295,672,664
<b>Sewer Miscellaneous</b>							
Utility - Miscellaneous	425	1807	30,744	-	30,744	(30,744)	-
<b>Other Miscellaneous</b>							
Non-Utility - Furniture - Fixtures	800	1824	30	-	30	-	30
Utility - Computer Equipment	900	1805	3,477	-	3,477	-	3,477
Non-Utility - Computer Equipment	900	1825	935,436	-	935,436	-	935,436
<i>Subtotal: Other Miscellaneous</i>			938,942	-	938,942	-	938,942
<b>Executive Director</b>							
Non-Utility - Building	910	1822	853,138	-	853,138	(237,434)	615,705
Non-Utility - Furniture - Fixtures	910	1824	74,490	-	74,490	(74,490)	-
Non-Utility - Vehicles	910	1826	25,864	-	25,864	(25,864)	-
<i>Subtotal: Executive Director</i>			953,493	-	953,493	(337,788)	615,705
<b>Customer Service</b>							
Non-Utility - Furniture - Fixtures	911	1824	165,426	-	165,426	(141,439)	23,987
Non-Utility - Computer Equipment	911	1825	2,615,144	614,876	3,230,020	(2,476,240)	753,780
Non-Utility - Miscellaneous	911	1827	9,472	-	9,472	(9,472)	-
<i>Subtotal: Customer Service</i>			2,790,042	614,876	3,404,918	(2,627,151)	777,767
<b>Management Information Systems</b>							
Non-Utility - Furniture - Fixtures	912	1824	8,773	-	8,773	(8,773)	-
Non-Utility - Computer Equipment	912	1825	11,479,797	347,096	11,826,893	(10,077,473)	1,749,420
Non-Utility - Miscellaneous	912	1827	63,345	-	63,345	(57,053)	6,292
<i>Subtotal: Management Information Systems</i>			11,551,915	347,096	11,899,011	(10,143,299)	1,755,712

**Pittsburgh Water & Sewer Authority**  
**Utility Plant In Service Net of Accumulated Depreciation**  
**As of December 31, 2018**

Description	Department	GL Account	ACTUAL 2018 Beginning Plant Balance	Additions	ACTUAL 2018 Ending Plant Balance	ACTUAL 2018 Accumulated Depreciation	ACTUAL 2018 Net Plant In Service
<b>Finance</b>							
Non-Utility - Furniture - Fixtures	913	1824	50,129	23,343	73,472	(50,139)	-
Non-Utility - Computer Equipment	913	1825	6,142	-	6,142	(6,142)	-
<i>Subtotal: Finance</i>			56,271	23,343	79,614	(56,280)	-
<b>Warehouse</b>							
Utility - Machine - Equipment	918	1803	1,115	-	1,115	-	1,115
Non-Utility - Furniture - Fixtures	918	1824	35,332	-	35,332	(35,332)	0
Non-Utility - Computer Equipment	918	1825	33,455	-	33,455	(33,455)	-
Non-Utility - Vehicles	918	1826	173,808	-	173,808	(173,808)	-
Non-Utility - Miscellaneous	918	1827	3,937,558	-	3,937,558	(2,312,318)	1,625,240
<i>Subtotal: Warehouse</i>			4,181,267	-	4,181,267	(2,554,912)	1,626,355
<b>Engineering</b>							
Non-Utility - Building	930	1822	367,490	-	367,490	(211,574)	155,916
Non-Utility - Furniture - Fixtures	930	1824	207,933	116,569	324,502	(179,100)	145,401
Non-Utility - Computer Equipment	930	1825	1,397,849	-	1,397,849	(989,248)	408,601
Non-Utility - Vehicles	930	1826	53,895	-	53,895	(477,520)	(423,626)
Non-Utility - Miscellaneous	930	1827	218,241	-	218,241	(124,439)	93,801
<i>Subtotal: Engineering</i>			2,245,408	116,569	2,361,976	(1,981,882)	380,094
<i>Total: Fixed Assets</i>			\$ 898,312,735	\$ 45,504,033	\$ 943,816,768		
<b>Other Assets</b>							
Construction in Progress		1840	\$ 91,503,027	\$ 36,128,959	\$ 127,631,985	\$ -	\$ 127,631,985
Capitalized Interest		1841	7,429,145	(8,052)	7,421,093	-	7,421,093
CIP Accrual		1842	4,870,954	3,003,980	7,874,934	-	7,874,934
<b>Total Utility Plant</b>			<b>\$ 1,002,115,861</b>	<b>\$ 84,628,920</b>	<b>\$ 1,086,744,780</b>	<b>\$ (325,640,812)</b>	<b>\$ 761,080,915</b>

**TAB**

**10**



## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.1. Provide capitalization and capitalization ratios for the last 5-year period and projected through the next 2 years (with short-term debt and without short-term debt) for the company, parent and consolidated system.

a. Provide year-end interest coverages before and after taxes for the last 3 years and at the latest date, including indenture and Securities and Exchange Commission (SEC) bases, for the company, parent and consolidated system.

b. Provide year-end preferred stock dividend coverages for the last 3 years and at latest date, including charter and SEC bases.

**RESPONSE:**

Not applicable.

Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.2. Provide latest prospectus for the company and the parent.

**RESPONSE:** Not applicable.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

## VII. RATE OF RETURN

VII.3. Supply projected capital requirements and the sources of company, parent and consolidated system for the historic test year and each of 3 comparable future years.

**RESPONSE:**

Attached are PWSA's sources and uses of cash for capital improvement expenditures for Fiscal Years 2019-2024.

	HTY	FTY	FPFTY	Projected	Projected	Projected
	12 Months	12 Months	12 Months	12 Months	12 Months	12 Months
	Ending	Ending	Ending	Ending	Ending	Ending
	12/31/2019	12/31/2020	12/31/2021	12/31/2022	12/31/2023	12/31/2024
<b>Capital Requirements</b>						
Water Treatment Plant	15,665,185	16,884,025	31,260,131	29,455,887	18,164,003	7,054,471
Waste/Storm Water Systems	15,362,759	35,140,573	46,010,731	37,623,291	38,191,236	32,042,104
Miscellaneous Other Projects	4,023,798	16,650,000	7,634,500	5,200,000	4,000,000	5,200,000
Pumping and Storage	9,667,165	31,065,447	71,377,720	65,541,850	94,750,016	44,069,562
Water Distribution System	19,841,782	77,597,135	63,277,796	112,385,623	131,689,581	136,347,581
Water Distribution System - Lead	35,747,107					
Stormwater		26,927,774	46,008,174	30,591,717	14,881,563	13,453,392
Green Infrastructure	6,691,152					
	\$ 106,998,948	204,264,954	265,569,052	280,798,368	301,676,400	238,167,110
<b>Funding Sources</b>						
Debt (Revenue Bonds)	\$ 82,462,755	149,026,299	238,835,405	254,699,574	273,541,635	211,491,887
Cash (PAYGO)	-	26,977,306	26,733,647	26,098,794	28,134,765	26,675,223
PENNVEST	24,536,193	28,261,349	-	-	-	-
Federal Funds	-	-	-	-	-	-
Other Grants	-	-	-	-	-	-
	\$ 106,998,948	204,264,954	265,569,052	280,798,368	301,676,400	238,167,110

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.4. Provide a schedule of debt and preferred stock of company, parent and consolidated system as of historic test year-end and latest date, detailing for each issue (if applicable):

- a. Date of issue.
- b. Date of maturity.
- c. Amount issued.
- d. Amount outstanding.
- e. Amount retired.
- f. Amount required.
- g. Gain on reacquisition.
- h. Coupon rate.
- i. Discount or premium at issuance.
- j. Issuance expenses.
- k. Net proceeds.
- l. Sinking fund requirements.
- m. Effective interest rate.
- n. Dividend rate.
- o. Effective cost rate.
- p. Total average weighted effective cost rate.

**RESPONSE:**

Please see the attached FY 2019 debt schedules for the response to: a, b, c, d, e, h, i, j, k, l, and m.

In order to accurately reflect the PWSA's debt portfolio, additional columns have been added to provide information related to the variable rate debt and the related swap

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

agreements, currently outstanding. The debt structure of the Authority is very complicated and includes fixed rate debt, hedged and unhedged variable rate debt, senior and subordinate lien debt. Additionally, debt has been issued both in the public markets and privately placed with banks. The summary attempts to summarize all aspects of the Authority's debt.

**4.f.** Not applicable.

**4.g.** Not applicable.

**4.n.** Not applicable.

**4.o.** Not applicable.

**4.p.** Not applicable.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.5. Supply financial data of company and/or parent for last 5 years:

- a. Earnings-price ratio (average).
- b. Earnings-book value ratio (per share basis) (average book value).
- c. Dividend yield (average).
- d. Earnings per share (dollar).
- e. Dividends per share (dollars).
- f. Average book value per share yearly.
- g. Average yearly market price per share (monthly high-low basis).
- h. Pre-tax funded debt interest coverage.
- i. Post-tax funded debt interest coverage.
- j. Market price-book value ratio.

**RESPONSE:**

Not applicable to a municipally-owned, cash flow method.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.6. Provide AFUDC charged by company at historic test year-end and latest date, explain method by which rate was calculated and provide workpaper showing derivation of the company's current AFUDC rate.

**RESPONSE:**

PWSA does not utilize a AFUDC accrual in its accounting system. PWSA has not utilized capitalized interest in the HTY nor do they anticipate utilizing any in the FTY and FPFTY. Financing costs incurred during construction are expensed as they occur.

Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.7. Set forth provisions of company's and parent's charter and indentures, if applicable, which describe coverage requirements, limits on proportions of types of capital outstanding, and restrictions on dividend payouts.

**RESPONSE:**

The following documents are attached:

- Amended and Restated Trust Indenture - November 1, 2017
- Supplemental Trust Indenture – July 1, 2019



Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.8. Attach copies of the summaries of the company's projected revenues, expenses and capital budgets for the next 2 years.

**RESPONSE:**

Please see below for a summary of the total PWSA's water and wastewater projected revenues, expenses and capital budget for 2021 – 2022.

See attached Schedule in FR VII.8

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Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.9. Describe long-term debt reacquisitions by company and parent as follows:

- a. Reacquisitions by issue by year.
- b. Total gain on reacquisitions by issue by year.
- c. Accounting of gain for income tax and book purposes.

**RESPONSE:**

PWSA does not have any long-term debt reacquisitions.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.10. Provide the following information concerning compensating bank balance requirements for actual per book test year:

- a. Name of each bank.
- b. Address of each bank.
- c. Type of accounts with each bank (checking, savings, escrow, other services, etc.).
- d. Average daily balance in each account.
- e. Amount and percentage requirements for compensating bank balances at each bank.
- f. Average daily compensating bank balance at each bank.
- g. Documents from each bank explaining compensating bank balance requirements.
- h. Interest earned on each type of account.

**RESPONSE:**

PWSA does not have compensating bank balances.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.11. Provide the following information concerning bank notes payable for actual per book test year:

- a. Line of credit at each bank.
- b. Average daily balances of notes payable to each bank, by name of bank.
- c. Interest rate charged on each bank note (prime rate, formula).
- d. Purpose of each bank note, (for example, construction, fuel storage, working capital, debt retirement).
- e. Prospective future need for this type of financing.

**RESPONSE:**

- a. PWSA has a drawdown revolving line of credit facility with JPMorgan Chase Bank N.A. At this time, the maximum amount that can be drawn and outstanding at any one time is \$150 million.
- b. The average daily amount outstanding in 2019 was \$58.0 million.
- c. Each revolving advance bears interest at the LIBOR Index Rate, which ranged from 2.78600% to 3.44080% during the year ended December 31, 2019.
- d. PWSA uses this credit facility for financing certain capital costs. Once PWSA reaches the maximum, the intent is to refund the outstanding principal into long-term revenue bonds.
- e. PWSA will continue to rely on this type of borrowing instrument in the foreseeable future.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.12. Submit details on company or parent common stock offerings for the past 5 years to present, as follows:

- a. Date of prospectus.
- b. Date of offering.
- c. Record date.
- d. Offering period including dates and number of days.
- e. Amount and number of shares of offering.
- f. Offering ratio, if rights offering.
- g. Percent subscribed.
- h. Offering price.
- i. Gross proceeds per share.
- j. Expenses per share.
- k. Net proceeds per share in (12.) i and j.
- l. Market price per share.
  - (1) At record date.
  - (2) At offering date.
  - (3) One month after close of offering.
- m. Average market price during offering.
  - (1) Price per share.
  - (2) Rights per share-average value of rights.
- n. Latest reported earnings per share at time of offering.
- o. Latest reported dividends at time of offering.

Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

**RESPONSE:**

Not applicable.

Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.13. Attach a chart explaining company's corporate relationship to its affiliates showing system structure.

**RESPONSE:**

Not applicable.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.14. If the utility plans to make a formal claim for a specified allowable rate of return, provide the following data in statement or exhibit form:

- a. Claimed capitalization and capitalization ratios with supporting data.
- b. Claimed cost of long-term debt with supporting data.
- c. Claimed cost of short-term debt with supporting data.
- d. Claimed cost of total debt with supporting data.
- e. Claimed cost of preferred stock with supporting data.
- f. Claimed cost of common equity with supporting data.

**RESPONSE:**

Not applicable.



Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.15. Supply copies of the following documents for the company and, if applicable, its parent:

- a. Most recent annual report to shareholders including any statistical supplements.
- b. Most recent SEC form 10K.
- c. All SEC form 10Q reports issued within the preceding 12 months of the date of submittal of the rate increase request.

**RESPONSE:**

The following document is attached:

- Financial Statements and Required Supplementary and Supplementary Information:  
Years Ended December 31, 2018 and 2017 with Independent Auditor's Report

Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.16. Supply copies of the company's balance sheets for each month for the last 2 years.

**RESPONSE:**

Please see the response to FR XI.1.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.17. Provide the bond rating history for the company and, if applicable, its parent from the major credit rating agencies for the last five years.

**RESPONSE:**

The long-term debt issuer ratings, and their effective dates, for PWSA for the last five years are as follows:

<i>Moody's Underlying Rating</i>		<i>S&amp;P Underlying Rating</i>	
<b>Rate</b>	<b>Date</b>	<b>Rate</b>	<b>Date</b>
A3	06/04/2019	A	06/06/2019
A3	10/15/2018	A	11/20/2017
A2	1/17/2018	A	12/12/2013
A2	9/18/2017		
A2	11/20/2013		
A2	9/10/2013		
A2	2/1/2012		

Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.18. Provide copies of all bond rating reports relating to the company and, if applicable, its parent for the past 2 years.

**RESPONSE:**

Please see attached.

Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.19. Supply copies of all presentations by the company's and, if applicable, its parent's management and securities analysts during the past 2 years, including presentations of financial projections.

**RESPONSE:**

Please see attached.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.20. Provide a listing of all securities issuances for the company and, if applicable, its parent projected for the next 2 years. The response shall identify for each projected issuance the date, dollar amount, type of security, and effective cost rate.

**RESPONSE:**

PWSA expects to utilize a combination of long-term debt and available cash to meet financing needs during the next two years. Based on the current financial plan and CIP, PWSA expects to issue the long-term debt shown below during 2021 and 2022.

**2021 Projected**

Revenue Bonds:        \$131,556,065 3.50% 30 Year Term

**2022 Projected**

Revenue Bonds:        \$158,770,235 3.50% 30 Year Term

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.21. Identify any plan by the company to refinance high cost long-term debt or preferred stock.

**RESPONSE:**

There is a potential cost savings in the taxable refunding of the Series 2013 A and B bonds. The PWSA will consider completing this taxable refunding when going back to the capital markets to issue new money bonds during the summer or fall of 2020.

Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.22. Provide copies of all securities analysts' reports relating to the company and its parent, or both, issued within the past 2 years.

**RESPONSE:**

Please see PWSA's response to FR VII.18.



Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.23. If applicable, supply a listing of all common equity infusions from the parent to the company over the past 5 years. In each case, identify date and dollar amount.

**RESPONSE:**

Not applicable.

Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.24. If applicable, identify the company's common dividend payments to its parent for each of the last 5 years.

**RESPONSE:**

Not applicable.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.25. Provide the latest year-by-year financial projections for the company for the next 5 years. Also, please indicate the date these projections were prepared; whether approved by management; and whether the projections have been submitted to bond rating agencies. The information will be treated in a confidential manner, if requested by the company in writing, as set forth in 52 Pa. Code § 5.423.

**RESPONSE:**

Please refer to the direct testimony of Jennifer Presutti and Edward Barca. These projections were developed for the purpose of this rate case filing and Cost of Service analysis. These projections, developed in conjunction with PWSA by Raftelis Financial Consultants, Inc., have been approved by PWSA management but they have not been submitted to bond rating agencies.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.26. Provide the company's 5-year construction budget.

**RESPONSE:**

Please see below.

<b>Year</b>	<b>Construction Budget</b>
2020	\$ 204,264,954
2021	265,569,052
2022	280,798,368
2023	301,676,400
2024	238,167,110
<b>Total</b>	<b>\$ 1,290,475,883</b>

Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.27. Identify the company's and, if applicable, its parent's capital structure targets (percentages of capital types). Provide the complete basis for the capital structure targets.

**RESPONSE:**

Not applicable.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.28. For each month, of the most recent 24 months, supply the company's:

- a. Short-term debt balance.
- b. Short-term debt interest rate.
- c. Balance of construction work in progress.
- d. Balance of construction work in progress which is eligible for AFUDC accrual:

**RESPONSE:**

- a. PWSA does not have any short-term debt. The only debt-related current liabilities on PWSA's balance sheet is the current portion of long term debt.
- b. Please see the response to VII.28a
- c. Please see the table below.

<b>CWIP</b>	<b>2019</b>	<b>2018</b>
January	132,955,540	92,533,517
February	137,805,044	95,145,649
March	144,039,995	96,878,139
April	153,319,772	99,640,485
May	160,190,788	105,074,223
June	170,973,537	110,881,729
July	177,725,303	116,706,440
August	185,282,000	121,770,628
September	193,782,592	127,114,976
October	203,086,300	136,191,777
November	213,425,552	145,110,915
December	224,471,050	127,631,985

- d. Not applicable.

Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.29. Fully identify all debt, other than instruments traded in public markets, owed to all shareholders, corporate officers, or members of the board of directors, its affiliates, parent company, or subsidiaries.

**RESPONSE:**

Not applicable.

Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.30. Provide a summary statement of all stock dividends, splits, or par value changes during the 2-year calendar period preceding the rate case filing.

**RESPONSE:**

Not applicable.



Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.31. If a claim of the filing utility is based on utilization of the capital structure or capital costs of the parent company and consolidated system, the reasons for this claim must be fully stated and supported.

**RESPONSE:**

Not applicable.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.32. To the extent not provided elsewhere, supply financial data of the company, and its parent, if applicable, for the last 5 years.

- a. Times interest earned ratio—pre- and post tax basis.
- b. Preferred stock dividend coverage ratio—post tax basis.
- c. Times fixed charges earned ratio—pre tax basis.
- d. Dividend payout ratio.
- e. AFUDC as a percent of earnings available for common equity.
- f. Construction work in progress as a percent of net utility plant.
- g. Effective income tax rate.
- h. Internal cash generations as a percent of total capital requirements.

**RESPONSE:**

- a. Please see the table below.

<b>Times interest earned</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Pre-Tax	1.63	0.95	0.82	3.12	2.57
Post-Tax	N/A	N/A	N/A	N/A	N/A

- b. Not applicable.
- c. Please see the table below.

<b>Times Fixed Charges Earned</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Pre-Tax	1.62	0.95	0.82	3.12	2.57
Post-Tax	N/A	N/A	N/A	N/A	N/A

- d. Not applicable
- e. Not applicable
- f. Please see the table below.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
<b>CWIP as Percent of Net Utility Plant</b>	10.74%	13.13%	14.53%	18.39%	16.29%

g. Not applicable

h. Since 2013, PWSA has financed capital assets almost entirely with funds from bond issuances, Pennvest loans, and, more recently, utilizing their revolving line of credit. However, starting in FY 2020, the PWSA has a goal of funding at least 10% of capital expenditures with internally generated funds (PAYGO), as measured on a five-year basis. Please refer to the direct testimony of Ed Barca and Tom Huestis for more information.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.1. Provide capitalization and capitalization ratios for the last 5-year period and projected through the next 2 years (with short-term debt and without short-term debt) for the company, parent and consolidated system.

a. Provide year-end interest coverages before and after taxes for the last 3 years and at the latest date, including indenture and Securities and Exchange Commission (SEC) bases, for the company, parent and consolidated system.

b. Provide year-end preferred stock dividend coverages for the last 3 years and at latest date, including charter and SEC bases.

**RESPONSE:**

Not applicable.

Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.2. Provide latest prospectus for the company and the parent.

**RESPONSE:** Not applicable.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

## VII. RATE OF RETURN

VII.3. Supply projected capital requirements and the sources of company, parent and consolidated system for the historic test year and each of 3 comparable future years.

**RESPONSE:**

Attached are PWSA's sources and uses of cash for capital improvement expenditures for Fiscal Years 2019-2024.

	HTY	FTY	FPFTY	Projected	Projected	Projected
	12 Months	12 Months	12 Months	12 Months	12 Months	12 Months
	Ending	Ending	Ending	Ending	Ending	Ending
	12/31/2019	12/31/2020	12/31/2021	12/31/2022	12/31/2023	12/31/2024
<b>Capital Requirements</b>						
Water Treatment Plant	15,665,185	16,884,025	31,260,131	29,455,887	18,164,003	7,054,471
Waste/Storm Water Systems	15,362,759	35,140,573	46,010,731	37,623,291	38,191,236	32,042,104
Miscellaneous Other Projects	4,023,798	16,650,000	7,634,500	5,200,000	4,000,000	5,200,000
Pumping and Storage	9,667,165	31,065,447	71,377,720	65,541,850	94,750,016	44,069,562
Water Distribution System	19,841,782	77,597,135	63,277,796	112,385,623	131,689,581	136,347,581
Water Distribution System - Lead	35,747,107					
Stormwater		26,927,774	46,008,174	30,591,717	14,881,563	13,453,392
Green Infrastructure	6,691,152					
	<b>\$ 106,998,948</b>	<b>204,264,954</b>	<b>265,569,052</b>	<b>280,798,368</b>	<b>301,676,400</b>	<b>238,167,110</b>
<b>Funding Sources</b>						
Debt (Revenue Bonds)	\$ 82,462,755	149,026,299	238,835,405	254,699,574	273,541,635	211,491,887
Cash (PAYGO)	-	26,977,306	26,733,647	26,098,794	28,134,765	26,675,223
PENNVEST	24,536,193	28,261,349	-	-	-	-
Federal Funds	-	-	-	-	-	-
Other Grants	-	-	-	-	-	-
	<b>\$ 106,998,948</b>	<b>204,264,954</b>	<b>265,569,052</b>	<b>280,798,368</b>	<b>301,676,400</b>	<b>238,167,110</b>

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.4. Provide a schedule of debt and preferred stock of company, parent and consolidated system as of historic test year-end and latest date, detailing for each issue (if applicable):

- a. Date of issue.
- b. Date of maturity.
- c. Amount issued.
- d. Amount outstanding.
- e. Amount retired.
- f. Amount required.
- g. Gain on reacquisition.
- h. Coupon rate.
- i. Discount or premium at issuance.
- j. Issuance expenses.
- k. Net proceeds.
- l. Sinking fund requirements.
- m. Effective interest rate.
- n. Dividend rate.
- o. Effective cost rate.
- p. Total average weighted effective cost rate.

**RESPONSE:**

Please see the attached FY 2019 debt schedules for the response to: a, b, c, d, e, h, i, j, k, l, and m.

In order to accurately reflect the PWSA's debt portfolio, additional columns have been added to provide information related to the variable rate debt and the related swap

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

agreements, currently outstanding. The debt structure of the Authority is very complicated and includes fixed rate debt, hedged and unhedged variable rate debt, senior and subordinate lien debt. Additionally, debt has been issued both in the public markets and privately placed with banks. The summary attempts to summarize all aspects of the Authority's debt.

**4.f.** Not applicable.

**4.g.** Not applicable.

**4.n.** Not applicable.

**4.o.** Not applicable.

**4.p.** Not applicable.



## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.5. Supply financial data of company and/or parent for last 5 years:

- a. Earnings-price ratio (average).
- b. Earnings-book value ratio (per share basis) (average book value).
- c. Dividend yield (average).
- d. Earnings per share (dollar).
- e. Dividends per share (dollars).
- f. Average book value per share yearly.
- g. Average yearly market price per share (monthly high-low basis).
- h. Pre-tax funded debt interest coverage.
- i. Post-tax funded debt interest coverage.
- j. Market price-book value ratio.

**RESPONSE:**

Not applicable to a municipally-owned, cash flow method.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.6. Provide AFUDC charged by company at historic test year-end and latest date, explain method by which rate was calculated and provide workpaper showing derivation of the company's current AFUDC rate.

**RESPONSE:**

PWSA does not utilize a AFUDC accrual in its accounting system. PWSA has not utilized capitalized interest in the HTY nor do they anticipate utilizing any in the FTY and FPFTY. Financing costs incurred during construction are expensed as they occur.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.7. Set forth provisions of company's and parent's charter and indentures, if applicable, which describe coverage requirements, limits on proportions of types of capital outstanding, and restrictions on dividend payouts.

**RESPONSE:**

The following documents are attached:

- Amended and Restated Trust Indenture - November 1, 2017
- Supplemental Trust Indenture – July 1, 2019

Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.8. Attach copies of the summaries of the company's projected revenues, expenses and capital budgets for the next 2 years.

**RESPONSE:**

Please see below for a summary of the total PWSA's water and wastewater projected revenues, expenses and capital budget for 2021 – 2022.

See attached Schedule in FR VII.8

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Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.9. Describe long-term debt reacquisitions by company and parent as follows:

- a. Reacquisitions by issue by year.
- b. Total gain on reacquisitions by issue by year.
- c. Accounting of gain for income tax and book purposes.

**RESPONSE:**

PWSA does not have any long-term debt reacquisitions.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.10. Provide the following information concerning compensating bank balance requirements for actual per book test year:

- a. Name of each bank.
- b. Address of each bank.
- c. Type of accounts with each bank (checking, savings, escrow, other services, etc.).
- d. Average daily balance in each account.
- e. Amount and percentage requirements for compensating bank balances at each bank.
- f. Average daily compensating bank balance at each bank.
- g. Documents from each bank explaining compensating bank balance requirements.
- h. Interest earned on each type of account.

**RESPONSE:**

PWSA does not have compensating bank balances.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.11. Provide the following information concerning bank notes payable for actual per book test year:

- a. Line of credit at each bank.
- b. Average daily balances of notes payable to each bank, by name of bank.
- c. Interest rate charged on each bank note (prime rate, formula).
- d. Purpose of each bank note, (for example, construction, fuel storage, working capital, debt retirement).
- e. Prospective future need for this type of financing.

**RESPONSE:**

- a. PWSA has a drawdown revolving line of credit facility with JPMorgan Chase Bank N.A. At this time, the maximum amount that can be drawn and outstanding at any one time is \$150 million.
- b. The average daily amount outstanding in 2019 was \$58.0 million.
- c. Each revolving advance bears interest at the LIBOR Index Rate, which ranged from 2.78600% to 3.44080% during the year ended December 31, 2019.
- d. PWSA uses this credit facility for financing certain capital costs. Once PWSA reaches the maximum, the intent is to refund the outstanding principal into long-term revenue bonds.
- e. PWSA will continue to rely on this type of borrowing instrument in the foreseeable future.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.12. Submit details on company or parent common stock offerings for the past 5 years to present, as follows:

- a. Date of prospectus.
- b. Date of offering.
- c. Record date.
- d. Offering period including dates and number of days.
- e. Amount and number of shares of offering.
- f. Offering ratio, if rights offering.
- g. Percent subscribed.
- h. Offering price.
- i. Gross proceeds per share.
- j. Expenses per share.
- k. Net proceeds per share in (12.) i and j.
- l. Market price per share.
  - (1) At record date.
  - (2) At offering date.
  - (3) One month after close of offering.
- m. Average market price during offering.
  - (1) Price per share.
  - (2) Rights per share-average value of rights.
- n. Latest reported earnings per share at time of offering.
- o. Latest reported dividends at time of offering.



Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

**RESPONSE:**

Not applicable.

Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.13. Attach a chart explaining company's corporate relationship to its affiliates showing system structure.

**RESPONSE:**

Not applicable.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.14. If the utility plans to make a formal claim for a specified allowable rate of return, provide the following data in statement or exhibit form:

- a. Claimed capitalization and capitalization ratios with supporting data.
- b. Claimed cost of long-term debt with supporting data.
- c. Claimed cost of short-term debt with supporting data.
- d. Claimed cost of total debt with supporting data.
- e. Claimed cost of preferred stock with supporting data.
- f. Claimed cost of common equity with supporting data.

**RESPONSE:**

Not applicable.

Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.15. Supply copies of the following documents for the company and, if applicable, its parent:

- a. Most recent annual report to shareholders including any statistical supplements.
- b. Most recent SEC form 10K.
- c. All SEC form 10Q reports issued within the preceding 12 months of the date of submittal of the rate increase request.

**RESPONSE:**

The following document is attached:

- Financial Statements and Required Supplementary and Supplementary Information:  
Years Ended December 31, 2018 and 2017 with Independent Auditor's Report

Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.16. Supply copies of the company's balance sheets for each month for the last 2 years.

**RESPONSE:**

Please see the response to FR XI.1.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.17. Provide the bond rating history for the company and, if applicable, its parent from the major credit rating agencies for the last five years.

**RESPONSE:**

The long-term debt issuer ratings, and their effective dates, for PWSA for the last five years are as follows:

<i>Moody's Underlying Rating</i>		<i>S&amp;P Underlying Rating</i>	
<b>Rate</b>	<b>Date</b>	<b>Rate</b>	<b>Date</b>
A3	06/04/2019	A	06/06/2019
A3	10/15/2018	A	11/20/2017
A2	1/17/2018	A	12/12/2013
A2	9/18/2017		
A2	11/20/2013		
A2	9/10/2013		
A2	2/1/2012		

Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.18. Provide copies of all bond rating reports relating to the company and, if applicable, its parent for the past 2 years.

**RESPONSE:**

Please see attached.

Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.19. Supply copies of all presentations by the company's and, if applicable, its parent's management and securities analysts during the past 2 years, including presentations of financial projections.

**RESPONSE:**

Please see attached.



## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.20. Provide a listing of all securities issuances for the company and, if applicable, its parent projected for the next 2 years. The response shall identify for each projected issuance the date, dollar amount, type of security, and effective cost rate.

**RESPONSE:**

PWSA expects to utilize a combination of long-term debt and available cash to meet financing needs during the next two years. Based on the current financial plan and CIP, PWSA expects to issue the long-term debt shown below during 2021 and 2022.

**2021 Projected**

Revenue Bonds:        \$131,556,065 3.50% 30 Year Term

**2022 Projected**

Revenue Bonds:        \$158,770,235 3.50% 30 Year Term

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.21. Identify any plan by the company to refinance high cost long-term debt or preferred stock.

**RESPONSE:**

There is a potential cost savings in the taxable refunding of the Series 2013 A and B bonds. The PWSA will consider completing this taxable refunding when going back to the capital markets to issue new money bonds during the summer or fall of 2020.

Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.22. Provide copies of all securities analysts' reports relating to the company and its parent, or both, issued within the past 2 years.

**RESPONSE:**

Please see PWSA's response to FR VII.18.

Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.23. If applicable, supply a listing of all common equity infusions from the parent to the company over the past 5 years. In each case, identify date and dollar amount.

**RESPONSE:**

Not applicable.

Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.24. If applicable, identify the company's common dividend payments to its parent for each of the last 5 years.

**RESPONSE:**

Not applicable.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.25. Provide the latest year-by-year financial projections for the company for the next 5 years. Also, please indicate the date these projections were prepared; whether approved by management; and whether the projections have been submitted to bond rating agencies. The information will be treated in a confidential manner, if requested by the company in writing, as set forth in 52 Pa. Code § 5.423.

**RESPONSE:**

Please refer to the direct testimony of Jennifer Presutti and Edward Barca. These projections were developed for the purpose of this rate case filing and Cost of Service analysis. These projections, developed in conjunction with PWSA by Raftelis Financial Consultants, Inc., have been approved by PWSA management but they have not been submitted to bond rating agencies.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.26. Provide the company's 5-year construction budget.

**RESPONSE:**

Please see below.

<b>Year</b>	<b>Construction Budget</b>
2020	\$ 204,264,954
2021	265,569,052
2022	280,798,368
2023	301,676,400
2024	238,167,110
<b>Total</b>	<b>\$ 1,290,475,883</b>

Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.27. Identify the company's and, if applicable, its parent's capital structure targets (percentages of capital types). Provide the complete basis for the capital structure targets.

**RESPONSE:**

Not applicable.



## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.28. For each month, of the most recent 24 months, supply the company's:

- a. Short-term debt balance.
- b. Short-term debt interest rate.
- c. Balance of construction work in progress.
- d. Balance of construction work in progress which is eligible for AFUDC accrual:

**RESPONSE:**

- a. PWSA does not have any short-term debt. The only debt-related current liabilities on PWSA's balance sheet is the current portion of long term debt.
- b. Please see the response to VII.28a
- c. Please see the table below.

<b>CWIP</b>	<b>2019</b>	<b>2018</b>
January	132,955,540	92,533,517
February	137,805,044	95,145,649
March	144,039,995	96,878,139
April	153,319,772	99,640,485
May	160,190,788	105,074,223
June	170,973,537	110,881,729
July	177,725,303	116,706,440
August	185,282,000	121,770,628
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October	203,086,300	136,191,777
November	213,425,552	145,110,915
December	224,471,050	127,631,985

- d. Not applicable.

Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.29. Fully identify all debt, other than instruments traded in public markets, owed to all shareholders, corporate officers, or members of the board of directors, its affiliates, parent company, or subsidiaries.

**RESPONSE:**

Not applicable.

Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.30. Provide a summary statement of all stock dividends, splits, or par value changes during the 2-year calendar period preceding the rate case filing.

**RESPONSE:**

Not applicable.

Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.31. If a claim of the filing utility is based on utilization of the capital structure or capital costs of the parent company and consolidated system, the reasons for this claim must be fully stated and supported.

**RESPONSE:**

Not applicable.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

VII.32. To the extent not provided elsewhere, supply financial data of the company, and its parent, if applicable, for the last 5 years.

- a. Times interest earned ratio—pre- and post tax basis.
- b. Preferred stock dividend coverage ratio—post tax basis.
- c. Times fixed charges earned ratio—pre tax basis.
- d. Dividend payout ratio.
- e. AFUDC as a percent of earnings available for common equity.
- f. Construction work in progress as a percent of net utility plant.
- g. Effective income tax rate.
- h. Internal cash generations as a percent of total capital requirements.

**RESPONSE:**

- a. Please see the table below.

<b>Times interest earned</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Pre-Tax	1.63	0.95	0.82	3.12	2.57
Post-Tax	N/A	N/A	N/A	N/A	N/A

- b. Not applicable.
- c. Please see the table below.

<b>Times Fixed Charges Earned</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Pre-Tax	1.62	0.95	0.82	3.12	2.57
Post-Tax	N/A	N/A	N/A	N/A	N/A

- d. Not applicable
- e. Not applicable
- f. Please see the table below.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**VII. RATE OF RETURN**

	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
CWIP as Percent of Net Utility Plant	10.74%	13.13%	14.53%	18.39%	16.29%

g. Not applicable

h. Since 2013, PWSA has financed capital assets almost entirely with funds from bond issuances, Pennvest loans, and, more recently, utilizing their revolving line of credit. However, starting in FY 2020, the PWSA has a goal of funding at least 10% of capital expenditures with internally generated funds (PAYGO), as measured on a five-year basis. Please refer to the direct testimony of Ed Barca and Tom Huestis for more information.

**Pittsburgh Water & Sewer Authority**  
**Revenues, Expenses, & Capital Budget**

	<b>FTY</b>	<b>FPFTY</b>	<b>Projected</b>	<b>Projected</b>
	<b>12 Months</b>	<b>12 Months</b>	<b>12 Months</b>	<b>12 Months</b>
	<b>Ending</b>	<b>Ending</b>	<b>Ending</b>	<b>Ending</b>
	<b>12/31/2020</b>	<b>12/31/2021</b>	<b>12/31/2022</b>	<b>12/31/2023</b>
<b>Projected Revenues &amp; Expenses</b>				
Total System Revenues	\$180,032,499	\$225,819,903	\$241,351,830	\$243,021,331
Direct Operating Expenses	(109,582,585)	(119,282,962)	(118,148,871)	(121,281,102)
Indirect Operating Expenses	(1,235,575)	(1,246,472)	(1,254,177)	(1,293,087)
Debt Service (Principal & Interest)	(67,401,602)	(75,364,165)	(92,519,434)	(100,712,575)
Internally Generated Funds / PAYGO	(26,977,306)	(7,113,647)	(5,098,794)	(7,134,765)
Other Capital Costs	<u>(1,000,000)</u>	<u>(22,782,861)</u>	<u>(24,315,316)</u>	<u>(24,331,155)</u>
<i>Rate Surplus / (Deficit)</i>	\$ (26,164,570)	\$ 29,796	\$ 15,238	\$ (11,731,353)
 <b>Projected Capital Budget</b>				
Water Treatment Plant	\$ 12,060,018	\$ 22,328,665	\$ 21,039,919	\$ 18,164,003
Water Pumping and Storage	22,189,605	50,984,086	46,815,607	94,750,016
Water Distribution	55,426,525	45,198,426	80,275,445	131,689,581
Wastewater System	25,100,410	32,864,808	26,873,779	38,191,236
Stormwater System	19,234,124	32,862,981	21,851,226	14,881,563
Other	<u>11,892,857</u>	<u>5,453,214</u>	<u>3,714,286</u>	<u>4,000,000</u>
<i>Total Capital Requirements</i>	\$145,903,539	\$189,692,180	\$200,570,263	\$301,676,400

**Pittsburgh Water and  
Sewer Authority**

**Financial Statements  
and Required Supplementary  
and Supplementary Information**

**Years Ended December 31, 2018 and 2017  
with Independent Auditor's Report**

**MaherDuessel**



# PITTSBURGH WATER AND SEWER AUTHORITY

YEARS ENDED DECEMBER 31, 2018 AND 2017

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## Independent Auditor's Report

### **Board of Directors Pittsburgh Water and Sewer Authority**

We have audited the accompanying financial statements of the Pittsburgh Water and Sewer Authority (Authority), a component unit of the City of Pittsburgh (City), Pennsylvania, as of and for the years ended December 31, 2018 and 2017, and the related notes to the financial statements, which collectively comprise the Authority's basic financial statements as listed in the table of contents.

### **Management's Responsibility for the Financial Statements**

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

### **Auditor's Responsibility**

Our responsibility is to express an opinion on these financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

## Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the Authority as of December 31, 2018 and 2017, and the changes in financial position and cash flows thereof for the years then ended in accordance with accounting principles generally accepted in the United States of America.

## Other Matters

### *Required Supplementary Information*

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis on pages i through x be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board, who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

### *Supplementary Information*

Our audits were conducted for the purpose of forming an opinion on the financial statements that collectively comprise the Authority's basic financial statements. The combining statements of net position and revenue, expenses, and changes in net position (combining statements) are presented for purposes of additional analysis and are not a required part of the basic financial statements.

The combining statements are the responsibility of management and were derived from and relate directly to the underlying accounting and other records used to prepare the basic financial statements. Such information has been subjected to the auditing procedures applied in the audit of the basic financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other

Board of Directors  
Pittsburgh Water and Sewer Authority  
Independent Auditor's Report  
Page 3

records used to prepare the basic financial statements or to the basic financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the combining statements are fairly stated in all material respects, in relation to the basic financial statements as a whole.

*Mahe Duessel*

Pittsburgh, Pennsylvania  
April 23, 2019

# PITTSBURGH WATER AND SEWER AUTHORITY

2018 Financial Statements

Management's Discussion and Analysis

The Pittsburgh Water and Sewer Authority (Authority) comparative 2018 and 2017 fiscal year financial statements enclosed have been conformed to meet the requirements of Governmental Accounting Standards Board (GASB) Statement No. 34, *"Basic Financial Statements – and Management's Discussion and Analysis – for State and Local Governments."* The financial statements incorporate three basic statements: the Statements of Net Position, the Statements of Revenues, Expenses, and Changes in Net Position, and the Statements of Cash Flows.

This Management's Discussion and Analysis (MD&A) is based upon facts, decisions, and conditions known as of the date of the audit report. Please note that the historical information provided in the financial statements and MD&A reflects the results of past operations and is not necessarily indicative of results of future operations. Future operations will be affected by various factors, including, but not limited to, regulatory mandates, rate changes, weather, labor contracts, population changes, business environment and other matters, the nature and effect of which cannot now be determined.

## Using This Financial Report – Overview of Reporting Changes

The Statements of Net Position present information about the resources which are available to the Authority and claims against these resources. Both assets and liabilities are classified in a format which segregates current from noncurrent. In addition, assets available for special purposes – labeled "restricted assets" - are segregated from those assets available for operations. The Authority's restricted assets represent money on deposit with the bond trustee to meet indenture, debt service, and construction program requirements. Liabilities have a similar classification segregating claims on restricted assets from claims on assets available for operations. The net position section of the Statements of Net Position classifies the total net position as net investment in capital assets, restricted, and unrestricted.

The Statements of Revenues, Expenses, and Changes in Net Position summarize operating and non-operating activity for the fiscal year and the resulting impact on the Authority's net position.

The Statements of Revenues, Expenses, and Changes in Net Position include wastewater treatment revenues and expenses for services provided by the Allegheny County Sanitary Authority (ALCOSAN). There are no outstanding bond issues associated directly or indirectly with wastewater revenue streams.

The Statements of Cash Flows have been prepared using the direct method. The statements provide an analysis of the Authority's cash by operating, investing, and capital and related financing activities over the respective fiscal year.

## Financial Highlights 2018 and 2017

In 2018, operating income increased by 108.3% or \$32.1 million to \$61.7 million. The Authority realized an overall net income of \$39.5 million due to increases in operating revenues, decreases in operating expenses and decreases in non-operating expenses, up from a \$6.3 million net loss in 2017.

Below are the 2018 financial highlights:

Total operating revenues in 2018 were up \$28.7 million or 14.1% to \$231.7 million when compared to 2017. Wastewater treatment revenues decreased by \$1.7 million, attributable to ALCOSAN's rate increase being offset by decreases in consumption and adjustments. Water and sewer conveyance revenues increased \$31.0 million from 2017, attributable to rate increases by the Authority. Other operating income decreased by \$0.6 million from 2017, attributable to the sum of various miscellaneous payments.

Total non-operating revenues (expenses) decreased by \$18.2 million from 2017, largely impacted by \$13.6 million in donated property revenue as well as bond issuance costs dropping to zero in 2018 compared to \$3.9 million in 2017, from \$35.9 million in 2017 to \$17.7 million in 2018.

Total operating expenses decreased in 2018 to \$170.1 million compared to \$173.4 million in 2017. Significant operating expenses included the following factors:

- Salary and employee benefit expenses were up \$3.1 million or 14.3%. The increase is attributed to an average salary rate increase of 2%, and increased employee headcount in 2018. Part of this increase is offset by a decrease in professional service expense.

The majority of Authority employees are represented by one of three labor unions. The Pittsburgh Joint Collective Bargaining Committee (PJCBC) represents blue-collar employees. The American Federation of State, County and Municipal Employees (AFSCME) represents Local 2719 employees and Local 2037. A new four-year agreement with AFSCME became effective January 1, 2017 and will expire December 31, 2020. A new four-year agreement with the PJCBC became effective January 1, 2017 and expires December 31, 2020.

- Expenses stayed relatively flat from 2017 to 2018 for multiple cost categories, including chemicals, equipment, materials, inventory, utilities, and overall administrative expenses.
- There were cost categories that decreased significantly from 2017 to 2018, in many cases due to one-time expenses that occurred in 2017. The sewage treatment expense (paid to ALCOSAN) dropped by \$3.3 million from \$75.1 million in 2017 to \$71.8 million in 2018. In addition to net changes in consumption, this is also attributable to the net of catch up billings in 2017 and adjustment made in 2018. Equipment rentals dropped by \$0.8 million from 2017, when there was a one-time emergency rental. Engineering related professional services decreased \$1.7 million from 2017, as positions once filled by consultants in 2017 became filled by Authority employees in 2018. Bad debt expense decreased by \$7.7 million from \$4.2 million in 2017 to a \$3.5 million credit in 2018. The large swing in bad debt expense is attributable to a conservative approach to calculating necessary uncollectible reserves in 2017 for customer accounts with significant balances. Efforts of the collection team in 2018 resulted in these accounts either being paid down or adjusted, which ultimately resulted in a lower allowance for uncollectible accounts and a credit to bad debt expense.
- In 2018, large inventory adjustments and write-offs totaling \$3.1 million were booked as a result of procedural reviews and reconciliations to ensure that inventory reporting was accurate. Other significant non-salary direct operating expense increases from 2017 to 2018 include surface restoration costs, which increased by \$1.9 million, and urgent water and sewer repairs, which increased by \$1.0 million. Administrative expenses that increased from 2017 to 2018 include legal expenses, which increased by \$1.0 million, a result of regulatory costs, and claims, which increased by \$0.6 million, mainly attributable to accrued contingencies for legal settlements.
- Reimbursements for City of Pittsburgh services dropped by 8.4% or \$0.5 million from \$5.4 million in 2017 to \$4.9 million in 2018, as the calculation for this payment switched from a lump sum basis to a transactional basis. The expense of water provided to other entities, mainly comprised of subsidy payments to Pennsylvania American Water Company (PAWC) decreased by 31.8% or \$1.8 million to \$3.8 million in 2018 compared to \$5.6 million in 2017.

Interest expense decreased 1.6% or \$0.5 million to \$34.4 million in 2018 compared to \$34.9 million in 2017. This drop is attributable to the net effect of increased interest payments on borrowings to fund capital projects offset by the Authority no longer having costs associated with credit and remarketing of variable rate debt, a result of the December 2017 refunding, which changed the debt structure.

In 2018, the Authority expended \$4.5 million replacing private lead lines.

In 2018, cash collections increased by \$43.0 million, with \$233.1 million collected from billings compared to \$190.1 million in 2017 due to rate increases by both the Authority and ALCOSAN.

Other 2018 highlights include:

- The Authority continued its relationship with Jordan Tax Service, Inc. (JTS) as its Collector and the law firm of Goehring, Rutter & Boehm, P.C. as Special Legal Counsel for the collection of delinquent water, sewer, and sewage treatment charges. The agreement calls for a collection commission, plus other administrative and legal proceeding costs, to be added to all Authority delinquent claims not paid within 90 days of the initial billing date. If fully collected, the Authority stands to collect 100% of delinquent balances without incurring a collection agency fee. JTS collected for the Authority \$1.5 million during 2018.
- Debt service coverage was 1.71 in 2018 and 1.29 in 2017. These coverage factors exceed the 1.2 coverage ratio required under the bond indenture.
- The Authority expended \$69.2 million on capital projects in 2018, an increase of \$37.2 million or approximately 116% over the \$32.0 million expended in 2017. All capital expenditures in 2018 were funded by the revolving line of credit, which was put in place in July 2016. Pennvest funding was not utilized in 2018. However, in October 2018, the PENNVEST Board approved a funding award of \$49.1 million to be used for the replacement of both public and private lead service lines. The award is made up of a \$13.6 million grant and \$35.4 million one percent interest loan. The state funding award, the largest ever granted to the Authority, will fund the replacement of approximately 3,400 public lead service lines and 3,400 associated private lead lines in 2019. Replacement locations will be focused in neighborhoods with a likelihood of at-risk populations, like pregnant mothers and young children. The Authority will close on this funding award in 2019.
- In July 2016, the Authority entered into a drawdown, revolving line of credit financing with JPMorgan Chase Bank N.A. The maximum amount that could be drawn and outstanding at any one time was \$80,000,000 and has an initial term of four years. In September 2018, the maximum draw amount was increased from \$80,000,000 to \$150,000,000. The Authority utilizes funds borrowed under this vehicle to finance capital projects. As of December 31, 2018, the Authority has drawn \$113.0 million on this facility.
- In August 2018, the Authority entered into a drawdown, revolving line of credit with PNC Bank, National Association. The maximum amount that can be drawn and outstanding at any one time is \$20,000,000 and has a term of one year. The line of credit provides additional liquidity that can be used for operating expenses. No drawdowns have ever occurred on this facility. As of December 31, 2018, the Authority has drawn \$0.0 million on this facility.
- As a result of December 2017 bond refunding activity, a modernized bond indenture sprung into effect on December 28, 2017. The new indenture establishes an improved rate covenant calculation applicable to the 2019 financials, which will be viewed more favorably by rating agencies and credit providers. The modernized indenture and rate covenant will allow the Authority additional financing opportunities and a lower cost of capital, supporting a larger capital spending plan.
- HB 1490 was passed into law in December 2017. HB 1490 establishes the Authority as a "Utility" as defined by the Public Utility Code, resulting in Public Utility Commission (PUC) regulation of the Authority's rate making, its operating effectiveness, debt issuances, and other aspects of conducting its business similar to the way the PUC regulates investor-owned utilities. Effective April 1, 2018, the PUC began oversight of the Authority. PUC oversight requires compliance and conformity with their established regulations regarding administration, finances, operations,

reporting, capital expenditures, and customer service for water and wastewater utilities. The PUC now approves all PWSA rates and fees through tariff filings.

- The City of Pittsburgh is the largest of the 83 municipalities that convey raw sewage to ALCOSAN for treatment. In January 2004, the Authority and the City of Pittsburgh executed a Consent Order and Agreement (Order) regarding sanitary and combined sewer overflows within the City of Pittsburgh. The other signatories to the Order are the Pennsylvania Department of Environmental Protection (DEP) and Allegheny County Health Department, which executed the Order on April 21, 2004. The Long-Term Control Plan to address combined and sanitary sewer overflows required under the order was submitted on schedule on July 31, 2013. Due to the complexities of regional governance, the Authority's regulatory body was switched from the DEP to the US Environmental Protection Agency (EPA). On January 21, 2016, the EPA issued a Clean Water Act Section 308 Information Request (308 Request) to the Authority. The request is meant to provide a jurisdictional basis for EPA to engage the Authority and the City of Pittsburgh in an enforcement action by consent. The Authority intends that through such an action, it can more fully participate in the implementation of interim regional wet weather activities, controls, and improvements. The action will also permit the Authority and the City of Pittsburgh to participate more fully in the identification and implementation of any final wet weather control measures for the region. The Authority has fulfilled the first portion of the 308 Request, which was due on March 31, 2016. The second phase of the 308 Request supplied a source reduction study, which was submitted December 1, 2016 and GI Demonstration projects must be constructed and performance evaluations completed by December 1, 2017. The demonstration project evaluations were submitted on time on December 1, 2017.

The 308 Request does not contain fines or penalties for past non-compliance, but does propose binding obligations for work on a going forward basis. The Authority continues to meet the requirements of the 308 Request. The Final Consent Order will be adjudicated between the City, the Authority, and the USEPA to establish the extent of improvements that will be required to be complete within a specified time frame. Based upon initial discussions with the regulators, the Authority anticipates that the final recommendations implementation plan will be modified to assure its affordability to the Authority's rate payers. See Note 13 – Consent Agreement for additional details.

#### **Financial Highlights 2017 and 2016**

In 2017, operating income decreased by 7.9% or \$2.5 million to \$29.6 million. The Authority experienced an overall net loss of \$6.3 million due to increases in operating expenses and in non-operating expenses, down from a \$1.8 million net loss in 2016.

Below are the 2017 financial highlights:

Total operating revenues in 2017 were up \$22.3 million or 12.3% to \$203.0 million when compared to 2016. Wastewater treatment revenues increased by \$6.8 million. Water and sewer conveyance revenues increased \$14.7 million from 2016. Both of these increases are attributable to rate increases by the Authority and ALCOSAN. Other operating income increased by \$0.8 million from 2016, attributable to the sum of various miscellaneous payments.

Total non-operating revenues (expenses) increased by \$2.0 million from 2016, largely impacted by \$3.9 million in bond issuance costs offset by a \$2.0 million decrease in interest and amortization, from \$36.9 million in 2016 to \$34.9 million in 2017.

Total operating expenses increased in 2017 to \$173.4 million compared to \$148.6 million in 2016. Significant operating expenses included the following factors:

- Salary and employee benefit expenses were up \$0.7 million or 3.6%. The increase is attributed to an average salary rate increase of 2%, and increased employee headcount in 2017.



The majority of Authority employees are represented by one of three labor unions. The Pittsburgh Joint Collective Bargaining Committee (PJCBC) represents blue-collar employees. The American Federation of State, County and Municipal Employees (AFSCME) represents Local 2719 employees and Local 2037. A new four-year agreement with AFSCME became effective January 1, 2017 and will expire December 31, 2020. A new four-year agreement with the PJCBC became effective January 1, 2017 and expires December 31, 2020.

- Overall direct operating expenses, excluding salaries and benefits, increased by \$15.9 million or 19.4% to \$97.9 million in 2017 from \$82.0 million in 2016. Operating contracts increased by \$13.9 million; the bulk of this increase is attributable to the wastewater treatment expense, which increased by \$13.0 million or 20.9% to \$75.1 million when compared to \$62.1 million in 2016, due to a combination of ALCOSAN's rate increase and timing. Other significant changes in operating contracts include temporary help decreasing by \$1.3 million, to \$1.2 million in 2017 compared to \$2.5 million in 2016 (increased temporary employees were required to support billing issues that arose in 2015), water and sewer repairs and maintenance increased by \$2.1 million in total, due to an overall increase in line repair. Chemicals expenses decreased by \$0.04 million from 2016. Equipment expenses decreased from 2016 by \$0.8 million, to \$0.4 million in 2017. Repairs and maintenance increased by \$1.4 million from 2016, the main driver being surface restoration costs. Testing increased by \$0.8 million from 2016 due to increased lead testing.
- Overall general and administrative expenses increased 29.0% or \$3.9 million, to \$24.8 million in 2017 from \$20.9 million in 2016. Fees increased by \$0.2 million from 2016, largely driven by increased credit card fee. Freight and postage increased by \$0.1 million from 2016. Lease and rents increased by \$0.7 million from 2016 due to increased heavy equipment rental. Professional services increased overall by \$1.4 million; contributing factors include a \$0.4 million increase in consultant costs, a \$0.4 million increase in legal costs, and various smaller increases in other categories. Utility expense increased by \$0.1 million from 2016. Miscellaneous administrative costs increased by \$3.6 million from the previous year, the biggest factor being a \$3.4 million increase to bad debt reserve after a conservative review of customer accounts.
- Overall other expenses decreased 3.9% or \$2.5 million to \$60.3 million in 2017 from \$62.8 million in 2016. Non-city water subsidy to Pennsylvania American Water Company (PAWC) increased by 183% or \$3.6 million to \$5.6 million in 2017 compared to \$2.0 million in 2016. Interest expense decreased 10.2% or \$3.8 million to \$33.2 million in 2017 compared to \$37.0 million in 2016. Interest on long-term debt decreased by \$4.5 million from 2016, attributable to bond refunding activity which was slightly offset by smaller increases in counter-party payments, liquidity, and remarketing fees, Pennvest interest, and revolver interest.
- In 2017, cash collections increased by \$15.8 million, with \$190.1 million collected from billings compared to \$174.3 million in 2016 due to rate increases by both the Authority and ALCOSAN.

Other 2017 highlights include:

- The Authority continued its relationship with Jordan Tax Service, Inc. (JTS) as its Collector and the law firm of Goehring, Rutter & Boehm, P.C. as Special Legal Counsel for the collection of delinquent water, sewer, and sewage treatment charges. The agreement calls for a collection commission, plus other administrative and legal proceeding costs, to be added to all Authority delinquent claims not paid within 90 days of the initial billing date. If fully collected, the Authority stands to collect 100% of delinquent balances without incurring a collection agency fee. JTS collected for the Authority \$1.6 million during 2017.
- Debt service coverage was 1.29 in 2017 and 1.21 in 2016. These coverage factors exceed the 1.2 coverage ratio required under the bond indenture.

- The Authority expended \$32.0 million on capital projects in 2017, a decrease of \$0.3 million over the \$32.3 million expended in 2016. Of \$50.4 million budgeted in Pennvest loans, \$38.1 million was spent in prior years, \$0.2 million was spent in 2017, and \$10.75 million of approved funding remained available. The balance of capital expenditures in 2017 was funded by the revolving line of credit, which was put in place in July 2016.
- In July 2016, the Authority entered into a drawdown, revolving line of credit financing with JPMorgan Chase Bank N.A. The maximum amount that can be drawn and outstanding at any one time is \$80,000,000 and has an initial term of four years. The Authority will use funds borrowed under this vehicle to finance capital projects. As of December 31, 2017, the Authority has drawn \$43.8 million on this facility.
- In December of 2017, the Authority closed on three different revenue refunding bond series: \$159,795,000 Tax-Exempt Series A of 2017, \$5,595,000 Taxable Series B of 2017 and \$218,805,000 Tax-Exempt Series C of 2017. Series A and B of 2017 are fixed rate tax-exempt bonds that were issued to refund all of Series A of 2008 and Series D1 of 2008, as well as a portion of Series B of 1998, and a portion of Series B of 2013. Series C of 2017 are floating rate notes that were issued to refund Series B1 of 2008, Series B2 of 2008 and Series D2 of 2008, all variable-rate debt. In addition to providing savings to the Authority, these issuances resulted in the Authority achieving 67.32% total bondholder consent to the installation of a new, modernized indenture which sprung into effect on December 28, 2017. The new indenture establishes an improved rate covenant calculation applicable to the 2019 financials, which will be viewed more favorably by rating agencies and credit providers. The modernized indenture and rate covenant will allow the Authority additional financing opportunities and a lower cost of capital, supporting a larger capital spending plan. The issuance of the Series A and B of 2017 bonds resulted in a \$5,534,870 NPV savings to the Authority and the issuance of the Series C of 2017 notes resulted in a \$7,858,340 NPV savings to the Authority.
- HB 1490 was passed into law in December 2017. HB 1490 establishes the Authority as a "Utility" as defined by the Public Utility Code, resulting in regulation of the Authority's rate making, its operating effectiveness, debt issuances, and other aspects of conducting its business similar to the way the PUC regulates investor-owned utilities. HB 1490 includes provisions that allow the Authority to impose, charge, or collect rates or charges as necessary to permit the Authority to comply with its covenants with the holders of any bonds or other financial obligations of the Authority, and prohibits the PUC from requiring the Authority to take any action that would cause the interest on the Authority's financial obligations to be includible in gross income of the holders of such obligations for federal income tax purposes. HB 1490 also requires the Authority to file a compliance plan related to information technology, accounting, billing, collections, and other operating systems and procedures as well as a long-term infrastructure improvement plan. The Authority is pursuing development of rate actions and performance compliance plans to meet the requirements of HB 1490.
- The City of Pittsburgh is the largest of the 83 municipalities that convey raw sewage to ALCOSAN for treatment. In January 2004, the Authority and the City of Pittsburgh executed a Consent Order and Agreement (Order) regarding sanitary and combined sewer overflows within the City of Pittsburgh. The other signatories to the Order are the Pennsylvania Department of Environmental Protection (DEP) and Allegheny County Health Department, which executed the Order on April 21, 2004. The Long-Term Control Plan to address combined and sanitary sewer overflows required under the order was submitted on schedule on July 31, 2013. Due to the complexities of regional governance, the Authority's regulatory body was switched from the DEP to the US Environmental Protection Agency (EPA). On January 21, 2016, the EPA issued a Clean Water Act Section 308 Information Request (308 Request) to the Authority. We understand the nature of the request is to provide a jurisdictional basis for EPA to engage the Authority and the City of Pittsburgh in an enforcement action by consent. We intend that through such an action, we can more fully participate in the implementation of interim regional wet weather activities,

controls, and improvements. We further understand that such an action will also permit the Authority and the City of Pittsburgh to participate more fully in the identification and implementation of any final wet weather control measures for the region. We have fulfilled the first portion of the 308 Request, which was due on March 31, 2016. The second phase of the 308 Request supplied a source reduction study, which was submitted December 1, 2016 and GI Demonstration projects must be constructed and performance evaluations completed by December 1, 2017. The demonstration project evaluations were submitted on time on December 1, 2017.

The 308 Request does not contain fines or penalties for past non-compliance, but does propose binding obligations for work on a going forward basis. The Authority continues to meet the requirements of the 308 Request. The Final Consent Order will be adjudicated between the City, the Authority, and the USEPA to establish the extent of improvements that will be required to be complete within a specified time frame. Based upon initial discussions with the regulators, the Authority anticipates that the final recommendations implementation plan will be modified to assure its affordability to the Authority's rate payers. See Note 13 – Consent Agreement for additional details.

### CONDENSED FINANCIAL STATEMENTS

#### CONDENSED STATEMENTS OF NET POSITION

(Dollars expressed in thousands)

	December 31,		Variance	
	2018	2017	Dollars	%
<b>Capital assets:</b>				
Producing assets	\$ 618,177	\$ 589,567	\$ 28,610	4.85%
Construction in progress	139,303	100,240	39,063	38.97%
Hedging derivative - interest rate swap	4,750	-	4,750	0.00%
Restricted assets	23,326	29,948	(6,622)	-22.11%
Current assets	78,787	46,417	32,370	69.74%
<b>Total Assets</b>	<b>864,343</b>	<b>766,172</b>	<b>98,171</b>	<b>12.81%</b>
<b>Deferred Outflows of Resources</b>	<b>103,291</b>	<b>113,605</b>	<b>(10,314)</b>	<b>-9.08%</b>
<b>Liabilities:</b>				
Current liabilities	69,662	62,962	6,700	10.64%
Long-term liabilities	897,581	860,651	36,930	4.29%
<b>Total Liabilities</b>	<b>967,243</b>	<b>923,613</b>	<b>43,630</b>	<b>4.72%</b>
<b>Deferred Inflows of Resources</b>	<b>4,750</b>	<b>-</b>	<b>4,750</b>	<b>0.00%</b>
<b>Net Position:</b>				
Net investment in capital assets	(14,892)	(29,609)	14,717	-49.70%
Restricted	16,388	13,240	3,148	23.78%
Unrestricted	(5,855)	(27,467)	21,612	-78.68%
<b>Total Net Position</b>	<b>\$ (4,359)</b>	<b>\$ (43,836)</b>	<b>\$ 39,477</b>	<b>-90.06%</b>

**CONDENSED STATEMENTS OF REVENUES, EXPENSES, AND CHANGES IN NET POSITION**  
(Dollars expressed in thousands)

	Year Ended December 31,		Variance	
	2018	2017	Dollars	%
			Increase (Decrease)	
Operating revenues	\$ 231,734	\$ 202,996	\$ 28,738	14.16%
Operating expenses:				
Direct operating	72,633	71,156	1,477	2.08%
Wastewater treatment	71,822	75,107	(3,285)	-4.37%
Reimbursement for City of Pittsburgh services	4,911	5,363	(452)	-8.43%
Subsidy of non-customer City residents	3,814	5,594	(1,780)	-31.82%
Depreciation	16,894	16,172	722	4.46%
<b>Total Operating Expenses</b>	<b>170,074</b>	<b>173,392</b>	<b>(3,318)</b>	<b>-1.91%</b>
Operating income	61,660	29,604	32,056	108.28%
Non-operating revenues (expenses):				
Donated property	13,649	1,595	12,054	755.74%
Interest revenue	469	460	9	1.96%
Interest expense and other	(31,823)	(37,972)	6,149	-16.19%
<b>Total Non-operating Revenues (Expenses)</b>	<b>(17,705)</b>	<b>(35,917)</b>	<b>18,212</b>	<b>-50.71%</b>
Special item: private lead line replacement	(4,478)	-	(4,478)	0.00%
<b>Total Special Items</b>	<b>(4,478)</b>	<b>-</b>	<b>(4,478)</b>	<b>0.00%</b>
<b>Net Income/(Loss)</b>	<b>\$ 39,477</b>	<b>\$ (6,313)</b>	<b>\$ 45,790</b>	<b>-725.33%</b>

**Financial Condition 2018 and 2017**

The Authority's financial condition in 2018 remained stable for a sixteenth consecutive year. Water utility revenues increased to \$159.5 million from \$128.5 million. The rate increase effective March 1, 2019 should have a positive impact on utility revenue and unrestricted cash. Total cash and cash equivalents stood at \$46.9 million at year-end 2018. Investment interest rates remain near historic lows, impacting the return on reserves invested.

**CONDENSED FINANCIAL STATEMENTS**

**CONDENSED STATEMENTS OF NET POSITION**

(Dollars expressed in thousands)

	December 31,		Variance	
	2017	2016	Dollars	%
<b>Capital assets:</b>				
Producing assets	\$ 589,567	\$ 587,937	\$ 1,630	0.28%
Construction in progress	100,240	88,861	11,379	12.81%
Restricted assets	29,948	26,337	3,611	13.71%
Current assets	46,417	51,537	(5,120)	-9.93%
<b>Total Assets</b>	<b>766,172</b>	<b>754,672</b>	<b>11,500</b>	<b>1.52%</b>
<b>Deferred Outflows of Resources</b>	<b>113,605</b>	<b>95,905</b>	<b>17,700</b>	<b>18.46%</b>
<b>Liabilities:</b>				
Current liabilities	62,962	67,285	(4,323)	-6.42%
Long-term liabilities	860,651	820,815	39,836	4.85%
<b>Total Liabilities</b>	<b>923,613</b>	<b>888,100</b>	<b>35,513</b>	<b>4.00%</b>
<b>Net Position:</b>				
Net investment in capital assets	(29,609)	(5,395)	(24,214)	448.82%
Restricted	13,240	9,999	3,241	32.41%
Unrestricted	(27,467)	(42,127)	14,660	-34.80%
<b>Total Net Position</b>	<b>\$ (43,836)</b>	<b>\$ (37,523)</b>	<b>\$ (6,313)</b>	<b>16.82%</b>

**CONDENSED STATEMENTS OF REVENUES, EXPENSES, AND CHANGES IN NET POSITION**  
(Dollars expressed in thousands)

	Year Ended December 31,		Variance	
	2017	2016	Dollars	%
			Increase (Decrease)	
Operating revenues	\$ 202,996	\$ 180,727	\$ 22,269	12.32%
Operating expenses:				
Direct operating	71,156	60,687	10,469	17.25%
Wastewater treatment	75,107	62,125	12,982	20.90%
Reimbursement for City of Pittsburgh services	5,363	7,150	(1,787)	-24.99%
Subsidy of non-customer City residents	5,594	1,974	3,620	183.38%
Depreciation	16,172	16,657	(485)	-2.91%
<b>Total Operating Expenses</b>	<b>173,392</b>	<b>148,593</b>	<b>24,799</b>	<b>16.69%</b>
Operating income	29,604	32,134	(2,530)	-7.87%
Non-operating revenues (expenses):				
Donated property	1,595	981	614	62.59%
Interest revenue	460	383	77	20.10%
Interest expense and other	(37,972)	(35,276)	(2,696)	7.64%
<b>Total Non-operating Revenues (Expenses)</b>	<b>(35,917)</b>	<b>(33,912)</b>	<b>(2,005)</b>	<b>5.91%</b>
<b>Net Income/(Loss)</b>	<b>\$ (6,313)</b>	<b>\$ (1,778)</b>	<b>\$ (4,535)</b>	<b>255.06%</b>

**Financial Condition 2017 and 2016**

The Authority's financial condition in 2017 remained stable for a fifteenth consecutive year. Water utility revenues increased to \$128.5 million from \$113.8 million. The rate increase effective January 2018 as implemented in 2017 should have a positive impact on utility revenue and unrestricted cash. Total cash and cash equivalents stood at \$11.1 million at year-end 2017. Investment interest rates remain historically low, impacting return on reserves invested.

**Requests for Information**

This financial report is designed to provide a general overview of the Authority's finances for all those with an interest in its finances. Questions concerning any of the information provided in this report or requests for additional financial information should be addressed to the Executive Director, Penn Liberty Plaza I, 1200 Penn Ave., Pittsburgh, PA 15222.

# PITTSBURGH WATER AND SEWER AUTHORITY

## STATEMENTS OF NET POSITION

*(Dollars expressed in thousands)*

DECEMBER 31, 2018 AND 2017

	2018	2017
<b>Assets</b>		
<b>Current assets:</b>		
Cash and cash equivalents	\$ 46,920	\$ 11,076
Accounts receivable, net:		
Water:		
Billed	8,537	9,335
Unbilled	8,583	6,760
Total water	17,120	16,095
Wastewater treatment:		
Billed	7,014	9,975
Unbilled	3,719	3,746
Total wastewater treatment	10,733	13,721
Other receivables	1,510	1,074
Total accounts receivable, net	29,363	30,890
Prepaid expenses	520	674
Inventory	1,984	3,777
Total current assets	78,787	46,417
<b>Noncurrent assets:</b>		
Restricted assets:		
Cash and cash equivalents	13,970	18,264
Investments	9,356	11,684
Total restricted assets	23,326	29,948
Hedging derivative - interest rate swap	4,750	-
Capital assets, not being depreciated	139,303	100,240
Capital assets, net of accumulated depreciation	618,177	589,567
Total noncurrent assets	785,556	719,755
<b>Total Assets</b>	<b>864,343</b>	<b>766,172</b>
<b>Deferred Outflows of Resources</b>		
Deferred charge on refunding	102,534	110,326
Accumulated decrease in fair value of hedging derivatives	757	3,279
<b>Total Deferred Outflows of Resources</b>	<b>103,291</b>	<b>113,605</b>

(Continued)

The notes to financial statements are an integral part of this statement.

# PITTSBURGH WATER AND SEWER AUTHORITY

## STATEMENTS OF NET POSITION

*(Dollars expressed in thousands)*

DECEMBER 31, 2018 AND 2017

(Continued)

	2018	2017
<b>Liabilities</b>		
<b>Current liabilities:</b>		
Bonds and loans payable	23,400	24,603
Accrued payroll and related obligations	1,373	1,217
Accounts payable wastewater treatment	19,349	17,863
Accounts payable and other accrued expenses	20,911	15,506
Accrued interest payable from restricted assets	4,629	3,773
<b>Total current liabilities</b>	<b>69,662</b>	<b>62,962</b>
<b>Noncurrent liabilities:</b>		
Unearned revenue	143	164
Accrued payroll and related obligations	558	594
Swap liability	13,254	18,319
Bonds and loans payable, net	883,626	841,574
<b>Total noncurrent liabilities</b>	<b>897,581</b>	<b>860,651</b>
<b>Total Liabilities</b>	<b>967,243</b>	<b>923,613</b>
<b>Deferred Inflows of Resources</b>		
Accumulated increase in fair value of hedging derivatives	4,750	-
<b>Net Position</b>		
Net investment in capital assets	(14,892)	(29,609)
Restricted	16,388	13,240
Unrestricted	(5,855)	(27,467)
<b>Total Net Position</b>	<b>\$ (4,359)</b>	<b>\$ (43,836)</b>

(Concluded)

The notes to financial statements are an integral part of this statement.



# PITTSBURGH WATER AND SEWER AUTHORITY

## STATEMENTS OF REVENUES, EXPENSES, AND CHANGES IN NET POSITION

*(Dollars expressed in thousands)*

YEARS ENDED DECEMBER 31, 2018 AND 2017

	2018	2017
<b>Operating Revenues:</b>		
Residential, commercial, and industrial water sales	\$ 159,506	\$ 128,488
Wastewater treatment	67,261	68,935
Other	4,967	5,573
Total operating revenues	231,734	202,996
<b>Operating Expenses:</b>		
Direct operating expenses	72,633	71,156
Wastewater treatment	71,822	75,107
Reimbursement for City of Pittsburgh services	4,911	5,363
Expense of water provided by other entities:		
Subsidy of customers located in the City	3,814	5,594
Depreciation	16,894	16,172
Total operating expenses	170,074	173,392
Operating Income	61,660	29,604
<b>Non-operating Revenues (Expenses):</b>		
Donated property	13,649	1,595
Interest revenue	469	460
Investment income (loss) - change in fair value of swap	2,542	835
Interest and amortization	(34,365)	(34,913)
Bond issuance costs	-	(3,894)
Total non-operating revenues (expenses)	(17,705)	(35,917)
<b>Special Item:</b>		
Private lead line replacement	(4,478)	-
Net Income (Loss)	39,477	(6,313)
<b>Net Position:</b>		
Beginning of year	(43,836)	(37,523)
End of year	\$ (4,359)	\$ (43,836)

The notes to financial statements are an integral part of this statement.

# PITTSBURGH WATER AND SEWER AUTHORITY

## STATEMENTS OF CASH FLOWS

(Dollars expressed in thousands)

YEARS ENDED DECEMBER 31, 2018 AND 2017

	2018	2017
<b>Cash Flows From Operating Activities:</b>		
Cash received from customers	\$ 236,767	\$ 195,504
Cash paid to suppliers and employees and customer refunds	(68,688)	(71,227)
Cash paid to City of Pittsburgh for reimbursement of services	(4,911)	(5,363)
Cash paid to other water companies for subsidy of customers located in the City of Pittsburgh	(3,814)	(5,594)
Cash paid to ALCOSAN for wastewater treatment	(70,336)	(72,527)
Net cash provided by (used in) operating activities	89,018	40,793
<b>Cash Flows From Investing Activities:</b>		
Purchase of investment securities	(92,905)	(96,126)
Proceeds from sale and maturities of investment securities	94,036	93,117
Interest income	469	460
Net cash provided by (used in) investing activities	1,600	(2,549)
<b>Cash Flows From Capital and Related Financing Activities:</b>		
Purchase/construction of property, plant, and equipment	(70,918)	(27,586)
Private lead line replacements	(4,478)	-
Proceeds from issuance of revenue bonds	-	407,569
Proceeds from revolving line of credit	69,200	32,000
Proceeds from Pennvest Loans	-	988
Payment to refunding bond escrow agent	-	(397,742)
Payment made for bond issuance costs	-	(3,894)
Principal payments on debt	(24,603)	(22,481)
Principal payments on capital lease	(438)	(424)
SWAP receipts	4,430	2,467
SWAP payments	(10,564)	(12,512)
Liquidity and remarketing fees	(307)	(1,456)
Interest paid on borrowings	(21,390)	(19,353)
Net cash provided by (used in) capital and related financing activities	(59,068)	(42,424)
<b>Increase (Decrease) in Cash and Cash Equivalents</b>	31,550	(4,180)
<b>Cash and Cash Equivalents:</b>		
Beginning of year	29,340	33,520
End of year	\$ 60,890	\$ 29,340
Consists of:		
Restricted cash and cash equivalents	\$ 13,970	\$ 18,264
Unrestricted cash and cash equivalents	46,920	11,076
	\$ 60,890	\$ 29,340
<b>Reconciliation of Operating Income to Net Cash Provided by (Used in) Operating Activities:</b>		
Operating income	\$ 61,660	\$ 29,604
Adjustments to reconcile operating income to net cash provided by (used in) operating activities:		
Depreciation	16,894	16,172
Reserve for uncollectible amounts	3,506	(4,236)
Change in:		
Accounts receivable - water and wastewater	(1,543)	1,257
Other accounts receivable	(436)	(277)
Prepaid expenses	154	(609)
Inventory	1,793	(1,559)
Accounts payable wastewater treatment	1,486	2,580
Accounts payable and other accrued expenses	5,405	(2,430)
Accrued payroll and related obligations	120	312
Unearned revenue	(21)	(21)
Net cash provided by (used in) operating activities	\$ 89,018	\$ 40,793
<b>Schedule of Non-Cash Capital and Related Financing Activities:</b>		
Donated property	\$ 13,649	\$ 1,595

The notes to financial statements are an integral part of this statement.

# PITTSBURGH WATER AND SEWER AUTHORITY

## NOTES TO FINANCIAL STATEMENTS

(DOLLARS EXPRESSED IN THOUSANDS UNLESS OTHERWISE INDICATED)

YEARS ENDED DECEMBER 31, 2018 AND 2017

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### 1. Organization

The Pittsburgh Water and Sewer Authority (Authority) provides water to approximately 80,000 residential, commercial, and industrial customers located in the City of Pittsburgh (City), Pennsylvania, and collects wastewater throughout the City.

A Board of Directors (Board) appointed by the Mayor of the City governs the Authority.

The Authority is a body politic and corporate, organized and existing under the Pennsylvania Municipalities Authorities Act. The Authority was established by the City in 1984 to assume responsibility from the City for management, operation, maintenance, and improvement of virtually the entire City water supply, distribution, and wastewater collection systems (the "Water and Wastewater System" or "System"). The Authority's term of existence is through 2045. At inception, the City contributed \$5.3 million to the Authority in the form of customer accounts receivable. The Authority is authorized to issue bonds and notes payable solely from the Authority's revenues.

Prior to April 1, 2018, the Authority had the right to establish user fees and charges without being subject to the approval of any department, board, or agency of Pennsylvania or the City. Effective April 1, 2018, the Public Utility Commission (PUC) began oversight of the Authority. PUC oversight requires compliance and conformity with their established regulations regarding administration, finances, operations, reporting, capital expenditures, and customer service for water and wastewater utilities. The PUC now approves all Authority rates and fees through tariff filings.

### 2. Summary of Significant Accounting Policies

#### Reporting Entity

These financial statements present the financial position, changes in net position, and cash flows of the Authority. The Authority is a component unit of the City in accordance with applicable guidance. The Authority's financial statements are not intended to present the financial position or results of operations of the City taken as a whole.

# PITTSBURGH WATER AND SEWER AUTHORITY

## NOTES TO FINANCIAL STATEMENTS

(DOLLARS EXPRESSED IN THOUSANDS UNLESS OTHERWISE INDICATED)

YEARS ENDED DECEMBER 31, 2018 AND 2017

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### Basis of Accounting and Measurement Focus

The accompanying financial statements have been prepared using the economic resources measurement focus and the accrual basis of accounting in accordance with accounting principles generally accepted in the United States of America, as prescribed by the Governmental Accounting Standards Board (GASB). Revenues are recorded when earned and expenses are recorded when a liability is incurred, regardless of the timing of related cash flows.

The Authority functions as a Business-Type Activity, as defined by GASB.

### Classification of Net Position

The Authority's net position is classified into three components – net investment in capital assets; restricted; and unrestricted. These classifications are defined as follows:

- Net investment in capital assets – This component of net position consists of capital assets, net of accumulated depreciation, reduced by the outstanding balances of bonds, mortgages, notes, or other borrowings that are attributable to the acquisition, construction, or improvement of those assets. Deferred outflows of resources and deferred inflows of resources that are attributable to the acquisition, construction, or improvement of those assets or related debt are also included in this component of net position. If there are significant unspent related debt proceeds or deferred inflows of resources at the end of the reporting period, the portion of the debt or deferred inflows of resources attributable to the unspent amount is not included in the calculation of net investment in capital assets. Instead, that portion of the debt or deferred inflow of resources is included in the same net position component (restricted or unrestricted) as the unspent amount.
- Restricted – This component of net position consists of restricted assets reduced by liabilities and deferred inflows of resources related to those assets. Generally, a liability relates to restricted assets if the asset results from a resource flow that also results in the recognition of a liability or if the liability will be liquidated with the restricted assets reported.

# PITTSBURGH WATER AND SEWER AUTHORITY

## NOTES TO FINANCIAL STATEMENTS

(DOLLARS EXPRESSED IN THOUSANDS UNLESS OTHERWISE INDICATED)

YEARS ENDED DECEMBER 31, 2018 AND 2017

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- Unrestricted – This component of net position is the net amount of the assets, deferred outflows of resources, liabilities, and deferred inflows of resources that are not included in the determination of net investment in capital assets or the restricted components of net position.

When an expense is incurred that can be paid using either restricted or unrestricted resources, the Authority's policy is to first apply the expense towards restricted resources and then towards unrestricted resources.

### Deposits and Investments

The Authority's cash and cash equivalents are considered to be cash on hand, demand deposits, and all highly liquid investments, both restricted and unrestricted, with maturity of three months or less at date of purchase.

Investments are recorded at fair value. Accordingly, the change in fair value of investments is recognized as an increase or decrease to investment assets and investment income.

### Fair Value Measurements

The Authority categorizes its fair value measurements within the fair value hierarchy established by accounting principles generally accepted in the United States of America. The hierarchy is based on the valuation inputs used to measure the fair value of the asset. Level 1 inputs are quoted prices in active markets for identical assets; Level 2 inputs are significant other observable inputs; Level 3 inputs are significant unobservable inputs.

### Premiums and Discounts

Original issue bond premiums and discounts are amortized over the life of the related bonds using the straight-line method of amortization, which is materially comparable to the effective interest method. The unamortized balance of premiums and discounts is presented net on the statements of net position as a decrease or increase to bonds payable.

# PITTSBURGH WATER AND SEWER AUTHORITY

## NOTES TO FINANCIAL STATEMENTS

(DOLLARS EXPRESSED IN THOUSANDS UNLESS OTHERWISE INDICATED)

YEARS ENDED DECEMBER 31, 2018 AND 2017

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### Deferred Charge on Refunding

In accordance with applicable guidance, the excess of the reacquisition price over the net carrying amount of refunded debt is recorded as a deferred outflow of resources on the statements of net position and amortized as a component of interest expense over the shorter of the term of the refunding issue or refunded bonds.

### Remarketing, Liquidity, and Letter of Credit Fees

Associated with the Authority's variable rate bonds, the Authority pays various fees to periodically remarket the bonds and to third parties to provide liquidity in the event that the Authority is unable to remarket the variable rate bonds and needs to repurchase the bonds on a temporary basis until they can be later remarketed. These fees are generally paid quarterly and are calculated as a percentage of the outstanding par amount of the variable rate bonds. In December 2017, these fees were eliminated with the Authority's bond refunding structures.

### Capital Assets

Capital assets owned by the Authority are recorded at cost including that portion of deferred interest that is ultimately capitalized. Depreciation of capital assets owned by the Authority is provided on the straight-line method based on the estimated useful lives of the various classes of assets. Utility assets have estimated useful lives ranging from 30 to 70 years. Non-utility assets have estimated useful lives ranging from five to 10 years.

The Authority also receives donated property relating mostly to dedicated water and sewer lines. These assets are capitalized at acquisition value at the date of the donation and depreciated in accordance with the estimated useful lives noted above.

The water and sewer system represents assets leased from the City. Amortization of capital lease assets is provided on the straight-line basis applying an estimated average remaining useful life from the inception of the lease.

Maintenance and repairs are charged to expense as incurred.

# PITTSBURGH WATER AND SEWER AUTHORITY

## NOTES TO FINANCIAL STATEMENTS

(DOLLARS EXPRESSED IN THOUSANDS UNLESS OTHERWISE INDICATED)

YEARS ENDED DECEMBER 31, 2018 AND 2017

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### Deferred Outflows/Inflows of Resources

In addition to assets, the statement of financial position reports a separate section for deferred outflows of resources. This separate financial statement element, deferred outflows of resources, represents a consumption of net position that applies to a future period(s) and so will not be recognized as an outflow of resources (expense) until then.

In addition to liabilities, the statement of financial position will sometimes report a separate section for deferred inflows of resources. This separate financial statement element, deferred inflow of resources, represents an acquisition of net position that applies to a future period(s) and so will not be recognized as an inflow of resources (revenue) until that time.

### Classification of Revenues

The Authority has classified its revenues as either operating or non-operating revenues according to the following criteria:

- Operating revenues – Operating revenues include activities that have the characteristics of exchange transactions, such as residential, commercial, and industrial water sales and wastewater treatment.
- Non-operating revenues – Non-operating revenues include activities that have the characteristics of non-exchange transactions, such as interest income and other revenue sources.

### Compensated Absences

A liability for vacation, personal, and sick days is accrued when related benefits are attributable to services rendered and to the extent it is probable that the Authority will ultimately compensate employees.

### Inventory

Inventory is stated at cost, on a moving average price basis.

# PITTSBURGH WATER AND SEWER AUTHORITY

## NOTES TO FINANCIAL STATEMENTS

(DOLLARS EXPRESSED IN THOUSANDS UNLESS OTHERWISE INDICATED)

YEARS ENDED DECEMBER 31, 2018 AND 2017

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### Accounts Payable Wastewater Treatment

The Authority has adopted a methodology for recording estimated wastewater treatment accounts payable that assumes a uniform meter reading date for all customers in each cycle. The estimate is based on the portion of wastewater treatment invoices paid after year-end with usage estimated to have occurred during the previous fiscal year. Generally, the methodology assumes either 33%, 66%, or 100% of a cycle remains unbilled at year-end.

### Special Item

The Authority has recorded a special item for private line lead replacements. In accordance with GASB Statement No. 34, a special item is defined as an expenditure within control of management and either unusual or infrequent in occurrence. The Authority has determined that private lead line replacements qualify as a special item.

### Use of Estimates

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect the reported amounts of assets, deferred outflows of resources, liabilities, deferred inflows of resources, and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

### Adoption of Accounting Pronouncements

The requirements of the following GASB Statements were adopted for the Authority's 2018 financial statements. The adoption of these pronouncements did not have a significant impact to the Authority's financial statements.

GASB Statement No. 75, "*Accounting and Financial Reporting for Postemployment Benefits Other Than Pensions*," improves accounting and financial reporting by state and local governments for postemployment benefits other than pensions (other postemployment benefits or OPEB). It also improves information provided by state and local governmental employers about financial support for OPEB that is provided by other entities. The Authority has no OPEBs.



# PITTSBURGH WATER AND SEWER AUTHORITY

## NOTES TO FINANCIAL STATEMENTS

(DOLLARS EXPRESSED IN THOUSANDS UNLESS OTHERWISE INDICATED)

YEARS ENDED DECEMBER 31, 2018 AND 2017

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GASB Statement No. 85, "*Omnibus 2017*," addresses practice issues that have been identified during implementation and application of certain GASB Statements. This Statement addresses a variety of topics including issues related to blending component units, goodwill, fair value measurements and application, and postemployment benefits (pensions and other postemployment benefits (OPEB)).

GASB Statement No. 86, "*Certain Debt Extinguishment Issues*," improves consistency in accounting and financial reporting for in-substance defeasance of debt by providing guidance for transactions in which cash and other monetary assets acquired with only existing resources – resources other than the proceeds of refunding debt – are placed in an irrevocable trust for the sole purpose of extinguishing debt.

### Pending Pronouncements

GASB has issued statements that will become effective in future years, including Statement Nos. 83 (Certain Asset Retirement Obligations), 84 (Fiduciary Activities), 87 (Leases), 88 (Certain Disclosures Related to Debt, including Direct Borrowings and Direct Placements), 89 (Accounting for Interest Cost Incurred before the End of a Construction Period), and 90 (Majority Equity Interest – an amendment of GASB Statements No. 14 and No. 61). Management has not yet determined the impact of these statements on the financial statements.

### **3. Transactions with the City of Pittsburgh**

During July 1995, the City and the Authority entered into a Capital Lease Agreement and a Cooperation Agreement (collectively referred to as the "Agreements").

#### Cooperation Agreement

Under the terms of the Cooperation Agreement, City Water Department employees became employees of the Authority. As a result, the Authority assumed various obligations from the City. The City and the Authority provide various services to each other in accordance with the Cooperation Agreement, and the Authority reimburses the City for direct and indirect costs attributed by the City to the operation and maintenance of the System.

# PITTSBURGH WATER AND SEWER AUTHORITY

## NOTES TO FINANCIAL STATEMENTS

(DOLLARS EXPRESSED IN THOUSANDS UNLESS OTHERWISE INDICATED)

YEARS ENDED DECEMBER 31, 2018 AND 2017

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Under the Agreement, the Authority provides up to 600 million gallons of water annually for the City's use without charge. Also, the Authority assumes the City's obligation for the cost of subsidizing water service to residents of the City situated beyond the Authority's service area so that those water users pay charges that mirror the rates of the Authority.

On February 4, 2019, the Authority's Board issued a resolution that the existing Cooperation Agreement shall be terminated in accordance with the terms of the agreement, 90 days after the approval of the resolution. City and Authority officials are collaborating on a New Cooperation Agreement to further implement efficiencies and improvements, including: permitting the Authority to reimburse the City for pension costs for Authority employees covered by the City's pension plans, allowing the City to charge the Authority the usual rates that other utilities pay for permit fees, and charging the City for water usage, with a five-year phase-in starting in 2020.

### System Leases

The Capital Lease Agreement stipulates minimum lease payments of approximately \$101 million, all of which were satisfied during the initial three years of the capital lease.

The Capital Lease Agreement has a term of thirty years and provides the Authority with the option to purchase the System for one dollar in 2025.

### Pension

Employees of the Authority participate in the City's Municipal Pension Fund Plan (Plan). Employees who became members of the Plan prior to January 1, 1988 are required to contribute 5% of pre-tax pay. Those joining thereafter are required to contribute 4%. The Authority's 2018 and 2017 payroll covered by the Plan was approximately \$15,883 and \$13,800, respectively. Employee contributions for the years 2018 and 2017 amounted to \$614 and \$543, respectively.

The City's obligations relative to the Plan are determined in accordance with various Pennsylvania statutes. The extent of the Authority's participation in such obligations with respect to those former City employees whose membership continued upon becoming employees of the Authority, as well as new members, is determined by the shared interpretation of the City and Authority of the intent of the Cooperation Agreement.

# PITTSBURGH WATER AND SEWER AUTHORITY

## NOTES TO FINANCIAL STATEMENTS

(DOLLARS EXPRESSED IN THOUSANDS UNLESS OTHERWISE INDICATED)

YEARS ENDED DECEMBER 31, 2018 AND 2017

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During negotiations regarding the New Cooperation Agreement, the City and Authority determined upon a payment of approximately \$3,900 for the Authority's share of the City's pension costs for the year-ended December 31, 2018. The Authority's payment was calculated based on the percentage of its covered payroll to the total covered payroll, which approximates 15.4%. No similar payment to the City was made for the year ended December 31, 2017. However, the 2017 Minimum Municipal Obligation calculated for the City's Plan indicated a 2017 normal cost of \$975 associated with Authority employees that participate in the City's Plan. The Authority estimates that the normal cost for 2017, together with other elements of expense for employee service during 2017, would not exceed the sum of the 2017 contributions made by the Authority and employees.

Normal retirement benefits are available upon attainment of age sixty and completion of twenty service years. Early retirement benefits are available upon attainment of age fifty and completion of eight service years. Early retirement benefits may be deferred until age sixty or may be obtained upon retirement at a reduced level. A member who terminates employment after attaining age forty and completing eight service years can sustain eligibility for benefits by continuing contributions through age fifty. A member who terminates employment after attaining fifteen service years, but has been a member since before January 1, 1975, can be vested by continuing contributions through age fifty.

Retirement benefits for employees who were members of the Plan are based upon a percentage of either three-year or four-year average pay, depending on date of hire, subject to certain specified minimum monthly benefit amounts. Special membership and benefit rules apply to those experiencing disability.

The "net pension liability" is an actuarial present value of credited projected benefits (a standardized measure for financial statement disclosure of the present value of pension benefits, adjusted for the effects of projected salary increases, estimated to be payable in the future by the Plan as a result of members' service to date) less the pension plan's net position available for paying such benefits. The measure is intended to help users assess the Plan's funding status on a going concern basis, assess progress made in accumulating sufficient assets to pay benefits when due, and make comparisons among public employee retirement systems. The Plan has not reported or attributed measurements of assets or the net pension liability on the basis of the group of members who are Authority employees. The City's net pension liability at December 31, 2018 and 2017 is \$233,514 and \$218,567, respectively.

# PITTSBURGH WATER AND SEWER AUTHORITY

## NOTES TO FINANCIAL STATEMENTS

(DOLLARS EXPRESSED IN THOUSANDS UNLESS OTHERWISE INDICATED)

YEARS ENDED DECEMBER 31, 2018 AND 2017

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Additional information about the Plan and required supplementary information showing the Plan's progress in accumulating sufficient assets to pay benefits when due is presented in the City's Comprehensive Annual Financial Report.

#### 4. Revenue and Accounts Receivable

##### Water

Water sales revenue is recognized as earned during the period when water is supplied to customers. Customers are billed on a monthly billing cycle by the Authority based on actual or estimated meter readings. The Authority recognizes unbilled accounts receivable for water service provided prior to year-end that is billed during the following year.

Water accounts receivable are presented net of a reserve for uncollectible amounts. This reserve, based on an analytical review of outstanding accounts and historical collection data, is recognized coincident with recognition of revenue. At December 31, 2018 and 2017, the reserve for uncollectible water accounts was approximately \$19.75 million and \$22.01 million, respectively. The Authority has rights to utilize collection agencies, service terminations, liens, and real property sales to protect its interests, limit further losses, and motivate payments from delinquent customers.

##### Wastewater Treatment

Although the Authority does not provide wastewater treatment, it assumed responsibility for certain wastewater treatment revenue and expenses beginning in 1996. Effective May 2004, the Authority began direct billing City residents for current and delinquent wastewater treatment charges and remitting to ALCOSAN the aggregate amount of service charges billed. Wastewater treatment activity and the related assets and liabilities appear on the statements of revenue, expenses and changes in net position and the statements of net position, respectively. The related estimated amount of unbilled accounts receivable at year-end has been recorded on the statement of net position. At December 31, 2018 and 2017, the reserve for uncollectible wastewater accounts was approximately \$10.61 million and \$11.85 million, respectively.

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### Bad Debt Recovery/Expense

For the year ended December 31, 2018, bad debt recoveries of \$3.5 million included in direct operating expenses on the statement of revenues, expenses, and changes in net position relate in part to collection on City-owned accounts negotiated to be payable and the resolution of large outstanding balances from other local government entities. Bad debt expense for the year ended December 31, 2017 was \$4.2 million.

## 5. Capital Assets

Capital assets consisted of the following at December 31, 2018 and 2017:

	Balance at January 1, 2018	Additions	Reclassifications/ Transfers	Balance at December 31, 2018
Capital assets, not being depreciated:				
Construction in progress	\$ 100,240	\$ 84,567	\$ (45,504)	\$ 139,303
Capital assets, being depreciated:				
Utility assets	875,597	44,402	-	919,999
Non-utility assets	22,717	1,102	-	23,819
Total capital assets, being depreciated	898,314	45,504	-	943,818
Less accumulated depreciation	(308,747)	(16,894)	-	(325,641)
Total capital assets, being depreciated, net	589,567	28,610	-	618,177
Total capital assets	\$ 689,807	\$ 113,177	\$ (45,504)	\$ 757,480

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	Balance at January 1, 2017	Additions	Reclassifications/ Transfers	Balance at December 31, 2017
Capital assets, not being depreciated:				
Construction in progress	\$ 88,861	\$ 29,181	\$ (17,802)	\$ 100,240
Capital assets, being depreciated:				
Utility assets	858,169	17,428	-	875,597
Non-utility assets	22,343	374	-	22,717
Total capital assets, being depreciated	880,512	17,802	-	898,314
Less accumulated depreciation	(292,575)	(16,172)	-	(308,747)
Total capital assets, being depreciated, net	587,937	1,630	-	589,567
Total capital assets	\$ 676,798	\$ 30,811	\$ (17,802)	\$ 689,807

During 2018 and 2017, the Authority received donated utility assets of \$13,649 and \$1,595, respectively, related to various development projects.

### 6. Payroll and Related Obligations

Payroll and related obligations presented on the statements of net position are comprised of:

	Balance at December 31, 2017	Change	Balance at December 31, 2018	Current Portion
Compensated absences	\$ 462	\$ (6)	\$ 456	\$ 55
Workers' compensation	200	(33)	167	10
Payroll, withholdings, and taxes	1,149	159	1,308	1,308
	\$ 1,811	\$ 120	\$ 1,931	\$ 1,373

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	Balance at December 31, 2016	Change	Balance at December 31, 2017	Current Portion
Compensated absences	\$ 429	\$ 33	\$ 462	\$ 58
Workers' compensation	219	(19)	200	10
Payroll, withholdings, and taxes	851	298	1,149	1,149
	<u>\$ 1,499</u>	<u>\$ 312</u>	<u>\$ 1,811</u>	<u>\$ 1,217</u>

### 7. Bonds and Loans Payable

#### Series 1998

In March 1998, the Authority issued \$36,440 Series B First Lien Revenue Bonds ("1998 Series B Bonds"), the proceeds of which are dedicated to a capital improvements program.

The 1998 Series B Bonds are capital appreciation bonds with an original issuance amount of \$36,440. During 2017, \$12,406 (par) of the 1998 Series B Bonds with an accreted value of \$34,625 were refunded with the Series 2017 A bonds. The remaining 1998 Series B Bonds have maturity values ranging from \$14.6 million to \$26.9 million from 2027 to 2030. The bonds were issued to yield rates from 5.18% to 5.3%. The 1998 Series B Bonds accrue and compound interest on a semi-annual basis and are carried at cost plus accrued interest. Total maturity value of the 1998 Series B Bonds is \$95.45 million.

The 1998B Bonds at December 31, 2018 and 2017 have carrying amounts of approximately \$56.8 million and \$53.9 million, respectively.

#### Series 2008

During June 2008, the Authority issued \$320,515 Series 2008 Water and Sewer System First Lien Revenue Bonds ("2008 Variable Rate Demand Bonds"): \$145,495 Series B of 2008 (variable rate demand), \$51,910 Series C-1 of 2008 (variable rate demand), \$51,885 Series C-2 of 2008 (variable rate demand), and \$71,225 Series D-2 of 2008 (variable rate demand). The purpose of this bond issue was to currently refund the Series 1998A and Series 1998C, to currently refund certain maturities of the Series 2007 B-1 and Series 2007 B-2 Bonds, to

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advance refund certain maturities of the Series 1998B Bonds, to fund approximately \$98 million of certain capital additions, to fund the premium for the Bond Insurance Policy securing payments on 2008 Variable Rate Demand Bonds, and to fund termination payments on certain interest rate swaps. During 2017, the 2008 Series B Bonds were currently refunded and the 2008 Series D-1 Bonds were advance refunded with the Series 2017 Bonds.

In connection with these advance refundings, portions of the proceeds of the 2008 Bonds were deposited into irrevocable trusts with an escrow agent to provide for certain debt service payments on the refunded bonds.

The maturity value of defeased 1998B compound interest bonds outstanding at December 31, 2018 and 2017 was \$19,800.

The 2008 Series C Bonds (2008 Variable Rate Bonds) as originally offered bear interest at a variable rate with interest payments due on the first business day of each month. Interest rates are reset weekly; the fluctuating rate per annum to be determined by the respective remarketing agents. The weekly rate is subject to a cap of 12% per annum.

As of September 1, 2015, the C-1-D bonds were converted to the LIBOR-based interest rate mode. At December 31, 2018 and 2017, the interest rate was 2.87% and 1.56%, respectively.

During September 2013, the 2008 Series C-1A, B and C bonds were converted and reoffered. The bonds were converted to index interest rate mode. The reoffered bonds are as follows: Series C1-A \$10,000,000; Series C1-B \$10,000,000; and Series C1-C \$5,000,000.

During November 2014, the 2008 Series C-1A, B, C, and C-2 were reissued and restructured to bear interest based upon 70% of one-month LIBOR. The fixed rate paid on the swaps by the Authority was amended from 3.998% to 3.50%.

Variable Rate Bonds are subject to optional redemption, in whole or in part, on any date, at the option of the Authority. The 2008 Series C Bonds that mature on September 1 of 2035 are subject to mandatory sinking fund redemption.



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The 2008 Series Bonds are subject to extraordinary redemption prior to maturity at the option of the Authority in the event of a condemnation, damage, or destruction of the water and sewer system.

The 2008 Series C-1 and C-2 Bonds at December 31, 2018 and 2017 have carrying amounts of approximately \$104 million.

In conjunction with the issuance of the 2008 Variable Rate Bonds, the Authority entered into various pay fixed/receive variable interest rate swaps to effectively change the Bonds' variable interest rates to synthetic fixed rates. These swap transactions are discussed in Note 8: Interest Rate Swaps.

### Series 2013

During December 2013, the Authority issued \$130,215 Series A First Lien Revenue Refunding Bonds ("2013 Series A Bonds"), the proceeds of which were used to defease through current refunding the entire balance of the Series 2003, Series 2007 B-1, and Series 2007 B-2 and pay certain amounts in respect of termination of certain interest rate swap agreement related to the Series 2007 B-1 and B-2 bonds; \$86,695 Series B First Lien Revenue Bonds ("2013 Series B Bonds"), the proceeds of which are to fund certain water and sewer system capital improvement projects and reimburse the Authority for certain capital expenditures paid for by the Authority.

The 2013 Bonds were issued at a bond premium of \$14,828, which is being amortized as an adjustment to interest expense over the life of the bonds.

During 2017, \$42,340 of Series 2013 B bonds outstanding were currently refunded with Series 2017 A bonds.

The 2013 Bonds at December 31, 2018 and 2017 have carrying amounts of approximately \$125 million and \$133 million, respectively.

### Series 2017

During December 2017, the Authority issued \$165,390 First Lien Revenue Refunding Bonds composed of Series A (159,795) and Series B (taxable) (\$5,595). The proceeds of the bonds were used to fund the costs of the refunding of all or a portion of the Authority's

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outstanding Series of 1998B, 2008A, 2008D-1, and 2013B water and sewer system revenue bonds.

The 2017 A and B Bonds were issued at a bond premium of \$23,374, which is being amortized as an adjustment to interest expense over the life of the bonds.

The 2017 A Bonds at December 31, 2018 and 2017 have carrying amounts of approximately \$152 million and \$160 million, respectively. The 2017 B Bonds were paid off during 2018; the carrying amount at December 31, 2017 was approximately \$5 million. The maturity value of defeased 2008-D1 bonds outstanding at December 31, 2017 was \$24,665.

During December 2017, the Authority issued \$218,805 Series C First Lien Revenue Refunding Bonds, the proceeds of which were used to fund the costs of refunding the Authority's outstanding Series 2008 B-1, B-2, and D-2 water and sewer system revenue bonds.

The 2017 C Bonds at December 31, 2018 and 2017 have a carrying amount of approximately \$219 million.

### Deferred Charge on Refunding

In conjunction with the debt refundings described above, the Authority has recorded a deferred charge on refunding, which is shown as a deferred outflow of resources on the statements of net position. The deferred charge on refunding at December 31, 2018 and 2017 is as follows:

	Balance at December 31, 2017	Additions	Amortization	Balance at December 31, 2018
Deferred charge on refunding	<u>\$ 110,326</u>	<u>\$ -</u>	<u>\$ 7,792</u>	<u>\$ 102,534</u>
	Balance at December 31, 2016	Additions	Amortization	Balance at December 31, 2017
Deferred charge on refunding	<u>\$ 25,008</u>	<u>\$ 98,931</u>	<u>\$ 13,613</u>	<u>\$ 110,326</u>

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### Capital Revolving Line of Credit

In July 2016, the Authority obtained an \$80 million revolving line of credit to finance certain capital projects. In October 2018, the capital revolving line of credit was amended to increase the maximum amount that can be drawn and outstanding at any one time to \$150 million. The capital revolving line of credit is secured by the revenues of the Authority. The Authority has until July 1, 2020 to request revolving advances on the line of credit, at which time the Authority has the option to convert the unpaid principal amount of the outstanding revolving advances to a term loan advance. Each revolving advance bears interest at the LIBOR Index Rate, which ranged from 2.04% to 3.429% and 1.4958% to 2.04% for the years ended December 31, 2018 and 2017, respectively. At December 31, 2018 and 2017, the interest rate was 3.429% and 2.04%, respectively. At December 31, 2018 and 2017, the Authority had drawn \$113 million and \$43.8 million, respectively, in revolving advances.

### Operating Line of Credit

In August 2018, the Authority obtained a \$20 million revolving line of credit for operating expenses. The operating line of credit expires August 30, 2019 and is secured by the revenues of the Authority. Amounts outstanding under the operating line of credit will bear interest at a rate per annum equal to the daily LIBOR rate plus 0.65%. No draws were made on the operating line of credit during 2018.

### State Loans

The Authority has several loans outstanding from PENNVEST for various capital projects and water and sewer improvement projects, with carrying amounts of approximately \$28 million and \$31 million at December 31, 2018 and 2017, respectively. Interest rates vary from 1.00% to 3.25%.

### Capital Lease

During 2015, the Authority entered into a lease agreement as lessee for financing the acquisition of a utility assets valued at \$7,445. The utility assets have a ten-year estimated useful life. Depreciation on the utility assets began in 2016, with accumulated depreciation totaling \$2,234 and \$1,489 for the years ended December 31, 2018 and 2017, respectively. This lease agreement qualifies as a capital lease for accounting purposes and, therefore, has

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been recorded at the value of future minimum lease payments as of the inception date. At December 31, 2018 and 2017, the outstanding balance of the capital lease was \$5,893 and \$6,331, respectively.

### Swap Borrowing

During November 2014, the Authority terminated the original 2008 Series 2008 C-1A, C-1B, C-1C, and C-2 swaps and reissued and restructured the swaps to bear interest based upon 70% of one-month LIBOR. At termination, those derivative instruments had an aggregate fair value of (\$9,471), which is considered a swap borrowing from the counterparty. The swap borrowing is being amortized over the remaining life of the bond. At December 31, 2018 and 2017, the unamortized balance is \$7,587 and \$8,038, respectively.

During December 2017, the Authority terminated the original 2008 Series B-1, B-2, and D swaps and reissued and restructured the swaps to bear interest based upon 70% of one-month LIBOR. At termination, those derivative instruments had an aggregate fair value of (\$70,869), which is considered a swap borrowing from the counterparty. The swap borrowing is being amortized over the remaining life of the bond. At December 31, 2018 and 2017, the unamortized balance is \$67,649 and \$70,393, respectively.

Bonds, state loans payable, revolving line of credit, capital lease, and swap borrowing consisted of the following at December 31, 2018 and 2017:

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	Balance at December 31, 2017	Additions	Accretion	Reductions	Balance at December 31, 2018
Bonds and loans payable:					
Revenue bonds:					
1998 Series B	\$ 53,911	\$ -	\$ 2,912	\$ -	\$ 56,823
2008 Series C-2	51,820	-	-	-	51,820
2008 Series C-1A	10,000	-	-	-	10,000
2008 Series C-1B	10,000	-	-	-	10,000
2008 Series C-1C	5,000	-	-	-	5,000
2008 series C-1D	26,840	-	-	-	26,840
2013 Series A	93,825	-	-	(7,705)	86,120
2013 Series B	38,760	-	-	-	38,760
2017 Series A	159,795	-	-	(7,925)	151,870
2017 Series B	5,595	-	-	(5,595)	-
2017 Series C	218,805	-	-	-	218,805
	<u>674,351</u>	<u>-</u>	<u>2,912</u>	<u>(21,225)</u>	<u>656,038</u>
State loans (PENNVEST)	31,188	-	-	(3,378)	27,810
Revolving line of credit	43,800	69,200	-	-	113,000
Capital lease	6,331	-	-	(438)	5,893
Swap borrowing	78,431	-	-	(3,195)	75,236
	<u>834,101</u>	<u>69,200</u>	<u>2,912</u>	<u>(28,236)</u>	<u>877,977</u>
Unamortized bond (discount) premium	<u>32,076</u>	<u>-</u>	<u>-</u>	<u>(3,027)</u>	<u>29,049</u>
Total bonds and loans, net	<u>\$ 866,177</u>	<u>\$ 69,200</u>	<u>\$ 2,912</u>	<u>\$ (31,263)</u>	<u>\$ 907,026</u>

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	Balance at December 31, 2016	Additions	Accretion	Reductions	Balance at December 31, 2017
<b>Bonds and loans payable:</b>					
<b>Revenue bonds:</b>					
1998 Series B	\$ 85,513	\$ -	\$ 4,150	\$ (35,752)	\$ 53,911
2007 Series A	5,480	-	-	(5,480)	-
2008 Series A	68,970	-	-	(68,970)	-
2008 Series B-1	72,750	-	-	(72,750)	-
2008 Series B-2	72,745	-	-	(72,745)	-
2008 Series D-1	24,665	-	-	(24,665)	-
2008 Series D-2	71,225	-	-	(71,225)	-
2008 Series C-2	51,820	-	-	-	51,820
2008 Series C-1A	10,000	-	-	-	10,000
2008 Series C-1B	10,000	-	-	-	10,000
2008 Series C-1C	5,000	-	-	-	5,000
2008 Series C-1D	26,840	-	-	-	26,840
2013 Series A	95,285	-	-	(1,460)	93,825
2013 Series B	83,020	-	-	(44,260)	38,760
2017 Series A	-	159,795	-	-	159,795
2017 Series B	-	5,595	-	-	5,595
2017 Series C	-	218,805	-	-	218,805
	<u>683,313</u>	<u>384,195</u>	<u>4,150</u>	<u>(397,307)</u>	<u>674,351</u>
State loans (PENNVEST)	33,516	988	-	(3,316)	31,188
Revolving line of credit	11,800	32,000	-	-	43,800
Capital lease	6,755	-	-	(424)	6,331
Swap borrowing	8,479	70,869	-	(917)	78,431
	<u>743,863</u>	<u>488,052</u>	<u>4,150</u>	<u>(401,964)</u>	<u>834,101</u>
Unamortized bond (discount) premium	11,912	23,374	-	(3,210)	32,076
Total bonds and loans, net	<u>\$ 755,775</u>	<u>\$ 511,426</u>	<u>\$ 4,150</u>	<u>\$ (405,174)</u>	<u>\$ 866,177</u>

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Debt service payments on the Revenue Bonds at December 31, 2018 are as follows:

	Revenue Bonds		Total
	Principal	Interest	
2019	\$ 19,955	\$ 26,471	\$ 46,426
2020	21,005	25,507	46,512
2021	21,840	24,455	46,295
2022	22,890	23,358	46,248
2023	24,110	22,209	46,319
2024-2028	98,068	136,085	234,153
2029-2033	125,222	109,233	234,455
2034-2038	194,930	41,622	236,552
2039-2040	90,341	5,459	95,800
	618,361	414,399	1,032,760
Accretion	37,677	(37,677)	-
Total	<u>\$ 656,038</u>	<u>\$ 376,722</u>	<u>\$ 1,032,760</u>

Debt service payments of the State Loans at December 31, 2018 are as follows:

	State Loans		Total
	Principal	Interest	
2019	\$ 3,443	\$ 514	\$ 3,957
2020	3,509	447	3,956
2021	3,578	379	3,957
2022	3,607	309	3,916
2023	2,980	244	3,224
2024-2028	8,366	656	9,022
2029-2033	2,327	62	2,389
	<u>\$ 27,810</u>	<u>\$ 2,611</u>	<u>\$ 30,421</u>

Repayment of the revolving line of credit will begin once the Authority has drawn all available advances from the line, but no later than July 2020.

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Minimum lease payments of the capital lease at December 31, 2018 are as follows:

	Capital Lease		Total
	Principal	Interest	
2019	\$ 454	\$ 193	\$ 647
2020	469	178	647
2021	485	161	646
2022	502	145	647
2023	520	127	647
2024-2028	2,880	355	3,235
2029	583	10	593
	<u>\$ 5,893</u>	<u>\$ 1,169</u>	<u>\$ 7,062</u>

Amortization on the swap borrowing is as follows:

Year Ending December 31,	Principal	Interest
2019	\$ 3,273	\$ 1,813
2020	3,353	1,733
2021	3,435	1,652
2022	3,518	1,568
2023	3,604	1,482
2024-2028	19,381	6,049
2029-2033	21,240	3,577
2034-2038	15,800	1,130
2039-2040	1,632	36
	<u>\$ 75,236</u>	<u>\$ 19,040</u>

Interest payments were calculated for the Variable Rate Bonds using the synthetic fixed rate interest rates as described in Note 8.



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Interest and amortization expense for the years ended December 31 is as follows:

	<u>2018</u>	<u>2017</u>
Bond, loan and swap interest	\$ 24,327	\$ 27,243
Accretion	2,912	4,150
Amortization of deferred refunding loss, discounts and premiums	4,765	1,065
Liquidity and remarketing fees	-	1,483
Other	2,361	972
	<u>\$ 34,365</u>	<u>\$ 34,913</u>

In accordance with the provisions of the trust indentures for the 1998, 2007A, 2008, 2013, and 2017 Bonds, the Authority has created a number of funds that are restricted for specific purposes. The complement of these restricted funds, collectively referred to on the statements of net position as "Restricted Assets," at December 31, 2018 and 2017 was:

	<u>2018</u>	<u>2017</u>
Capital project funds	\$ 1	\$ 1
Debt service and reserve funds	6,937	16,707
Operating reserve account	15,792	12,654
Other funds	596	586
	<u>\$ 23,326</u>	<u>\$ 29,948</u>

Among the Authority's debt covenants is one which requires that rates charged by the Authority will be sufficient to satisfy a formula which is intended to ensure that the Authority will be able to satisfy debt service requirements. The trust indenture also requires that revenue collections be deposited into a Revenue Fund and disbursed therefrom as provided for in the trust indenture. This Revenue Fund constitutes the vast majority of unrestricted funds cash and cash equivalents. At December 31, 2018 and 2017, the Authority was in compliance with these covenants.

# PITTSBURGH WATER AND SEWER AUTHORITY

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### 8. Interest Rate Swaps

Interest rate swaps disclosures (not in thousands) as of December 31, 2018 and 2017 are presented below.

Interest rate swaps at December 31, 2018:

Current Notional Amount	Effective Date	Maturity Date	Interest Rate Paid	Interest Rate Received	Counterparty Credit Rating	Underlying Bonds
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#### Hedging Derivatives, Cash Flow Hedges, Receive Variable - Pay Fixed, Interest Rate Swaps:

\$ 72,747,500	12/28/2017	9/1/2039	1.732%	70% 1mo LIBOR	A-	Series 2017 C *
41,464,000	11/3/2014	9/1/2035	2.000%	70% 1mo LIBOR	A-	Series 2008 C *
72,747,500	12/28/2017	9/1/2039	1.732%	70% 1mo LIBOR	A+	Series 2017 C *
71,225,000	12/28/2017	9/1/2040	1.735%	70% 1mo LIBOR	A+	Series 2017 C *

#### Investment Derivatives, Receive Variable - Pay Fixed, Interest Rate Swap:

62,196,000	11/3/2014	9/1/2035	3.500%	70% 1mo LIBOR	A+	Series 2008 C
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\* - Represents a hybrid instrument comprised of an on-market swap and a borrowing. The information above reflects the on-market rate as of the date on which the swap was associated with the underlying bonds.

# PITTSBURGH WATER AND SEWER AUTHORITY

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### Interest Rate Swap – Fair Value Information:

Notional Amount	12/31/2016 Fair Value *	Change in Fair Value	Swap Termination Loss	12/31/2017 Fair Value *	Change in Fair Value	12/31/2018 Fair Value *	Underlying Bonds
<b>Hedging Derivatives, Cash Flow Hedges, Receive Variable - Pay Fixed, Interest Rate Swaps:</b>							
\$ 72,747,500	\$ (22,398,125)	\$ (586,521)	\$ (22,984,646)	\$ -	\$ -	\$ -	Series 2008 B-1
72,747,500	-	(484,501)	-	(484,501) ***	2,021,053	1,536,552 **	Series 2017 C
41,464,000	(1,935,072)	100,932	-	(1,834,140) ***	1,077,156	(756,984) ***	Series 2008 C
72,747,500	(22,398,125)	(435,294)	(22,833,419)	-	-	-	Series 2008 B-2
72,747,500	-	(484,501)	-	(484,501) ***	2,020,053	1,535,552 **	Series 2017 C
71,225,000	(24,165,415)	(885,464)	(25,050,879)	-	-	-	Series 2008 D
71,225,000	-	(475,904)	-	(475,904) ***	2,154,251	1,678,347 **	Series 2017 C
	(70,896,737)	(3,251,253)	(70,868,944)	(3,279,046)	7,272,513	3,993,467	
<b>Investment Derivatives, Receive Variable - Pay Fixed, Interest Rate Swap:</b>							
62,196,000	(15,874,882)	835,346	-	(15,039,536) ***	2,542,135	(12,497,401) ***	Series 2008 C
<b>Total</b>	<b>\$ (86,771,619)</b>	<b>\$ (2,415,907)</b>	<b>\$ (70,868,944)</b>	<b>\$ (18,318,582)</b>	<b>\$ 9,814,648</b>	<b>\$ (8,503,934)</b>	

\* The fair value is an estimated net present value of the expected cash flows calculated using relevant mid-market data inputs and based on the assumption of no unusual market conditions or forced liquidation.

\*\* Reported as hedging derivative - interest rate swap on the Statement of Net Position.

\*\*\* Reported as swap liability on the Statement of Net Position.

### Description of the Swaps

During fiscal year 2008, the Authority entered into five pay-fixed, receive-variable interest rate swap contracts. The 2008 C interest rate swaps were effective June 12, 2008. Beginning September 1, 2008, the Authority began to make semi-annual interest payments on the 1<sup>st</sup> of each March and September through September 1, 2035 (two swaps); September 1, 2039 (two swaps); and, September 1, 2040 (for one swap), respectively. The Counterparties make monthly interest payments on the 1<sup>st</sup> of each calendar month, which began July 1, 2008 through September 1, 2035 for two of the swaps; September 1, 2039 for two of the swaps; and September 1, 2040 for one swap.

# PITTSBURGH WATER AND SEWER AUTHORITY

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The intention of the 2008 swaps was to effectively change the Authority's variable interest rate on the \$145,495 Water and Sewer System (Variable Rate Demand) First Lien Revenue Refunding Bonds Series B of 2008, on the \$71,225 Water and Sewer System (Variable Rate Demand) First Lien Revenue Bonds Series D-2 of 2008, and on the \$103,795 Water and Sewer System (Variable Rate Demand) Subordinate Revenue Refunding Bonds Series C of 2008 (the bonds) to synthetic fixed rates of 4.038%, 4.103%, and 3.998%, respectively.

During November 2014, the 2008 Series C Bonds were reissued and restructured to bear interest based upon 70% of one-month LIBOR. In conjunction with this reissuance/restructuring, the floating rate on the Series 2008 C swaps was converted from SIFMA to 70% of one-month LIBOR and the fixed rate was amended from 3.998% to 3.50%. With respect to the Series 2008 C swap treated as an effective hedge, this "off-market" swap is considered to be a hybrid instrument consisting of an on-market swap and a borrowing. The on-market swap rate is calculated as of the date of reissuance. The borrowing will be amortized over the remaining life of the swap and is included in bonds and loans payable on the statement of net position. See Note 7: Bonds and Loans Payable for detail on the borrowing.

The bonds will accrue interest at a weekly rate that is determined by a remarketing agent on each effective rate date. The interest rate on the bonds may not exceed 12%. Per the interest rate swap agreements, the Authority will receive SIFMA Municipal Swap Index while paying fixed rates as noted in the chart above.

The interest payments on the 2008 interest rate swaps are calculated based on notional amounts, all of which reduce, beginning on September 1, 2012 for the 2008 C Bonds, September 1, 2032 for the 2008 D2 Bonds and September 1, 2035 for the 2008 B Bonds, so that the notional amounts approximate the principal outstanding on the respective bonds. The interest rate swaps expire consistent with the final maturity of the respective bonds.

During December 2017, the swaps that were previously associated with the 2008 B-1, 2008 B-2 and 2008D bonds were newly associated with the 2017C refunding Bonds.

### Description of 2017 C Swaps

During fiscal year 2017, the Authority restructured three pay-fixed, receive-variable interest rate swap contracts. The original interest rate swaps were effective June 12, 2008. Beginning December 28, 2017, the Authority will make semi-annual interest payments on

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the 1<sup>st</sup> of each March and September through September 1, 2039 (two swaps); and, September 1, 2040 (for one swap), respectively. The Counterparties make monthly interest payments on the 1<sup>st</sup> of each calendar month, which begin February 2018 through September 1, 2039 for two of the swaps; and, September 1, 2040 for one swap.

The intention of the 2017 swaps restructuring is to effectively change the Authority's variable interest rate on the \$216,720,000, Water and Sewer System First Lien Revenue Refunding Bonds Series C of 2017 with notional amounts of \$71,225,000, \$72,747,500, and \$72,747,500 to fixed rates of 3.8255%, 3.770%, and 3.7835%, respectively.

The bonds will accrue interest at a weekly rate that is determined by a remarketing agent on each effective rate date. The interest rate on the bonds may not exceed 12%. Per the interest rate swap agreements, the Authority will receive 70% of one-month LIBOR.

The interest payments on the interest rate swaps are calculated based on notional amounts, all of which reduce beginning on September 2032, so that the notional amounts approximate the principal outstanding on the respective bonds. The interest rate swaps expire consistent with the final maturity of the respective bonds.

### Accounting and Risk Disclosures

During the years ended December 31, 2018 and 2017, the Authority paid \$10,564 and \$12,512, respectively, fixed and received \$4,430 and \$2,467, respectively, variable related to their outstanding swap agreements.

As noted in the tables above, current period changes in fair value for the interest rate swaps that are accounted for as hedges are recorded on the statements of net position as an adjustment to hedging derivative – interest rate swap, deferred outflows or deferred inflows. Additionally, current period changes in fair value for the interest rate swap accounted for as an investment is recorded on the statements of revenues, expenses, and changes in net position as a component of investment income. The fair value of the outstanding interest rate swaps as of December 31, 2018 and 2017 is reported on the statements of net position as a swap liability. The swaps are valued using significant other observable inputs (Level 2 inputs).

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The Authority has the ability to early terminate the interest rate swaps and to cash settle the transaction on any business day by providing at least two business days' written notice to the counterparty. Evidence that the Authority has sufficient funds available to pay any amount payable to the counterparty must be provided at the time notice is given. At early termination, the Authority will be required to pay or receive a settlement amount which is comprised of the fair value of the terminated transaction(s) based on market quotations and any amounts accrued under the contract(s).

Through the use of derivative instruments such as interest rate swaps, the Authority is exposed to a variety of risks, including credit risk, interest rate risk, termination risk, basis risk, and rollover risk.

- Credit risk is the risk that a counterparty will not fulfill its obligations. The credit ratings by Moody's Investors Service, Inc., a nationally recognized statistical rating organization for the respective counterparties are listed in the table above. If a counterparty failed to perform according to the terms of the interest rate swap agreement, there is some risk of loss to the Authority, up to the fair value of the swaps.

The Authority currently does not enter into master netting arrangements with its counterparties. As such, each derivative instrument should be evaluated on an individual basis for credit risk. As of December 31, 2018, the Series 2008 C derivative instruments currently have a negative fair value position to the Authority; therefore, the Authority is not exposed to credit risk. However, the Series 2017 C derivative instruments were subject to credit risk, as they had a positive fair market value.

Concentration of credit risk: The Authority currently has two counterparties, with three and two outstanding interest rate swaps, respectively. The Authority's outstanding market value as of December 31, 2018 and 2017, respectively, is \$(9,283,582) and \$(15,999,941) with one counterparty and \$779,568 and \$(2,318,641) with the second counterparty. Both counterparties operate in the same markets and could be similarly impacted by changes in economic or other conditions.

# PITTSBURGH WATER AND SEWER AUTHORITY

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It is the Authority's policy to require counterparty collateral posting provisions in its non-exchange traded derivative instruments. Their terms require collateral to be posted if the respective counterparty's credit rating falls below BBB+ by Standard & Poor's and the swap insurer becomes bankrupt. The amount of collateral to be posted is calculated based on derivatives in asset positions to the Authority. As of year-end, the counterparties had not and were not required to post collateral for these transactions.

- Termination risk is the risk that a derivative's unscheduled end will affect the Authority's asset/liability strategy or will present the Authority with potentially significant unscheduled termination payments to the counterparty. The counterparties to the interest rate swaps do not have the ability to voluntarily terminate the interest rate swap; however, the Authority is exposed to termination risk in the event that one or more of the counterparties default. During 2014, 2008 C swaps were terminated and reissued. During 2017, the 2008 B-1, B-2, and D swaps were terminated and reissued.
- Interest rate risk is the risk that changes in interest rates will adversely affect the fair values of a government's financial instruments or cash flows. The interest rate swap that is accounted for as an investment exposes the Authority to interest rate risk. The interest rate swap is highly sensitive to changes in interest rates; changes in the variable rate will have a material effect on the swap's fair value. The interest rate swap will terminate on September 4, 2035.
- Basis risk is the risk that arises when variable interest rates on a derivative and an associated bond or other interest-paying financial instrument are based on different indexes. The Authority is subject to basis risk on the 2008 C swaps as the interest index on the variable rate arm of the swaps is based on the 70% of one-month LIBOR and the variable interest rate on the bonds is based on a different index, a weekly rate that is determined by a remarketing agent. Although expected to correlate, the relationships between different indexes vary and that variance could adversely affect the Authority's calculated payments, and as a result cost savings or synthetic interest rates may not be realized.

# PITTSBURGH WATER AND SEWER AUTHORITY

## NOTES TO FINANCIAL STATEMENTS

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The Authority is further subject to basis risk in the event that the underlying bonds become fixed rate Bank Bonds or that the maturity of the underlying bonds is accelerated as discussed in Note 7: Bonds and Loans Payable.

- Rollover risk is the risk that a derivative associated with the Authority's debt does not extend to the maturity of that debt. When the derivative terminates, the associated debt will no longer have the benefit of the derivative. The Authority is not exposed to rollover risk as the swap agreements terminate on the same day the last payment is due on the respective bonds.

### Contingencies

All of the Authority's derivative instruments include provisions that require the Authority to post collateral in the event that the credit ratings of its credit support provider's senior long term, unsecured debt credit rating falls below BBB+ by Standard & Poor's and FSA, the swap insurer, becomes bankrupt. The amount of collateral to be posted is calculated based on derivatives in negative fair value positions to the Authority. The collateral is to be posted in the form of cash, U.S. Treasuries or other approved securities. As of year-end, the Authority had not and was not required to post collateral for these transactions.

## **9. Deposits and Investments with Financial Institutions**

The Authority is authorized to invest in: obligations of the U.S. Government and government-sponsored agencies and instrumentalities; fully insured or collateralized certificates of deposits; commercial paper of the highest rating; repurchase agreements collateralized by government obligations or securities; highly rated bank promissory notes or investment funds or trusts; and, as to trustee assets, as otherwise permitted by the trust indenture as supplemented and amended in 1998. Throughout the years ended December 31, 2018 and 2017, the Authority invested its funds in such authorized investments. The Authority does not have a formal investment policy which addresses custodial credit risk, interest rate risk, credit risk, or concentration of credit risk.

GASB Statement No. 40, "*Deposit and Investment Risk Disclosures*," requires disclosures related to the following deposit and investment risks: credit risk (including custodial credit risk and concentration of credit risk), interest rate risk, and foreign currency risk. The following is a description of the Authority's deposit and investment risks:



# PITTSBURGH WATER AND SEWER AUTHORITY

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Custodial Credit Risk – Custodial credit risk is the risk that in the event of a bank failure, the Authority’s deposits may not be returned to it. As of December 31, 2018 and 2017, \$51,969 and \$17,874, respectively, of the Authority’s bank balance of \$52,219 and \$18,124, respectively, was exposed to custodial credit risk; \$51,969 and \$17,874 of these amounts exposed to custodial credit risk are collateralized in accordance with Act 72 of the Pennsylvania state legislature, which requires the institution to pool collateral for all governmental deposits and have the collateral held by an approved custodian in the institution’s name. These deposits have carrying amounts of \$46,920 and \$11,076 as of December 31, 2018 and 2017, respectively, all of which is reported as current assets in the statements of net position.

At December 31, 2018, the Authority held the following investment balances:

	<u>Carrying value</u>	<u>Maturity in years Less than 1 year</u>
PA INVEST	\$ 8,761	\$ 8,761
Money market	13,970	13,970
U.S. Treasury bills	595	595
Total Investments	<u>\$ 23,326</u>	<u>\$ 23,326</u>

At December 31, 2017, the Authority held the following investment balances:

	<u>Carrying value</u>	<u>Maturity in years Less than 1 year</u>
PA INVEST	\$ 8,649	\$ 8,649
Money market	18,264	18,264
U.S. Treasury bills	3,035	3,035
Total Investments	<u>\$ 29,948</u>	<u>\$ 29,948</u>

Money market funds are included in cash and cash equivalents as non-current restricted assets on the statements of net position.

# PITTSBURGH WATER AND SEWER AUTHORITY

## NOTES TO FINANCIAL STATEMENTS

(DOLLARS EXPRESSED IN THOUSANDS UNLESS OTHERWISE INDICATED)

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The carrying value of the Authority's investments is the same as their fair value amount. U.S. Treasury bills are valued using quoted market prices (Level 1 inputs).

The Authority's investments in money markets and PA INVEST (external investment pool) are the same as the value of the pool shares and are reported at amortized cost, which approximates market. All investments in an external investment pool that are not SEC-registered are subject to oversight by the Commonwealth. The Authority can withdraw funds from INVEST without limitations or fees.

**Interest Rate Risk** – Interest rate risk is the risk that changes in the interest rates will adversely affect the fair value of the Authority's investments. The Authority is not subject to interest rate risk, as all of its investments at December 31, 2018 and 2017 had maturities of less than one year.

**Credit Risk** – Credit risk is the risk that an issuer or other counterparty to an investment will not fulfill its obligation. As of December 31, 2018, the Authority's investments in PA INVEST were rated AAAM by Standard & Poor's. The Authority's investments in U.S. Treasury bills at December 31, 2018 were rated AA+ by Standard & Poor's.

**Concentration of Credit Risk** – Concentration of credit risk is the risk of loss attributed to the magnitude of a government's investments in a single issuer. The Authority places no limit on the amount it may invest in any one issuer. The Authority has no investments of greater than 5% with one issuer.

As further described in Note 8, the Authority has a derivative instrument that is accounted for as an investment. Credit and interest rate risks related to this investment are described in Note 8.

# PITTSBURGH WATER AND SEWER AUTHORITY

## NOTES TO FINANCIAL STATEMENTS

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### 10. Net Position

Net position represents the difference between assets, deferred outflows of resources, and liabilities. An analysis of net position amounts is as follows:

	December 31,	
	2018	2017
Net investment in capital assets:		
Net property, plant, and equipment	\$ 757,480	\$ 689,807
Debt subject to capital improvements	(794,111)	(752,979)
Swap liability net of deferred outflow and inflow	(12,497)	(15,040)
Swap borrowing	(75,236)	(78,431)
Deferred charge on refunding	102,534	110,326
Restricted for capital activity and debt service:		
Capital projects	1	1
Debt service and reserve funds	6,937	16,707
	<u>(14,892)</u>	<u>(29,609)</u>
Restricted assets:		
Operating reserve account	15,792	12,654
Other funds	596	586
	<u>16,388</u>	<u>13,240</u>
Unrestricted	<u>(5,855)</u>	<u>(27,467)</u>
Total net position	<u>\$ (4,359)</u>	<u>\$ (43,836)</u>

### 11. Operating Lease

#### Operating Lease

The Authority leases office space. The term of the lease is for twenty years commencing on August 1, 2007 and ending on July 31, 2027. The lease is subject to an automatic roll-over for five years, if the Authority does not communicate in writing one year prior to expiration that it desires not to extend the lease. The general terms of the lease require the lessor to provide for utilities, building repairs, maintenance, and real estate taxes.

# PITTSBURGH WATER AND SEWER AUTHORITY

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The total minimum future commitments under the lease for year ended December 31, 2018 are as follows:

2019	\$	815
2020		815
2021		815
2022		823
2023		844
2024-2027		<u>3,164</u>
	\$	<u>7,276</u>

The total annual rental for office space was approximately \$707 and \$660 for 2018 and 2017, respectively.

## 12. Commitments and Contingencies

The Authority is proceeding with a capital improvement program which the Authority's independent engineer has estimated will entail expenditure of the existing construction funds and potential future bond issues.

The Authority was insured for general liability coverage through 2001; however, effective January 1, 2002, it became self-insured. In previous years, the Authority established a fund to pay for deductibles, small claims, and other litigation costs. At year-end, the balance in this fund was approximately \$596. This fund is grouped with "Restricted Assets" on the statements of net position. During 2018 and 2017, the Authority paid \$0 from this fund for claims.

In addition to the matters discussed below and in Note 13, Consent Agreement, various other claims and lawsuits are pending against the Authority.

### Attorney General Criminal Complaint

On September 6, 2017, the Authority self-reported violations of the Safe Drinking Water Act, dating back to July of 2016, to the Pennsylvania Department of Environmental Protection (PADEP). The Authority failed to provide at least 45-day notice prior to

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# PITTSBURGH WATER AND SEWER AUTHORITY

## NOTES TO FINANCIAL STATEMENTS

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commencing partial water line replacements to affected residents and failed to collect representative water samples from residences within 72 hours of completion of the partial water line replacements.

On November 17, 2017, the Authority and the PADEP entered into a voluntary Consent Order and Agreement in full satisfaction of these violations whereby the Authority paid the PADEP a fine of \$2,400,000, with \$1,800,000 of the fine designated for the Authority to perform a Community Environmental Project acceptable to the PADEP. The fine was paid, and the Community Environmental Project was designated and approved by the PADEP as a grant to assist low income homeowners in the Authority's service system in their replacement of privately-owned lead service lines on their property.

At some point after the Authority self-reported these violations to the PADEP, the PADEP referred the matter to the PA Attorney General's Office for investigation of potential criminal liability. After investigation, the PA Attorney General's Office concluded that no individuals were criminally liable for any of the violations of the Safe Drinking Water Act.

However, on February 1, 2019, the PA Attorney General's Office filed a criminal complaint against the Authority as a corporation. The complaint alleged the same self-reported violations, the same type of monetary penalties, and the same suggested type of Community Environmental Project as the Authority already paid under the voluntary Consent Order and Agreement dated November 17, 2017.

The Authority is contesting these duplicative charges and penalties.

### Lead Mitigation

The Authority has implemented a number of critical initiatives to comply with the lead service line replacement consent order, and other requirements mandated by the PADEP. These initiatives include: (1) a lead service line identification program to be completed by 2020 for residential properties and 2022 for commercial properties, (2) a water treatment program to mitigate lead corrosion so as to comply with current water quality standards, and (3) a lead service line replacement program. These requirements are stipulated in the PADEP consent order with the City of Pittsburgh and the Authority dated November 2017.

# PITTSBURGH WATER AND SEWER AUTHORITY

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*Lead Service Line Identification Program:* The lead service line identification program determines the materials of manufacture for each existing water service line in the Authority's system. The first phase of that program was completed with the digitization of existing records, which is currently available to the public via the Authority's website. The second phase has been a video inspection of accessible service lines to evaluate the materials of manufacture. This phase requires intensive field inspections which are catalogued and stored in a geographical information system. These records are made publicly available on the Authority's website as soon as possible, but no more than 120 days after the inspection is completed and accepted by the Authority. The Authority is currently evaluating the feasibility of continuing the video inspection process given the value of the data obtained and will be working with PADEP to reach an alternative solution. The third phase includes identifying service line locations that were unable to be confidently determined using the above methods. The identification program will culminate in a complete digital file and mapping of all service lines within the Authority's service territory.

*Water Treatment:* Chemical treatment testing of orthophosphate application to the Authority's finished water demonstrates rapid mitigation of lead and copper corrosion to levels well below any current federal drinking water standard. This chemical treatment proposal has received final approval from the PADEP; this same chemical treatment has been approved for use in numerous other public water supplies in the United States. On March 29, 2019, the Authority received the necessary PADEP Operating Permit for the recently completed four Orthophosphate Addition and Storage Facilities and commenced the addition of Orthophosphate in 1/3 of the treatment system (Highland No. 2 Distribution Supersystem) on April 1, 2019. The second 1/3 of the system will begin receiving Orthophosphate on April 15, 2019 (Lanpher Distribution Supersystem) and the final 1/3 of the system will begin receiving Orthophosphate on April 29, 2019 (Highland No. 1 Distribution Supersystem). The Authority anticipates that the lead corrosion control treatment will be fully effective in 3 to 6 months, so as to lower lead levels in the Authority's customer lead service lines to acceptable drinking water standards.

*Lead Service Line Replacement:* The Authority was ordered by PADEP to replace 1,341 public owned lead service lines by June 30, 2018 and an additional 7 percent of the public owned lead service lines by December 31, 2018 (a total of about 2,200). By the end of 2018 a total of 2,765 public lead service lines had been replaced. In addition, the Authority is required to continue to replace 7 percent of the initial number of lead service lines in the system (855) until two consecutive 6-month monitoring period sampling events are below the lead action level.

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# PITTSBURGH WATER AND SEWER AUTHORITY

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The Authority closed on a combination of grants and loans through PENNVEST in March 2019 that provides approximately \$49.1 million in funding to continue replacing lead service lines. Construction for the replacement of 3,400 public lead service lines (and corresponding private line and ancillary work) was bid in early 2019 and a total of \$36.3 million in construction and consulting contracts have been awarded to date. Additional construction will be awarded as the project, which started in late March 2019 and is scheduled to be complete in June 2020, progresses. The Authority estimates that there are about 10,000 lead service lines remaining in its water system as of early 2019. Once the chemical treatment has become fully effective, the Authority will begin replacing lead service lines in concert with a water main replacement program. In this manner, the Authority can minimize the overall cost for water main and service line replacements. Most of the remaining lead service lines are connected to the oldest water mains in the system. The Authority intends to implement a small diameter water main program throughout the city to replace the oldest pipes and services at the same time. The Authority will strive to implement this program at the lowest possible cost to the Authority, while addressing those water mains that have the highest likelihood of failure. The Authority's investment in water main replacement will continue unabated to ensure that the Authority can mitigate the amount of annual pipe breaks and minimize the risk of service disruption to its customers.

### Environmental Protection Agency

The Authority has been cooperating with the Environmental Protection Agency ("EPA") in an investigation related to The Authority's Aspinwall Water Treatment Plant. The investigation is ongoing and involves potential violations of the Clean Water Act, Sections 1319(c)(2) and (4) in 2016 and prior years, which could result in penalties.

### Construction Commitments

In January 2019, the Authority awarded \$35.9 million in contracts for lead line replacements.

## **13. Consent Agreement**

The Authority is subject to federal regulation under the Clean Water Act (1977) and regulations adopted under that Act. Among the specific requirements applicable to the Authority's system are those imposed by the United States Environmental Protection

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# PITTSBURGH WATER AND SEWER AUTHORITY

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Agency's Combined Sewer Overflow (CSO) Policy (1994). On January 29, 2004, the Authority and the City of Pittsburgh executed a Consent Order and Agreement (COA) regarding wet weather sewer overflows within the City. The other signatories to the COA are the Pennsylvania Department of Environmental Protection (DEP) and the Allegheny County Health Department (ACHD).

Generally, the COA requires the Authority and the City to assess the City sewers to develop a plan with ALCOSAN to address wet weather sewer overflows within the City. The COA is part of a sewer assessment program for all municipalities served by ALCOSAN. To date, assessment activities have been completed for all accessible critical sewers and separate sanitary sewers with the exception of any additional sewers discovered through continued research and investigation. Ongoing pipe and manhole repairs are being completed to provide CCTV access to remaining inaccessible critical/sanitary sewer pipes. Assessment activities for non-critical sewers are to be completed on a longer schedule. The majority of accessible non-critical manholes have been inspected with ongoing efforts to complete any remaining or newly identified. The required Wet Weather Feasibility Study (WWFS) was submitted to the DEP and ACHD on time in July of 2013. This long-term control plan outlined system-wide improvements, including Green Infrastructure (GI) that the Authority would implement over the next 20 years.

As this COA with the DEP expired in March 2015, the U.S. Environmental Protection Agency (USEPA) became the main regulatory body to which the Authority is responsible. On January 21, 2016 the USEPA issued a Clean Water Act Section 308 Information Request to the Authority. The nature of the request is to provide a jurisdictional basis for USEPA to engage the Authority/City in an enforcement action by consent, or a Consent Decree (CD). The Authority intends that through such an action, it can more fully participate in the implementation of interim regional wet weather activities, controls, and improvements. The Authority further understands that such an action will also permit the Authority/City to participate more fully in the identification and implementation of any final wet weather control measures for the region. The USEPA 308 request requires the Authority to submit detailed information on past CSO performance and activities. It also requires the Authority to conduct a source reduction analysis for the entire service area, followed by GI demonstration projects completed in December 2017. The results of the analysis and demonstration projects will be used to determine the details in the final consent decree.

In addition to the assessment, the USEPA 308 request requires the Authority and the City to continue implementing the Nine Minimum Controls to reduce combined sewer overflows,

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# PITTSBURGH WATER AND SEWER AUTHORITY

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and to perform repairs and maintenance of deficiencies revealed by the assessment. The Authority maintains an expedited response to significant structural failures of the sewer system where imminent structural failures are determined by a professional engineer and prioritized for repair. Ongoing sewer line replacement, point repair, lining, point lining, and gunite projects have been implemented to address structural deficiencies. The USEPA 308 request also requires the submission of monthly reports updating the progress of the evaluations and improvements, as well as water quality impacts.

Given the broad scope of a potential CD, the size of the City sewer system, and the various conditions and/or deficiencies that may be discovered by the assessment, it is difficult to predict the total cost of compliance with the CD. Moreover, it is difficult to predict what, if any, largescale and/or regional capital improvements may be required after the completion of the assessment to address wet weather sewer overflows in the City and in the ALCOSAN service area. The Authority hired two engineering firms to assess and model the sewer system, and has fulfilled the first portion of the USEPA 308 request due by March 31, 2016. The second phase of the request supplied a source reduction study which was submitted December 1, 2016 and GI Demonstration projects must be constructed and performance evaluations completed by December 1, 2017. An additional 308 request from EPA was received in October of 2016 seeking more detailed information and further actions regarding the assessment of the Authority's sewer system. This response was delivered on time in January 2017 and continues to require additional monthly reporting. The demonstration project evaluations were submitted on time on December 1, 2017.

The Authority, along with the other impacted local municipalities, is awaiting a response from the USEPA and the DEP on its proposed regional plan. Costs associated with CD and COA compliance will be reflected in the capital improvement program and funded by proceeds of potential future bond issuances.

### **14. Subsequent Event**

In March 2019, the Authority entered into a new PENNVEST loan totaling \$35.4 million for various capital projects and water and sewer improvement projects.

## **SUPPLEMENTARY INFORMATION**

# PITTSBURGH WATER AND SEWER AUTHORITY

## COMBINING STATEMENT OF NET POSITION

(Dollars expressed in thousands)

DECEMBER 31, 2018

<u>Assets</u>	Water	Sewer	Sewer Treatment	Total
Current assets	\$ 52,787	\$ 26,000	\$ -	\$ 78,787
Noncurrent assets	526,323	259,233	-	785,556
<b>Total Assets</b>	<b>579,110</b>	<b>285,233</b>	<b>-</b>	<b>864,343</b>
<b>Deferred Outflows of Resources</b>				
Deferred charge on refunding	68,698	33,836	-	102,534
Accumulated decrease in fair value of hedging derivatives	507	250	-	757
<b>Total Deferred Outflows of Resources</b>	<b>69,205</b>	<b>34,086</b>	<b>-</b>	<b>103,291</b>
<b>Liabilities</b>				
Current liabilities	57,260	1,669	10,733	69,662
Noncurrent liabilities	601,379	296,202	-	897,581
<b>Total Liabilities</b>	<b>658,639</b>	<b>297,871</b>	<b>10,733</b>	<b>967,243</b>
<b>Deferred Inflows of Resources</b>				
Accumulated increase in fair value of hedging derivatives	3,182	1,568	-	4,750
<b>Net Position</b>				
Net investment in capital assets	(9,978)	(4,914)	-	(14,892)
Restricted	10,980	5,408	-	16,388
Unrestricted	(14,508)	19,386	(10,733)	(5,855)
<b>Total Net Position</b>	<b>\$ (13,506)</b>	<b>\$ 19,880</b>	<b>\$ (10,733)</b>	<b>\$ (4,359)</b>

## PITTSBURGH WATER AND SEWER AUTHORITY

### COMBINING STATEMENT OF REVENUES, EXPENSES, AND CHANGES IN NET POSITION

*(Dollars expressed in thousands)*

YEAR ENDED DECEMBER 31, 2018

	Water	Sewer	Sewer Treatment	Total
<b>Operating Revenues</b>	\$ 98,906	\$ 65,567	\$ 67,261	\$ 231,734
<b>Operating Expenses:</b>				
Direct operating expenses	48,664	23,969	-	72,633
Wastewater treatment	-	-	71,822	71,822
Reimbursement for City of Pittsburgh services	4,911	-	-	4,911
Expense of water provided by other entities:				
Subsidy of customers located in the City	3,814	-	-	3,814
Depreciation	11,319	5,575	-	16,894
Total operating expenses	68,708	29,544	71,822	170,074
<b>Operating Income (Loss)</b>	30,198	36,023	(4,561)	61,660
<b>Non-operating Revenues (Expenses):</b>				
Donated property	9,145	4,504	-	13,649
Interest revenue	314	155	-	469
Investment income - change in fair value of swap	1,703	839	-	2,542
Interest and amortization	(23,025)	(11,340)	-	(34,365)
Total non-operating revenues (expenses)	(11,863)	(5,842)	-	(17,705)
<b>Special Item:</b>				
Private lead line replacement	(4,478)	-	-	(4,478)
<b>Net Income (Loss)</b>	13,857	30,181	(4,561)	39,477
<b>Net Position:</b>				
Beginning of year	(27,363)	(10,301)	(6,172)	(43,836)
End of year	\$ (13,506)	\$ 19,880	\$ (10,733)	\$ (4,359)

## CREDIT OPINION

4 June 2019

 Rate this Research

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# Pittsburgh Water & Sewer Authority, PA

## Update to credit analysis

### Summary

The Pittsburgh Water & Sewer Authority, PA's (A3 stable) credit profile has benefitted from improvements to operations and controls implemented through Pennsylvania Public Utility Commission (PUC) oversight, effective as of April 2018, as well as the strength of its new management team. Both changes to PWSA's governance have contributed to its improved financial position as of fiscal 2018 year end.

The authority continues to face material pressure to improve its infrastructure given years of disinvestment. Coupled with a substantial consent decree pertaining to combined sewer overflows during wet weather events and elevated lead levels in the city's water, the authority will necessarily add to its already elevated debt burden in the near term. High leverage, elevated fixed costs, and the system's major capital needs remain primary credit concerns.

Moody's affirmed the A3 rating for Pittsburgh Water & Sewer Authority, PA's First Lien Revenue Bonds on June 4, 2019 and assigned an A3 rating to the authority's \$109 million Water and Sewer System First Lien Revenue Bonds, Series A of 2019. The outlook was revised to stable from negative.

### Credit strengths

- » Diverse, urban Pittsburgh (A1 stable) service area, supported by strong "eds & meds" presence
- » Considerable size; system assets include water conveyance and treatment, and sewer conveyance that ties to ALCOSAN
- » Significant, recently implemented rate increases boost revenues; PUC oversight should bring improvements and controls

### Credit challenges

- » Substantial debt burden; debt ratio is 101%
- » Narrow liquidity versus similarly sized peers
- » Long term inadequate maintenance of infrastructure has led to severe inefficiencies and has contributed to a projected \$2 billion in capital improvement needs; plan to be implemented over ten - twenty years
- » Exposure to a large regional consent decree through ALCOSAN

- » Elevated lead levels in water

### Rating outlook

The outlook has been revised to stable from negative, reflecting the authority's improved financial position as well as the credit-positive impact of PUC oversight and the strength of PWSA's new management team, which will serve to stabilize the authority's finances and operations in the near term.

PWSA is still in the beginning stages of addressing its major capital needs and operating deficiencies, and future rating reviews will consider whether the authority is able to execute its capital plans while maintaining a healthy financial position.

### Factors that could lead to an upgrade

- » Substantial improvement in liquidity that is maintained over several reporting periods
- » Meaningful reduction of debt
- » Sustained improvements in debt service coverage

### Factors that could lead to a downgrade

- » Material narrowing of debt service coverage and liquidity position
- » Inability to raise rates sufficiently to meet debt service coverage covenants while also funding significant deferred capital improvements
- » Failure to effectively deploy new revenues address near term infrastructure and operating needs
- » Escalation of environmental concerns, particularly lead levels in treated drinking water

This publication does not announce a credit rating action. For any credit ratings referenced in this publication, please see the ratings tab on the issuer/entity page on [www.moodys.com](http://www.moodys.com) for the most updated credit rating action information and rating history.

## Key indicators

### Exhibit 1

Pittsburgh Water and Sewer Authority					
System Characteristics					
Asset Condition (Net Fixed Assets / Annual Depreciation)	45 years				
System Size - O&M (in \$000s)	\$153,180				
Service Area Wealth: MFI % of US median	87.6%				
Legal Provisions					
Rate Covenant (x)	1.10				
Debt Service Reserve Requirement	DSRF funded at lesser of standard 3-prong test (Aa)				
Management					
Rate Management	A				
Regulatory Compliance and Capital Planning	A				
Financial Strength					
	2014	2015	2016	2017	2018
Operating Revenue (\$000)	\$164,255	\$174,164	\$180,727	\$202,996	\$231,734
System Size - O&M (\$000)	\$125,766	\$131,694	\$148,593	\$157,220	\$153,180
Net Revenues (\$000)	\$53,014	\$57,455	\$49,174	\$47,071	\$81,565
Net Funded Debt (\$000)	\$765,960	\$757,490	\$738,176	\$821,167	\$875,669
Annual Debt Service (\$000)	\$47,519	\$58,346	\$59,380	\$57,818	\$58,963
Annual Debt Service Coverage (x)	1.12	1.12	0.92	0.81	1.37
Cash on Hand	91 days	78 days	53 days	26 days	112 days
Debt to Operating Revenues (x)	4.7x	4.3x	4.1x	4.0x	3.8x

Source: Moody's Investors Service, Pittsburgh Water and Sewer Authority audited financial statements

## Profile

PWSA is an authority of the city of Pittsburgh (A1 stable), providing water treatment and conveyance to 84% of the city's population of roughly 305,000 residents and sewer conveyance for the entire city.

## Detailed credit considerations

### Service area and system characteristics: Large and stable Pittsburgh service area; Considerable aged infrastructure concerns

The authority provides water distribution and wastewater collection and conveyance for the city of Pittsburgh and neighboring municipalities. The city's healthy and growing economy, as well as its exposure to the strong "eds & meds" presence from healthcare and higher education institutions, are positives for the authority.

The authority's 10 largest customers (3.7% of revenues) include University of Pittsburgh Medical Center (A1 negative), University of Pittsburgh (Aa1 stable), Fox Chapel Authority, Allegheny Health Network, Carnegie Mellon University, Allegheny County (Aa3 stable), the city's public housing authority, and a state prison. All of the authority's five largest customers have been in the city for at least 75 years.

The authority continues to maintain an ample water supply, providing water to a population of approximately 305,000. The system is permitted to draw up to 100 million gallons per day (MGD) from the Allegheny River, its sole water source, though average demand for water is well below that level, at 70 MGD. The authority treats drinking water at one plant located on the river, as well as a microfiltration plant at one of its reservoirs. The authority has capacity to store approximately 3 days' worth of finished water for uninterrupted supply to its customers.

The authority does not treat wastewater. It transmits all of its sewage to the Allegheny County Sanitary Authority. There is no contractual limit to the amount of sewage that can be conveyed, however, during wet weather events, the existing system frequently overflows.

The system currently experiences unusually large water loss. One of the authority's current major infrastructure projects is a complete metering and mapping of its system. Metering will not only address the system's water loss but will also help PWSA target repairs such that widespread boil water advisories should become less frequent. Some of the authority's other important near term improvements include hiring an expanded workforce to carry out maintenance of the system's general infrastructure up to current industry standards, and replacing water mains in line with accepted industry norms.

Ordinary system updates and routine infrastructure improvements had been sorely lacking at PWSA, and years of deferred maintenance have led to cost inefficiencies and exacerbated the natural wear and tear on an already aged system. We believe that new oversight, under the purview of the PUC, will help PWSA bring its system to good working order by setting guidelines for system improvements based on industry-wide standards.

In April of 2016, the authority was ordered by the Pennsylvania Department of Environmental Protection (PADEP) to test for lead in the drinking water treated by PWSA, related to an unauthorized use of alternative corrosion control chemicals. Samples from 100 homes in June 2016 found lead of 22 parts per billion (ppb) at the 90th percentile. The EPA action level for lead at the 90th percentile is 15ppb, at which level additional testing in terms of frequency and number of samples is required and mitigation efforts are needed

PWSA has since tested for elevated lead levels each June and December. The authority has yet to realize two consecutive testing periods where lead is below the EPA requirement. However, the authority was approved to treat its water with orthophosphate in March of 2019, and expects that this new treatment will bring lead levels to within the required range by December 2019.

#### **Debt service coverage and liquidity: Rate increases have strengthened finances, though cash still somewhat narrow**

As cited in prior reviews, the authority's overall credit profile has been severely impacted by its limited liquidity, with days' cash on hand declining to a very narrow 29 days' as of 2017 year end. Favorably, the authority's cash position has materially improved as of audited 2018 financial statements, and reported cash is a more healthy \$47 million, or 112 days' cash on hand. This is more in line with the authority's historical operating norms, but is still somewhat weak versus similarly sized peers. Median days' cash on hand for Moody's-rated water and sewer systems in the US generating revenues between \$100 million and \$500 million annually is 473 days.

Beginning in 2019, the authority must meet a 1.10x coverage test on its consolidated debt service and a 1.25x coverage test on its senior debt service without the use of free cash. Positively, PWSA met both of these requirements as of audited 2018 financials, reporting senior lien debt service coverage of 1.89x and overall coverage of 1.37x.

The authority implemented a 28% rate increase in early 2018. The authority also implemented a 13% rate increase in early 2019, which was the first rate plan approved by the PUC. PWSA expects to end 2019 with net revenues before debt service of roughly \$75 million, which would result in senior lien debt service coverage of 1.7x and overall coverage of 1.32x, favorable metrics given the authority's current credit profile.

The authority's rate increases were prompted by its substantial capital needs. Improved revenues will shore up reserves somewhat, but more will be required to support future debt issuance and increased expenditures for its expanded workforce, technology upgrades, and any pay-go capital needs. The authority's current estimate for capital improvements is \$2.0 billion over 20 years, with more than \$900 million of new money debt expected to be issued over the next five years.

#### **LIQUIDITY**

The authority's ending days' cash on hand for 2018 is materially improved over prior years, to 112 days' when pass through expenses for ALCOSAN are included, and 166 days' when ALCOSAN expenses are excluded. The authority expects to maintain liquidity in this range for 2019.

Liquidity for capital expenditures is supported by an \$150 million revolving credit facility with JP Morgan Chase Bank, NA (Aa1 (cr)). An emergency \$20 million liquidity line is in place with PNC Bank, NA (A2 (cr)).



### Debt and legal covenants: High leverage likely to increase, satisfactory and improved legals

The authority introduced a new indenture in 2017, which strengthened the rate covenant. The new requirement is 125% of senior debt service coverage plus 110% of subordinate debt service coverage. Free cash will no longer be used to increase coverage under the new indenture. The new test is effective for fiscal year 2019. The debt service reserve is funded at the lesser of the three-pronged test.

#### DEBT STRUCTURE

The additional borrowing implied by the authority's capital needs will increase an already elevated debt burden. The authority's total debt is equal to 101% of fixed assets as of 2018 year end, well above similarly sized peers. The outstanding debt amortizes slowly, with only 44% of principal scheduled to be repaid in the next 10 years.

The authority will reduce its variable rate debt outstanding with its Series 2019 A&B issuance. At fiscal year end 2018, the authority's debt profile includes total bonded debt of \$656 million, of which \$552 million is senior-lien bonds, and \$103 million is privately placed subordinate-lien bonds, all of which is variable rate. Subsequent to the 2019 issuance, the subordinate lien debt will be refunded with fixed rate bonds, the associated swaps will be terminated, and the debt will be publicly offered.

The Series 2019 A&B issuance will reduce the authority's variable rate debt to roughly 28.6% of total bonded debt outstanding, down from 49% as of 2018 fiscal year end. Assured Guaranty Municipal Corp. (A2 stable insurance financial strength) insures much of the authority's variable rate bonds and all of the authority's swaps, and provides the surety policy for all debt service reserve funds. This counterparty concentration may adversely impact the authority should AGM's credit quality deteriorate. Subsequent to the subordinate refunding, there will be no liquidity support facilities outstanding.

The authority also maintains \$28 million outstanding in PennVest loans and an \$150 million revolving credit facility, of which \$113 million is currently drawn. Given an intercreditor agreement, PennVest, JPM, and PNC share a third lien priority on system revenues.

#### DEBT-RELATED DERIVATIVES

The authority has entered into floating-to-fixed rate swaps in connection with substantially all of its variable rate debt (\$322 million as of YE18) under ISDA Master Agreements with JP Morgan Chase Bank N.A. (64%) and Merrill Lynch Capital Services (36%), whereby the authority pays a fixed interest rate semi-annually (3.67% on average) and receives 70% of LIBOR.

AGM provides swap insurance for all swaps and, despite a negative \$86 million aggregate mark-to-market as of April 2019, no collateral is required to be posted unless an Insurer Event occurs. The amortization schedule for each swap mirrors that of the corresponding bonds and the swaps terminate at bond maturity. For all of the swaps, per the 2017 indenture, regularly scheduled swap payments are subordinate to subordinate bond debt service. Early termination is optional for the authority only, and termination by the counterparty depends upon specified termination events, including the downgrade of PWSA's underlying rating below investment grade. An authority termination payment would be subordinate to first and second lien debt service payments.

#### PENSIONS AND OPEB

The authority's employees participate in the city's pension program. It is anticipated that the authority's share of its pension contribution will be provided for through a renegotiated Cooperation Agreement with the city.

### Management and Governance

Continued turnover at the senior managing level of the authority had been a considerable credit concern. Favorably, however, the authority's current management team has developed a comprehensive plan to bring operations to good working order and to proceed with much needed capital improvements. Management views its relationship with the PUC as well as the DEP and EPA as an opportunity for partnership and has proactively sought to engage these agencies as PWSA moves forward with its substantial CIP. This is a definitive, positive change from the authority's prior actions, and has informed our stable outlook on PWSA's current credit profile.

The authority is currently managed by a seven member board, with six members appointed by the mayor and one by the city council. The authority currently provides water at no cost to city-owned buildings and public areas. The city and authority are in the process of renegotiating their cooperation agreement to more accurately reflect the exchange of services provided.

Pennsylvania's Public Utility Commission began oversight of the authority in April 2018. The PUC is responsible for regulating the authority's rate making, operating effectiveness, and debt issuance. We expect that the PUC will bring standardization and effective

governance to the authority's future operations. The PUC is required to approve rate increases that will ensure PWSA complies with its bondholder covenants, though we note that the approval process for increases can be lengthy.

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# Pittsburgh Water and Sewer Authority, PA 'A' Senior Debt Rating Affirmed

June 6, 2019

NEW YORK (S&P Global Ratings) June 6, 2019--S&P Global Ratings assigned its 'A' rating to the Pittsburgh Water and Sewer Authority (PWSA), Pa.'s series 2019A first-lien revenue bonds and its 'A-' rating to PWSA's 2019B subordinate-lien revenue refunding bonds. At the same time, we affirmed our 'A' long-term rating on the authority's senior debt and our 'A-' rating on the subordinate debt. The outlook is stable.

"Our view of PWSA's general creditworthiness is based on its very strong enterprise risk profile and its strong financial risk profile," said Ms. Boeke Burke.

The authority has been subject to scrutiny from local and state elected officials who voiced concerns over authority operations. An auditor general's opinion released in November 2017 cited "aging and deteriorating infrastructure issues and financial and operational long-term viability issues..." and was an important factor in HB 1490, which placed PWSA under the state Public Utility Commission's (PUC) oversight as of April 1, 2018. The PUC now regulates the authority's rates and fees, and must approve additional debt. PWSA's board additionally terminated the Cooperation Agreement with Pittsburgh in February 2019 and is currently negotiating a new agreement with the city, which will redefine the authority's and the city's respective responsibilities and cost allocations. We expect the agreement will provide for transactional payments between the city and PWSA based on actual expenses, in accordance with customary utility practices under the PUC.

"The stable outlook reflects our expectation that both the timing and magnitude of rate adjustments that PWSA is likely to request, versus what the Public Utility Commission ultimately grants, will generally prove to be aligned," she added. We are assuming that the financial profile will be further stabilized by the sufficiency test in the rate covenant--which does not allow for the use of cash transfers. We will also likely keep in place the one-notch distinction between the first- and subordinate-lien debt.

Certain terms used in this report, particularly certain adjectives used to express our view on rating relevant factors, have specific meanings ascribed to them in our criteria, and should therefore be read in conjunction with such criteria. Please see Ratings Criteria at [www.standardandpoors.com](http://www.standardandpoors.com) for further information. Complete ratings information is available to subscribers of RatingsDirect at [www.capitaliq.com](http://www.capitaliq.com). All ratings affected by this rating action can be found on S&P Global Ratings' public website at [www.standardandpoors.com](http://www.standardandpoors.com). Use the Ratings search box located in the left column.

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## Pittsburgh Water and Sewer Authority, PA 'A' Senior Debt Rating Affirmed

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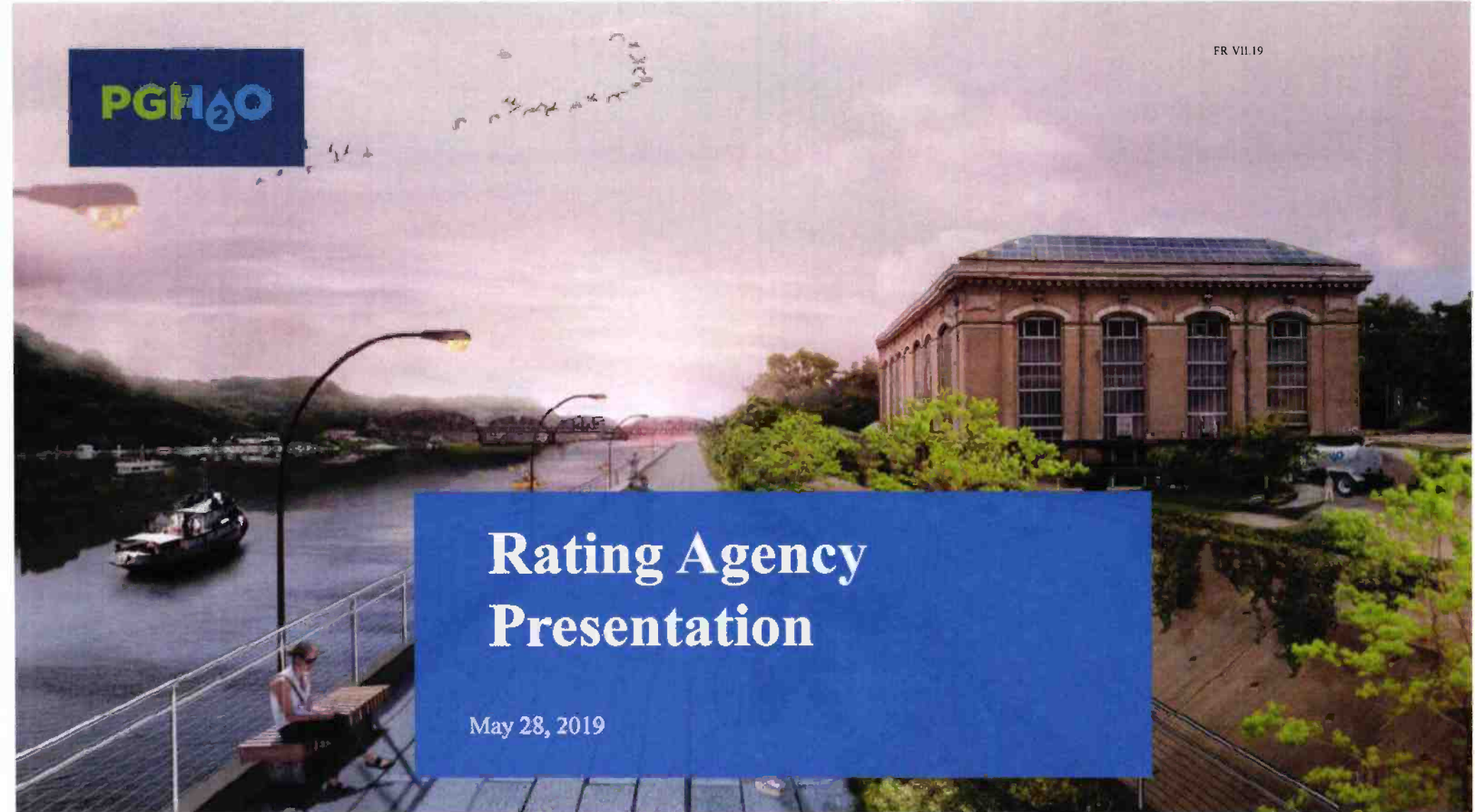




FR VII.19

# Rating Agency Presentation

May 28, 2019



# Presentation Participants

## The Pittsburgh Water and Sewer Authority



**Robert Weimar**  
*Executive Director*

**Edward Barca**  
*Treasurer*

**Debbie Lestitian, CPA, Esquire**  
*Chief Corporate Counsel/Chief of Administration*

**Jennifer Presutti**  
*Budget Director*

## Financial Advisor: Public Resources Advisory Group



**Tom Huestis**  
*Senior Managing Director*

**Christine Fay**  
*Senior Managing Director*

## Senior Manager: Morgan Stanley

**Morgan Stanley** **Richard Weiss**  
*Executive Director*





# The PWSA: Utility On The Move



- Management Stability Has Lead To Highly Qualified Team
- PWSA Services The City and Surrounding Boroughs
- Water and Sewer Systems Need To Be Restored
- Capital Improvement Plan Addresses Key System Risks
- Financial Condition Now Solid With Market Service Rates
- Pro Forma Projections
- Plan of Finance
- PWSA's Trajectory Portends A Solid Future

# The PWSA: Utility On The Move (con't)

## Delivering Results

Board and Management Team

“Getting Stuff Done”:

- Rebuilding the Team
- Reconstructing the System
- Renewing Our Commitments
- Creating Culture of Accountability

## Poised for Partnership

Ample water supply, providing water and sewer services to approximately 500,000 people daily, with excess capacity



## Committed to Public Strategy

Balancing:

- Affordable Customer Service
- Financial Stability
- Regulatory Compliance
- Environmental Stewardship

## Long-Term Investing

Investing in:

- Human Capital
- Implementing Sustainable Financial Policies
- Improving System Resilience

## Section I.

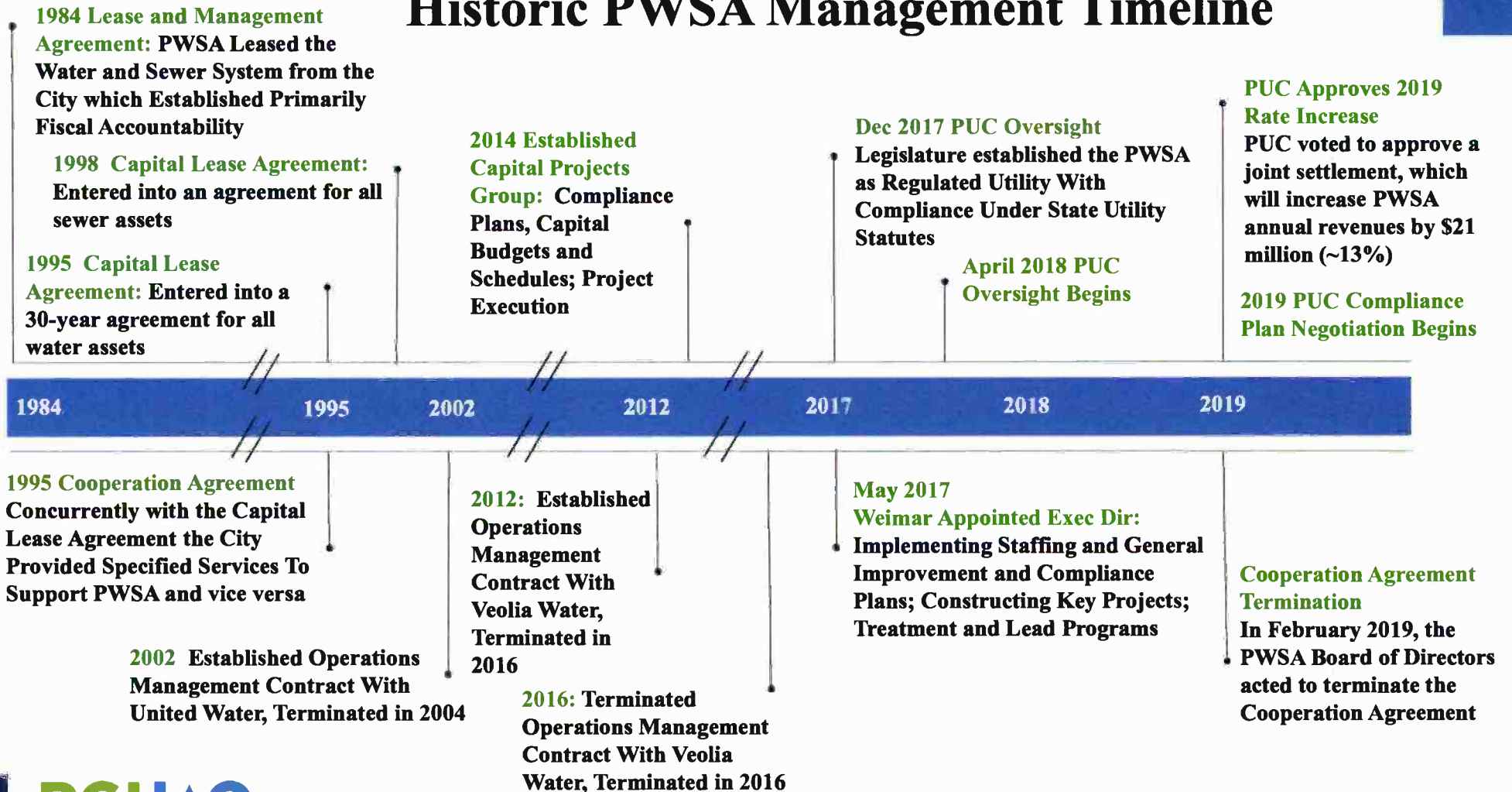
# Governance and Management Highlights



# PWSA Management and Governance

Board Member (Appointed)	Board Title	Years On Board (5 Year Terms)	Experience (*Denotes Permanent Position)
Paul Leger	Chairperson	< 5	Retired, Former Director of Finance, City of Pittsburgh
Margaret Lanier	Vice Chairperson	< 5	Director of Finance*/Treasurer,* City of Pittsburgh
James Turner	Secretary	< 2	Retired, Former Professor, University of Pittsburgh GSPIA
Deborah Gross	Assistant Secretary / Treasurer	< 5	Councilwoman, City of Pittsburgh
Chatón Turner	Member	< 2	Senior Associate Counsel, University of Pittsburgh Medical Center
Michael Domach	Member	> 1	Professor, Carnegie Mellon University
TBD	Member	--	Appointed By Mayor Confirmed By City Council

# Historic PWSA Management Timeline





# Cooperation Agreement Negotiation Update

## The new Cooperation Agreement will be restructured to achieve the following objectives:

- Provide for transactional payments between the City and the PWSA that are based upon actual, verifiable, direct expenses, and in accordance with customary utility practices under the PUC
- Establish a business like relationship between the City and the PWSA
- Provide for cooperation by the City and the PWSA in their respective capital projects and compliance responsibilities which may impact each other
- The ongoing Cooperation Agreement negotiations will not modify the Capital Lease Agreement
  - The PWSA fully intends to purchase the asset for \$1 in 2025

### Items that will not be amended:

- PWSA payments to the City will continue to be subordinate to all debt obligations of PWSA



### Some of the items that are being negotiated:

- Setting forth a schedule to phase in payments for City water usage
- Reimbursing the City for:
  - Fuel and maintenance costs for PWSA vehicles
  - Costs related to pension
  - Permits and licenses related to PWSA capital projects
- Assign responsibility for water service lines and sewer laterals serving City properties and parks
- Setting forth and modifying provisions relating to PWSA's subsidy payments to another water utility serving City residents
- Payments by PWSA of the City's Payroll Tax and Pennsylvania Public Utility Realty Tax
- Granting by the City of Easements and Rights of Way for existing facilities



- ❑ The City and the PWSA are actively negotiating a new Cooperation Agreement
- ❑ If any delegation of PWSA to the City under the Proposed Cooperation Agreement conflicts with provision of the Public Utility Code or PUC regulations, the Public Utility Code provisions and PUC regulations shall control

# PWSA Management

**PWSA Management Goal: Comprehensively rebuild the utility's operations, facilities' resilience, and short-term and long-term financial position to restore a BEST IN CLASS Utility**

Key Management Position	Title	Experience
Robert Weimar	Executive Director	Appointed June 2017. Previous Acting Director of Engineering and Construction. 47 years of water and sewer utility and consulting engineer experience
Debbie Lestitian, CPA, Esquire	Chief Corporate Counsel / Chief of Administration	Appointed February 2018. Holds current Pennsylvania licenses as an Attorney and as a Certified Public Accountant with over 25 years of business experience in the private sector
Jennifer Presutti	Budget Director	Appointed September 2018. Has 15 years of public sector finance and budgeting experience including positions with the City of Pittsburgh (Director of the Office of Management and Budget) and various not-for-profit entities
Edward Barca	Treasurer	Appointed August 2018. Previous Assistant Director of Finance for the City of Pittsburgh. Prior experience in financial planning and client services for various financial institutions
Cyril "Rick" Obermeier	Director of Field Operations	Appointed September 2017. Has had increasing operations and engineering responsibilities with PWSA and previously the City of Pittsburgh Water Department since 1982
Julie Quigley	Director of Administration / Information Technology	Appointed October 2017. Has spearheaded critical technological innovations. Created the current Customer Assistance Program and reformed the entire PWSA Customer Service Department
Barry King	Director of Engineering and Construction	Appointed May 2019. Has 23 years of engineering experience with a nationally recognized consulting engineer firm and with Calvert County, Maryland

# Management Team Stabilized

June 2016 – June 2017

June 2017 – Present Day

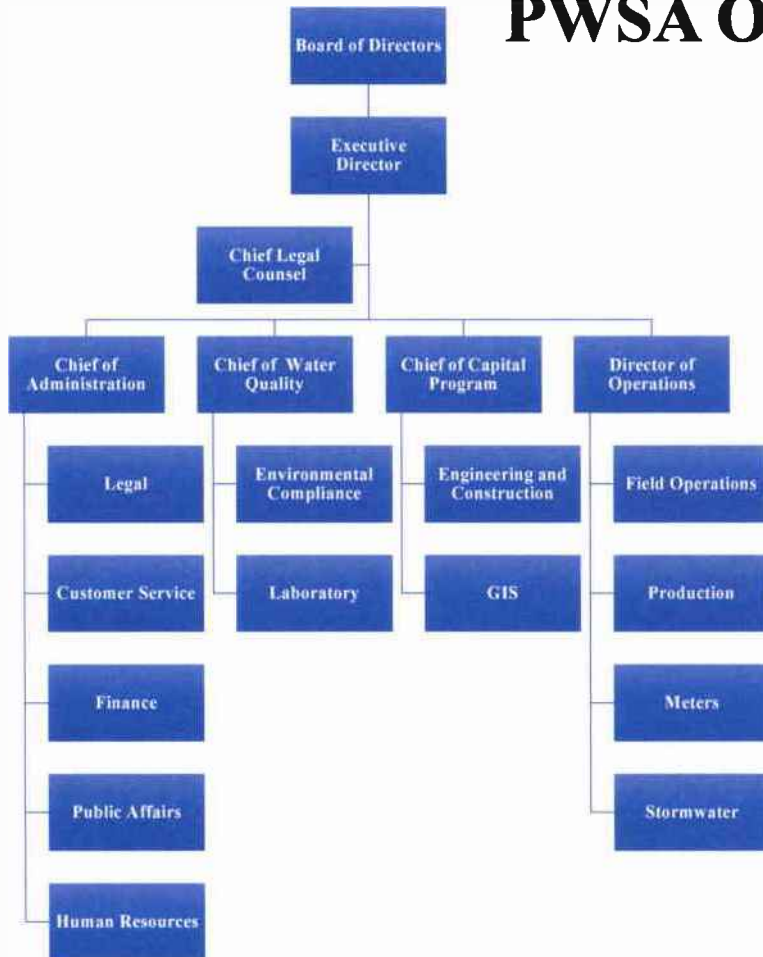


- Four people filled the Executive Director position
- Turnover with five other senior-level management positions
- Embedded consultants appointed to executive and senior management positions

- **One person** has occupied the Executive Director position
- A reorganization of the senior-level management that has included hiring experienced personnel to fill those respective positions
- A complete phaseout of **all** embedded consultants acting in executive and senior management positions



# PWSA Organizational Structure



## New Management Positions Hired Since June 2017:

- Chief Corporate Counsel / Chief of Administration
- Director of Administration / Information Technology (Prior Mgmt Employee Returned)
- Budget Director
- Treasurer
- Director of Engineering and Construction
- Chief of Program Management
- Deputy Director of Field Operations
- Senior Manager of Project Controls
- Deputy Director of Engineering
- Senior Group Manager of the Water Program
- Senior Managers Operations: Metering, Field Ops Water (2), Field Ops Warehouse, SCADA, Water Treatment Plant Operations (2)

# Pennsylvania Public Utility Commission

## **Jurisdiction Established**

- Act 65 of 2017 was passed into law on December 21, 2017 and established the PWSA as a “Utility”, resulting in regulation of PWSA’s rate making, operating effectiveness, debt issuance, and other aspects of conducting business
  - Includes provisions to impose, charge or collect rates or charges as necessary to permit the PWSA to comply with its debt covenants
  - First municipal water authority to be regulated by the PUC

## **Compliance Plan**

- The PUC issued a Tentative Implementation Order on January 18, 2018 which included methods by which the PUC and affected entities can carry out the Act 65 provisions
  - The PWSA submitted a compliance plan to the PUC on September 28, 2018 which included provisions to bring existing information technology, accounting, billing, collection, and other operating systems and procedures into regulatory compliance
- Expected to be approved by the PUC in January 2020

## **Long-Term Infrastructure Improvement Plan**

- The PWSA filed a draft Long-Term Infrastructure Improvement Plan (“LTIIIP”) with the PUC on September 28, 2018 which will be updated to support a Distribution System Improvement Charge in the future
- Expected to be approved by the PUC in 1<sup>st</sup> Quarter 2020

## **Initial Tariff Approval Process**

- On February 7, 2019, the PUC approved a joint settlement which increases PWSA annual revenues by \$21 million (~13 %)

## **PUC Approved 2019 Debt Issuance**

- On March 25, 2019, the PUC determined that the 2019 proposed debt issuance “appears to be necessary or proper for the present and probable future capital needs of the utility”
- Approval is required by the PUC on all future debt issuances

# Management Initiatives

## Lead Mitigation Initiatives

### Lead Service Line Replacement Program

- As May 21 2019, 3,465 public lead service lines had been replaced
- On March 7, 2019, the PWSA received a combination of grants and loans from Pennsylvania Infrastructure Investment Authority (“PENNVEST”) totaling over \$49.1 million to fund the replacement of the 3,400 public as well as private lead service lines in 2019

### Water Treatment Program

- As of April 29, 2019, the entire Water System receives orthophosphate treatment which ensures rapid mitigation of lead and copper corrosion to levels well below current federal drinking water standards
- It is anticipated that lead corrosion control treatment will be fully effective in three to six months

## Development and Training

- An expanded infrastructure improvement program, with \$150 million to \$250 million annual capital expenditures, and enhanced water and sewer operations will require a larger workforce
- The PWSA’s 2019 budget assumes that 122 new employees will be added to the current 301-person workforce
- The eventual goal is to have a workforce of 524 people by FY 2023

## PGH20 2030 Plan

- In October 2018, PWSA laid out its vision for rebuilding and upgrading the drinking water, stormwater, and sewer systems, known as the PGH2O 2030 Plan
- Includes \$1.1 billion in capital improvement program spending over the next five years, including for upgrading the water treatment plant, drinking water, stormwater and sewer systems, and building green infrastructure
- Adopted long-term financial planning initiatives that include implementing financial policies, monitoring financial metrics, and modernizing the capital and operating budget process
- Improved operating efficiencies through the use technology and streamlined systems and processes
- Target of reducing non-revenue water to below 25% in ten years

## Customer Assistance Programs

- The PWSA customer assistance program, which helps customers who need it the most with bill assistance.
- Customers under 150% of the federal poverty level are eligible to apply.
- The winter shut off moratorium provides single-family residential customers earning an annual income that is at or below 250% of the federal poverty level assurance that their water service will not be shutoff from December 1st through March 31st if they are unable to pay their bill.

# Management Initiatives (con't.)

## Advanced Metering Infrastructure Program

- The PWSA selected Sensus USA, a global leader in utility infrastructure systems, to provide state of the art Advanced Metering Infrastructure (AMI) technology throughout the City of Pittsburgh
- The innovative AMI system will greatly enhance monthly automated meter reads with a wireless system that collects multiple remote reads per day, allowing for better leak detection, increased billing features, and improved customer service
- Installed networked meters will allow customers to monitor water usage in real time

## Takeover of Stormwater System

- Currently, stormwater management is the responsibility of the City of Pittsburgh
- During 2018, the PWSA gave notice that it intends to assume responsibility for the stormwater system within the City of Pittsburgh
- Due to the nature of the combined collection system (sewage and stormwater conveyed in the same pipe), the PWSA has interest in taking full responsibility for the combined sources of flow into these conveyances to improve overall operations and for environmental compliance to mitigate CSO, street flooding and basement backup with one investment to lower overall investments

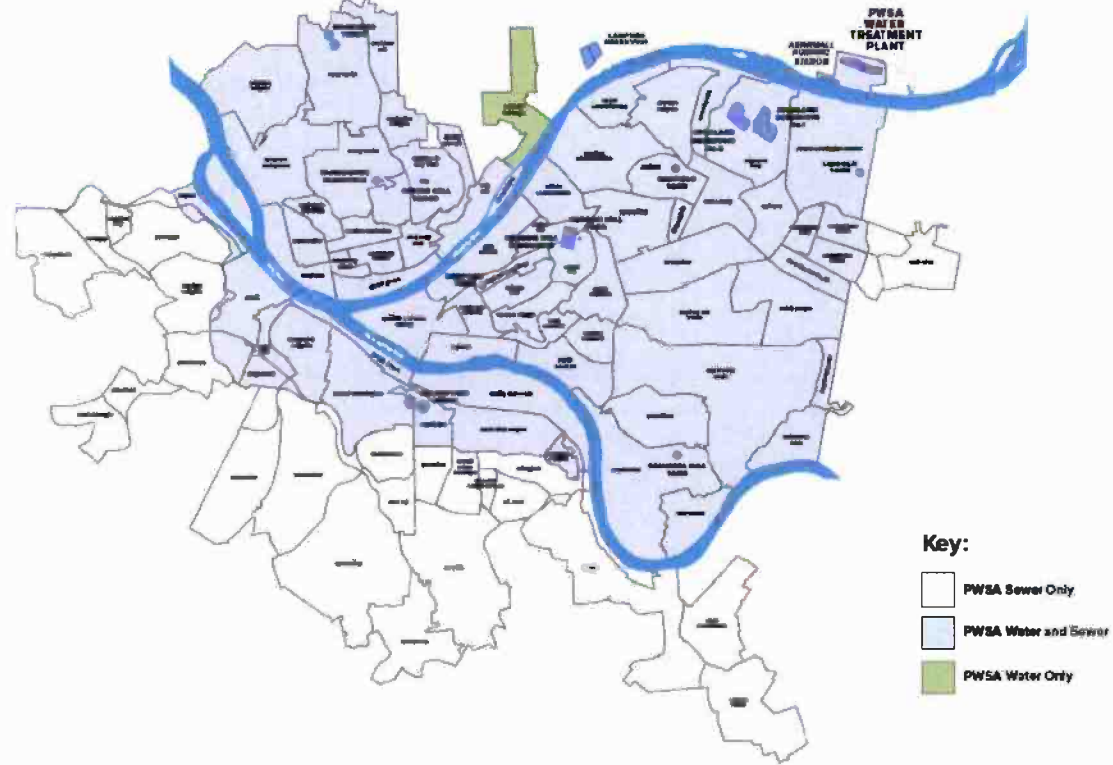
## Technology Initiatives

- Implementation of an e-Builder Project Information System beginning in July 2015 to improve project management
- e-Builder was supported by the development of a Program Management Plan to codify processes, activities, and procedures for CIP project planning and delivery
- Implement information technology systems to improve service, including a Computerized Maintenance Management System (tied to e-Builder), an enhancement GIS database, Water GEMS water distribution system hydraulic modeling software, a Human Resources Information System, and an updated Customer Information System

## De-Risking of Debt Portfolio

- Just over half of PWSA's \$645 million in total outstanding long-term debt is variable rate, including \$104 million in direct-purchase agreements with various financial institutions
- In recent years, the PWSA negotiated a more favorable cost of borrowing and language in the continuing covenant agreements that could have exposed it to remote but, potentially material, contingent risks
- The proposed financing will refund roughly \$104 million of subordinate variable-rate debt and terminate the associated swaps consistent with the PWSA Board's goals and implement Management's priorities of de-risking its overall debt portfolio

# Section II. PWSA Service Area and Customer Base





# Pittsburgh's Rise as a "Global Innovation City"

## Strategic location with highly skilled and educated workforce



- Role as the anchor and economic engine for western Pennsylvania, based on an employment base that has reinvented itself from one which once relied heavily on manufacturing jobs to one with a prevalent healthcare and education presence
- Three signature rivers make it US's second largest inland port
- 18 commercial railroad systems
- Interstate highway access
- Access to 50%+ of US buying power within 500 miles
- University of Pittsburgh Medical Center has become the largest employer in the Commonwealth
- Competitive advantage through highly-skilled workforce, world-class research institutions, and technology-intense advanced manufacturing
  - In 2016, per capita university R&D spending was nearly 2.5 times the national average

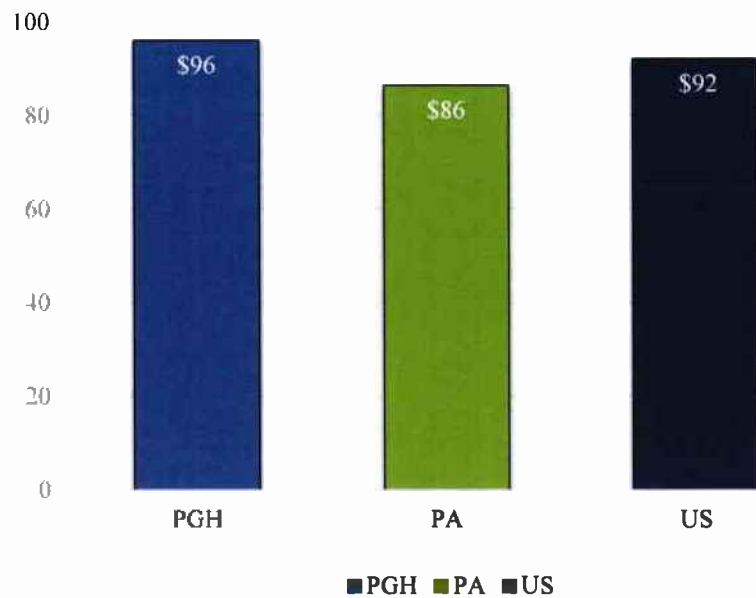
### Companies with Recent Investments in Pittsburgh



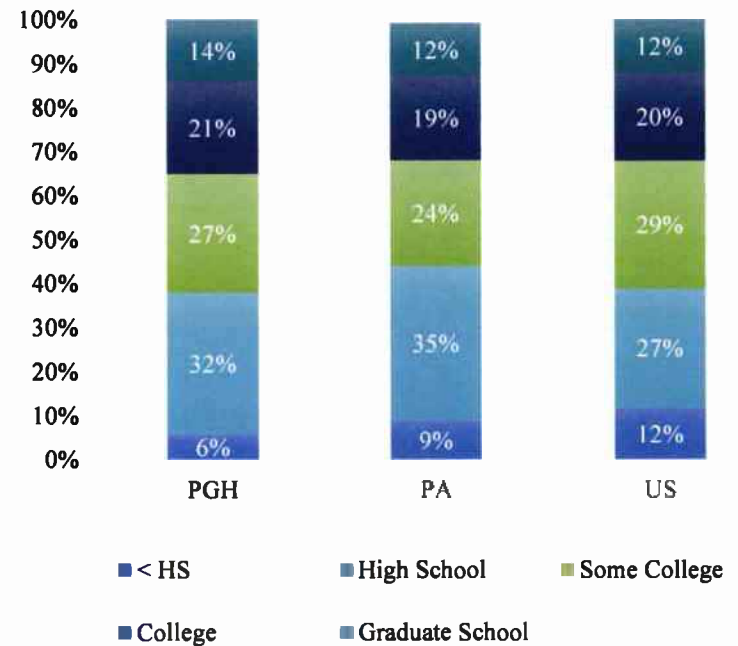
# Pittsburgh Economic Strength

**Pittsburgh has experienced robust economic growth in recent years, driven by a highly educated and productive workforce**

**Real Output Per Worker (\$000)<sup>(1)</sup>**



**% of Adults 25 and Older<sup>(1)</sup>**

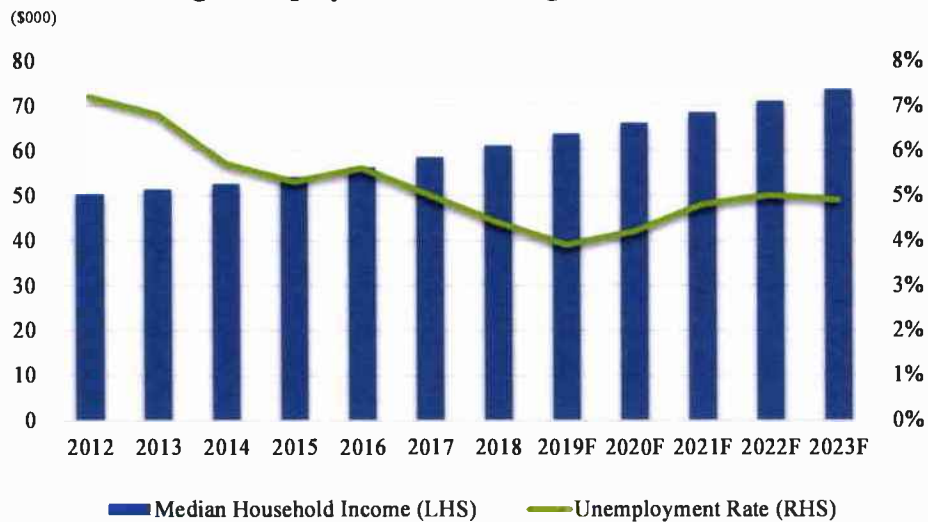


Source:  
1) Moody's Analytics: Pittsburgh Metro Precis Report (January 2019)

# Pittsburgh Economic Strength (con't.)

- Unemployment rate is below pre-recession levels
- Wages are rising quickly when comparing to historical trends
- Stable employer base made up of “Meds and Eds” and government jobs

Falling Unemployment and Strong Income Growth<sup>(1)</sup>



2018 Top 10 Employers<sup>(2)</sup>

Company	Industry	Employment
UPMC Health System	Healthcare	53,000
Highmark Health	Healthcare	21,251
U.S. Government	Government	18,358
Commonwealth of Pennsylvania	Government	16,573
PNC Financial Services Group, Inc.	Financial Services	13,000
University Of Pittsburgh	Education	12,338
Giant Eagle	Retail	9,764
Wal-Mart Stores, Inc.	Retail	9,000
Allegheny County	Government	7,236
BNY Mellon Corp.	Financial Services	7,000

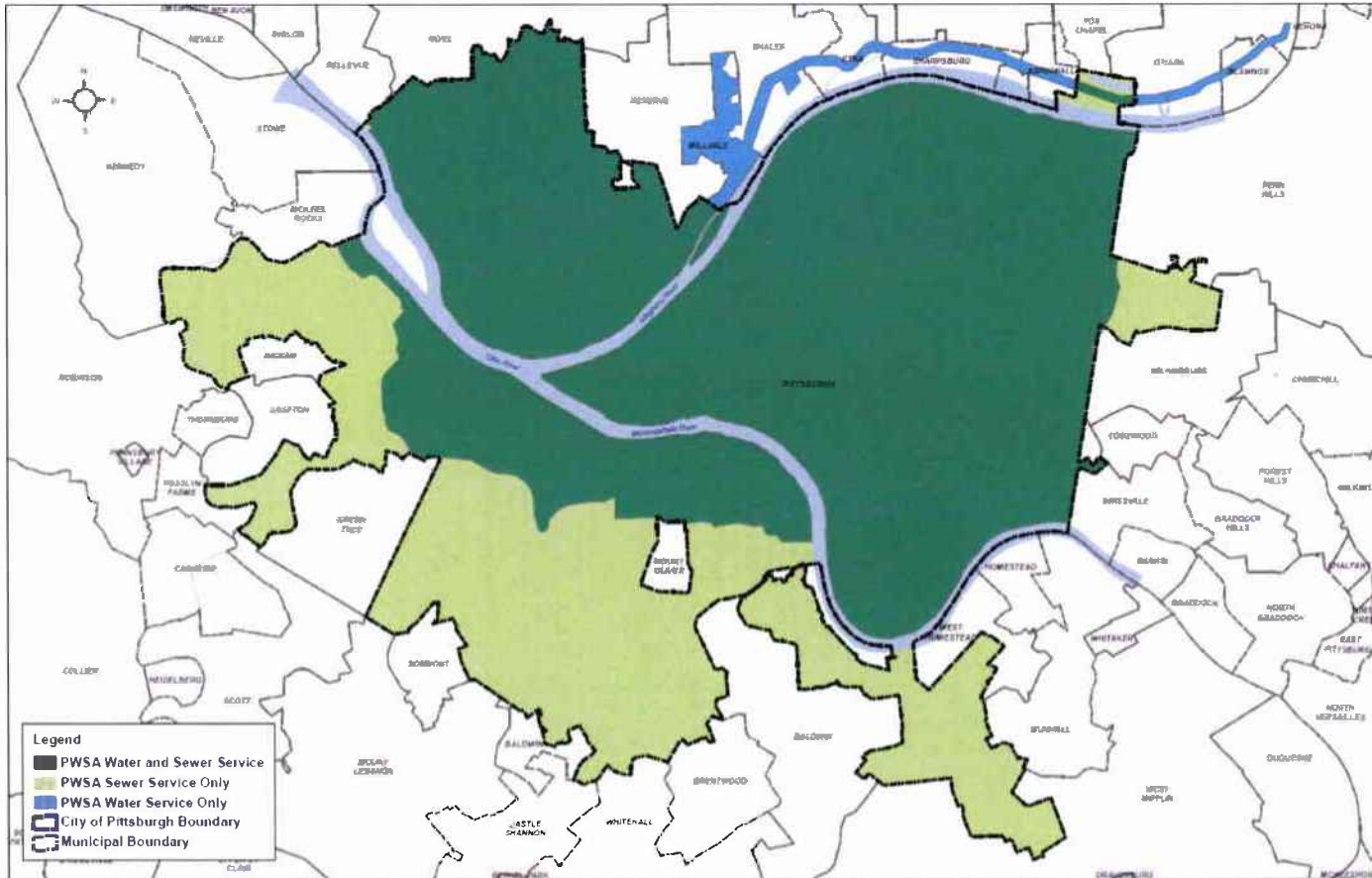
Source

1) Moody's Analytics Pittsburgh Metro Precis Report (January 2019)

2) 2018 City of Pittsburgh Comprehensive Annual Financial Report



# PWSA Service Area



# PWSA Customer Base

## Large and diverse customer base provides stable and consistent revenues

### 2018 Top Ten Largest Customers by Consumption

Rank	User	% of Total Consumption
1	Fox Chapel Water Authority	7.60
2	Allegheny County Government	1.30
3	University of Pittsburgh	1.20
4	Reserve Water Department	1.10
5	Borough of Aspinwall	0.08
6	Veterans Affairs Financial Services	0.08
7	Housing Authority of the City of Pittsburgh	0.07
8	West Penn Hospital	0.06
9	Carnegie Mellon University	0.06
10	Allegheny Commons East Association	0.05
<b>Total</b>		<b>11.60<sup>(1)</sup></b>

Note:

<sup>1</sup> Totals do not add due to rounding

### 2018 Water Consumption by Customer Classification

User	# of Customers	Percentage of Usage
Residential	71,776	35%
Commercial	6,902	32%
Industrial	97	2%
Wholesale	16	15%
Other	3,946	16%
<b>Total</b>	<b>80,605</b>	<b>100%</b>

- Provides ample water supply to a population of approximately 306,000
- 10 largest customers account for less than 12% of revenues
- Five largest customers (~11% of total revenue) have been in the System for at least 75 years
- In addition to its sales to residential, commercial, and industrial customers, PWSA has agreements with the five adjacent municipalities or authorities listed below with three of those being wholesale water customers:
  - Fox Chapel Water Authority (Wholesale Customer)
  - Reserve Township (Wholesale Customer)
  - Borough of Aspinwall (Wholesale Customer)
  - Hampton-Shaler Water Authority
  - West View Water Authority
- PWSA purchased the neighboring Borough of Millvale's water system in 2010, adding nearly two thousand customers to its customer base



## Section III.

# Water and Sewer System Facilities and Operation



# Water System Overview

## System Supply

- Sole source of water for the Water System is the Allegheny River
- Authority and its predecessors have held withdrawal permits since 1943

## Treatment, Pumping, and Distribution Facilities

- 117 MGD rapid sand water treatment plant near the Borough of Aspinwall
- 26 MGD secondary membrane micro filtration plant in the Highland Park section of the City to retreat water from the Highland #1 Reservoir (enabling the reservoir to remain uncovered) before it goes into the water distribution system
- 964 miles of water mains plus 80,864 individual service connections
- 24,900 valves
- 7,450 fire hydrants
- 11 pumping stations (one raw water, two finished water, and eight distribution)
- Four reservoirs (one uncovered source water and three covered finished water) and 10 distribution storage tank reservoirs with 455 million gallons of total capacity (two to three days of uninterrupted supply)

## Production and Demand

- In 2018, the water treatment plant treated over 24.8 billion gallons of water
- Average withdrawal is approximately 70 MGD



**Lanpher Reservoir Cover**



**Water Treatment Plant**



# Sewer System Overview

## Overview

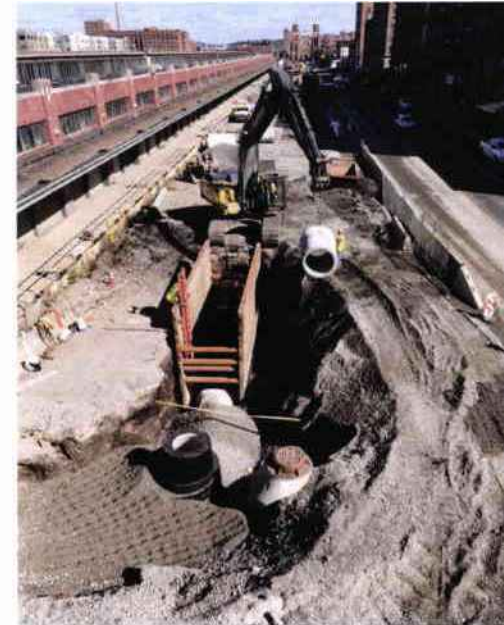
- Conveys wastewater collected from 24 neighboring suburban municipalities and generated within City boundaries to ALCOSAN interceptors along the rivers of the City for conveyance to ALCOSAN's Woods Run Sewage Treatment Plant (the "WWTF") on the Ohio River

## PWSA Sewage Collection and Pumping Facilities

- Comprised of an extensive network of approximately
  - 1,213 miles of sanitary, storm, and combined sewers
  - 29,000 manholes (which includes flow dividers and diversion chambers)
  - 30,000 inlets (which includes catch basins and storm inlets)
  - 38 combined sewer overflow (CSO) outfalls
  - 185 storm sewer outfalls
  - Four wastewater pump stations
  - Approximately 23% of the PWSA Sewer System consists of separate sewers that consist of dedicated separate sanitary and storm sewer pipelines

## ALCOSAN Treatment Capacity

- Permitted dry weather capacity of 190 MGD and wet weather capacity of 250 MGD
- Flow regulation at the plant limits peak wet weather flow to the permitted capacity
- Combined sewage which exceeds the capacity of the flow regulators at the trunk sewers, interceptors, and the WWTF is discharged as CSOs to receiving waters
- ALCOSAN maintains 53 diversion structures and an additional 153 diversion structures are maintained by the PWSA and other authorities
- Major upgrades to the WWTP are mandated by the USEPA COA Recently Negotiated with Between EPA and ALCOSAN



**Smallman Street Sewer**

# Relationship Between PWSA and ALCOSAN

## The Pittsburgh and Water Authority (“PWSA”)

- Approximately 77% of PWSA’s Sewer System is combined sewers that are designed so that during wet weather events a portion of the collected stormwater and diluted wastewater that exceeds ALCOSAN’s conveyance and treatment capacity is discharged into natural waters through 98 combined sewer overflow (“CSO”) diversion chambers, some of which includes PWSA’s CSO
- PWSA’s combined sewers also convey wastewater from 24 neighboring suburban municipalities pursuant to agreements with the City
- The remaining 23% of the Sewer System includes dedicated separate sanitary sewers and storm sewers
- The PWSA serves as the billing agent for ALCOSAN

(All 83 municipalities and authorities are billing agents for ALCOSAN)

## Allegheny County Sanitary Authority (“ALCOSAN”)

- ALCOSAN Established in 1947 Provides County-wide Sewage Treatment
- Wastewater is conveyed from the PWSA’s Sewer System to ALCOSAN interceptors located along rivers and tributaries which deliver flow to ALCOSAN’s WWTF for treatment prior to discharge into the Ohio River
- ALCOSAN’s interceptor system includes shallow-cut pipes, deep tunnels, and diversion structures to which PWSA’s sewer system connects
- The ALCOSAN WWTF currently operates under the National Pollutant Discharge Elimination System Permit No. 0025984
- In total, the ALCOSAN WWTF receives wastewater flows from 83 municipalities and authorities

# Environmental Regulation

## Consent and Order Agreement with DEP Replaced with Consent Decree with the USEPA

### Clean Water Act Section 308 Information Request

- PWSA's Consent and Order Agreement ("COA") with the DEP expired in March 2015. The City and PWSA as joint permit holders requested that the USEPA become the primary regulatory body to which the Authority is responsible
- On January 21, 2016, the USEPA issued a Clean Water Act Section 308 Information Request to the Authority
- The nature of the request is to provide a jurisdictional basis for USEPA to engage the Authority/City in an enforcement action by consent, or a Consent Decree ("CD"), which requires the PWSA to:
  - Submit detailed information on past CSO performance and activities
  - Conduct a green infrastructure ("GI") and source reduction study for the service area, followed by GI demonstration projects
  - Continue implementing Nine Minimum Controls to reduce combined sewer overflows and perform repairs and maintenance of deficiencies
    - Ongoing sewer line replacement, point repair, lining, point lining, and Gunite projects have been implemented to address structural deficiencies
  - Submission of monthly reports updating the progress of evaluations and improvements as well as water quality impacts
- The PWSA hired two international engineering firms to assess and model the Sewer System, and has fulfilled the first portion of the USEPA 308 request due by March 31, 2016
- The second phase of the USEPA request required a GI and source reduction study which was completed in November 2016 and titled PWSA's Green First Plan. Four GI demonstration projects have been completed and additional projects are in design for construction in 2019 and 2020 to show how the Green First Plan will contribute to Regional Water Quality improvement

# Environmental Regulation (con't.)

## Ongoing Commitment to Maintain Regulatory Compliance

### Effects of the Consent Decree

- An additional 308 request from EPA was received in October of 2016 seeking more detailed information and further actions regarding the assessment of the PWSA's Sewer System
  - This response was delivered on time in January 2017 and continues to require additional monthly reporting. The demonstration project evaluations were submitted on time on December 1, 2017
- The PWSA's Green First Plan is a comprehensive regional CSO and SSO reduction implementation plan for the City and other communities that proposes at least \$46 million for stream removal projects and at least \$690 million for distributed GI and source control projects over the next 20 years to achieve the required CSO control levels. The PWSA, along with the other impacted local municipalities, is awaiting a response from the USEPA and the DEP on its proposed regional plan. PWSA and the City also intend to defray its ratepayer costs by obtaining ALCOSAN Grants.
- Given the broad scope of a potential CD, the size of the City Sewer System, and the various conditions and/or deficiencies that may be discovered by the assessment, it is difficult to predict the total cost of compliance with the CD; however, PWSA's integrated management approach will provide the least cost strategy for PWSA, and will present more opportunities for PWSA to be awarded Grow Funds from ALCOSAN
- It is also difficult to predict what, if any, large scale and/or regional capital improvements may be required after the completion of the assessment to address wet weather sewer overflows in the PWSA and in the ALCOSAN service areas
- Costs associated with CD and COA compliance will be reflected in the capital improvement program and funded by proceeds of potential future bond issuances
- The PWSA is implementing Integrated Planning with the other 11 municipalities in the Saw Mill Run Watershed. Integrated Planning is now permitted under the Clean Water Act to provide greater flexibility to prioritize and schedule projects that provide the greatest environmental and health benefits



# Cybersecurity and Resiliency

## Cybersecurity

- The PWSA has engaged the U.S. Department of Homeland Security to conduct Cyber Hygiene vulnerability scans. Weekly reports will be delivered to the PWSA describing the results
- The PWSA has a current cyber risk insurance policy that covers computer fraud, funds transfer fraud, and E-commerce extortion. In addition, the policy covers expenses related to crisis management, security breach remediation, computer program and electronic data restoration, and business interruption expenses

## Data and Asset Security

- Firewall hardware and anti-virus software are in place. A third party managed services contractor identifies and recommends server and device patching/updates
- Homeland Security and the FBI are assisting PWSA evaluate and plan upgrades to address any existing deficiencies

## Phishing

- Since July 2018, the PWSA has conducted three phishing training campaigns with all users via a third party service. Additionally, a “Report a Phishing Email” button was added to MS Outlook for all users

## Disaster Recovery Plan

- The PWSA has partnered with a third party to provide disaster recovery and business continuity services

## Section IV.

# Capital Improvement Plan and Capital Planning



# Capital Planning Process

## Overview

- The PWSA Capital Improvement Program (“CIP”) focuses on sustaining cost-effective operations, while optimizing the system's asset performance and life expectancy

## Development and Approval Process

- The Annual CIP process begins each year around March/April when project nominations are solicited from the entire organization
- Following the nomination period, the Finance and Engineering departments evaluate nominated projects and make recommendations for what should be considered for immediate priorities.
- Further planning efforts consist of the preparation of a Project Sheet, which provides more detailed information on a project’s potential scope options, risks, schedule, and the development of a preliminary cost estimate
- This process lasts several months and culminates with the presentation of the updated CIP to PWSA’s Board of Directors

## Capital Project Prioritization: PADEP Intends to Review And Approve CIP And Projects Priorities As Part of An ACO Process

- The following criteria are used to evaluate and prioritize capital projects:
  - Safety – Potential health and safety risks to personnel and the public if action is not taken
  - Regulatory Compliance – Regulatory compliance schedule and potential fines for non-compliance
  - Reliability/Operational Flexibility – Location, age, and condition of infrastructure and risk if action is not taken
  - Capacity – Meets community health needs and growth, as needed
  - Operations and Maintenance Efficiency – Potential for operating cost savings
  - Regional Cooperation/Stewardship – Coordination with external stakeholders or meeting the communities needs
  - Level of Service – Improvement to customer service
  - Sustainability – Energy efficiency and “green” approach to improving water quality

# Capital Planning: Water Distribution System

## **Water Main Replacement Program Overview**

- The PWSA has approximately 960 miles of water mains with an average age of approximately 80 years old with more than 40% installed prior to 1920
- Given the age of the water distribution system, the PWSA is initiating an aggressive water main replacement program to improve Water System reliability and water quality, reduce water main breaks, water loss and source disruptions, and ensure sufficient water pressure
- The PWSA has a short-term goal of replacing small diameter water mains at an annual replacement rate of 20 miles per year over the next several years with the long-term goal of an average replacement rate of 10 miles per year
- This ongoing capital program will have capital expenditures that are projected to range from \$10 million to \$40 million per year

## **Water Main Condition Assessment and Prioritization**

- A formalized condition assessment and project prioritization system is currently being developed for both small and large (16 inches or larger) diameter mains to target capital investment under a formalized asset management program
- For small diameter water mains, a prioritization model is being used that takes into account the availability of data to anticipate the likelihood (pipe diameter, fire flow improvements, pipe break history, lead service lines, working pressure, and pipe age criteria) and consequences of failure (water main location, traffic functional classification, and critical facilities criteria) as well as water quality impacts. Future evaluations will use a more comprehensive evaluation of each water main segment using available GIS data and the recently updated hydraulic model and will be integrated into an updated Water Supply Master Plan and CMMS development

## **Coordination with Other Infrastructure Investments**

- Water main replacement will be coordinated with other PWSA projects including lead service line removal projects as well as other utility and City projects to reduce overall costs

# Capital Planning: Water Treatment, Storage and Pumping

## Water Treatment Program Overview

- Primary project improvements include: River Intakes, Raw Water Pump Stations, and Standby Power Systems (some are now under construction)
- Improve chemical feed and automated controls
- Modify chemical dosing rates and feed locations to optimize treatment
- Upgrade electrical and SCADA system to optimize control and plant efficiency

## Water Pumping and Storage System Condition Assessment and Prioritization

- A formalized condition assessment and project prioritization has been implemented to prioritize maintenance and upgrade Improvements.
- Comprehensive pressure monitoring and corrosion chemical measurement now operating to address PADEP concerns about localized issues
- Future evaluations will use a more comprehensive evaluation of each key rising main using available GIS data and the recently updated hydraulic model and will be integrated into an updated Water Supply Master Plan and CMMS development

## Coordination with Other Infrastructure Investments

- PWSA's capital program will be prioritized to ensure operational risk of failure is minimized

# PWSA FY 2019 – 2023 Capital Improvement Plan

## High Priority Capital Projects

### Water Pumping and Storage:

- Combined High Service Pump Station:
  - \$53,620,000
- Lanpher Reservoir:
  - \$49,454,000
- Highland No. 2 Reservoir and Cover Liner Replacement:
  - \$27,510,000

### Water Distribution:

- Washouts – Identification:
  - \$13,140,000
- Small Water Main Replacements (Includes lead service replacements where found):
  - \$10,000,000 - \$40,000,000 annually based upon funding availability

### Water Treatment Plant:

- Clearwell Improvements:
  - \$67,810,000

### Sewer System:

- 31st Ward Sewer System Improvements:
  - \$13,730,000
- Large/Small Diameter Sewer Rehabilitation:
  - \$10,000,000 - \$15,000,000 annually

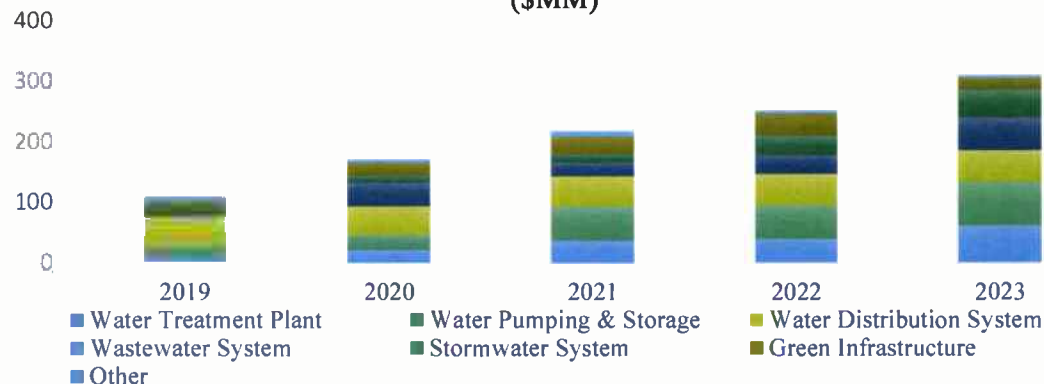
## Sources of Funds Forecast (\$MM)

Funding Source	2019	2020	2021	2022	2023	Total
Debt (Revenue Bonds) <sup>(1)</sup>	77.5	145.3	211.0	243.1	300.2	977.1
PENNVEST	27.0	22.1	-	-	-	49.1
Cash (Pay-Go)	5.0	2.0	7.0	7.0	8.0	29.0
<b>Total</b>	<b>109.5</b>	<b>169.4</b>	<b>218.0</b>	<b>250.1</b>	<b>308.2</b>	<b>1,055.2</b>

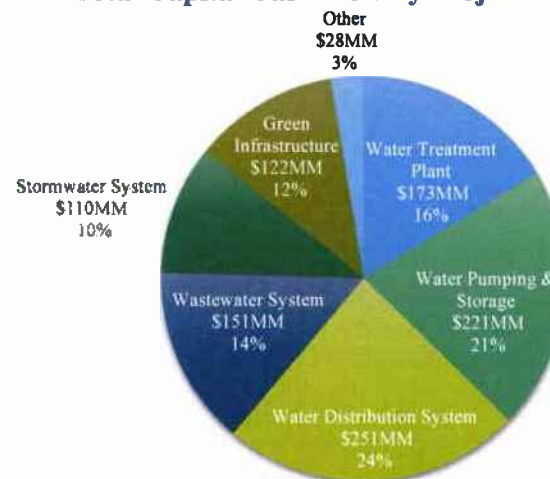
Note:

(1) Assumes all senior lien bonds other than \$125 million in subordinate bonds in FY 2023.

## Annual Capital Cash Flow Forecast by Project Class (\$MM)



## Total Capital Cash Flow by Project Class





# Consulting Engineer's 2018 Annual Report

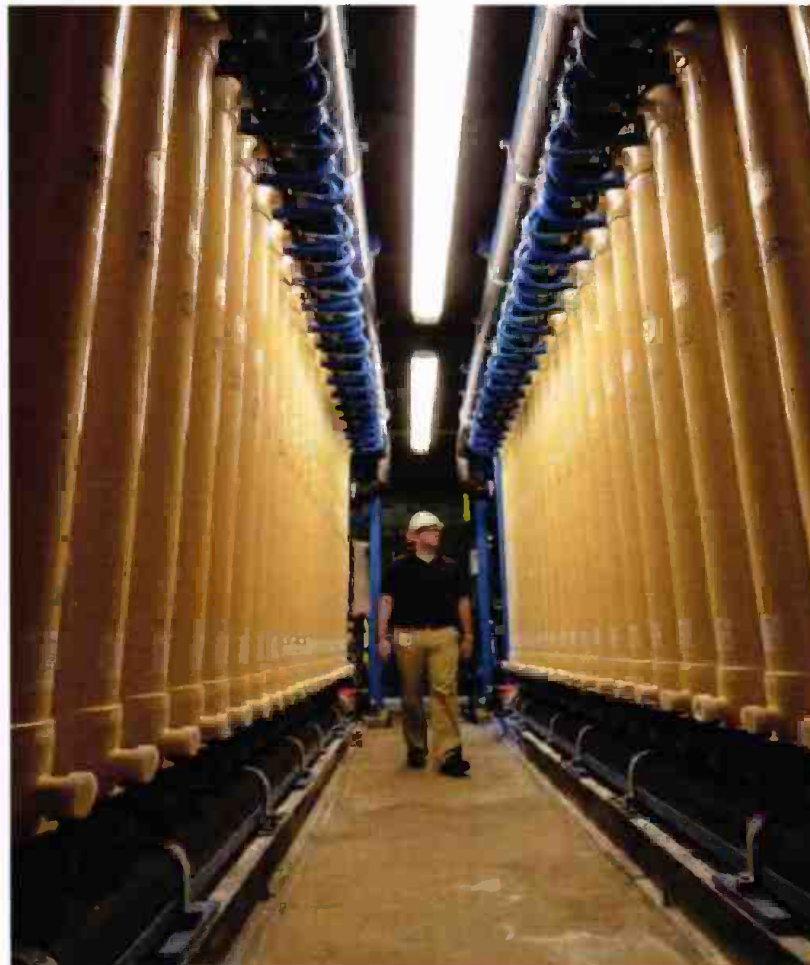
## Overview

- The System is described as functional but in need of significant upgrades to satisfy future operational needs.
- All critical recommendations and a majority of the recommended system upgrades are included in the current CIP
- *“During 2018, the PWSA made significant progress on their quest to improve the water, sewer, stormwater and operational systems for which they are responsible.”*
- *“In summary, it is the opinion of the Consulting Engineer, based on our understanding of the proposed rate increases, and the progress made during 2018, that the Capital Improvement Plan 2019 coupled with the oversight of the Commission, there will be sufficient funds to advance the goals and obligations of the PWSA.”*



## Section V.

# Financial Condition of the Authority





# PWSA Rate Setting History

## Demonstrated Ability to Raise Rates to Meet Financial Obligations

### 2018 Rate Increase

- In November 2017, the PWSA Board of Directors adopted a new schedule of rates and charges that was effective on January 1, 2018, and superseded the rate schedule adopted in 2016
- The Authority approved rate increases in aggregate by 49% from the rates in effect in 2017 through the following schedule:
  - 28% in 2018 – rate approved by PWSA Board and enacted
  - **10% in 2019 – approved by the PWSA but not implemented**
  - **11% in 2020 – approved by the PWSA but not implemented**
- *The PUC rate-setting process superseded the 2019 and 2020 schedule of rates and charges adopted by the PWSA Board of Directors in November 2017*

### 2019 Rate Increase

- On February 7, 2019, the PUC approved a joint settlement that will increase rates approximately 13% (a 3% increase compared to the rate increase that was approved in 2017 by the PWSA Board of Directors but superseded by PUC Oversight), resulting in increased annual revenues of \$21 million
- Details on the PUC Oversight and rate approval process are included on the following slide

**PWSA Rate Setting History<sup>(1,2)</sup>**

Year	Residential		Commercial		Industrial		Wholesale	Health and Education		DISC
	Rate (\$)	Increase (%)	Rate (\$)	Increase (%)	Rate (\$)	Increase (%)	Increase (%)	Rate (\$)	Increase (%)	Rate (%)
2010	7.50	0.00	7.19	0.00	6.74	0.00	0.00	9.83	0.00	0.00
2011	8.08	7.70	7.74	7.70	7.26	7.70	7.70	10.59	7.70	5.00
2012	8.48	5.00	8.13	5.00	7.62	5.00	5.00	11.12	5.00	7.00
2013	8.48	0.00	8.13	0.00	7.62	0.00	0.00	11.12	0.00	7.00
2014	9.38	9.60	9.15	11.00	8.37	9.00	1.80	13.55	17.90	7.00
2015	9.58	2.10	9.34	2.00	8.55	2.10	Var.	13.84	2.10	7.00
2016	9.65	0.70	9.41	0.70	8.61	0.70	Var.	13.94	0.70	7.00
2017	11.80	22.30	11.42	21.30	10.40	20.80	Var.	17.04	22.20	0.00
2018	16.33	38.40	15.04	31.70	13.08	25.80	Var.	19.85	16.50	0.00
2019	18.47	13.10	17.04	13.30	14.79	13.10	Var.	22.53	13.50	0.00

**Notes:**

- 1) Rate per 1,000 gallons over minimum use per month
- 2) Increase represents percentage increase over prior year

# New PUC Rate-Setting Process

## Act 65 brings PUC oversight to PWSA's rate-setting process

### PUC Oversight

- Act 65 was enacted by the legislature on December 21, 2017 and established the Authority as a “Utility,” resulting in PUC regulation of the PWSA’s rate making, operating effectiveness, debt issuance, and other aspects of conducting business
- *Includes provisions to impose, charge, or collect rates or charges as necessary to permit the Authority to comply with its bond and financing covenants*
- The initial rate filing process requires the Authority to also file a compliance plan related to information technology, accounting, billing, collections, and other operating System procedures as well as a long-term infrastructure plan
- The PUC rate-setting process can last a **maximum of 270 days (or about 9 months)** unless all parties agree on a joint settlement sooner
- The PUC has been supportive in helping the PWSA achieve its operational and financial objectives

### 2018 PUC Rate-Setting Process and 2019 Results

- On July 2, 2018, the PWSA filed Tariff Water – Pa. P.U.C. No. 1 (Water Tariff) and Tariff Wastewater – Pa. P.U.C. No. 1 (Wastewater Tariff). Through these filings, the PWSA requested that the Commission approve its new tariffs pursuant to Act 65 of 2017, 66 Pa.C.S. § 3201 et seq. The PWSA proposed increases to water and wastewater total annual operating revenues of approximately \$27 million per year or 17.1% on a total revenue basis over the amount of annual revenues at present rates
- On February 7, 2019, the Commission voted 5-0 to approve a joint settlement which will increase revenue by \$21 million per year (13%), effective March 1, 2019
  - The PWSA’s 2019 budget reflects the PUC approved rates and bolsters revenues
- Also addressed:
  - The ongoing program for the replacement of lead service lines, including the formation of the Community Lead Response Advisory Committee, and related coordination with the City of Pittsburgh
  - Customer service issues including the modification of customer bills, revisions in customer termination notices, the availability of payment arrangements as permitted by Ch. 14 of the Public Utility Code
  - Low-income customer issues such as the collection of additional data, funding for the Bill Discount Program and its availability to eligible consumers, and the formation of the Low Income Assistance Advisory Committee that will include the Commission’s Bureau of Consumer Services, the Dollar Energy Fund, and local community and social service groups

# Billing and Collections History and Procedures

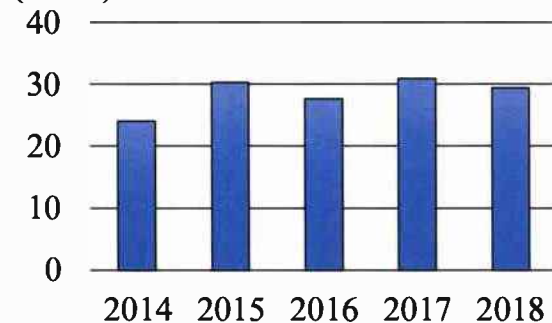
## PWSA Collections History <sup>(1)</sup>

2014-2018

Year	Cash Collections (\$MM)	YOY % Increase
2014	158.2	-
2015	164.9	4.24%
2016	174.3	5.70%
2017	190.1	9.06%
2018	233.1	22.62%

## PWSA Net Accounts Receivables <sup>(1)</sup>

(\$MM)



Source:

1) As per 2014, 2015, 2016, 2017, and 2018 financial audit

## **PWSA Water and Sewer Services**

- Sales revenue is recognized as earned during the period when water and sewer services are supplied to customers
- Customers are billed on a monthly billing cycle by the Authority based on actual or estimated meter readings
- Unbilled accounts receivables for service provided prior to year-end is billed during the following year
- Bills are due 20 days after the billing date and interest is applied on the next invoicing date
- Collections calls are made to customers of any accounts eligible to be terminated
- If the customer is unresponsive, liens can be applied to the property for non-payment
- Water services are terminated when necessary

## **ALCOSAN Services**

- Although PWSA does not provide wastewater treatment, since 2004 it has assumed responsibility as ALCOSAN's agent for billing and collecting wastewater treatment service charges to PWSA customers
- ALCOSAN bills PWSA quarterly while PWSA bills customers monthly
- Given PWSA's role as billing agent, revenues collected for ALCOSAN and associated expenses should be netted out in assessing PWSA's cash as a percentage of operating expenses

# Affordability Procedures for Low-Income Customers

**The PWSA is proud to offer a customer assistance program that helps customers who need it most**

## **Bill Discount Program**

- The Bill Discount Program provides eligible customers with a 50% discount on PWSA's fixed water and wastewater conveyance charges for one year
- Customers earning an annual income that is at or below 150% of the federal poverty level are eligible for the Bill Discount Program
- The Bill Discount Program applies to renters when the tenant is the responsible billing party
- Additional information on the customer assistance programs can be found at:  
<http://www.pgh2o.com/CAP>

## **Winter Shut Off Moratorium**

- The Winter Shut Off Moratorium provides qualifying customers with the assurance that their water service will not be shutoff from December 1<sup>st</sup> through March 31<sup>st</sup>
- The Winter Moratorium is available to single-family residential customers earning an annual income that is at or below 250% of the federal poverty level

## **Bill Discount Eligibility Chart**

People in Household	Annual Income Eligibility (150% of Federal Poverty Level)
1	\$18,090
2	\$24,360
3	\$30,630
4	\$36,900
5	\$43,170
6	\$49,440
7	\$55,710
8	\$61,980
For more than 8 people, add this amount for each additional person	\$6,270

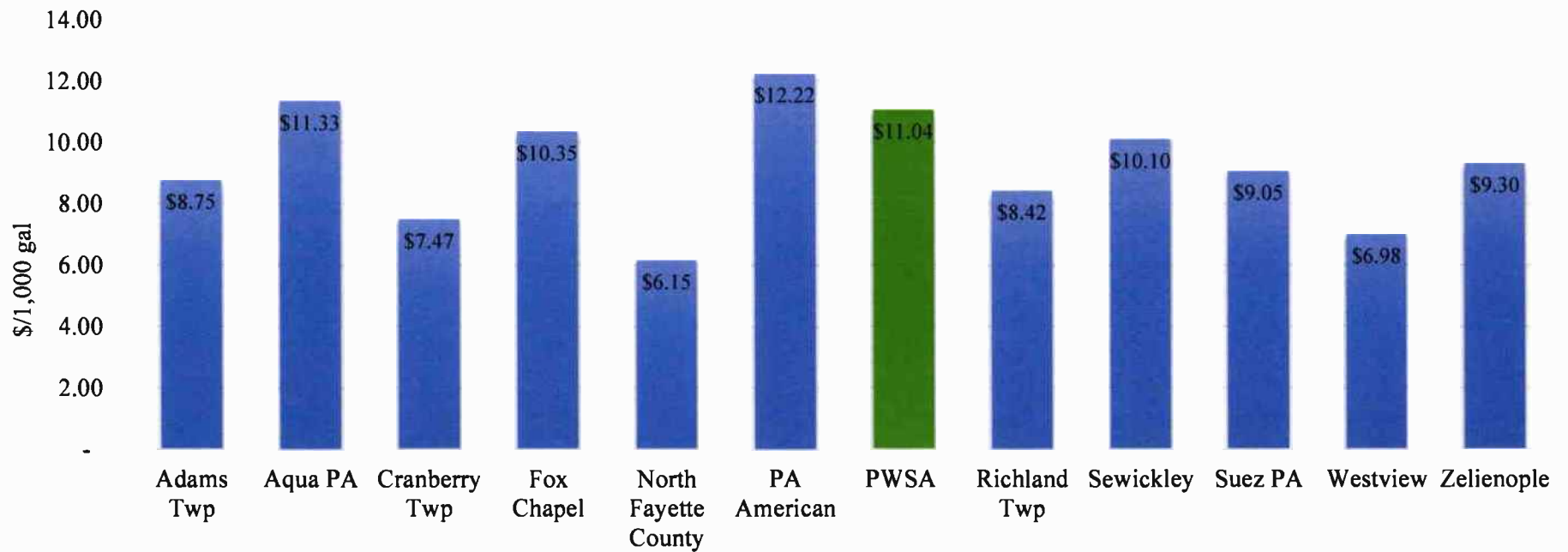
## **Winter Shut Off Eligibility Chart**

People in Household	Annual Income Eligibility (250% of Federal Poverty Level)
1	\$30,150
2	\$40,625
3	\$51,050
4	\$61,500
5	\$71,950
6	\$82,400
7	\$92,850
8	\$103,300
For more than 8 people, add this amount for each additional person	\$10,450



# Comparable Water and Sewer System Use Charges

## Water System Rate Comparison, 2019<sup>(1)</sup>



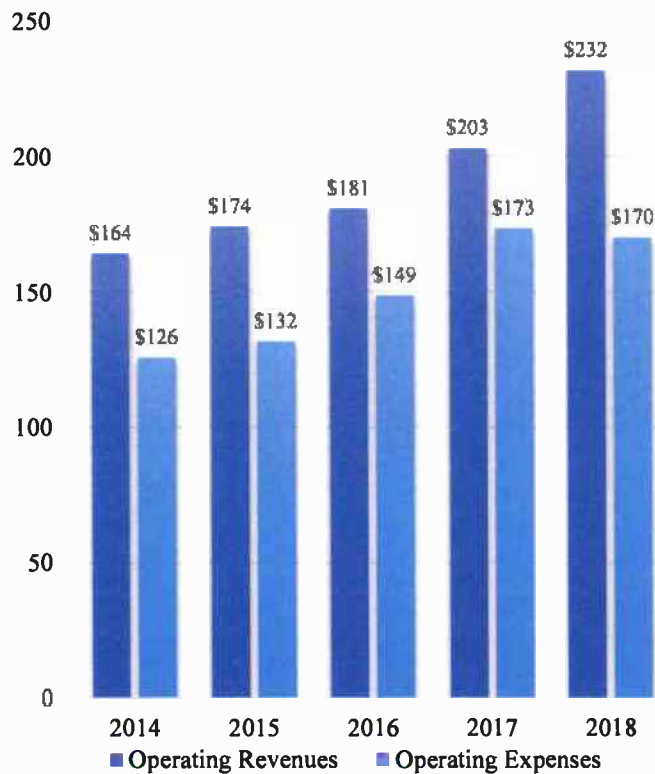
Source:

1) The Pittsburgh Water and Sewer Authority

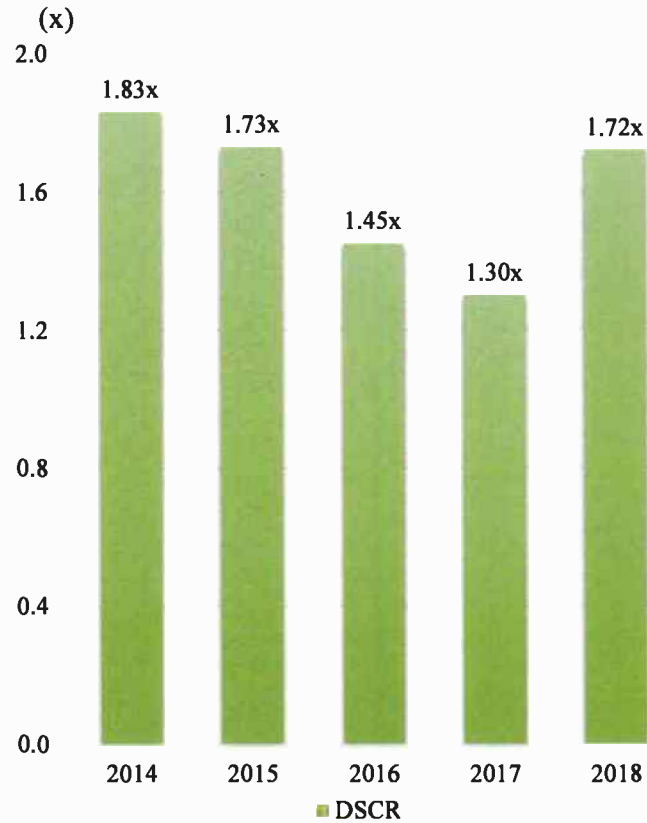
# Historical & Current Financial Operations and Debt

## Service Coverage

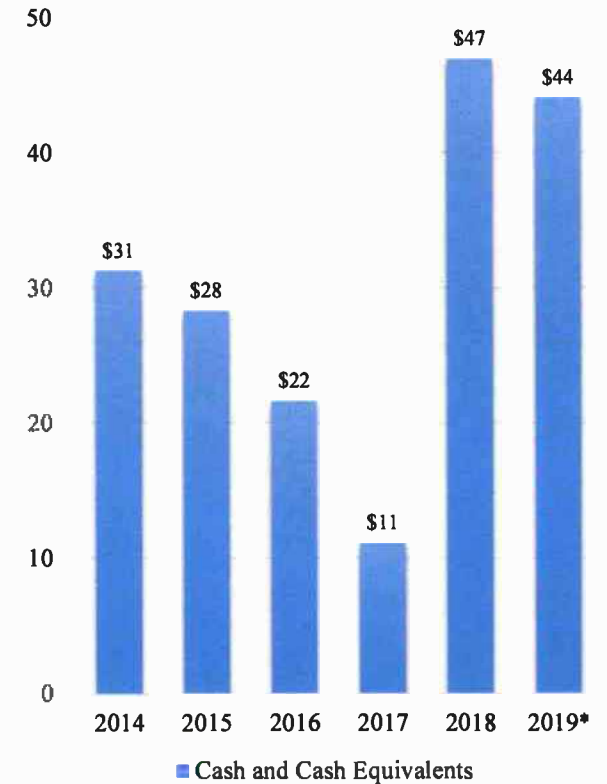
**Operating Revenue & Expenditures**  
(\$MM)



**Debt Service Coverage<sup>(1)</sup>**



**Cash and Cash Equivalents**  
(\$MM)



**Notes:**

1) Rate Covenant debt service coverage calculations through FY 2018 include unrestricted Revenue Fund cash and investments at the beginning of the year. Starting in FY 2019, unrestricted Revenue Fund cash and investments will no longer be used to compute Rate Covenant compliance under the Amended and Restated Trust Indenture

**Notes:**

\* As of 05/09/2019 (Cash Basis)



# Financial History

## Audited Financial Statements <sup>(1)</sup>

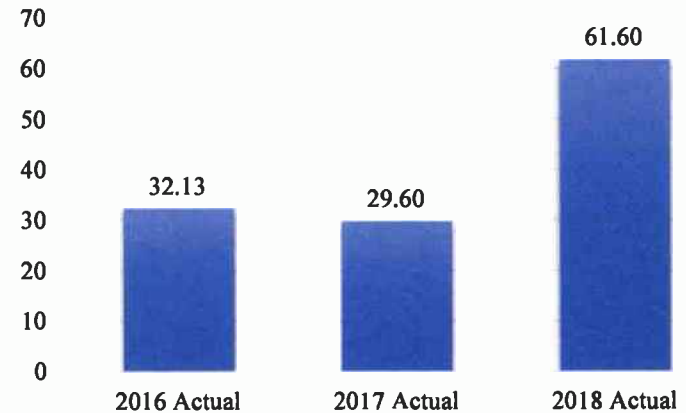
(\$000)

	FY 2016	FY 2017	FY 2018
<b>Operating Revenues</b>			
Residential Water and Conveyance Sales	\$ 113,818	\$ 128,488	\$ 159,506
Wastewater Treatment (ALCOSAN)	62,125	68,935	67,261
Other	4,784	5,573	4,967
<b>Total Operating Revenues</b>	<b>\$ 180,727</b>	<b>\$ 202,996</b>	<b>\$ 231,734</b>
<b>Operating Expenses</b>			
Direct Operating Expenses	\$ 60,687	\$ 71,156	\$ 72,633
Wastewater Direct Expenses	62,125	75,107	71,822
Cooperation Agreement Costs	7,150	5,363	4,911
Subsidy of Customers Located in the City	1,974	5,594	3,814
Depreciation	16,657	16,172	16,894
<b>Total Operating Expenses</b>	<b>\$ 148,593</b>	<b>\$ 173,392</b>	<b>\$ 170,074</b>
<b>Net Operating Income</b>	<b>\$ 32,134</b>	<b>\$ 29,604</b>	<b>\$ 61,660</b>
<b>Other Revenues (Expenses)</b>			
Donated Property	\$ 981	\$ 1,595	\$ 13,649
Interest Revenue	383	460	469
Inv. Inc. Change From Market Swap Value	1,690	835	2,542
Interest & Amortization	(36,966)	(34,913)	(34,365)
Bond Issuance Costs	-	(3,894)	-
<b>Total Other Revenue (Expenses)</b>	<b>\$ (33,912)</b>	<b>\$ (35,917)</b>	<b>\$ (17,705)</b>
<b>Special Item</b>			
Private Lead Line Replacement	-	-	\$ (4,478)
<b>Net Income / (Loss)</b>	<b>\$ (1,778)</b>	<b>\$ (6,313)</b>	<b>\$ 39,477</b>

Source:

1) As per 2016, 2017, and 2018 financial audit.

## Net Operating Income (\$MM)

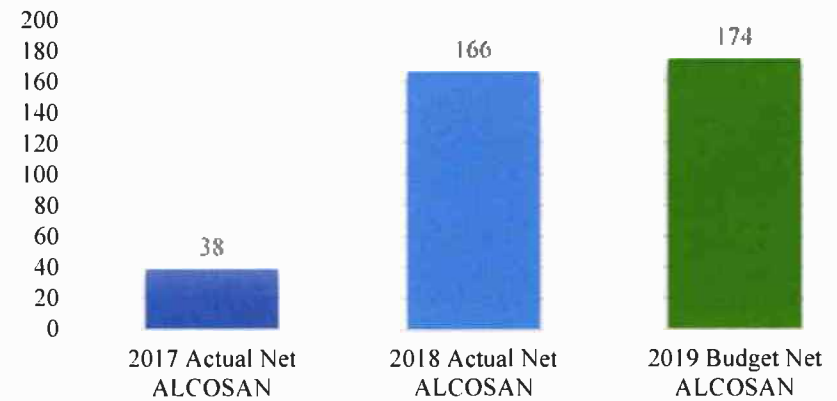




# Summary of Year-to-Date FY 2019 Budget

	2019 Budget	YTD 2019 Actual <sup>1)</sup>
<b>Receipts</b>		
Water and Conveyance	\$183,756,758	\$50,742,363
ALCOSAN Collections	74,971,805	21,768,296
Other Misc. and Fee Operating Receipts	5,412,936	1,443,331
<b>Total Receipts</b>	<b>\$264,141,499</b>	<b>\$73,953,900</b>
<b>Operating Expenses</b>		
Executive Director's Office	\$3,012,463	\$1,253,941
Customer Service	7,622,863	2,287,230
Management Information Systems	3,534,194	548,889
Finance	4,618,298	468,379
Procurement	577,151	110,054
Human Resources	1,434,270	475,626
Legal	2,822,799	1,052,639
Warehouse	405,818	141,828
External Affairs	1,297,622	266,879
Engineering and Construction	16,640,577	1,381,628
Environmental Compliance	4,776,195	474,004
General Administration	36,000	9,781
Water Quality	3,825,075	592,444
Water Treatment Plant	21,315,738	5,569,220
Water Distribution	24,004,868	8,114,959
Sewer Operations	15,903,795	3,998,359
ALCOSAN Expenses	75,484,220	25,461,346
Co-Op Expenses	7,000,000	4,007,008
Non-City Water Subsidy	1,700,000	893,350
<b>Total Operating Expenses</b>	<b>\$196,011,946</b>	<b>\$57,107,564</b>
<b>Net Operating Income</b>	<b>\$68,129,553</b>	<b>\$20,273,120</b>
<b>Transfers to Reserves</b>		
Transfer to Reserves	2,510,983	836,994
<b>Debt Service</b>		
Bond Debt Service	\$54,175,208	\$24,849,326
PENNVEST Debt Service	\$3,940,108	1,281,359
<b>Total Debt Service</b>	<b>\$58,115,316</b>	<b>26,130,685</b>
<b>Total Costs</b>	<b>\$254,127,259</b>	<b>\$84,075,243</b>
<b>Net Cashflows</b>	<b>\$10,014,240</b>	<b>\$(10,121,343)</b>

**Days Cash on Hand (DCOH) Netting Out ALCOSAN Expenses**



- Although the PWSA acts as the billing and collecting wastewater treatment service charges to PWSA customers, the PWSA is not responsible for these operations. The ALOCSAN expenses have been netted out to compute an adjusted day cash on hand
  - Days Cash on Hand without netting out the ALCOSAN expenses were:
    - 2017 Actual: 23
    - 2018 Actual: 100
    - 2019 Budget: 104

**Note:**

1) As of 04/30/2019 (Cash Basis)





# Pension and Retirement Benefits

## Pension Overview

- Employees of the PWSA have historically participated in the City's Municipal Pension Fund Plan ("Plan") and the City's obligations relative to the Plan were determined in accordance with various Pennsylvania statutes
  - Employees who became members prior to January 1, 1998 are required to contribute 5%
  - Those who became members after January 1, 1998 are required to contribute 4%

## Recent Pension Developments

- During negotiations regarding the new Cooperation Agreement, the City and the PWSA determined a payment of approximately \$3.9 million for the PWSA's share for the year ended December 31, 2018
  - Calculated based on the percentage of its covered payroll to the total covered payroll, which approximates 15.4%

## 457 Plan

- Employees of the PWSA have the ability to participate in a voluntary 457 plan
- All contributions are made up of 100% pre-tax and/or after-tax employee salary deferrals

## 401(a) Plan

- Beginning July 1, 2019, all new full-time non-union employees will be eligible to participate in a 401(a) retirement plan instead of being enrolled in the City's Municipal Pension Fund Plan

## Section VI.

# Pro Forma Projections



# Implementing Financial Planning

## The PWSA will continue implementing and achieving sound fiscal management

Following financial difficulties in the past, the PWSA has had significant success implementing financial policies and objectives that have reversed its trend of performance issues:

### Past Performance Issues

- Decades of Minimal Investment in Infrastructure
- Lack of Budget for Maintenance and Upgrades
- “Fix it When it Fails” Mentality
- Frequent Leadership Changes
- Inconsistent Regulatory Compliance

### Current Performance Achievements

- 5-Year \$1 Billion Capital Plan
- Staffing and Equipment at Needed Levels
- Implementation of Financial Policies and Improved Financial Reporting
- Getting Ahead of the Curve on Replacement
- New, Committed Executive Leadership Team
- New Compliance Team, Using State of the Art Reporting

**In addition to the achievements listed above, the PWSA will additionally strive to achieve the following in accordance with the PGH<sub>2</sub>O 2030 12-year PWSA plan:**

#### Utilizing Additional Financing Sources

- Exploring Commonwealth and Federal programs, including grants and low-interest loans
- The PWSA has a proven track record of successfully competing for these funding programs and is in a strong position to continue to do so moving forward

#### Implementing Financial Policies

- The PWSA has and will continue to adopt and follow best practices for financial policies and governing principles
  - Providing guidance on the capitalization of assets, issuance of debt, cash management, and financial management

#### Modernizing Capital and Operating Budget Process

- Strengthened interdepartmental communication and planning.
- PUC oversight informs budgeting process
- Ensuring that operating expenses are appropriate and support enhanced O&M and capital project management

#### Monitoring Financial Metrics

- Debt service coverage ratios of 1.35x for the First Lien (“Senior Lien”) and 1.15x for all debt
- Achieving cash reserves (operating reserves, rate stabilization fund, and revenue fund reserves) at a level of 65 days cash on hand by the end of 2019, and to over 100 days in the next five years, which is consistent with industry norms

# Five-Year Financial Projections

## Assumptions

- Revenues reflect revised rates adopted on November 8, 2017, effective on January 1, 2018, the PUC approved 2019 rate increase which took effect on March 1, 2019. All anticipated rate increases assumed for fiscal years 2021, 2022, and 2023 are subject to future PUC approval
- Expense increases are attributable to costs of expected staffing increases and increased use of contractors as necessary to improve service levels and implement the CIP, and are dependent upon related revenue increases
  - Operating Expense also excludes the estimated City Co-op Payment of \$7.0 million in 2019 and \$4.0 million in 2020, 2021, 2022, and 2023 as the expense is subordinate to debt service obligations
- Includes projected future bonded debt and pay-go capital necessary to implement the CIP (see slide 32)
- Combined Debt Service includes Senior Lien Bonds, Subordinate Bonds, and PENNVEST loans debt service and construction loan facility interest

## Projected Revenues, Expenses, and Debt Service

(\$000)

	2019	2020	2021	2022	2023
Revenues	\$264,142	\$267,216	\$297,558	\$323,975	\$350,709
Operating Expenses	(189,012)	(191,690)	(198,926)	(206,567)	(214,826)
<b>Net Revenue Available for Debt Service</b>	<b>\$75,130</b>	<b>\$75,526</b>	<b>\$98,632</b>	<b>\$117,408</b>	<b>\$135,883</b>
Senior Lien Debt Service	\$44,212	\$51,180	\$66,357	\$80,253	\$93,164
Senior Lien Debt Service Coverage	1.70x	1.48x	1.49x	1.46x	1.46x
<b>Net Revenue After Senior Lien Debt Service<sup>(1)</sup></b>	<b>\$30,918</b>	<b>\$24,346</b>	<b>\$32,275</b>	<b>\$37,155</b>	<b>\$42,719</b>
Combined Debt Service	\$56,748	\$65,104	\$80,598	\$94,452	\$110,737
Combined Debt Service Coverage	1.32x	1.16x	1.22x	1.24x	1.23x
<b>Net Revenue After Subordinate Debt Service<sup>(1)</sup></b>	<b>\$18,383</b>	<b>\$10,422</b>	<b>\$18,034</b>	<b>\$22,956</b>	<b>\$25,146</b>

Notes:

- 1) The difference between these two lines is Subordinate Bonds and PENNVEST loans debt service and construction loan facility interest. PENNVEST loans include interest and amortization of principal of loans that have not reached "close out". Revolving construction loan facility interest is assumed to be an average amount of \$150 million at 2.95% per year (\$3.75 million).

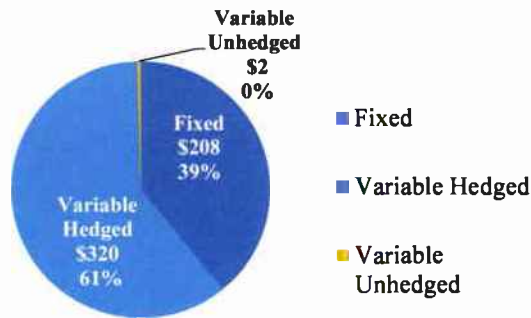
## Section VII.

## Plan of Finance



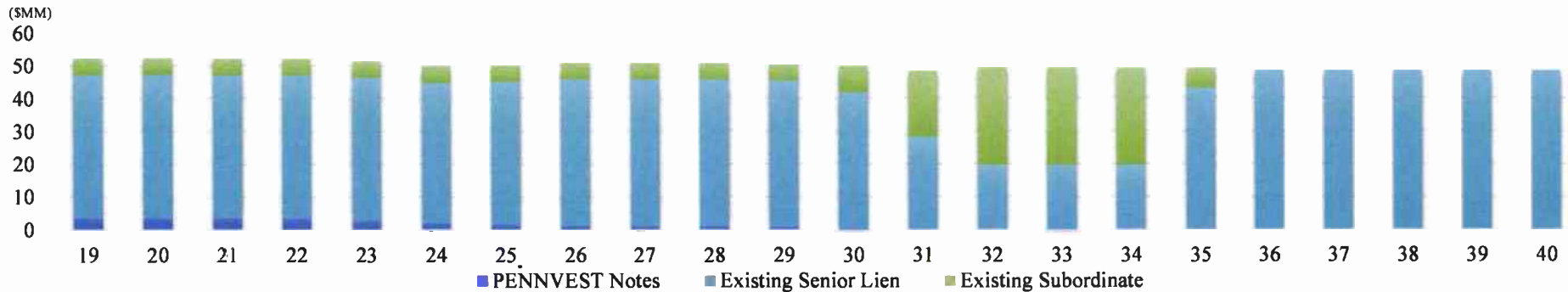
# PWSA's Current Debt Portfolio

## Existing Debt Service Composition<sup>(1)</sup> (SMM)



- \$820.56 million of debt outstanding with a final maturity in 2040
  - \$551.40 million of Senior Lien Bonds
    - \$216.72 million of interest rate swaps related to the Series 2017 C-1, C-2, and C-3 Bonds
  - \$103.66 million of Subordinate Bonds
    - \$103.66 million of interest rate swaps related to the Series 2008C Bonds
  - \$165.5 million of subordinated Subordinate debt
    - \$52.50 million borrowed under the PENNVEST loan program
    - \$113.00 million Revenue Note, Series of 2018, evidencing draws from the construction loan facility with J.P. Morgan.

## Existing Debt Service Profile<sup>(1, 2, 3, 4, 5, 6, 7, 8)</sup>



**Notes:**

- Does not reflect the refunding of the Revenue Note or the refunded Subordinate Lien Bonds
- Interest on Series 2017C-1 Senior Lien Bonds is calculated at a rate of 4.424% representing the associated swap rate of 3.784% with the JPMorgan Chase Bank, N.A. plus Public Market FRN fees
- Interest on Series 2017C-2 Senior Lien Bonds is calculated at a rate of 4.41% representing the associated swap rate of 3.77% plus with the Bank of America, N.A. plus Public Market FRN fees
- Interest on Series 2017C-3 Senior Lien Bonds is calculated at a rate of 4.466% representing the associated swap rate of 3.826% with the JPMorgan Chase Bank, N.A. plus Public Market FRN fees
- Interest on Series 2017C-4 Senior Lien Bonds is calculated at a rate of 2.50% representing Public Market FRN fees
- Interest on Series 2008C-1 ABC Subordinate Lien Bonds is calculated at a rate of 4.91% representing the associated swap rate of 3.5% plus the Direct Placement fee with the Bank of America, N.A. The subordinate lien debt service will be refunded and the associated swap will be terminated with the proceeds of the 2019B Subordinate Bonds and certain funds of the Authority
- Interest on Series 2008C-1D Subordinate Lien Bonds is calculated at a rate of 4.60% representing the associated swap rate of 3.5% plus the Direct Placement fee with the Bank of America, N.A. plus the expected basis cost from the mismatch in the LIBOR index between the related swap and note. The subordinate lien debt service will be refunded and the associated swap will be terminated with the proceeds of the 2019B Subordinate Bonds and certain funds of the Authority
- Interest on Series 2008C-2 Subordinate Lien Bonds is calculated at a rate of 4.775% representing the associated swap rate of 3.5% plus the Direct Placement fee with the JPMorgan Chase Bank, N.A. plus the expected basis cost from the mismatch in the LIBOR index between the related swap and note. All or a portion of the subordinate lien debt service will be refunded and the associated swap will be terminated with the proceeds of the 2019B Subordinate Bonds and certain funds of the Authority





# Plan of Finance

- Plan of Finance contemplates one series of new money and one current refunding, including the associated swaps terminations
  - New money issuance of approximately \$109.9 million of Senior Lien Bonds to repay a portion of PWSA’s construction loan facility
  - Subordinate Lien refunding of \$103.66 million of PWSA’s Series C1 & C2 of 2008 Bonds
    - \$23.850 million estimate to terminate PWSA’s swaps associated with the Subordinate Lien Bonds of which \$7.255 million will be funded from an equity contribution and the remainder from bond proceeds
      - \$62.196 million current notional with J.P. Morgan
      - \$41.464 million current notional with Merrill Lynch Capital Services
  - As part of the financing, the Authority expects to obtain a debt service reserve fund surety and to insure a portion of the maturities for both series

Sources:	Senior Lien New Money	Subordinate Lien Refunding and Swap Terminations	Total
Par Amount:	\$109,900,000.00	\$111,610,000.00	\$221,510,000.00
Premium:	19,436,775.60	10,528,716.10	29,965,491.70
Authority Equity Contribution:	-	7,255,000.00	7,255,000.00
Prior Debt Service	-	1,653,742.58	1,653,742.58
<b>Total Sources:</b>	<b>\$129,336,775.60</b>	<b>\$131,047,458.68</b>	<b>\$260,384,234.28</b>
Uses:	Senior Lien New Money	Subordinate Lien Refunding and Swap Terminations	Total
Construction Loan Facility Pay-Down:	\$128,082,675.60	-	\$128,082,675.60
Refunding Escrow Deposits:	-	\$105,332,940.25	105,332,940.25
Swap Termination Payments:	-	23,850,000.00	23,850,000.00
Issuance Costs: <sup>(1)</sup>	1,254,100.00	1,864,518.43	3,118,618.43
<b>Total Uses:</b>	<b>\$129,336,775.60</b>	<b>\$131,047,458.68</b>	<b>\$260,384,234.28</b>

**Notes:**

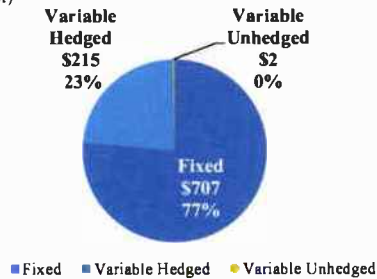
1) Includes Cost of Issuance, Underwriters’ Discount, Debt Service Reserve Fund Surety Deposit, and Additional Proceeds

# PWSA's Pro Forma Debt Service Schedule

- Senior Lien new money portion is structured to have 25-year level debt service
- Subordinate Lien refunding portion is structured to create uniform dissavings

## Pro Forma Debt Service Summary

(\$MM)



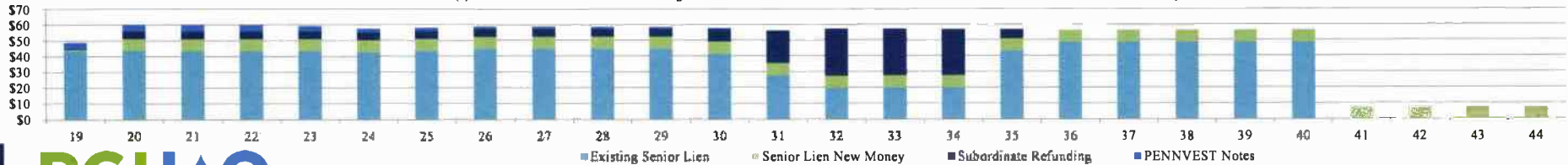
Fiscal Year (ending 12/31)	Existing and Pro Forma Debt Service				Aggregate
	Senior Lien	New Money	Subordinate	Other Subordinate	
	Existing Debt Service	Debt Service	Refunding Debt Service <sup>(1)</sup>	Debt Service <sup>(2)</sup>	Pro Forma Debt Service
2019	\$43,326,828	\$885,305.56	\$4,119,670	\$3,956,434	\$52,288,237
2020	43,379,078	7,800,000.00	4,934,200.00	3,956,434	60,069,712
2021	43,163,828	7,799,750.00	4,936,300.00	3,956,434	59,856,312
2022	43,121,828	7,798,750.00	4,933,500.00	3,916,558	59,770,636
2023	43,197,328	7,796,750.00	4,935,500.00	3,224,026	59,153,604
2024	42,451,828	7,798,500.00	4,936,250.00	2,352,574	57,539,152
2025	43,033,328	7,798,500.00	4,935,750.00	1,981,820	57,749,398
2026	44,219,328	7,796,500.00	4,934,000.00	1,511,421	58,461,249
2027	44,259,015	7,797,250.00	4,936,000.00	1,455,238	58,447,503
2028	44,226,015	7,795,250.00	4,936,500.00	1,455,238	58,413,003
2029	44,240,665	7,795,250.00	4,935,500.00	1,167,788	58,139,203
2030	41,105,553	7,796,750.00	7,873,000.00	660,915	57,436,218
2031	27,581,553	7,799,250.00	20,138,200.00	446,009	55,965,012
2032	19,505,153	7,797,250.00	29,567,000.00	94,509	56,963,912
2033	19,698,236	7,795,500.00	29,323,000.00	38,623	56,855,359
2034	19,663,309	7,798,500.00	29,232,000.00		56,693,809
2035	42,892,671	7,795,500.00	6,021,600.00		56,709,771
2036	48,313,753	7,796,250.00			56,110,003
2037	48,309,949	7,800,000.00			56,109,949
2038	48,307,032	7,796,000.00			56,103,032
2039	48,261,343	7,799,000.00			56,060,343
2040	48,302,986	7,798,000.00			56,100,986
2041		7,797,500.00			7,797,500
2042		7,796,750.00			7,796,750
2043		7,800,000.00			7,800,000
2044		7,796,250.00			7,796,250
<b>Total</b>	<b>\$890,560,667</b>	<b>\$195,824,306</b>	<b>\$175,627,976</b>	<b>\$30,174,021</b>	<b>\$1,292,186,903</b>

(1) FY 2019 amount includes existing subordinate bonds debt service through July 3, 2019.

(2) Includes PENNVEST loans with existing amortizations as of March 2019. Does not include future PENNVEST drawdown amounts or capital line of credit interest.

## Pro Forma Debt Service Profile

(\$MM)





# Amended and Restated Indentures

<p><b>Rate Covenant</b> <i>(Senior Lien Trust Indenture)</i></p>	<ul style="list-style-type: none"> <li>• The Authority shall set rates, fees, and other charges so that Rate Covenant Net Revenues satisfy the following three requirements in each fiscal year:               <ol style="list-style-type: none"> <li>(1) Shall be sufficient to:                   <ul style="list-style-type: none"> <li>– Pay Annual Debt Service on Senior Debt, meet the Reserve Requirements for each Series Debt Service Reserve Requirement, pay Annual Debt Service on Subordinate Debt (including associated reserves), meet the Operating Reserve Requirement, and pay all other amounts which the Authority is by law or contract obligated to pay</li> </ul> </li> <li>(2) Must not be less than 125% of Annual Debt Service for Senior Debt and 110% of aggregate Annual Debt Service for Subordinate Debt</li> <li>(3) Excluding Rate Stabilization Fund transfers to the Revenue Fund and grant proceeds, must be at least 100% of Annual Debt Service on Senior and Subordinate Debt</li> </ol> </li> </ul>	<ul style="list-style-type: none"> <li>• As a result of the changes made to the Senior Lien Indenture in 2017:           <ul style="list-style-type: none"> <li>– Fund balances are no longer used in calculating debt service coverage</li> <li>– Rate Stabilization Fund transfers can be used to increase or decrease debt service coverage on a one-time basis</li> </ul> </li> </ul>
<p><b>Additional Bonds Tests</b> <i>(Senior Lien and Subordinate Trust Indentures)</i></p>	<p><b>Bonds Issued to Pay Costs</b></p> <ul style="list-style-type: none"> <li>• Secured by a Common Debt Service Reserve, the Common Reserve will be fully funded in an amount sufficient to pay the least of the standard three-prong test; if the bonds have a Series Debt Service Reserve, the Series Reserve will be fully funded in an amount specified for such Series upon issuance of the Bonds</li> <li>• Certificate of a Qualified Independent Consultant that PWSA will be able to meet the Rate Covenant in the Senior Indenture, taking into account:           <ul style="list-style-type: none"> <li>– Maximum Annual Debt Service on the proposed Bonds</li> <li>– Additional Net Revenues from rates, fees, and other charges adjusted to reflect any rate increases that had not been effect throughout the Test Period but have been approved and implemented by the PWSA by the issuance of the bonds and go into effect within five years</li> <li>– Additional Net Revenues that PWSA may realize within the following five years from the addition of assets it proposes to finance through the issuance of the bonds</li> </ul> </li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>• Certificate of a the Authorized Representative of the Authority stating that based on the Authority's financial records for the Test Period, the Authority has met the Rate Covenant in the Senior Indenture, taking into account the maximum Annual Debt Service on the proposed Series of Additional Bonds</li> <li>• For purposes of these tests, Additional Indebtedness Test Net Revenues are used in place of Rate Covenant Net Revenues</li> </ul>	<p><b>Senior Lien or Subordinate Lien Bonds Issued to Refund any Indebtedness</b></p> <ul style="list-style-type: none"> <li>• PWSA must deliver the following:           <ul style="list-style-type: none"> <li>– Evidence that PWSA has made provision for the payment or redemption of all Indebtedness to be refunded</li> <li>– A Certificate of an Authorized Representative of PWSA showing that the refunding will not increase Annual Debt Service payable in any year</li> <li>– If the proposed refunding does not comply with the above, it is subject to the same requirements as the issuance of Bonds to pay costs</li> </ul> </li> </ul>
<p><b>Debt Service Reserve Fund Requirement</b> <i>(Senior Lien and Subordinate Trust Indentures)</i></p>	<ul style="list-style-type: none"> <li>• Can be a Common Debt Service Reserve or a Separate Series Debt Service Reserve           <ul style="list-style-type: none"> <li>– Common Debt Service Reserve Requirement shall mean that for all Bonds secured by the Common Reserve, the reserve is sufficient to pay the least of the standard three-prong test</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Can be any form of Credit Facility in lieu of cash and investments</li> </ul>

# Financing Schedule

May							June							July							
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	
			1	2	3	4				5	6	7	8	1		1	2	3	4	5	6
5	6	7	8	9	10	11	2	3	4	5	6	7	8	7	8	9	10	11	12	13	
12	13	14	15	16	17	18	9	10	11	12	13	14	15	14	15	16	17	18	19	20	
19	20	21	22	23	24	25	16	17	18	19	20	21	22	21	22	23	24	25	26	27	
26	27	28	29	30	31		23	24	25	26	27	28	29	28	29	30	31				
							30														

Key transaction date
  Market holiday

Anticipated Financing Schedule*	
Receipt of Ratings:	By COB June 4, 2019
Post POS:	June 5, 2019
Pricing:	June 18, 2019
Settlement:	July 2, 2019

**Section VIII.**

**Conclusion**



# Credit Strengths

## Committed Management Team

- Current management team is experienced and committed to delivering quality, reliable service to PWSA ratepayers
- PGH<sub>2</sub>O 2030 is a strategic plan for the utility that identifies over \$1 billion of high priority capital improvements and includes a number of financial targets including maintaining a minimum 1.35x debt service coverage ratio on the Senior Lien and 1.15x on total debt service
- Strong financial results in FY 2018 of 1.72x debt service coverage

## Solid Rate Management Record

- Long standing history of willingness to raise rates, predating PUC process
- Positive trajectory following February 2019 PUC joint settlement
  - Rates were raised by roughly 13%

## Strong and Diversified Customer Base and Service Area

- Robust and diverse service area economy of Pittsburgh with strong higher education and healthcare presence
- Healthy economic area that has demonstrated a unique ability to reinvent itself
- Well established customer base with the top five customers located in the System for at least 75 years

## Water and Sewer Systems Operations and Capital Planning

- Ample water supply, providing water to approximately 306,000 people
- Water demand of 70 million gallons per day (MGD) while supply allows for up to 100 MGD
- Demonstrated improvement in lead monitoring levels and progress in lead service line replacement
- In the process of implementing a regional strategy for CSO and SSO reductions

# Contact Information



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**The Pittsburgh Water and Sewer Authority (“PWSA”)**

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Edward Barca                      Treasurer                      (412) 255-8947

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**Financial Advisor: Public Resources Advisory Group**

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Christine Fay                      Senior Managing Director                      (610) 565-5990

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**The Pittsburgh Water and Sewer Authority Debt Summary**  
**Outstanding Bonds and Loans Payable**

FR VII.4



As of November 21, 2019

	A	B	C	D	E	F	G	H	I	J	K	L	M
<b>Senior Lien</b>													
Series Name	Date of Issue	Date of Maturity	Amount Issued	Amount Outstanding	Amount Retired	Coupon Rate / Bank Index	Fixed Rate Swap (Paid)	Variable Swap Rate (Received)	Net Rate	Discount at Issuance	Premium at Issuance	Issuance Expenses	Net Proceeds
Series B of 1998 <sup>1</sup>	Mar-1998	9/1/2030	\$ 32,400	\$ 59,353	\$ 70,655	5.18%	N/A	N/A	N/A	\$ -	\$ -	\$ -	\$ 32,400
Series 2013A	Dec-2013	9/1/2033	130,215	75,430	54,785	0.75%-5.00%	N/A	N/A	N/A	-	10,903	798	140,320
Series 2013B	Dec-2013	9/1/2040	86,695	38,760	47,935	3.00%-5.25%	N/A	N/A	N/A	-	3,926	553	90,068
Series 2017A	Dec-2017	9/1/2032	159,795	142,605	17,190	3.00%-5.00%	N/A	N/A	N/A	-	23,374	1,778	181,319
Series 2017C-1 (JPM Swap) <sup>2,3</sup>	Dec-2017	9/1/2039	72,748	72,748	-	70% LIBOR + 64%	3.784%	70% LIBOR	4.4235%	-	-	693	72,054
Series 2017C-2 (MLCS Swap) <sup>2,3</sup>	Dec-2017	9/1/2039	72,748	72,748	-	70% LIBOR + 64%	3.770%	70% LIBOR	4.4100%	-	-	693	72,054
Series 2017C-3 (JPM Swap) <sup>2,3</sup>	Dec-2017	9/1/2040	71,225	71,225	-	70% LIBOR + 64%	3.826%	70% LIBOR	4.4655%	-	-	679	70,546
Series 2017C-4 (Unhedged) <sup>2</sup>	Dec-2017	9/1/2035	2,085	2,085	-	70% LIBOR + 64%	N/A	N/A	1.4632%	-	-	20	2,065
Series 2019A	June-2019	9/1/2044	109,855	109,855	-	5.00%	N/A	N/A	N/A	-	22,468	1,123	131,200
<b>Subordinate Lien</b>													
Series Name	Delivery Date	Final Maturity	Issue Size	Outstanding Principal	Amount Retired	Coupon Rate / Bank Index	Fixed Rate Swap (Paid)	Variable Swap Rate (Received)	Net Rate	Discount at Issuance	Premium at Issuance	Issuance Expenses	Net Proceeds
Series 2019B	June-2019	9/1/2035	104,290	104,290	-	4.00%-5.00%	N/A	N/A	N/A	-	22,621	27,605	103,660
<b>Third Lien</b>													
Series Name	Delivery Date	Final Maturity	Issue Size	Outstanding Principal	Amount Retired	Coupon Rate / Bank Index	Fixed Rate Swap (Paid)	Variable Swap Rate (Received)	Net Rate	Discount at Issuance	Premium at Issuance	Issuance Expenses	Net Proceeds
Pennvest Loans	Various	4/1/2045	103,087	60,350	42,737	1.00% - 3.25%	N/A	N/A	N/A	-	-	-	103,087
Capital Lease	Dec-15	12/1/2025	7,445	5,442	2,003	0.00%	N/A	N/A	N/A	-	-	-	7,445

<sup>1</sup> Column C is the Initial Stated Amount (Capital Appreciation Bonds); Column D is based on accreted value as of 11/21/2019 and Column E is the total amount paid as of 11/21/2019.

<sup>2</sup> Column L represents a proportional breakdown of cost of issuance per Official Statements.

<sup>3</sup> Column C represents the portion of the Series C of 2017 which is connected to certain swap agreements or is unhedged.

<sup>4</sup> One Month LIBOR is assumed to be 1.716% (11/20/2019); 70% of one month LIBOR is 0.8232% for the purposes of this summary.

**THE PITTSBURGH WATER AND SEWER AUTHORITY**

**To**

**THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A.,  
As Trustee**

**2019-1 SUPPLEMENTAL TRUST INDENTURE  
DATED AS OF JULY 1, 2019**

**Relating to the Issuance of**

**\$109,855,000**

**The Pittsburgh Water and Sewer Authority  
Water and Sewer System First Lien Revenue Bonds, Series A of 2019**

This 2019-1 SUPPLEMENTAL TRUST INDENTURE (the "2019-1 Supplemental Indenture") is dated as of July 1, 2019 by and between THE PITTSBURGH WATER AND SEWER AUTHORITY (the "Authority") and THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A., as trustee (the "Trustee").

**WITNESSETH:**

**WHEREAS**, the Authority is a public body, politic and corporate, exercising public powers of the Commonwealth of Pennsylvania (the "Commonwealth") as an agency thereof, duly organized and validly existing under the provisions of the Pennsylvania Municipality Authorities Act of the Commonwealth, Title 53 of the Pennsylvania Consolidated Statutes Annotated, Section 5601, et seq., as amended (the "Act"); and

**WHEREAS**, the Authority's senior lien debt has been issued under a Trust Indenture dated as of October 15, 1993, Amended and Restated as of November 1, 2017 and Effective on December 28, 2017 (the "Original Indenture") with a bond trustee, being The Bank of New York Mellon Trust Company, N.A. (the "Trustee"), as amended and supplemented by a 2017-1 Supplemental Trust Indenture dated as of November 1, 2017 (the "2017-1 Supplemental Indenture") and a 2017-2 Supplemental Trust Indenture dated as of December 1, 2017 (the "2017-2 Supplemental Indenture") (the Original Indenture, as amended and supplemented by the 2017-1 Supplemental Indenture and the 2017-2 Supplemental Indenture, collectively, the "Existing Senior Indenture"); and

**WHEREAS**, Sections 3.01 and 3.02 of the Original Indenture empower the Trustee and the Authority to enter into a Supplemental Indenture in connection with the issuance of additional bonds to refund any indebtedness including subordinate indebtedness, to pay costs of issuance, to fund costs associated with Capitalized Interest, and to fund reserves; and

**WHEREAS**, in order to promote the health, safety and welfare of those it serves, the Authority adopted Resolution No. 36 of 2016 under which it (a) approved the undertaking of capital projects with respect to the Water and Sewer System (the "Capital Project") consisting of projects related to lead service line replacements, water treatment plant improvements, wastewater/sewer rehabilitation, water distribution, and green infrastructure, and (b) authorized the issuance of its \$80,000,000 maximum principal amount Revenue Note, Series of 2016 (the "2016 Note") representing a drawdown, revolving, interim construction loan from JPMorgan Chase Bank, National Association ("JPMorgan Bank"); and

**WHEREAS**, in order to increase the drawdown, revolving, interim construction loan, the Authority adopted Resolution No. 64 of 2018 in which it authorized (a) the issuance of its \$150,000,000 maximum principal amount Revenue Note, Series of 2018 (the "2018 Note"), and (b) the refunding and retirement of the 2016 Note with proceeds of the 2018 Note; and

**WHEREAS**, both the 2016 Note and the 2018 Note have constituted Subordinate Debt; and

**WHEREAS**, the Authority has drawn on the 2016 Note and the 2018 Note to fund Costs of the Capital Project, and the Authority now desires to refund all or a portion of the interim debt evidenced by the 2018 Note with long-term Senior Debt under the Indenture (defined below);



and

**WHEREAS**, in order to provide funds (a) to refund, on a long-term basis, all or a portion of the interim debt evidenced by the 2018 Note, the proceeds of which were used to fund the Capital Project, (b) to pay the premium related to a Debt Service Reserve Fund Policy, and (c) to pay the costs of issuing the 2019A Bonds (defined below) and insuring the 2019A Insured Bonds (defined below) (collectively, the “Refunding Project”), the Authority desires to issue its \$109,855,000 Water and Sewer System First Lien Revenue Bonds, Series A of 2019 (the “2019A Bonds”); and

**WHEREAS**, the 2019A Bonds are being issued under and secured by the terms of the Existing Senior Indenture as supplemented by this 2019-1 Supplemental Indenture (the Existing Senior Indenture, as amended and supplemented by this 2019-1 Supplemental Indenture, and as amended and supplemented from time to time in the future, is referred to herein as the “Indenture”); and

**WHEREAS**, the definitive form of the 2019A Bonds, including the certificate of authentication thereon, will be substantially in the form attached hereto and incorporated herein as Exhibit A, with such necessary or appropriate insertions, omissions and variations as may be required or permitted by the Indenture; and

**WHEREAS**, the execution and delivery of this 2019-1 Supplemental Indenture has been duly authorized by a resolution of the Authority adopted on April 5, 2019 (the “Resolution”), and all things necessary to make the 2019A Bonds, when executed by the Authority, authenticated by the Trustee and issued by the Authority, the valid, binding and legal obligations of the Authority, and to constitute this 2019-1 Supplemental Indenture a valid, binding and legal pledge of the security therefor, as hereinafter provided, have been duly done and performed; and

**WHEREAS**, the scheduled payment of principal of and interest on the 2019A Insured Bonds (hereinafter defined) when due will be guaranteed under an insurance policy to be issued by Assured Guaranty Municipal Corp. concurrently with the delivery of the 2019A Bonds;

**NOW, THEREFORE**, the parties hereto, intending to be legally bound, hereby agree as follows:

## **ARTICLE I DEFINITIONS**

SECTION 1.01 Definitions. The terms previously defined in the recitals hereto and in the Existing Senior Indenture shall, for all purposes of the Indenture, have the meanings therein specified, unless the context clearly otherwise requires. In addition, the following terms shall have the following meanings herein, unless the context clearly otherwise requires:

### Bond Insurer

The term "Bond Insurer" or "Insurer" shall mean, with respect to the 2019A Insured Bonds, Assured Guaranty Municipal Corp., a stock insurance company incorporated under the laws of the State of New York, or any successor thereto.

### Interest Payment Date

The term "Interest Payment Date" for the 2019A Bonds shall mean each March 1 and September 1, commencing September 1, 2019.

### Official Statement

The term "Official Statement" means the Official Statement for the 2019A Bonds dated June 18, 2019.

### Rating Agency

The term "Rating Agency" shall mean S&P when the 2019A Bonds are rated by S&P and Moody's when the 2019A Bonds are rated by Moody's.

### Tax Regulatory Certificate

The term "Tax Regulatory Certificate" shall mean the Tax Certificate of the Authority dated July 2, 2019 related to the 2019A Bonds.

### 2019A Bond Insurance Policy

The term "2019A Bond Insurance Policy" shall mean the financial guaranty insurance policy issued by the Bond Insurer insuring the scheduled payment when due of the principal of and interest on the 2019A Insured Bonds as provided therein.

### 2019A Insured Bonds

The term "2019A Insured Bonds" shall mean the 2019A Bonds stated to mature on September 1, 2024 through 2039 and on September 1, 2044. These are the 2019A Bonds that are insured by the Bond Insurer; the 2019A Bonds stated to mature on September 1, 2020 through 2023 are not insured by the Bond Insurer.

**ARTICLE II  
CONCERNING 2019A BONDS**

SECTION 2.01 The 2019A Bonds. There is hereby created one new series of Bonds to be issued under and secured by the Indenture, on a parity with the other first lien Bonds of the Authority, issued or to be issued pursuant to Sections 3.01 and 3.02 of the Existing Senior Indenture, to be designated "The Pittsburgh Water and Sewer Authority, Water and Sewer System First Lien Revenue Bonds, Series A of 2019," in the aggregate principal amount of \$109,855,000. The 2019A Bonds shall be issued for the purpose of providing funds for the payment of the costs of the Refunding Project. The 2019A Bonds shall be substantially in the form attached hereto as Exhibit A, with such necessary or appropriate insertions, omissions and variations as may be required or permitted by the Indenture. The 2019A Bonds shall be executed in the form and manner herein specified and delivered to the Trustee for authentication and the Trustee shall authenticate and deliver the principal amount of 2019A Bonds, but only upon receipt by the Trustee of the Resolution, this 2019-1 Supplemental Indenture and certificates, opinions and all other materials and documents as provided in Section 3.01 and 3.02 of the Existing Senior Indenture. The 2019A Bonds as issued hereunder will be subject to the provisions of the Existing Senior Indenture and this 2019-1 Supplemental Indenture.

SECTION 2.02 Maturities and Interest Rates. The 2019A Bonds shall be issuable only as fully registered bonds in denominations of \$5,000 or any integral multiple thereof. The 2019A Bonds shall be numbered and shall bear such prefixes as may be satisfactory to the Authority and the Trustee. The 2019A Bonds shall bear interest on the unpaid principal thereof at the annual fixed rates set forth below, computed on the basis of a 360-day year consisting of twelve 30-day months, payable semiannually on March 1 and September 1 of each year, commencing September 1, 2019 until the principal thereof shall have been paid or provided for. The 2019A Bonds shall mature on the following dates and in the following principal amounts and bear interest at the following rates:

<u>2019A Bonds</u>		
<u>Maturity Date (September 1)</u>	<u>Principal</u>	<u>Interest Rate</u>
2020	\$2,295,000	5.000%
2021	\$2,415,000	5.000%
2022	\$2,540,000	5.000%
2023	\$2,665,000	5.000%
2024	\$2,800,000	5.000%
2025	\$2,940,000	5.000%
2026	\$3,085,000	5.000%
2027	\$3,240,000	5.000%
2028	\$3,400,000	5.000%
2029	\$3,570,000	5.000%
2030	\$3,750,000	5.000%
2031	\$3,935,000	5.000%
2032	\$4,135,000	5.000%
2033	\$4,340,000	5.000%

2034	\$4,560,000	5.000%
2035	\$4,785,000	5.000%
2036	\$5,025,000	5.000%
2037	\$5,275,000	5.000%
2038	\$5,540,000	5.000%
2039	\$5,815,000	5.000%
2044	\$33,745,000	5.000%

Each 2019A Bond shall bear interest from the immediately preceding Interest Payment Date to which interest has been paid, (a) unless the date of authentication is after the Record Date and on or before the succeeding Interest Payment Date in which case such 2019A Bond shall bear interest from such succeeding Interest Payment Date or (b) unless the date of authentication is on or prior to September 1, 2019 and if no interest has been paid on such 2019A Bond, such 2019A Bond shall bear interest from July 2, 2019.

The debt service schedule for the 2019A Bonds is set forth in Exhibit B hereto.

**SECTION 2.03 Redemption Provisions.**

**Optional Redemption.**

The 2019A Bonds maturing on or after September 1, 2030 are subject to redemption prior to maturity, at the option of the Authority, as a whole or in part, at any time, in the order of maturity selected by the Authority and by lot within a maturity on or after September 1, 2029. Any such redemption will be made at a redemption price equal to 100% of the principal amount thereof plus accrued interest to the redemption date.

**Mandatory Sinking Fund Redemption.**

The 2019A Bonds stated to mature on September 1, 2044 are subject to mandatory sinking fund redemption in part, by lot, on the dates and in the principal amounts set out below at par plus accrued interest to the date fixed for redemption:

**2019A Bonds Maturing on September 1, 2044**

<u>Redemption Date</u> <u>(September 1)</u>	<u>Principal Amount</u> <u>To Be Redeemed</u>
2040	\$6,105,000
2041	\$6,410,000
2042	\$6,735,000
2043	\$7,070,000
2044 (maturity)	\$7,425,000

**Extraordinary Optional Redemption.** The 2019A Bonds are subject to extraordinary redemption prior to maturity at the option of the Authority, in whole or in part, at any time, in the event of condemnation, damage or destruction of the Water and Sewer System, from

moneys deposited with or held by the Trustee for such purpose, upon payment of 100% of the principal amount thereof being redeemed, plus interest accrued to the date fixed for redemption for the 2019A Bonds.

**SECTION 2.04 Notice of Redemption.** When required to redeem 2019A Bonds under any provision of this 2019-1 Supplemental Indenture, other than Mandatory Sinking Fund Redemption under Section 2.03, or when directed to do so by the Authority pursuant to the provisions of this 2019-1 Supplemental Indenture, the Trustee shall cause notice of the redemption to be given not less than 20 days prior to the redemption date, by mailing copies of such notice of redemption by first class mail, postage prepaid, to all Holders of 2019A Bonds to be redeemed at their registered addresses, but failure to mail any such notice or defect in the mailing thereof in respect of any 2019A Bond shall not affect the validity of the redemption of any other 2019A Bond with respect to which notice was properly given. Each such notice shall be dated and shall be given in the name of the Authority and shall state the following information:

(a) the identification numbers, as established under this 2019-1 Supplemental Indenture, and the CUSIP numbers, if any, of the 2019A Bonds being redeemed, provided that any such notice shall state that no representation is made as to the correctness of CUSIP numbers either as printed on such 2019A Bonds or as contained in the notice of redemption and that reliance may be placed only on the identification numbers contained in the notice or printed on such 2019A Bonds;

(b) any descriptive information needed to identify accurately the 2019A Bonds being redeemed;

(c) in the case of partial redemption of any 2019A Bonds, the respective principal amounts thereof to be redeemed;

(d) the redemption date;

(e) the redemption price;

(f) that on the redemption date the redemption price will become due and payable upon each such 2019A Bond or portion thereof called for redemption, and that interest thereon shall cease to accrue from and after said date; and

(g) the place where such 2019A Bonds are to be surrendered for payment of the redemption price.

In addition, the Trustee shall at all reasonable times upon prior written request and at the expense of the requesting party make available to the Authority and the Bond Insurer complete information as to 2019A Bonds which have been redeemed or called for redemption.

If at the time of mailing of notice of any optional redemption there shall not have been deposited monies in the Redemption Fund available for payment pursuant to Section 6.09 of the Existing Senior Indenture sufficient to redeem all the 2019A Bonds called for redemption, such notice shall state that it is conditional in that it is subject to the deposit of the redemption

monies in the Redemption Fund available for payment on the redemption date, in which case such notice shall be of no effect unless monies are so deposited.

**SECTION 2.05 Book-Entry Only Bonds.** The 2019A Bonds shall be initially issued in book-entry only form. In the event that any provision of this Section 2.05 is inconsistent with other provisions of this 2019-1 Supplemental Indenture, so long as the 2019A Bonds shall be in book-entry only form, the provisions of this Section 2.05 shall govern. The Depository Trust Company ("DTC") will act as securities depository for the 2019A Bonds. The ownership of one fully registered 2019A Bond for each maturity set forth in this 2019-1 Supplemental Indenture, each in the aggregate principal amount of such maturity, will be registered in the name of CEDE & Co., as nominee for DTC; provided that if DTC shall request that the 2019A Bonds be registered in the name of a different nominee, the Trustee shall exchange all or any portion of the 2019A Bonds for an equal aggregate principal amount of 2019A Bonds of the applicable Series registered in the name of such nominee or nominees of DTC. No person other than DTC or its nominee shall be entitled to receive from the Authority or the Trustee either a 2019A Bond or any other evidence of ownership of the 2019A Bonds, or any right to receive any payment in respect thereof unless DTC or its nominee shall transfer record ownership of all or any portion of the 2019A Bonds on the registration books maintained by the Trustee, in connection with discontinuing the book entry system or otherwise.

So long as the 2019A Bonds or any portion thereof are registered in the name of DTC or any nominee thereof, all payments of the principal or redemption price of or interest on such 2019A Bonds shall be made to DTC or its nominee in New York Clearing House or equivalent next day funds on the dates provided for such payments under the Indenture. Each such payment to DTC or its nominee shall be valid and effective to fully discharge all liability of the Authority or the Trustee with respect to the principal or redemption price of or interest on the 2019A Bonds to the extent of the sum or sums so paid. In the event of the redemption of less than all of the 2019A Bonds Outstanding, the Trustee shall not require surrender by DTC or its nominee of the 2019A Bonds so redeemed, but DTC or its nominee may retain such 2019A Bonds and make an appropriate notation on the 2019A Bond certificate as to the amount of such partial redemption; provided that, in each case the Trustee shall request, and DTC shall deliver to the Trustee, a written confirmation of such partial redemption and thereafter the records maintained by the Trustee shall be conclusive as to the amount of the 2019A Bonds which have been redeemed.

The Authority and the Trustee may treat DTC or its nominee as the sole and exclusive Owner of the 2019A Bonds registered in its name for the purposes of payment of the principal or redemption price of or interest on the 2019A Bonds, selecting the 2019A Bonds or portions thereof to be redeemed, giving any notice permitted or required to be given to Bondholders under the Indenture, registering the transfer of 2019A Bonds, obtaining any consent or other action to be taken by Bondholders and for all other purposes whatsoever; and neither the Authority nor the Trustee shall be affected by any notice to the contrary. Neither the Authority nor the Trustee shall have any responsibility or obligation to any participant in DTC, any person claiming a beneficial ownership interest in the 2019A Bonds under or through DTC or any such participant, or any other person which is not shown on the registration books of the Trustee as being a Bondholder, with respect to either: (i) the 2019A Bonds; or (ii) the accuracy of any records maintained by DTC or any such participant; or (iii) the payment by DTC or any such

participant of any amount in respect of the principal or redemption price of or interest on the 2019A Bonds; or (iv) any notice which is permitted or required to be given to Bondholders under the Indenture; or (v) the selection by DTC or any such participant of any person to receive payment in the event of a partial redemption of any Series of the 2019A Bonds; or (vi) any consent given or other action taken by DTC as Bondholder.

So long as the 2019A Bonds or any portion thereof are registered in the name of DTC or any nominee thereof, all notices required or permitted to be given to the Bondholders under the Indenture shall be given to DTC as provided in the Representation Letter between the Authority and DTC (the "DTC Representation Letter"), in such form as is acceptable to the Trustee, the Authority and DTC.

In connection with any notice or other communication to be provided to Bondholders pursuant to the Indenture by the Authority or the Trustee with respect to any consent or other action to be taken by Bondholders, DTC shall consider the date of receipt of notice requesting such consent or other action as the record date for such consent or other action, provided that the Authority or the Trustee may establish a special record date for such consent or other action. The Authority or the Trustee shall give DTC notice of such special record date not fewer than fifteen (15) calendar days in advance of such special record date to the extent possible.

At or prior to the issuance of the 2019A Bonds, the Authority and the Trustee shall execute or signify their approval of the DTC Representation Letter. Any successor Trustee shall, in its written acceptance of its duties under the Indenture, agree to take any actions necessary from time to time to comply with the requirements of the DTC Representation Letter.

The book-entry system for registration of the ownership of the 2019A Bonds may be discontinued at any time if either: (i) DTC determines to resign as securities depository for the 2019A Bonds; or (ii) the Authority provides thirty (30) days' notice of such discontinuation to the Trustee and DTC that continuation of the system of book-entry transfers through DTC (or through a successor securities depository) is not in the best interests of the Authority. Upon occurrence of either such event, the Authority may attempt to establish a securities depository book-entry relationship with another securities depository. If the Authority does not do so, or is unable to do so, and after the Authority has notified DTC and upon surrender to the Trustee of the Bonds held by DTC, the Authority will issue and the Trustee will authenticate and deliver the 2019A Bonds in registered certificate form in denominations of \$5,000 and integral multiples thereof, at the expense of the Authority, to such persons, and in such maturities and principal amounts, as may be designated by DTC, but without any liability on the part of the Authority or the Trustee for the accuracy of such designation. Whenever DTC requests the Authority or the Trustee to do so, the Authority or the Trustee shall cooperate with DTC in taking appropriate action after reasonable notice to arrange for another securities depository to maintain custody of certificates evidencing the 2019A Bonds.

SECTION 2.06 Consent to Amendment and Restatement of Original Indenture. In 2017, the Authority and the Trustee entered into the Original Indenture as then so amended and restated. See Sections 1.03, 1.04 and 1.05, on pages 31-32, of the Original Indenture. **THE PURCHASERS OF THE 2019A BONDS ARE HEREBY DEEMED, BY VIRTUE OF THEIR**

PURCHASE OF THE 2019A BONDS, TO HAVE CONSENTED TO THE ORIGINAL INDENTURE AS SO AMENDED AND RESTATED IN 2017 ON BEHALF OF THEMSELVES AND ALL FUTURE OWNERS OF THE 2019A BONDS.

### **ARTICLE III DEPOSITS TO FUNDS AND DISBURSEMENT OF MONEYS**

SECTION 3.01 Deposit of 2019A Bond Proceeds into Clearing Fund; Prepayment of Revenue Note, Series of 2018. Upon receipt, the proceeds of the 2019A Bonds shall be deposited to a Clearing Fund for the 2019A Bonds, which is hereby created, and shall be disbursed for the purposes and in the amounts set forth in a closing certificate of the Authority executed on the date of issuance of the 2019A Bonds. The closing certificate shall also state the amount of the proceeds of the 2019A Bonds that is to be delivered to the Trustee for application as hereinafter described.

A portion of the proceeds of the 2019A Bonds in the amount of \$131,200,000 in the Clearing Fund shall be applied to optionally prepay \$131,200,000 principal amount on the Authority's Revenue Note, Series of 2018, the registered owner of which is JPMorgan Chase Bank, National Association. The remaining proceeds of the 2019A Bonds shall be applied as set forth in the closing certificate of the Authority.

Amounts remaining on deposit in the Clearing Fund on August 1, 2019 shall, without further direction from the Authority, be applied by the Trustee to pay interest on the 2019A Bonds on the next applicable Interest Payment Date.

#### SECTION 3.02 Revenue Fund.

A. The Authority, in accordance with Section 6.02 of the Existing Senior Indenture, will transfer from the Revenue Fund to the Debt Service Fund from time to time, the amounts required to pay the principal of and interest on the 2019A Bonds.

The foregoing provisions relating to the Debt Service Fund are subject to the provision that there shall be credited to the transfer from the Revenue Fund available moneys deposited to the Debt Service Fund or earned as interest on moneys on deposit to the credit of the Debt Service Fund, and in determining the amount required to be transferred from the Revenue Fund to the Debt Service Fund pursuant to this Section, effect shall be given to the anticipated receipt on or before the appropriate payment date of the available moneys in the Debt Service Fund.

B. On or before each Interest Payment Date and on or before each date on which 2019A Bonds are to be redeemed, the Trustee shall pay from moneys held in the Debt Service Fund (or, the Debt Service Reserve Fund in the event that there are insufficient funds in the Debt Service Fund available for that purpose), the amount of principal, interest or redemption price payable with respect to the 2019A Bonds on such Interest Payment Date or redemption date; provided, however, that the principal or redemption price shall be paid only on presentation of the 2019A Bonds which are being paid, subject, however, to Section 2.05 hereof.

The Authority may deposit into the Debt Service Fund such additional funds as the



Authority shall determine which shall be applied by the Trustee at the written request of the Authority to the purchase of 2019A Bonds and such moneys shall be withdrawn by the Trustee and deposited in the Redemption Fund and applied to the payment of the purchase price of such 2019A Bonds which the Authority or the Trustee may agree to purchase; provided, however, that the Authority shall not purchase and the Trustee shall not apply moneys in the Debt Service Fund to the purchase of such 2019A Bonds at a price in excess of 100% of the principal amount thereof, plus accrued interest thereon to the date of purchase. At any time that the Trustee shall be requested to apply such moneys in the Debt Service Fund to purchase such 2019A Bonds, the Authority shall furnish to the Trustee not later than sixty (60) days prior to the next maturity date of any applicable year an Officers' Certificate specifying the 2019A Bonds which it has agreed to purchase, the purchase price thereof, the names of the sellers and the expenses involved in connection with such purchase.

SECTION 3.03 Deposit to Debt Service Reserve Fund. On the date of issuance of the 2019A Bonds there shall be on deposit to the Debt Service Reserve Fund, the existing Debt Service Reserve Insurance Policy No. 210578-R (the "Existing Reserve Policy") and a Debt Service Reserve Insurance Policy No. 219439-R (the "2019A Reserve Policy) both of Assured Guaranty Municipal Corp., which shall enable the amount on deposit in the Common Debt Service Reserve Fund to equal the Maximum Annual Debt Service Requirements on all Bonds Outstanding under the Indenture including the 2019A Bonds. The Authority confirms that the provisions in the Existing Senior Indenture and any insurance or reimbursement agreement entered into with the Bond Insurer shall remain in effect with respect to the Reserve Policy. The 2019A Bonds and all other Outstanding Bonds under the Indenture are Common Debt Service Reserve Secured Bonds (as defined in the Indenture).

**ARTICLE IV**  
**INTERNAL REVENUE CODE AND OTHER COVENANTS**

SECTION 4.01 Internal Revenue Code and Other Covenants. The Authority hereby covenants with the registered owners, from time to time, of the 2019A Bonds that no part of the proceeds of the 2019A Bonds or of any moneys on deposit with the Trustee hereunder will be used, at any time, directly or indirectly, in a manner which, if such use had been reasonably expected on the date of issuance of the 2019A Bonds, would have caused the 2019A Bonds to be arbitrage bonds within the meaning of Section 148 of the Internal Revenue Code of 1986, as amended (the "Code"), and the regulations thereunder proposed or in effect at the time of such use and applicable to the 2019A Bonds, and that it will comply with the requirements of that section and the regulations throughout the term of the 2019A Bonds. In the event the Authority is of the opinion that it is necessary to restrict or limit the yield on the investment of any moneys paid to or held by the Trustee to comply with the covenants herein set forth, the Authority shall issue to the Trustee a written certificate to such effect, with appropriate instructions, and the Trustee shall thereupon take such action in accordance with such certificate and instructions. The Authority's covenants set forth in the Tax Regulatory Certificate are hereby incorporated herein and made applicable to the 2019A Bonds.

**ARTICLE V**  
**AMENDMENTS**

SECTION 5.01 Amendments to Existing Senior Indenture. Pursuant to Section 11.01(a) and (e) of the Existing Senior Indenture, the Existing Senior Indenture may be amended without the consent of the Bondholders “to cure any ambiguity, formal defect or omission in this Indenture or any Supplemental Indenture” and “to make any such provision in regard to matters or questions arising under the Indenture as may be necessary or desirable and not inconsistent with the Indenture”.

SECTION 5.02 Transfers and Exchanges of Bonds. Pursuant to Section 11.01(a) and (e) of the Existing Senior Indenture, Section 2.04 of the Existing Senior Indenture is amended to add the following paragraph to the end of such section:

In the event the Bond are no longer Book-Entry Bonds, to the extent that the Holder of the Bonds under this Subordinate Indenture is not an exempt recipient under Treas. Reg. § 1.6045-(c)(3), such Holder shall provide or cause to be provided to the Trustee information regarding the amount paid for the Bonds, any brokers’ fees or commissions, and any other capitalized costs relating to the Bonds, in each case to the extent necessary for the Trustee to comply with any applicable tax reporting obligations, including without limitation any cost basis reporting obligations under Internal Revenue Code Section 6045. The Trustee may rely on the information provided to it and shall have no responsibility to verify or ensure the accuracy of such information.

SECTION 5.03 Book-Entry Only Bonds. Pursuant to Section 11.01(a) and (e) of the Existing Senior Indenture, Section 2.10 of the Existing Senior Indenture is amended to add the following two paragraphs to the end of such section:

In connection with any proposed transfer outside the Book-Entry Only system, prior to or in conjunction with the issuance of certificated Bonds, the Bondholder shall provide or cause to be provided to the Trustee all information necessary to allow the Trustee to comply with any applicable tax reporting obligations, including, without limitation, any cost basis reporting obligations under the Internal Revenue Code Section 6045.

The Authority acknowledges such tax reporting obligations and, if necessary, agrees to use commercially reasonable efforts to assist the Trustee in obtaining such information. The Trustee shall conclusively

rely on the information provided to it and shall have no responsibility to verify or ensure the accuracy of such information.

Section 5.04 Authorized Investments. Pursuant to Section 11.01(a) and (e) of the Existing Senior Indenture, Section 6.12 of the Existing Senior Indenture is amended to revise the last sentence of such section to read as follows:

Although the Authority recognizes that it may obtain brokerage confirmations or written instructions containing comparable information at no additional cost, the Authority agrees that confirmations are not required to be issued by the Trustee for each month in which a monthly statement of investments is provided it; provided that no statement is required for any Fund and/or Account held by the Trustee for any month in which no investment activity occurred during such month in such Fund or Account.

SECTION 5.05 Rate Covenant Net Revenues and Rate Covenant Tests. Pursuant to Section 11.01(a) and (e) of the Existing Senior Indenture, the last paragraph of Section 7.01(c) of the Existing Senior Indenture is amended to read as follows (new language underlined):

The Authority shall test for compliance with this Section 7.01(c) within 120 days after the end of each Fiscal Year. For purposes of such testing under Section 7.01(c)(i) and (ii), Rate Covenant Net Revenues may take into account for a Fiscal Year, transfers from or to the Rate Stabilization Fund made within 60 days after the end of such Fiscal Year.

SECTION 5.06 Bondholders Consent to Original Indenture as Amended and Supplemented. In 2017, the Holders of in excess of 66 2/3% in principal amount of the Bonds Outstanding consented to the Original Indenture (being an amended and restated indenture). By their purchase of the 2019A Bonds, the Holders of the 2019A Bonds, on behalf of themselves and all future holders of the 2019A Bonds, consent to the provisions of the Original Indenture, as amended and supplemented.

## ARTICLE VI

### MISCELLANEOUS PROVISIONS

SECTION 6.01 Provisions Related to Bond Insurance. The provisions related to the 2019A Bond Insurance Policy are set forth in Exhibit C hereto, and such provisions are incorporated herein by reference as if fully set forth herein.

SECTION 6.02 Benefitted Parties. Nothing in this 2019-1 Supplemental Indenture, expressed or implied, is intended or shall be construed to confer upon or give any Person, other than the parties hereto, the Bond Insurer (to the extent rights are granted to the Bond Insurer in this 2019-1 Supplemental Indenture) and the registered Owners of the 2019A Bonds, any right, remedy or claim under or by reason of this 2019-1 Supplemental Indenture or any covenant, condition or stipulation hereof; and the covenants, stipulations and agreements contained in this 2019-1 Supplemental Indenture are and shall be for the sole and exclusive benefit of the parties hereto, the Bond Insurer and the registered Owners of the 2019A Bonds.

SECTION 6.03 Successors and Assigns. All the covenants and agreements by or on behalf of the Authority, or by or on behalf of the Trustee, contained in this 2019-1 Supplemental Indenture for all purposes shall bind and inure to the benefit of their respective successors and assigns, whether so expressed or not.

SECTION 6.04 Meanings of Terms and Phrases. All terms and phrases used in this 2019-1 Supplemental Indenture for all purposes hereof, shall have the meanings given to such terms and phrases in the Existing Senior Indenture, as supplemented hereby, unless otherwise specifically defined herein or unless the context plainly otherwise requires.

SECTION 6.05 Governing Law. The laws of the Commonwealth of Pennsylvania shall govern the construction of this 2019-1 Supplemental Indenture.

SECTION 6.06 Counterparts. This 2019-1 Supplemental Indenture may be executed in any number of counterparts, each of which when so executed and delivered shall be an original, but such counterparts shall together constitute but one and the same instrument.

SECTION 6.07 In Full Force and Effect. The Indenture, as supplemented hereby, shall be and remain in full force and effect.

IN WITNESS WHEREOF, THE PITTSBURGH WATER AND SEWER AUTHORITY has caused this 2019-1 Supplemental Indenture to be executed in its name by its Chairman or Vice-Chairman and attested by its Secretary or Assistant Secretary and THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A., has caused this 2019-1 Supplemental Indenture to be executed in its name by one of its authorized officers, and corporate seal to be hereunder affixed, attested by one of its authorized officers, all as of the day and year first above written.

THE PITTSBURGH WATER AND SEWER  
AUTHORITY

By: Paul Lopez  
Chairman

Edward Barca  
Attest: Edward Barca  
Jon W. Turner  
(Assistant) Secretary

THE BANK OF NEW YORK MELLON TRUST  
COMPANY, N.A., as Trustee

By: \_\_\_\_\_  
Authorized Officer

Attest:

\_\_\_\_\_  
Authorized Officer

IN WITNESS WHEREOF, THE PITTSBURGH WATER AND SEWER AUTHORITY has caused this 2019-1 Supplemental Indenture to be executed in its name by its Chairman or Vice-Chairman and attested by its Secretary or Assistant Secretary and THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A., has caused this 2019-1 Supplemental Indenture to be executed in its name by one of its authorized officers, and corporate seal to be hereunder affixed, attested by one of its authorized officers, all as of the day and year first above written.

THE PITTSBURGH WATER AND SEWER  
AUTHORITY

By: \_\_\_\_\_  
Chairman

Attest:

\_\_\_\_\_  
(Assistant) Secretary

THE BANK OF NEW YORK MELLON TRUST  
COMPANY, N.A., as Trustee

By: *Bruno J. Brammer*  
Authorized Officer

Attest:

*Maranda Mangum*  
Authorized Officer

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**AMENDED AND RESTATED TRUST INDENTURE**

**BETWEEN**

**THE PITTSBURGH WATER AND SEWER AUTHORITY**

**and**

**THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A.  
as Successor Trustee**

**Originally dated as of October 15, 1993  
Amended and Restated as of November 1, 2017  
And Effective on the First Effective Date  
(December 28, 2017)**

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## AMENDED AND RESTATED TRUST INDENTURE

THIS AMENDED AND RESTATED TRUST INDENTURE dated as of the 1<sup>st</sup> day of November, 2017 (as amended and supplemented from time to time, the "Indenture"), is by and between THE PITTSBURGH WATER AND SEWER AUTHORITY, a body corporate and politic organized and existing under the laws of the Commonwealth of Pennsylvania, having its principal office in the City of Pittsburgh, Allegheny County, Pennsylvania (the "Authority"), and THE BANK OF NEW YORK MELLON TRUST COMPANY, N.A., a national banking corporation organized and existing under and by virtue of the laws of the United States of America, having power and authority to accept and execute trusts and having a corporate trust office in the City of Pittsburgh, Allegheny County, Pennsylvania, as successor trustee (the "Trustee").

WHEREAS, the Authority makes the following findings and statements:

1. The Act. The Authority is a public body, corporate and politic, duly organized and validly existing under the provisions of the Pennsylvania Municipality Authorities Act of the Commonwealth of Pennsylvania (the "Commonwealth"), Title 53 of the Pennsylvania Consolidated Statutes, Section 5601, et seq., as amended (the "Act").

2. Relationship with the City. The Authority was organized in February 1984 by the City of Pittsburgh, Allegheny County, Pennsylvania (the "City") for the purpose of assuming the responsibility for the operation of the City's water supply and distribution and wastewater collection systems (as further modified as defined herein, the "System"). Pursuant to a Lease and Management Agreement dated as of March 29, 1984 between the City and the Authority (the "Lease and Management Agreement"), the System was leased by the City to the Authority. The Authority then designated the City as its agent to operate and maintain the System. The City and the Authority entered into a Capital Lease Agreement dated as of July 15, 1995 (the "Capital Lease Agreement") under which the Lease and Management Agreement was terminated and the Authority was granted the option to acquire the portion of the System owned by the City. Pursuant to the Capital Lease Agreement, which has a term of 30 years, the Authority made three payments totaling \$101,416,974.60 during the first three years, and on September 1, 2025, upon the payment of \$1.00, the Authority will acquire title to the System. At the same time the City and the Authority entered into the Capital Lease Agreement, they also entered into a Cooperation Agreement dated as of June 15, 1995, effective January 1, 1995, as amended by a First Amendment to Cooperation Agreement dated March 21, 2011 (the "Cooperation Agreement"). The Cooperation Agreement provides for the following matters: the Authority agreed to assume responsibility for management and operation of the System, with some sewer functions remaining with the City. The City provides certain specified services to the Authority on a fee for services basis and the Authority makes certain payments to the City to reimburse it for costs incurred by the City in regard to the operation and maintenance of the System. The Authority agrees to provide the City with water without charge to be used by the City, its departments, agencies and instrumentalities, and the Authority agrees to reimburse the City for equalization payments made by the City to a private utility which serves customers in a portion of the City. In the 2011 amendment to the Cooperation Agreement, the City agreed to subordinate the payments it is entitled to under the Cooperation Agreement to the Authority's debt obligations.

3. Existing Senior Indenture. The Authority's senior lien debt has been issued under a Trust Indenture dated as of October 15, 1993 (the "Original Indenture") with a bond trustee, now being The Bank of New York Mellon Trust Company, N.A. (the "Trustee"), as amended and supplemented by a First Supplemental Indenture dated as of July 15, 1995 (the "First Supplemental Indenture"), a Second Supplemental Indenture dated as of March 1, 1998 (the "Second Supplemental Indenture"), a Third Supplemental Indenture dated as of March 1, 2002 (the "Third Supplemental Indenture"), a Fourth Supplemental Indenture dated as of September 15, 2003 (the "Fourth Supplemental Indenture"), a Fifth Supplemental Indenture dated as of June 1, 2005 (the "Fifth Supplemental Indenture"), a Sixth Supplemental Indenture dated as of March 1, 2007 (the "Sixth Supplemental Indenture"), a Seventh Supplemental Indenture dated as of June 1, 2008 (the "Seventh Supplemental Indenture"), an Amending Supplement to the Initial First Lien Indenture and the Seventh Supplemental Indenture dated as of October 15, 2009 (the "2009 Supplemental Indenture"), a Second Amendment to the Seventh Supplemental Indenture dated as of August 1, 2010 (the "2010 Supplemental Indenture"), a Second Amending Supplement to the Initial First Lien Indenture and the Third Amending Supplement to the Seventh Supplemental Indenture dated as of October 22, 2013 (the "2013 Supplemental Indenture"), an Eighth Supplemental First Lien Indenture dated as of December 1, 2013 (the "Eighth Supplemental Indenture"), a Third Amending Supplement to the First Lien Indenture and Fourth Amending Supplement to the Seventh Supplemental Indenture dated as of October 19, 2016 (the "2016 Supplemental Indenture"), a 2017-1 Supplemental Trust Indenture dated as of November 1, 2017 (the "2017-1 Supplemental Indenture"), and a 2017-2 Supplemental Trust Indenture dated as of December 1, 2017 (the "2017-2 Supplemental Indenture") (the Original Indenture, as amended and supplemented by the First Supplemental Indenture, the Second Supplemental Indenture, the Third Supplemental Indenture, the Fourth Supplemental Indenture, the Fifth Supplemental Indenture, the Sixth Supplemental Indenture, the Seventh Supplemental Indenture, the 2009 Supplemental Indenture, the 2010 Supplemental Indenture, the 2013 Supplemental Indenture, the Eighth Supplemental Indenture, the 2016 Supplemental Indenture, the 2017-1 Supplemental Indenture and the 2017-2 Supplemental Indenture, collectively, the "Existing Senior Indenture").

4. Existing Subordinate Indenture. The Authority's subordinate lien bond debt has been issued to date under a Subordinate Trust Indenture dated as of July 15, 1995 (the "Original Subordinate Indenture") between the Authority and a bond trustee, now being The Bank of New York Mellon Trust Company, N.A. (the "Subordinate Trustee"), as amended and supplemented by a First Supplemental Subordinate Indenture dated as of March 1, 1998 (the "First Supplemental Subordinate Indenture"), a Second Supplemental Subordinate Indenture dated as of June 1, 2008 (the "Second Supplemental Subordinate Indenture"), an Amending Supplement to the Initial Subordinate Indenture and Second Supplemental Subordinate Indenture dated as of November 1, 2009 (the "2009-1 Supplemental Subordinate Indenture"), an Amendment to the Amending Supplement to the Initial Subordinate Indenture and Second Supplemental Subordinate Indenture dated as of November 15, 2009 (the "2009-2 Supplemental Subordinate Indenture"), a Second Amending Supplement to the Second Supplemental Indenture dated as of September 1, 2012 (the "2012 Supplemental Subordinate Indenture"), a Third Amending Supplement to the Second Supplemental Subordinate Indenture dated as of September 1, 2013 (the "Third Supplemental Subordinate Indenture"), a Fourth Amending Supplement to the Second Supplemental Indenture dated as of November 3, 2014 (the "2014 Supplemental Subordinate Indenture"), and a Fifth Amending Supplement to the Second Supplemental

Indenture dated as of September 1, 2015 (the “2015 Supplemental Subordinate Indenture”) (the Original Subordinate Indenture, as amended and supplemented by the First Supplemental Subordinate Indenture, the Second Supplemental Subordinate Indenture, the 2009-1 Supplemental Subordinate Indenture, the 2009-2 Supplemental Subordinate Indenture, the 2012 Supplemental Subordinate Indenture, the 2013 Supplemental Subordinate Indenture, the 2014 Supplemental Subordinate Indenture and the 2015 Supplemental Subordinate Indenture, as amended and supplemented (the “Existing Subordinate Indenture”).

5. 1998B Bonds. In 1998, the Authority issued its \$36,440,069.70 Water and Sewer System First Lien Revenue Bonds, Series B of 1998 (the “1998B Bonds”) pursuant to the Second Supplemental Indenture. The 1998B Bonds are capital appreciation bonds that funded capital projects. The 1998B Bonds were initially insured by Financial Guaranty Insurance Company (“FGIC”). FGIC also provided a debt service reserve fund policy for the 1998B Bonds; such debt service reserve fund policy for the 1998B Bonds was terminated on November 29, 2017 and the debt service reserve requirement for the 1998B Bonds is now being satisfied by a policy issued by Assured Guaranty Municipal Corp. (“AGM”; formerly known as Financial Security Assurance Inc.). Pursuant to a Novation Agreement dated as of September 14, 2012 entered into between FGIC and National Public Finance Guarantee Corporation (“National”), the bond insurance policy relating to the 1998B Bonds and the debt service reserve fund policy for the 1998B Bonds were transferred by novation to National, with the effect that National is the designated successor in interest to, and substituted in place of, FGIC as if it were the original insurer for each such policy. Pursuant to side letters dated October 22, 2009 and October 13, 2016 between National and the Authority, National has certain approval rights related to the relationship between the Authority and the letter of credit banks securing the 2008B-1 Bonds (hereinafter defined) and the 2008B-2 Bonds (hereinafter defined).

6. 2008 Bonds. In 2008, the Authority issued \$310,355,000 of senior bonds, including the \$68,970,000 (Fixed Rate) Water and Sewer System First Lien Revenue Refunding Bonds, Series A of 2008 Taxable (the “2008A Bonds”), \$145,495,000 (Variable Rate Demand) Water and Sewer System First Lien Revenue Refunding Bonds, Series B of 2008 (the “2008B Bonds”), \$24,665,000 (Fixed Rate) Water and Sewer System First Lien Revenue Bonds, Series D-1 of 2008 (the “2008D-1 Bonds”), and \$71,225,000 (Variable Rate Demand) Water and Sewer System First Lien Revenue Bonds, Series D-2 of 2008 (the “2008D-2 Bonds”) pursuant to the Seventh Supplemental Indenture.

7. 2008A Bonds. The 2008A Bonds are fixed rate bonds and were issued to refund certain prior bonds, fund capital projects, and fund swap termination payments. The 2008A Bonds are insured by AGM. AGM also provides the debt service reserve fund policy for the 2008A Bonds.

8. 2008B-1 Bonds, 2008B-2 Bonds and Swaps. The 2008B Bonds are variable rate bonds that currently refunded certain prior bonds, funded a swap termination payment, and funded capital projects. The 2008B Bonds were initially insured by AGM, but, in 2009, the 2008B Bonds were divided into two subseries, the \$72,750,000 Series B-1 of 2008 (the “2008B-1 Bonds”) and the \$72,745,000 Series B-2 of 2008 (the “2008B-2 Bonds”), the AGM insurance was terminated, and the bonds were secured by direct draw letters of credit, pursuant to the 2009 Supplemental Indenture. AGM provides the debt service reserve fund policy for the



2008B Bonds. There were subsequent adjustments to the letter of credit banks securing the 2008B-1 Bonds and 2008B-2 Bonds as reflected in the 2013 Supplemental Indenture and the 2016 Supplemental Indenture. The current letter of credit providers are Bank of America, N.A. for the 2008B-1 Bonds and PNC Bank, National Association for the 2008B-2 Bonds. Pursuant to side letters dated October 22, 2009 and October 13, 2016 between National and the Authority, National has certain approval rights related to the relationship between the Authority and the letter of credit banks securing the 2008B-1 Bonds and the 2008B-2 Bonds. In 2008, with respect to the 2008B Bonds, the Authority entered into long-term interest rate swap agreements with Merrill Lynch Capital Services, Inc. and J.P. Morgan Chase Bank, National Association. The swap payments are insured by AGM.

9. 2008D-1 Bonds. The 2008D-1 Bonds are fixed rate bonds that funded capital projects. The 2008D-1 Bonds are insured by AGM. AGM also provides the debt service reserve fund policy for the 2008D-1 Bonds.

10. 2008D-2 Bonds and Swap. The 2008D-2 Bonds are variable rate bonds that funded capital projects. The 2008D-2 Bonds are insured by AGM. The liquidity facility for the 2008D-2 Bonds is a standby bond purchase agreement with PNC Bank, National Association. AGM also provides the debt service reserve fund policy for the 2008D-2 Bonds. In 2008, with respect to the 2008D-2 Bonds, the Authority entered into a long-term interest rate swap agreement with J.P. Morgan Chase Bank, National Association. The swap payments are insured by AGM. Pursuant to the 2010 Supplemental Indenture, a minor amendment was made to the redemption provisions related to the 2008D-2 Bonds.

11. 2008C-1 Subordinate Bonds, 2008C-2 Subordinate Bonds and Swaps. In 2008, the Authority issued its \$51,910,000 (Variable Rate Demand) Water and Sewer System Subordinate Revenue Refunding Bonds, Series C-1 of 2008 (the “2008C-1 Subordinate Bonds”) and its \$51,885,000 (Variable Rate Demand) Water and Sewer System Subordinate Revenue Refunding Bonds, Series C of 2008 (the “2008C-2 Subordinate Bonds”) pursuant to the Second Supplemental Subordinate Indenture. The 2008C-1 Subordinate Bonds and the 2008C-2 Subordinate Bonds are variable rate bonds issued to refund certain prior debt. With respect to such bonds, the Authority entered into long-term interest rate swap agreements with J.P. Morgan Chase Bank, National Association and Merrill Lynch Capital Services, Inc. These swaps are insured by AGM. AGM provides the debt service reserve fund policy for the 2008C-1 Subordinate Bonds and the 2008C-2 Subordinate Bonds.

12. Subseries of 2008C-1 Subordinate Bonds. The 2008C-1 Subordinate Bonds were initially insured by AGM with a liquidity facility provided by Dexia Credit Local. In 2009, the Authority, pursuant to the 2009-1 Supplemental Subordinate Indenture and an Amendment to the Amending Supplement to the Initial Subordinate Indenture and the 2009-2 Supplemental Subordinate Indenture, divided the 2008C-1 Subordinate Bonds into four subseries: the \$10,000,000 Water and Sewer System Subordinate Revenue Refunding Bonds, Series C-1A of 2008 (the “2008C-1A Subordinate Bonds”); the \$10,000,000 Water and Sewer System Subordinate Revenue Refunding Bonds, Series C-1B of 2008 (the “2008C-1B Subordinate Bonds”); the \$5,000,000 Water and Sewer System Subordinate Revenue Refunding Bonds, Series C-1C of 2008 (the “2008C-1C Subordinate Bonds”); and the \$26,910,000 Water and Sewer System Subordinate Revenue Refunding Bonds, Series C-1D of 2008 (the “2008C-1D

Subordinate Bonds”). All of these bonds were converted into a term mode. Dexia Credit Local was removed as the liquidity facility for all of these bonds. New banks were designated as liquidity facility providers for the 2008C-1A Subordinate Bonds, the 2008C-1B Subordinate Bonds and the 2008C-1C Subordinate Bonds. The 2008C-1D Subordinate Bonds were remarketed without a liquidity facility. In 2012, the 2008C-1D Subordinate Bonds were remarketed again without a liquidity facility and the Authority entered into the 2012 Supplemental Subordinate Indenture.

13. 2008C-2 Subordinate Bonds. The 2008C-2 Subordinate Bonds are insured by AGM with a liquidity facility furnished by PNC Bank, National Association.

14. Direct Placement of 2008C-1ABC Subordinate Bonds. In 2013, the Authority began a process in which all of the subordinate bonds would eventually be put into direct placements by 2016. Pursuant to the Third Supplemental Subordinate Indenture, the AGM insurance on the 2008C-1A Subordinate Bonds, the 2008C-1B Subordinate Bonds and the 2008C-1C Subordinate Bonds (collectively, the “2008C-1ABC Subordinate Bonds”) was terminated, and the 2008C-1ABC Subordinate Bonds were directly placed with Banc of America Preferred Funding Corporation. In connection with the direct placement, the Authority and Banc of America Preferred Funding Corporation entered into a Continuing Covenant Agreement dated as of September 1, 2013 (the “2008C-1ABC Continuing Covenant Agreement”).

15. 2013A Bonds and 2013B Bonds. Also in 2013, the Authority issued additional senior bonds, the \$130,215,000 (Fixed Rate) Water and Sewer System First Lien Revenue Refunding Bonds, Series A of 2013 (the “2013A Bonds”) and the \$86,695,000 (Fixed Rate) Water and Sewer System First Lien Revenue Bonds, Series B of 2013 (the “2013B Bonds”), pursuant to the Eighth Supplemental Indenture. The 2013A Bonds are fixed rate bonds that refunded certain prior bonds and paid termination payments in order to terminate interest rate swap agreements. The 2013B Bonds are fixed rate bonds that funded capital projects. The 2013A Bonds and the 2013B Bonds are insured by AGM. AGM also provides the debt service reserve fund policy for the 2013A Bonds and the 2013B Bonds.

16. Direct Placement of 2008C-2 Subordinate Bonds; LIBOR Rates for 2008C-1ABC Subordinate Bonds, 2008C-2 Subordinate Bonds and Swaps. In 2014 and 2015, the rest of the subordinate bonds were put into direct placements. Pursuant to the 2014 Supplemental Indenture, the 2008C-1ABC Subordinate Bonds, which were directly placed with the Banc of America Preferred Funding Corporation in 2013, were converted to a LIBOR-based interest rate mode; and the 2008C-2 Subordinate Bonds were directly placed with DNT Asset Trust (an affiliate of J.P. Morgan Chase Bank, N.A.) in a LIBOR-based interest rate mode. The Authority and Banc of America Preferred Funding Corporation entered into a First Amendment to Continuing Covenant Agreement dated as of November 3, 2014 (the “2008C-1ABC First Amendment to Continuing Covenant Agreement”). The Authority and DNT Asset Trust entered into a Continuing Covenant Agreement dated as of November 3, 2014 (the “2008C-2 Continuing Covenant Agreement”). In connection with these actions, the Authority entered into amendments to the long-term interest rate swap agreements with J.P. Morgan Chase Bank, National Association and Merrill Lynch Capital Services, Inc. to provide for LIBOR-based payments by the counterparties under the swap agreements (with respect to all of the 2008C Subordinate Bonds).

17. Direct Placement of 2008C-1D Subordinate Bonds. In 2015, pursuant to the 2015 Supplemental Indenture, the 2008C-1D Subordinate Bonds were directly placed with Bank of America, N.A. in a LIBOR-based interest rate mode. The Authority and Bank of America, N.A. entered into a Continuing Covenant Agreement dated as of September 1, 2015 (the “2008C-1D Continuing Covenant Agreement”).

18. Agreements with AGM Regarding Swap Insurance. The Authority has two agreements with AGM regarding the interest rate swap agreements that AGM insures related to the 2008C Subordinate Bonds: an Agreement Regarding Insured Swap Transaction dated as of September 1, 2013, as amended by an Amendment dated as of July 11, 2017 (collectively, the “AGM 2008C-1ABC and 2008C-1D Agreement”), and an Agreement Regarding Insured Swap Transaction dated as of November 1, 2014 (the “AGM 2008C-2 Agreement”). These agreements require the swaps or the insurance thereof to be terminated in certain circumstances.

19. Non-Bond Subordinate Debt: PENNVEST Loans and 2016 Revolving Credit Agreement. In addition to the senior and subordinate bonds, the Authority has two other types of debt which are subordinate to both the senior and the subordinate bonds, but are on parity with each other with respect to the Authority’s Revenues (as hereinafter defined). The first type of debt consists of multiple loans (the “PENNVEST Loans”) from the Pennsylvania Infrastructure Investment Authority (“PENNVEST”). The PENNVEST Loans were entered into by the Authority between 2001 and 2014 and have an outstanding principal amount of approximately \$33 million. The second type of debt is an \$80 million maximum principal amount revolving construction loan evidenced by a Revenue Note, Series of 2016 (the “2016 Note”). The 2016 Note was issued pursuant to a Revolving Credit and Security Agreement dated as of July 1, 2016 (the “2016 Revolving Credit Agreement”) between the Authority and the lender, JPMorgan Chase Bank, National Association. In connection with the execution of the 2016 Revolving Credit Agreement, the Authority, PENNVEST, JPMorgan Chase Bank, National Association and The Bank of New York Mellon Trust Company, N.A., as collateral trustee, entered into an Intercreditor Agreement dated as of July 1, 2016 (the “2016 Intercreditor Agreement”) setting forth their respective rights with respect to the Revenues.

20. Bondholder Consent for this Indenture. The Authority is determined to improve both its operations and its capital assets. As part of these improvements, the Authority intends to improve and modernize its financing documents and to refund and restructure much of its outstanding debt. The Authority has obtained the consent of 66 2/3% of the bondholders under the Existing Senior Indenture and other required consents in order to have this Indenture become effective as of the First Effective Date (defined herein). The Authority, upon consultation with its counsel, has determined that the consents referenced in the previous sentence are sufficient to permit the actions contemplated herein. If and when 100% bondholder approval is obtained, one additional provision of this Indenture will become effective (see Section 11.02).

21. 2017A Bonds and 2017B Bonds. The Authority has issued its \$159,795,000 Water and Sewer System First Lien Revenue Refunding Bonds, Series A of 2017 (the “2017A Bonds”) and its \$5,595,000 Water and Sewer System First Lien Revenue Refunding Bond, Series B of 2017 (Federally Taxable) (the “2017B Bonds”) to finance the refunding of a portion of the 1998B Bonds and the 2013B Bonds and all of the 2008A Bonds and the 2008D-1

Bonds pursuant to the 2017-1 Supplemental Indenture. \$53,887,917 principal amount (accrued value) of the 1998B Bonds remain outstanding, and \$38,760,000 principal amount of the 2013B Bonds remain outstanding.

22. 2017C Bonds. The Authority has issued its \$218,805,000 Water and Sewer System First Lien Revenue Refunding Bonds, Series C of 2017 (the “2017C Bonds”) to finance the refunding of the 2008B-1 Bonds, the 2008B-2 Bonds and the 2008D-2 Bonds pursuant to the 2017-2 Supplemental Indenture.

23. Need for Amended and Restated Trust Indenture. The Authority has determined that this Amended and Restated Trust Indenture is necessary to update and modernize provisions and covenants, including those related to financing structures and bondholder security.

24. First Effective Date. This Indenture as amended by the 2017-1 Supplemental Indenture and the 2017-2 Supplemental Indenture is effective as of the First Effective Date; and

WHEREAS, the Authority determined that substantial changes were needed in the Existing Senior Indenture to provide the Authority, among other things, greater flexibility in conducting its operations and in financing its capital needs; as a result, the Authority is amending and restating the provisions of the Existing Senior Indenture by entering into this Indenture, which is now effective as described in Section 1.03 hereof, and the Authority has requested the Trustee to participate in this Indenture; and

WHEREAS, the execution and delivery of this Indenture have been duly authorized by a resolution of the Authority; and

WHEREAS, all acts, conditions and things required by the Constitution and laws of the Commonwealth, including the Act, to happen, exist and be performed precedent to and in the execution and delivery of this Indenture have happened, exist and have been performed as so required, in order to make this Indenture a valid and binding trust indenture for the security of the Bonds, subject to the lien on Revenues created under this Indenture, in accordance with its terms;

NOW, THEREFORE, THIS AMENDED AND RESTATED TRUST INDENTURE WITNESSETH: that in consideration of the premises and of the acceptance by the Trustee of the trusts hereby created, and of the purchase and acceptance of the Bonds by the registered Owners thereof, and for the purpose of fixing and declaring the terms and conditions upon which the Bonds are or may be issued, authenticated, delivered, secured and accepted by all persons who shall from time to time be or become Owners thereof, and to declare the terms and conditions upon which the Bonds are secured, and to secure equally and on parity the payment of (i) the principal of, and interest and premium (if any) on all Bonds at any time issued and outstanding hereunder, according to their tenor, purport and effect, and (ii) Other Senior Parity Indebtedness and to secure the performance and observance of all of the covenants, agreements and conditions therein and herein contained, the Authority, intending to be legally bound, has executed and delivered this Indenture and by these presents does hereby sell, assign, transfer, set

over, grant a security interest in and pledge unto The Bank of New York Mellon Trust Company, N.A., as Trustee, its successors in the trust and its assigns forever, to the extent provided in this Indenture, the Revenues (as defined in this Indenture), after payment of the Current Expenses (as defined in this Indenture), together with all cash and investments from time to time held in any fund (other than the Rebate Fund) by the Trustee hereunder or held by the Authority in the Revenue Fund, the Operating Reserve Fund or the Rate Stabilization Fund (collectively, the "Trust Estate").

TO HAVE AND TO HOLD the same unto the Trustee, its successors and assigns in trust forever, IN TRUST, NEVERTHELESS, upon the terms and trusts herein set forth, to secure the payment of all Bonds issued hereunder and the interest thereon and the observance and performance of all the terms, provisions and conditions of this Indenture, and for the equal and ratable benefit and security of all and singular the present and future holders of the Bonds and Other Senior Parity Indebtedness Parties, without preference, priority or distinction as to lien or otherwise, except as otherwise hereinafter provided, of any one Bond or Other Senior Parity Indebtedness over any other Bond or Other Senior Parity Indebtedness by the reason of priority in the issue, sale or authentication thereof or otherwise and to secure the performance and observance of all of the covenants, agreements and conditions therein and herein contained, including the payment of Other Senior Parity Indebtedness, and it is hereby covenanted and agreed by and between the parties hereto that the terms and conditions upon which the Bonds are to be issued, authenticated, delivered, secured and accepted by all persons who shall from time to time be or become registered Owners thereof, and the trusts and conditions upon which the pledged Revenues are to be held and disposed of, are as follows:

## ARTICLE I

### DEFINITIONS AND GENERAL INDENTURE MATTERS

#### Section 1.01 Definitions.

(a) The following terms defined in the Recitals of this Indenture shall have the meanings as defined therein for all purposes of this Indenture (including any Supplemental Indentures), unless the context clearly otherwise requires:

Act  
AGM  
AGM 2008C-1ABC and 2008C-1D Agreement  
AGM 2008C-2 Agreement  
Capital Lease Agreement  
City  
Commonwealth  
Cooperation Agreement  
Eighth Supplemental Indenture  
Existing Senior Indenture  
Existing Subordinate Indenture  
FGIC  
Fifth Supplemental Indenture

First Supplemental Indenture  
First Supplemental Subordinate Indenture  
Fourth Supplemental Indenture  
Lease and Management Agreement  
National  
Original Indenture  
Original Subordinate Indenture  
PENNVEST  
PENNVEST Loans  
Second Supplemental Indenture  
Second Supplemental Subordinate Indenture  
Seventh Supplemental Indenture  
Sixth Supplemental Indenture  
Third Supplemental Indenture  
Third Supplemental Subordinate Indenture  
1998B Bonds  
2008A Bonds  
2008B-1 Bonds  
2008B-2 Bonds  
2008C-1 Subordinate Bonds  
2008C-1A Subordinate Bonds  
2008C-1ABC Subordinate Bonds  
2008C-1ABC Continuing Covenant Agreement  
2008C-1ABC First Amendment to Continuing Covenant Agreement  
2008C-1B Subordinate Bonds  
2008C-1C Subordinate Bonds  
2008C-1D Subordinate Bonds  
2008C-1D Continuing Covenant Agreement  
2008C-2 Subordinate Bonds  
2008C-2 Continuing Covenant Agreement  
2009 Supplemental Indenture  
2009-1 Supplemental Subordinate Indenture  
2009-2 Supplemental Subordinate Indenture  
2010 Supplemental Indenture  
2012 Supplemental Subordinate Indenture  
2013 Supplemental Indenture  
2013A Bonds  
2013B Bonds  
2014 Supplemental Subordinate Indenture  
2015 Supplemental Subordinate Indenture  
2016 Intercreditor Agreement  
2016 Note  
2016 Revolving Credit Agreement  
2016 Supplemental Indenture  
2017A Bonds  
2017B Bonds

2017C Bonds  
2017-1 Supplemental Indenture  
2017-2 Supplemental Indenture

(b) Terms defined below in this Article I shall have the meanings set forth below for all purposes of this Indenture (including any Supplemental Indentures), unless the context clearly otherwise requires:

Account

The term "Account" shall mean any of the various accounts, sometimes created within a Fund, under this Indenture including in a Supplemental Indenture.

Accreted Values

The term "Accreted Values" with respect to any Capital Appreciation Bonds, Capital Appreciation and Income Bonds, and Current Interest Capital Appreciation Bonds shall mean an amount equal to the Principal Amount of such Bonds (determined on the basis of the Principal Amount per \$5,000 at maturity thereof) plus the amount assuming semiannual compounding of earnings which would be produced on the investment of such Principal Amount, beginning on the dated date of such Bonds and ending at the maturity date thereof, at a yield which if produced until maturity will produce \$5,000 at maturity. As of any Valuation Date, the Accreted Value of any such Bonds shall mean the amount set forth for such date in the Supplemental Indenture and as of any date other than a Valuation Date, the sum of (a) the Accreted Value on the preceding Valuation Date and (b) the product of (i) a fraction, the numerator of which is the number of days having elapsed from the preceding Valuation Date and denominator of which is the number of days from such preceding Valuation Date to the next succeeding Valuation Date, and (ii) the difference between the Accreted Values for such Valuation Dates. For purposes of consents, voting rights, Bondowner rights, or any other matter herein determined by a percentage of the aggregate Principal Amount of Bonds Outstanding, Capital Appreciation Bonds, Capital Appreciation and Income Bonds, and Current Interest Capital Appreciation Bonds shall be valued at their Accreted Values.

Additional Bonds

The term "Additional Bonds" shall mean Bonds authenticated and delivered hereunder of any Series other than the First Effective Date Outstanding Bonds.

Additional Indebtedness Test

The term "Additional Indebtedness Test" shall mean the certification requirement set forth in Section 3.02(g)(ii) or 3.02(h)(ii) for the issuance of Additional Bonds, in Section 3.03(a) for the issuance of Other Senior Parity Indebtedness.

Additional Indebtedness Test Net Revenues

The term "Additional Indebtedness Test Net Revenues" shall mean Net Revenues adjusted for the purpose of determining fulfillment of the Additional Indebtedness Test to exclude for the relevant Test Period any Revenues consisting of Grants, proceeds of any business interruption insurance, and investment income earned on the Construction Fund and Rate Stabilization Fund.

#### Annual Budget

The term "Annual Budget" shall mean the budget required by Section 7.12 herein.

#### Annual Debt Service

The term "Annual Debt Service" shall mean the amount of payments scheduled to come due within a specified Fiscal Year for principal of and interest on any specified Indebtedness. For purposes of calculating Annual Debt Service, the following assumptions are to be used to calculate the principal and interest due in such specified Fiscal Year:

(a) In determining the Principal Amount due in the Fiscal Year, except to the extent that another subparagraph of this definition applies, payment shall be assumed to be made in accordance with any amortization schedule established for such Indebtedness, including any scheduled redemption of such specified Indebtedness and, for such purpose, the redemption payment shall be deemed a principal payment. In determining the amount of interest due in each Fiscal Year, except to the extent subparagraphs (b) through (h) of this definition apply, (i) interest payable at a fixed rate shall be assumed to be made at such fixed rate and on the required payment dates and (ii) the interest rate to be used for Variable Rate Indebtedness that has been Outstanding for at least twelve (12) months shall be the average rate over the twelve (12) months immediately preceding the date of calculation, or for Variable Rate Indebtedness that has been Outstanding less than twelve (12) months the interest rate to be used shall be the actual rate on the date of calculation, or, for Variable Rate Indebtedness proposed to be issued the interest rate to be used for such computation shall be determined by (1) a Qualified Independent Consultant to be a reasonable market rate for fixed-rate bonds of a corresponding term issued under this Indenture on the date of such calculation, with no credit enhancement and taking into consideration whether such Indebtedness bears interest that is or is not excluded from gross income for federal income tax purposes and that is or is not subject to any alternative minimum tax or (2) an Authorized Representative of the Authority by applying the Municipal Market Data (MMD) Index of the same rating category as the Authority for fixed-rate bonds of the most closely corresponding final term and parameters in (1) above.

For the purpose of verifying compliance with the rate covenant contained in Section 7.01 hereof, Variable Rate Indebtedness shall be deemed to bear interest at the actual rate or rates borne during any applicable Fiscal Year.

The amount of Capitalized Interest on deposit in the Debt Service Fund shall be subtracted from the amount of interest due for any related Fiscal Year, but only to the



extent that such Capitalized Interest is dedicated to a particular interest payment coming due during such Fiscal Year.

(b) Each maturity of Indebtedness that constitutes Balloon Indebtedness shall be treated as if it were to be amortized over a term of not more than forty (40) years and with substantially level annual debt service payments commencing not later than the year following the year in which such Balloon Indebtedness was issued, and extending not later than forty (40) years from the date such Balloon Indebtedness was originally issued. For fixed rate obligations, the interest rate used for such computation shall be determined by (1) a Qualified Independent Consultant to be a reasonable market rate for fixed-rate bonds of a corresponding term issued under this Indenture on the date of such calculation, with no credit enhancement and taking into consideration whether such Indebtedness bears interest that is or is not excluded from gross income for federal income tax purposes and that is or is not subject to any alternative minimum tax or (2) an Authorized Representative of the Authority by applying the Municipal Market Data (MMD) Index of the same rating category as the Authority for fixed-rate bonds of the most closely corresponding final term and parameters in (1) above in this sentence. For Balloon Indebtedness that also constitutes Variable Rate Indebtedness, the interest rate used for such computation shall be determined by (1) a Qualified Independent Consultant to be a reasonable market rate for fixed-rate Bonds of a corresponding term issued under this Master Bond Resolution on the date of such calculation, with no credit enhancement and taking into consideration whether such Bonds bear interest that is or is not excluded from gross income for federal income tax purposes and that is or is not subject to any alternative minimum tax or (2) an Authorized Representative of the Authority by applying the Municipal Market Data (MMD) Index of the same rating category as the Authority for fixed-rate bonds of the most closely corresponding final term and parameters in (1) above.

(c) Notwithstanding subparagraph (b) above, if any stated maturity date of Indebtedness that constitutes Balloon Indebtedness occurs within twelve (12) months from the date of the calculation of Annual Debt Service, the principal amount maturing shall be assumed to become due and payable on the stated maturity date unless there is delivered a certificate of an Authorized Representative of the Authority stating that (i) the Authority intends to refinance such maturity and (ii) the probable terms of such refinancing. Upon delivery of such certificate, such Balloon Indebtedness shall be assumed to be refinanced, and Annual Debt Service shall be calculated, in accordance with the probable terms set out in such certificate, except that such assumption shall not result in an interest rate lower than that which would be assumed under subparagraph (b) above and such Balloon Indebtedness shall be amortized over a term of not more than forty (40) years from the date of refinancing.

(d) If any Indebtedness that is then proposed to be issued constitutes Tender Indebtedness, then Tender Indebtedness shall be treated as if the principal amount of such Bonds were to be amortized over a term of not more than 40 years from the date such Tender Indebtedness was originally issued, except that if any principal maturity or amortization schedule is set forth in a Supplemental Indenture or other applicable agreement, such schedule shall be used to determine the principal maturity or

amortization of such Indebtedness. The interest rate used for such computation shall be determined by (1) a Qualified Independent Consultant to be a reasonable market rate for fixed-rate Bonds of a corresponding term issued under this Indenture on the date of such calculation, with no credit enhancement and taking into consideration whether such Indebtedness bears interest that is or is not excluded from gross income for federal income tax purposes and that is or is not subject to any alternative minimum tax or (2) an Authorized Representative of the Authority by applying the Municipal Market Data (MMD) Index of the same rating category as the Authority for fixed-rate bonds of the most closely corresponding final term and parameters in (1) above. For all principal and interest payments becoming due prior to the year in which such Tender Indebtedness is first subject to tender, such payments shall be treated as described in the other applicable subparagraphs of this definition.

(e) With respect to any Interim Indebtedness, it shall be assumed that the principal amount of the Interim Indebtedness will be continuously refinanced and will remain Outstanding until the first Fiscal Year for which interest on the Interim Indebtedness has not been capitalized or otherwise funded or provided for. For such first Fiscal Year, it shall be assumed that (i) the Outstanding principal amount of the Interim Indebtedness will be refinanced with a Series of Additional Bonds that will be amortized over a period not to exceed forty (40) years in such manner as will cause the maximum annual debt service payments applicable to such Series in any twelve (12) month period not to exceed 110% of the minimum annual debt service payments applicable to such Series for any other twelve (12) month period, and (ii) the Series of Additional Bonds will bear interest at a fixed interest rate estimated by (1) a Qualified Independent Consultant to be the interest rate such Series of Additional Bonds would bear if issued on such terms on the date of such estimate to be a reasonable market rate for fixed-rate bonds of a corresponding term issued under this Indenture on the date of such calculation, with no credit enhancement and taking into consideration whether such Indebtedness bears interest that is or is not excluded from gross income for federal income tax purposes and that is or is not subject to any alternative minimum tax or (2) an Authorized Representative of the Authority by applying the Municipal Market Data (MMD) Index of the same rating category as the Authority for fixed-rate bonds of the most closely corresponding final term and parameters in (1) above. Indebtedness which is Interim Indebtedness shall not be treated as Balloon Indebtedness.

(f) Except for Hedge Agreements, Qualified Interest Rate Swap Agreements are to be disregarded in calculating the Series Debt Service Reserve Requirement. Upon incurrence of a Hedge Agreement, all calculations, including for the annual amount on account of principal and interest on Indebtedness subject to the Hedge Agreement, shall be made using the Hedge Fixed Rate for the applicable period and such Indebtedness shall not be considered as Variable Rate Indebtedness for such period.

(g) If money that is not included in the definition of "Revenues" has been used to pay or has been irrevocably deposited with and is held by the Authority to pay principal and/or interest on Indebtedness, then the principal and/or interest paid from such money shall be excluded from the computation of Annual Debt Service.

(h) For any Indebtedness for which a binding commitment, letter of credit or other credit arrangement providing for the extension of such Indebtedness beyond its original maturity date exists, the computation of the annual amount payable on account of principal and interest on such Indebtedness shall, at the option of the Authority, be made on the assumption that such Indebtedness will be amortized in accordance with such credit arrangement.

#### Approval Amount

The term "Approval Amount" shall mean (a) prior to the Second Effective Date, sixty-six and two-thirds per centum (66-2/3 %) in aggregate Principal Amount of the applicable Bonds then Outstanding, and (b) on and after the Second Effective Date, a majority in aggregate Principal Amount of the applicable Bonds then Outstanding.

#### Authority

The term "Authority" shall mean The Pittsburgh Water and Sewer Authority, a body corporate and politic existing and operating under the Act.

#### Authorized Depository

The term "Authorized Depository" shall mean any incorporated bank or trust company doing business in the Commonwealth, which is insured by the Federal Deposit Insurance Corporation or by any other agency of the United States of America performing functions similar to the Federal Deposit Insurance Corporation (provided such an agency shall be in existence), which has a combined capital and surplus of not less than Fifty Million Dollars (\$50,000,000), and which is not unsatisfactory to the Trustee, and shall include the Trustee; provided that the Authority may deposit funds in any bank or trust company doing business in the Commonwealth to the extent that such funds are insured, by the Federal Deposit Insurance Corporation or by any other agency of the United States of America performing similar functions to the Federal Deposit Insurance Corporation.

#### Authorized Representative of the Authority

The term "Authorized Representative of the Authority" shall mean the Chairperson, the Vice Chairperson, the Secretary, the Assistant Secretary, the Executive Director, the Chief Financial Officer, the Director of Finance or any such other person or persons as may be designated to act on behalf of the Authority by a certificate executed by the Chairperson of the Authority and on file with the Trustee.

#### Balloon Indebtedness

The term "Balloon Indebtedness" shall mean all or any portion of any Indebtedness 25% or more of the initial principal of which matures on the same date or within such Fiscal Year. For purposes of this definition, the principal amount maturing on any date shall be reduced by the amount of such Indebtedness scheduled to be amortized by prepayment or redemption prior to its stated maturity date. If any indebtedness consists partially of Variable Rate Indebtedness and partially of indebtedness bearing interest at a fixed rate, the portion

constituting Variable Rate Indebtedness and the portion bearing interest at a fixed rate shall be treated as separate issues for purposes of determining whether any such indebtedness constitutes Balloon Indebtedness.

#### Board

The term "Board" shall mean the governing body of the Authority.

#### Bond or Bonds

The term "Bond" or "Bonds" shall mean any bond or all the bonds, as the case may be, authenticated and delivered under this Indenture, but not including Subordinate Debt.

#### Bond Counsel

The term "Bond Counsel" shall mean an attorney or firm of attorneys selected by the Authority which is a nationally recognized and experienced bond counsel relating to the financing of facilities through the issuance of tax-exempt or taxable bonds.

#### Bond Insurance Policy

The term "Bond Insurance Policy" shall mean a municipal bond insurance policy or policies, including any endorsements thereto, issued by a Bond Insurer guaranteeing the scheduled payment of the principal of and interest on Bonds.

#### Bond Insurer or Insurer

The term "Bond Insurer" or "Insurer" shall mean an insurance company guaranteeing the payment of principal and interest on Bonds when due.

#### Bond Year

The term "Bond Year" shall mean, each year, the twelve (12) month period commencing on the date of issuance of a Series of Bonds or the anniversary date thereof, or as otherwise provided in the Supplemental Indenture or the Tax Regulatory Certificate for a Series of Bonds.

#### Business Day

Except as otherwise defined in a Supplemental Indenture related to a Series of Bonds, the term "Business Day" shall mean a day on which banking business is transacted, but not including a Saturday, Sunday or legal holiday, or any day on which banks located in each of the cities in which the offices of the Trustee and the Paying Agent responsible for the administration of this Indenture are located are authorized by law to close, or any day on which the New York Stock Exchange is closed.

### Capital Additions

The term "Capital Additions" shall mean all new or additional property, which the Authority has authority to, or is required to, construct or acquire with respect to the System, and any and all permanent improvements, replacements, additions, extensions and betterments to real or fixed property of the Authority with respect to the System.

### Capital Appreciation Bonds

The term "Capital Appreciation Bonds" shall mean Bonds as to which the Accreted Value is payable only at the maturity or prior redemption of the Bonds. For purposes of consents, voting rights, Bondowner rights, or any other matter herein determined by a percentage of the aggregate Principal Amount of Bonds Outstanding, Capital Appreciation Bonds shall be valued at their Accreted Values.

### Capital Appreciation and Income Bonds

The term "Capital Appreciation and Income Bonds" shall mean Bonds as to which interest is deferred and compounded prior to the date after which interest ceases to be deferred and compounded and the interest becomes currently payable. For purposes of consents, voting rights, Bondowner rights, or any other matter in herein determined by a percentage of the aggregate Principal Amount of Bonds Outstanding, Capital Appreciation and Income Bonds shall be valued at their Accreted Values.

### Capitalized Interest

The term "Capitalized Interest" shall mean the amount of interest on Bonds, if any, funded from the proceeds of the Bonds or other money that are deposited with the Trustee in the Debt Service Fund as shall be described in a Supplemental Indenture upon issuance of Bonds to be used to pay interest on the Bonds.

### Code

The term "Code" shall mean the Internal Revenue Code of 1986, as amended, including applicable regulations, rulings and revenue procedures promulgated or applicable thereunder.

### Common Debt Service Reserve Requirement

The term "Common Debt Service Reserve Requirement" shall mean, for all Common Debt Service Reserve Secured Bonds, the least of (i) 10% of the aggregate original stated Principal Amount of all Common Debt Service Reserve Secured Bonds (provided that if any Common Debt Service Reserve Secured Bonds have more than a *de minimis* (2%) amount of original issue discount or premium, the issue price of such Common Debt Service Reserve Secured Bonds (net of pre-issuance accrued interest) is used to measure the 10% limitation in lieu of its stated Principal Amount), (ii) the maximum amount of aggregate Annual Debt Service

on all Common Debt Service Reserve Secured Bonds in any Fiscal Year, or (iii) 125% of average aggregate Annual Debt Service on all Common Debt Service Reserve Secured Bonds.

#### Common Debt Service Reserve Secured Bonds

The term "Common Debt Service Reserve Secured Bonds" shall mean any Series of Bonds for which the Supplemental Indenture authorizes said Bonds to be secured by the Common Debt Service Reserve Requirement.

#### Construction Fund

The term "Construction Fund" shall mean the Construction Fund designated and established pursuant to Section 5.01 hereof.

#### Construction Project

The term "Construction Project" shall mean the acquisition or construction of Capital Additions or other improvements to the System, as the same may be amended from time to time.

#### Consulting Engineer

The term "Consulting Engineer" shall mean a person who is a registered professional engineer under the laws of the Commonwealth qualified to pass on engineering questions relating to the operation and maintenance of water, stormwater and sewer systems, who is appointed by the Board, who is in fact independent (although such person may be regularly retained by the Authority) and who is not unsatisfactory to the Trustee. If such person be an individual, such person shall not be a member of the Board or an officer or employee of the Authority or the City. If such person be a partnership or corporation, such person shall not have a partner, director, officer or substantial stockholder who is a member of the Board or an officer or employee of the Authority or the City. The Consulting Engineer may perform similar services for the City.

#### Continuing Disclosure Undertaking

The term "Continuing Disclosure Undertaking" shall mean the continuing disclosure undertaking or continuing disclosure agreement, if any, relating to a Series of Bonds.

#### Cost

The term "Cost", when used with reference to a Construction Project or with reference to Capital Additions, shall mean the amounts required to be paid to construct and complete the Construction Project or to construct or otherwise acquire such Capital Additions, and shall include, in addition to such other items as are included within any proper definition of cost, allowances or charges for interest during construction and for a reasonable period thereafter, which is not otherwise provided for, taxes, engineering, legal, fiscal and superintendence expenses and premiums for casualty and other insurance and all expenses

incurred by the Authority in connection with the preparation, issue and sale of the Bonds or other Indebtedness including discounts (if any) incurred on the sale of the Bonds or other Indebtedness.

#### Counsel

The term "Counsel" shall mean legal counsel admitted to practice before the Supreme Court of the Commonwealth, who may but need not be counsel regularly retained by the Authority, and not unsatisfactory to the Trustee.

#### Counsel's Opinion

The term "Counsel's Opinion" shall mean an opinion signed by an attorney or firm of attorneys selected by the Authority or the Trustee, respectively.

#### Counterparty

The term "Counterparty" shall mean any counterparty (the party other than the Authority) on a Qualified Interest Rate Swap Agreement.

#### Credit Facility

The term "Credit Facility" shall mean a letter of credit, liquidity facility, a bond insurance policy, surety bond or similar arrangement securing any obligation of the Authority with respect to any Indebtedness.

#### Current Expenses

The term "Current Expenses" shall mean all current expenses directly or indirectly attributable to the ownership or operation of the System, including reasonable and necessary usual expenses of administration, operation, maintenance and repair; costs for billing and collecting the rates; insurance premiums; costs and expenses of any Credit Facility; and legal, engineering, auditing and financial advisory expenses; all as determined (except as otherwise specified in this Indenture) in accordance with GAAP for entities such as the Authority consistently applied, excluding (a) any payments payable by the Authority to the City under the Cooperation Agreement, (b) any payments in lieu of taxes or allowance for depreciation or amortization, and (c) expenses which constitute extraordinary, nonrecurring and non-continuing expenses of the System in the written opinion of the Qualified Independent Consultant.

#### Current Interest Capital Appreciation Bonds

The term "Current Interest Capital Appreciation Bonds" shall mean Bonds as to which a portion of interest is currently payable and a portion of the interest is deferred and compounded until the Accreted Value is payable only at the maturity or prior redemption of the Bonds. For purposes of consents, voting rights, Bondowner rights, or any other matter herein determined by a percentage of the aggregate Principal Amount of Bonds Outstanding, Current Interest Capital Appreciation Bonds shall be valued at their Accreted Values.

Debt Service Fund

The term “Debt Service Fund” shall mean the fund so designated and created by Section 6.01(3).

Debt Service Reserve Fund

The term “Debt Service Reserve Fund” shall mean the fund so designated and created by Section 6.01(4).

Debt Service Reserve Fund Policy

The term “Debt Service Reserve Fund Policy” shall mean a Municipal Bond Debt Service Reserve Fund Policy or Policies issued by a Bond Insurer and deposited into the Debt Service Reserve Fund.

Debt Service Reserve Requirement

The term “Debt Service Reserve Requirement” shall mean the applicable Common Debt Service Reserve Requirement or the Series Debt Service Reserve Requirement.

Default Rate

The term “Default Rate” shall mean the “Default Rate” as defined in a Credit Facility.

Disbursement Date

The term “Disbursement Date” shall have the meaning set forth in Section 6.02 hereof.

DTC

The term “DTC” shall have the meaning set forth in Section 2.10 hereof.

DTC Representation Letter

The term “DTC Representation Letter” shall have the meaning set forth in Section 2.10 hereof.

EMMA

The term “EMMA” shall mean the Electronic Municipal Market Access system operated by the MSRB, or any successor system.

First Effective Date



The term "First Effective Date" shall mean the date on which at least sixty-six and two-thirds per centum (66-2/3 %) in aggregate Principal Amount of the applicable Bonds Outstanding shall have approved this Amended and Restated Trust Indenture, as described in Section 1.03 hereof. The First Effective Date is December 28, 2017.

#### First Effective Date Outstanding Bonds

The term "First Effective Date Outstanding Bonds" shall mean the Bonds Outstanding on the First Effective Date (being the then Outstanding 1998B Bonds, 2013A Bonds, 2013 B Bonds, 2017A Bonds, 2017B Bonds and 2017C Bonds).

#### Fiscal Year

The term "Fiscal Year" shall mean the period of twelve months beginning on January 1 of each year or such other twelve month period as may be designated by the Authority.

#### Fund

The term "Fund" shall mean any of the various funds created under this Indenture including in a Supplemental Indenture.

#### GAAP

The term "GAAP" shall mean generally accepted accounting principles.

#### Grant

The term "Grant" shall mean a grant provided by any entity to or for the Authority for the payment of Current Expenses.

#### Hedge Agreement

The term "Hedge Agreement" shall mean an Interest Rate Swap, cap, collar, floor, forward or other hedging agreement, arrangement or security however denominated, expressly identified pursuant to its terms as being entered into in connection with and in order to hedge interest rate fluctuations on all or a portion of any Indebtedness where (a) interest on such Indebtedness or such portion of such Indebtedness is payable at a variable rate of interest for any future period of time or is calculated at a varying rate per annum, and (b) a fixed rate is specified by the Authority in such agreement, or such Indebtedness, taken together with such agreement results in a net fixed rate payable by the Authority for such period of time (the "Hedge Fixed Rate"), assuming the Authority and the party(ies) with whom the Authority has entered into the agreement make all payments required to be made by the terms of the agreement, provided that no such agreement may be entered into by the Authority unless any termination or similar payment which may be payable by the Authority thereunder is expressly subordinate to the obligation of the Authority on the Indebtedness.

#### Hedge Fixed Rate

The term “Hedge Fixed Rate” shall have the meaning set forth in the definition of Hedge Agreement above.

#### Holder of Bonds

The term “Holder of Bonds” or “Bondholder” or “Holder” or “Owner of Bonds” or “Owner” or “Bondowner” or any similar term shall mean any registered owner of any Bond.

#### Indebtedness

The term “Indebtedness” shall mean (a) Senior Debt, (b) Subordinate Debt, and (c) other debt of the Authority not secured by the Revenues. The term shall include all debt of the Authority outstanding as of the First Effective Date.

#### Indenture

The term “Indenture” or “this Indenture” shall mean this amended and restated trust indenture and all indentures supplemental hereto.

#### Independent Auditor

The term "Independent Auditor" shall mean a person who is engaged in the accounting profession, who is a nationally recognized certified public accountant under the laws of the Commonwealth, who is in fact independent (although such person may be regularly retained by the Authority) who is appointed by the Board and who is not unsatisfactory to the Trustee. If such person be an individual, such person shall not be a member of the Board, or an officer or employee of the Authority. If such person be a partnership or corporation, such person shall not have a partner, director, officer or substantial stockholder who is a member of the Board or an officer or employee of the Authority.

#### Interest Account

The term “Interest Account” shall mean the Interest Account in the Debt Service Fund so designated and created by Section 6.01(3) hereof.

#### Interest Payment Date

The term “Interest Payment Date” shall mean the interest payment dates specified in any Supplemental Indenture with respect to Bonds issued thereunder, or the applicable interest payment dates for any other Indebtedness.

#### Interim Indebtedness

The term “Interim Indebtedness” shall mean any Indebtedness (i) for or with respect to which no principal payments are required to be made other than on the maturity date thereof, which date shall be no later than five (5) years from the date of its delivery to the initial purchasers, and (ii) which are authorized by an agreement that declares the Authority’s intent, at

the time of issuance, to refund or refinance all or a part of the same prior to or on such maturity date, including commercial paper, notes, and similar obligations

Letter of Credit

The term “Letter of Credit” shall mean an irrevocable transferable direct-pay letter of credit or standby letter of credit issued for a Series of Bonds by a Letter of Credit Bank for the account of the Authority in favor of the Trustee supporting a Series of Bonds as set forth in a Reimbursement Agreement.

Letter of Credit Bank

The term “Letter of Credit Bank” shall mean the issuer of a Letter of Credit pursuant to a Reimbursement Agreement.

Liquidity Facility

The term “Liquidity Facility” shall mean a standby bond purchase agreement or other liquidity facility pursuant to which the provider or providers agree to purchase Bonds issued pursuant to this Indenture tendered for purchase in accordance with a Supplemental Indenture, (ii) the provider of which has short-term ratings of at least “A-1” from S&P and “P-1” from Moody’s (unless such requirement is waived by the applicable Bond Insurer or Letter of Credit Bank) and (iii) which is acceptable to the applicable Bond Insurer or Letter of Credit Bank and each Rating Service and otherwise satisfying the requirements of a Supplemental Indenture pursuant to which Bonds supported by such Liquidity Facility were issued.

Liquidity Facility Issuer

The term “Liquidity Facility Issuer” shall mean the issuer of a Liquidity Facility pursuant to a Reimbursement Agreement.

Moody's

The term "Moody's" shall mean Moody's Investors Service, its successors and assigns, and, if such corporation shall be dissolved or liquidated or shall no longer perform the functions of a securities rating agency, "Moody's" shall be deemed to refer to any other nationally recognized securities rating agency designated by the Authority, by notice to the Trustee.

MSRB

The term “MSRB” shall mean the Municipal Securities Rulemaking Board, or any successor agency.

### Net Revenues

The term "Net Revenues", when used with reference to any period, shall mean the Revenues of the Authority for such period, less all Current Expenses for such period.

### Operating Fund

The term "Operating Fund" shall mean the Operating Fund designated and created by Section 6.01(2) hereof.

### Operating Reserve Fund

The term "Operating Reserve Fund" shall mean the Operating Reserve Fund designated and created by Section 6.01(5) hereof.

### Operating Reserve Requirement

The term "Operating Reserve Requirement" shall mean an amount equal to one-sixth (1/6<sup>th</sup>) of the Current Expenses reflected in the most recent annual audited financial statements of the Authority.

### Other Senior Parity Indebtedness

The term "Other Senior Parity Indebtedness" shall mean any other Indebtedness incurred by the Authority under this Indenture or secured by this Indenture that the Authority is required, or has elected, to treat as payable on a parity with the Bonds with respect to the pledge of Revenues, including Reimbursement Obligations under Reimbursement Agreements and Periodic Payments under Qualified Interest Rate Swap Agreements.

### Other Senior Parity Indebtedness Party

The term "Other Senior Parity Indebtedness Party" shall mean the other party (not the Authority) on Other Senior Parity Indebtedness, including, without limitation, any Letter of Credit Bank, Liquidity Facility Issuer, or Counterparty (but only with respect to Periodic Payments).

### Outstanding

The term "Outstanding under this Indenture" or "Outstanding hereunder" or "Outstanding", when used with reference to Bonds, shall mean, at any date as of which the amount of Outstanding Bonds is to be determined, the aggregate of all Bonds authenticated and delivered under this Indenture, except

- (i) Bonds cancelled at or prior to such date;

- (ii) Bonds for the payment of which funds shall have been theretofore deposited in trust with the Trustee and which shall have matured by their terms but shall not have been surrendered for payment;
- (iii) Bonds for the redemption or payment of which funds in the full amount required, either alone or together with the interest to be earned thereon, but without the need to reinvest interest or principal, shall then be irrevocably held in trust by the Trustee, provided that notice of such redemption shall have been provided as set forth in Article IV or provisions satisfactory to the Trustee shall have been made for providing such notice;
- (iv) Bonds deemed to be paid pursuant to the provisions of Article XII hereof.

With respect to Indebtedness other than Bonds, "Outstanding" shall mean Indebtedness which has not been paid and with respect to which payment has not been provided for.

#### Paying Agent

The term "Paying Agent" shall initially mean The Bank of New York Mellon Trust Company, N.A., its successors and assigns, and any successor paying agent or co-paying agent appointed by the Authority.

#### Periodic Payments

The term "Periodic Payments" shall mean any regularly scheduled fixed payment payable by the Authority to the Counterparty pursuant to the terms of any Qualified Interest Rate Swap Agreement(s); however, Periodic Payments shall not include any termination payments or any other sums payable under the Qualified Interest Rate Swap Agreement that are not regularly scheduled payments payable by the Authority.

#### Policy Costs

The term "Policy Costs" shall mean, collectively, the repayment of any draws under a Debt Service Reserve Fund Policy and related reasonable expenses incurred by a Bond Insurer (together with interest thereon).

#### Prime Rate

The term "Prime Rate" means the rate of interest announced, from time to time, by the Trustee as its prime rate.

#### Principal Account

The term "Principal Account" shall mean the Principal Account in the Debt Service Fund so designated and created by Section 6.01(3) hereof.

#### Principal Amount

The term “Principal Amount” with respect to any Indebtedness, shall mean the stated principal thereon, the Accreted Value thereof, as applicable, or such other amount payable on any Indebtedness that is designated as principal pursuant to a Supplemental Indenture.

#### Principal Office of the Trustee

The term “Principal Office” shall mean the designated corporate trust office of the Trustee responsible for the administration of this Indenture or at the office of any successor trustee or paying agent appointed under this Indenture.

#### Qualified Independent Consultant

The term “Qualified Independent Consultant” shall mean an independent professional consultant having the skill and experience necessary to provide the particular certificate, report or approval required by the provision of this Indenture or any Supplemental Indenture in which such requirement appears, including without limitation a Consulting Engineer and an Independent Auditor.

#### Qualified Interest Rate Swap Agreement

The term “Qualified Interest Rate Swap Agreement” shall mean any agreement relating to any Bonds issued or to be issued under this Indenture with a Counterparty whereby the Authority will pay to the Counterparty periodic fixed amounts based upon a fixed percentage of a notional amount specified in such agreement and such Counterparty will pay to the Authority certain periodic floating amounts based upon a variable percent of the same notional amount; provided, that the underwriter for the applicable Bonds or the Authority's financial advisor has certified to the Authority and the Trustee that (based upon then current market conditions) such Qualified Interest Rate Swap Agreement creates an overall lower Debt Service Requirement than would be attained through the issuance of Additional Bonds in an amount equal to such notional amounts at a fixed rate without such Qualified Interest Rate Swap Agreement. Periodic Payments under a Qualified Interest Rate Swap Agreement may be on parity with the Bonds to which the Qualified Interest Rate Swap Agreement relates.

#### Rate Covenant

The term “Rate Covenant” shall mean the obligation of the Authority to fix, charge, collect and revise rates, fees and other charges for the use of, and the services furnished by, the System sufficient to meet the requirements of this Indenture, including without limitation Section 7.01.

#### Rate Covenant Net Revenues

The term “Rate Covenant Net Revenues” shall mean Net Revenues, provided that Net Revenues shall be adjusted for the purpose of determining compliance with the Rate Covenant as follows: (i) to include transfers from the Rate Stabilization Fund to the Revenue Fund (as provided in Section 6.08 hereof), and (ii) to exclude transfers to the Rate Stabilization Fund from the Revenue Fund (as provided in Section 6.08 hereof).

Rate Stabilization Fund

The term “Rate Stabilization Fund” shall mean the fund so designated and created pursuant to Section 6.01(8) hereof.

Rating Agency

The term “Rating Agency” shall mean Moody’s or S&P, or either of them, and their successors, or any other nationally recognized statistical rating organization selected by the Authority.

Rebate Fund

The term “Rebate Fund” shall mean the Rebate Fund designated and created pursuant to Section 6.01(10) hereof.

Record Date

The term "Record Date" shall mean the fifteenth day of (whether or not such day is a Business Day) immediately preceding any Interest Payment Date or such other date set forth in a Supplemental Indenture.

Redemption Fund

The term “Redemption Fund” shall mean the fund so designated and created pursuant to Section 6.01(9) hereof.

Reimbursement Agreement

The term “Reimbursement Agreement” shall mean an agreement between the Authority and a Letter of Credit Bank or between the Authority and a Liquidity Facility Issuer, which agreements may be amended from time to time in accordance with the terms hereof and thereof.

Reimbursement Obligations

The term “Reimbursement Obligations” shall mean the obligations to reimburse the Letter of Credit Bank for draws on such Letter of Credit Bank’s Letter of Credit, or to reimburse a Liquidity Facility Issuer making liquidity payments pursuant to a Liquidity Facility and to pay all other amounts due or to become due under the applicable Reimbursement Agreement.

Reserve Determination Date

The term “Reserve Determination Date” shall mean any date established in writing by an Authorized Representative of the Authority for the valuation of investments,

including any Debt Service Reserve Fund Policy and other applicable credit facilities, in the Debt Service Reserve Fund, which valuation shall be at least annually.

#### Resolution of the Board or Resolution of the Authority

The term "Resolution of the Board" or "Resolution of the Authority" shall mean a resolution certified by the Secretary or Assistant Secretary of the Authority to have been duly adopted by the Board and to be in full force and effect on the date of such certification.

#### Revenue Fund

The term "Revenue Fund" shall mean the fund so designated and created by Section 6.01(1) hereof.

#### Revenues

The term "Revenues" shall mean any and all rates, fees, rents and charges established or to be established, levied and collected in connection with, and all other payments, revenues of whatever kind or character arising from, the operation or ownership of any property of the Authority or any part thereof (except tap or connection fees and charges to the extent such fees or charges are pledged in accordance with the Act as a refund to such person who has paid for the construction of any extension of the System), any income earned on the moneys or investments on deposit in the Debt Service Fund, Debt Service Reserve Fund, Construction Fund, Revenue Fund, Operating Fund, Operating Reserve Fund, Rate Stabilization Fund and any sinking, purchase or analogous fund created hereunder and any Periodic Payments received by the Authority from the Counterparty pursuant to any Qualified Interest Rate Swap Agreement which, upon receipt, shall be transferred to and deposited in the Revenue Fund, all as determined (except as other specified in this Indenture) in accordance with GAAP for entities such as the Authority consistently applied. Revenues shall not include refundable customer deposits or other payments solely in aid of construction, any Grants, payments from PENNVEST or similar payments, or the proceeds resulting from the sale of all or a portion of the System.

#### Second Effective Date

The term "Second Effective Date" shall mean the date on which one hundred per centum (100%) in aggregate Principal Amount of the applicable Bonds Outstanding shall have approved this Amended and Restated Trust Indenture, as described in Section 1.04 hereof.

#### Senior Debt

The term "Senior Debt" shall mean Bonds and Other Senior Parity Indebtedness. The term shall include all bonds of the Authority outstanding under the Existing Senior Indenture as of the First Effective Date.



#### Separate Series Debt Service Reserve Requirement

The term "Separate Series Debt Service Reserve Requirement" shall mean, for any Series of Additional Bonds for which the Supplemental Indenture authorizes a Separate Series Debt Service Reserve Requirement, the amount, if any, specified in such Supplemental Indenture as the Separate Series Debt Service Reserve Requirement; provided, however, that such amount shall not exceed the maximum amount permitted by the Code. Such amount may be zero.

#### Separate Series Debt Service Reserve Secured Bonds

The term "Separate Series Debt Service Reserve Secured Bonds" shall mean any Series of Bonds for which the Supplemental Indenture authorizes said Bonds to be secured by funds constituting a Separate Series Debt Service Reserve Requirement.

#### Series or Series of Bonds

The term "Series" or "Series of Bonds" shall mean a separate series or subseries of Bonds issued under a Supplemental Indenture.

#### Series Debt Service Reserve Account

The term "Series Debt Service Reserve Account" shall mean each account in the Debt Service Reserve Fund related to a particular Series of Bonds that is required to be funded as required in a Supplemental Indenture.

#### Series Debt Service Reserve Requirement

The term "Series Debt Service Reserve Requirement" shall mean for any Series of the Bonds, the Common Debt Service Reserve Requirement or the Separate Series Debt Service Reserve Requirement set forth in the Supplemental Indenture authorizing such Series of Bonds.

#### Sinking Fund Account

The term "Sinking Fund Account" shall mean the Sinking Fund Account in the Debt Service Fund created in Section 6.01(3) hereof.

#### S&P

The term "S&P" shall mean Standard & Poor's Corporation, its successors and assigns, and, if such corporation shall be dissolved or liquidated or shall no longer perform the functions of a securities rating agency, "S&P" shall be deemed to refer to any other nationally recognized securities rating agency designated by the Authority, by notice to the Trustee.

#### Subordinate Debt

The term "Subordinate Debt" shall mean any bonds, notes or other obligations issued in connection with the System (a) which are designated by the Authority as Subordinate Debt, and (b) which may have pledged to their payment Net Revenues, alone or in conjunction with other sources, as a subordinate lien pledge after the pledge of Net Revenues to Senior Debt. Subordinate Debt shall include amounts owed to letter of credit banks or liquidity facility providers securing Subordinate Debt or periodic payments due on interest rate swap agreements related to Subordinate Debt, which shall be payable in accordance with Section 6.02(3) hereof, or termination or other payments (other than periodic payments) due under interest rate swap agreements related to Subordinate Debt, which shall be payable in accordance with Section 6.02(5) hereof.

#### Subordinate Debt Service Fund

The term "Subordinate Debt Service Fund" is the fund so designated and created by Section 6.01(6) hereof.

#### Subordinate Debt Service Reserve Fund

The term "Subordinate Debt Service Reserve Fund" is the fund so designated and created by Section 6.01(7) hereof.

#### Supplemental Indenture

The term "Supplemental Indenture" or "Indenture supplemental hereto" shall mean any indenture now or hereafter duly authorized and entered into in accordance with the provisions of this Indenture.

#### System

The term "System" shall mean and include, as of any particular time, (i) all tangible property, fixed or moveable, then owned or operated by the Authority and used in the rendering of water service, stormwater service, and sewer service by the Authority, (ii) all Capital Additions then constructed or otherwise acquired relating to water service, stormwater service, and sewer service, and (iii) all franchises used or useful to the Authority at such particular time in the rendering of water service, stormwater service, and sewer service by the Authority.

#### Tax Regulatory Certificate

The term "Tax Regulatory Certificate" shall mean a Tax Regulatory Certificate, Tax Regulatory Agreement, Non-Arbitrage Certificate or similar tax certificate of the Authority executed and delivered by the Authority in respect of a Series of Bonds issued under this Indenture.

#### Tender Indebtedness

The term “Tender Indebtedness” shall mean any Indebtedness a feature of which is an option or obligation on the part of the holders of such Indebtedness to tender all or a portion of such Indebtedness to a fiduciary for payment or purchase and requiring that such Indebtedness or a portion of such Indebtedness be purchased if properly tendered.

Term Bonds

The term “Term Bonds” shall mean any Bonds stated to mature on a specified date and required to be redeemed in part prior to maturity according to a sinking fund schedule.

Test Period

The term “Test Period” shall mean any 12 consecutive months of the last 24 months prior to the testing date.

Tested Fiscal Year

The term “Tested Fiscal Year” shall have the meaning set forth in Section 7.01 hereof.

Trust Estate

The term “Trust Estate” shall have the meaning set forth in the Granting Clause hereto.

Trustee

The term "Trustee" shall mean The Bank of New York Mellon Trust Company, N.A., its successors in the trust hereunder.

Valuation Date

The term “Valuation Date” with respect to any Capital Appreciation Bonds, Capital Appreciation and Income Bonds, or Current Interest Capital Appreciation Bonds, shall mean the date or dates set forth in the Supplemental Indenture on which specific Accreted Values are assigned to such Capital Appreciation Bonds, Capital Appreciation and Income Bonds, or Current Interest Capital Appreciation Bonds.

Variable Rate Indebtedness

The term “Variable Rate Indebtedness” shall mean any Indebtedness the interest rate on which is not fixed to maturity at the time of calculation, or other relevant time.

Section 1.02 Rules of Interpretation. Except where the context otherwise requires, (i) words importing one gender shall include all genders and words importing the singular number shall include the plural and vice versa, (ii) references to any entities shall

include their successors and assigns, and (iii) references to any documents shall include any subsequent amendments and supplements thereto.

Section 1.03 Certification and Effect of First Effective Date. The Authority hereby certifies to the Trustee that the Holders of in excess of 66 2/3% principal amount of the Bonds Outstanding under the Existing Senior Indenture have consented to this Amended and Restated Trust Indenture and therefore the First Effective Date is December 28, 2017, and this Amended and Restated Trust Indenture, as supplemented by the 2017-1 Supplemental Indenture and the 2017-2 Supplemental Indenture, is now effective. The Authority has provided the Trustee with a separate certificate setting forth the relevant calculations. This Amended and Restated Trust Indenture is now in full force and effect, and it supersedes the Existing Senior Indenture, except for the provisions incorporated by reference in Section 1.05 below and, through December 31, 2018, the Rate Covenant as described in Section 7.01 hereof.

Section 1.04 Second Effective Date. When 100% of Bondholders have consented to this Amended and Restated Indenture, the Authority will certify that fact to the Trustee. Thereupon, the amendment reflected in the definition of Approval Amount will become effective.

Section 1.05 First Effective Date Outstanding Bonds. The following First Effective Date Outstanding Bonds were issued under the Existing Senior Indenture, prior to the First Effective Date:

(a) The portion of the 1998B Bonds not refunded by the 2017A Bonds. These bonds are capital appreciation bonds. The following provisions of the Second Supplemental Indenture remain in full force and effect and are incorporated by reference in this Section 1.05(a) as if fully set forth herein: the provisions related to the accreted valuation of the 1998B Bonds, the maturities, redemption provisions, payment dates and interest rates on the 1998B Bonds, the form of the 1998B Bonds set forth in Exhibit A, the debt service schedule on the 1998B Bonds set forth in Exhibit B, and the compound accreted value table set forth in in Exhibit C.

(b) The portion of the 2008A Bonds not refunded by the 2017A Bonds and the 2017B Bonds. These are fixed rate bonds. The following provisions of the Seventh Supplemental Indenture remain in full force and effect and are incorporated by reference in this Section 1.05(b) as if fully set forth herein: the provision related to the maturities, redemption provisions, payment dates and interest rates on the 2008A Bonds, the form of the 2008A Bonds set forth in Exhibit B, and the debt service schedule for the 2008A Bonds set forth in Exhibit D.

(c) The 2013A Bonds. These bonds are fixed rate bonds. The following provisions of the Eighth Supplemental Indenture remain in full force and effect and are incorporated by reference in this Section 1.05(c) as if fully set forth herein: the provisions related to the maturities, redemption provisions, payment dates and interest rates on the 2013A Bonds, the form of the 2013A Bonds in Exhibit A, and the debt service schedule for the 2013A Bonds set forth in Exhibit B.

(d) The portion of the 2013B Bonds not refunded by the 2017A Bonds. These bonds are fixed rate bonds. The following provisions of the Eighth Supplemental Indenture remain in

full force and effect and are incorporated by reference in this Section 1.05(d) as if fully set forth herein: the provisions related to the maturities, redemption provisions, payment dates and interest rates on the 2013B Bonds, the form of the 2013A Bonds in Exhibit A, and the debt service schedule for the 2013B Bonds set forth in Exhibit B.

(e) The 2017A Bonds and the 2017B Bonds. The 2017-1 Supplemental Indenture remains in full force and effect as a Supplemental Indenture with respect to this Indenture.

(f) The 2017C Bonds. The 2017-2 Supplemental Indenture remains in full force and effect as a Supplemental Indenture with respect to this Indenture.

## ARTICLE II

### DESCRIPTION, EXECUTION AND REGISTRATION OF BONDS

Section 2.01 Issuance of Bonds; Form and Terms thereof. The Bonds may, at the election of the Authority, be issued in one or more Series and shall be designated generally as the “Water and Sewer System First Lien Revenue Bonds” of the Authority or similar designation. Subject to applicable provisions hereof, all Bonds shall be issued and shall contain such maturities, payment terms, interest rate provisions, redemption or prepayment features and other provisions as shall be set forth in the Supplemental Indenture providing for the issuance of such Bonds.

The Bonds shall be limited obligations of the Authority, payable solely from the Trust Estate. The Bonds shall constitute a valid claim of the respective Owners thereof against the Trust Estate, which is pledged to secure the payment of the principal of, redemption premium, if any, and interest on the Bonds, and which shall be utilized for no other purpose, except as expressly authorized in this Indenture. The Bonds shall not constitute general obligations of the Authority and under no circumstances shall the Bonds be payable from, nor shall the registered Owners thereof have any rightful claim to, any income, revenues, funds or assets of the Authority other than those pledged hereunder as security for the payment of the Bonds.

Section 2.02 Registration of Bonds. The Authority shall keep or cause to be kept at the Principal Office of the Trustee books for the registration and transfer of Bonds; and the Authority will register or transfer or cause to be registered or transferred therein, as hereinafter provided and under such reasonable regulations as it may prescribe, any Bond entitled to be so registered or transferred, upon presentation for such purpose. The Trustee is hereby appointed as registrar of the Authority for the purpose of registering, transferring and exchanging the Bonds. A Bond Insurer shall, upon the occurrence of an event of default triggering an obligation to make payments under the Insurance Policy, have the right to inspect the registration books maintained pursuant to this Section 2.02.

Section 2.03 Uniform Commercial Code. The Bonds shall be securities under the Pennsylvania Uniform Commercial Code Investment Securities and shall be negotiable instruments to the extent provided therein.

Section 2.04 Transfers and Exchanges of Bonds. Upon surrender for transfer of any fully registered Bond at the Principal Office of the Trustee, the Trustee shall authenticate and deliver in the name of the transferee or transferees one or more new fully registered Bonds of authorized denominations for the aggregate Principal Amount which the Bondholder is entitled to receive.

Any Bond shall be exchangeable for Bonds of any authorized denomination, in an aggregate Principal Amount equal to the Principal Amount of the Bond presented for exchange.

All Bonds presented for transfer or exchange shall be accompanied by a written instrument or instruments of transfer or authorization for exchange, in form satisfactory to the Trustee, duly executed by the Bondholder or by his duly authorized attorney. No transfer of any Bond shall be valid unless made on the registration books by the registered Owner in person, or by his duly authorized attorney. Such registrations, exchanges and transfers shall be without expense to the Holders of the Bonds, but any taxes, fees or other governmental charges required to be paid with respect to the same shall be paid by the Holder requesting any such registration, exchange or transfer as a condition precedent to the exercise of such privilege. Bonds may be presented for exchange or transfer only at the Principal Office of the Trustee or at the office of any Paying Agent as the Authority may hereafter appoint.

The Trustee shall not be required to register the transfer or exchange of any Bond (i) during a period beginning at the opening of business fifteen (15) days before the day of the mailing of notice of redemption of the Bonds and ending at the close of business on the date of such mailing, (ii) at any time following the selection of such Bonds, in whole or in part, for redemption, or (iii) during the period commencing on a Record Date and ending on the corresponding Interest Payment Date.

Section 2.05 Form of Bonds; Temporary Bonds. Bonds in definitive form shall be printed or typewritten. Until Bonds in definitive form of any Series are ready for delivery, the Authority may execute and upon its request in writing the Trustee shall initially authenticate and deliver in lieu of any thereof, and subject to the same provisions, limitations and conditions, one or more printed, or typewritten Bonds in temporary form, substantially of the tenor of the Bonds hereinbefore described, and with appropriate omissions, variations and insertions, with regard to the Bonds. Such Bonds or Bonds in temporary form may be for the amount of \$5,000 or any multiple or multiples thereof, as the Authority may determine. Until exchanged for Bonds in definitive form such Bonds in temporary form shall be entitled to the lien and benefit of this Indenture. The Authority shall, without unreasonable delay, prepare, execute and deliver to the Trustee, and thereupon, upon the presentation and surrender of any Bond or Bonds in temporary form, the Trustee shall authenticate and deliver, in exchange therefor, a Bond or Bonds in definitive form of the same Series and same maturity for the same aggregate Principal Amount as the Bond or Bonds in temporary form surrendered. Such exchange shall be made by the Authority at its own expense and without making any charge therefor. Until such Bonds in definitive form are ready for delivery, the Holder of one or more Bonds in temporary form may, with the consent of the Authority, exchange the same, upon the surrender thereof to the Trustee for cancellation, for Bonds in temporary form of like aggregate Principal Amount, of the same Series and maturity, in authorized denominations.

Section 2.06 Numbering of Bonds. Any Bond may bear such numbers, letters, or other marks of identification or designation, and may be endorsed with or have incorporated in the text thereof such legends or recitals with respect to transferability or in respect of the Bond or Bonds for which it is exchangeable and may contain such provisions, specifications and descriptive words, not inconsistent with the provisions of this Indenture, as may be determined by the Authority and approved by the Trustee.

Section 2.07 Execution of Bonds. All the Bonds shall, from time to time, be executed on behalf of the Authority by the manual or facsimile signature of its Chairperson or its Vice Chairperson and its corporate seal (which may be in facsimile) shall be thereunto affixed or thereon imprinted and attested by the manual or facsimile signature of its Secretary or its Assistant Secretary. If any of the officers whose signature shall be upon the Bonds shall cease to be such officers of the Authority before the Bonds so signed and sealed shall have been actually authenticated by the Trustee or delivered by the Authority, such Bonds nevertheless may be authenticated, issued, and delivered with the same force and effect as though the person or persons whose signature shall be upon such Bonds had not ceased to be such officer or officers of the Authority; and also any such Bond may be signed and sealed on behalf of the Authority by the signature of such persons as at the actual date of the execution of such Bond shall be the proper officers of the Authority, although at the nominal date of such Bond any such person shall not have been such officer of the Authority.

Section 2.08 Mutilated, Lost, Stolen or Destroyed Bonds. Upon receipt by the Authority and the Trustee of evidence satisfactory to all of them that any Outstanding Bond has been mutilated, destroyed, lost or stolen, and of indemnity satisfactory to all of them, the Authority, in its discretion, may execute and thereupon the Trustee shall authenticate and deliver, a new Bond of the same Series and same maturity and of like tenor in exchange and substitution for, and upon surrender and cancellation of, the mutilated Bond or in lieu of and in substitution for the Bond so destroyed, lost or stolen. The Authority may, for each new Bond authenticated and delivered under the provisions of this Section, require the payment of the expenses, including counsel fees, which may be incurred by the Trustee in the premises. Any Bond issued under the provisions of this Section in lieu of any Bond alleged to be destroyed, lost or stolen, shall constitute an original additional contractual obligation on the part of the Authority whether or not the Bond so alleged to be destroyed, lost or stolen be at any time enforceable by anyone; and shall be equally and proportionately entitled to the benefits of this Indenture with all other Bonds issued under this Indenture.

Section 2.09 Certificate of Authentication. Subject to the qualifications hereinbefore set forth, the Bonds to be secured hereby shall be substantially of the tenor and effect hereinbefore recited, and no Bonds shall be secured hereby or entitled to the benefit hereof, or shall be or become valid or obligatory for any purpose, unless there shall be endorsed thereon a certificate of authentication, substantially set forth in the form of the Bond as shall be set forth in the Supplemental Indenture providing for the issuance of such Bonds, executed by the Trustee; and such certificate on any Bond issued by the Authority shall be conclusive evidence and the only competent evidence that it has been duly authenticated and delivered hereunder. The Bonds shall be authenticated by the Trustee.

Section 2.10 Book-Entry Only Bonds. Unless a Supplemental Indenture shall provide otherwise with respect to a Series of Bonds, the Bonds of a Series shall be initially issued in book-entry only form. Unless a Supplemental Indenture shall provide otherwise with respect to a Series, in the event that any provision of this Section 2.10 is inconsistent with other provisions of this Indenture, so long as the Bonds shall be in book-entry only form, the provisions of this Section 2.10 shall govern. The Depository Trust Company ("DTC") will act as securities depository for the Bonds. The ownership of one fully registered Bond for each maturity set forth in this Indenture, each in the aggregate Principal Amount of such maturity, will be registered in the name of CEDE & Co., as nominee for DTC; provided that if DTC shall request that the Bonds be registered in the name of a different nominee, the Trustee shall exchange all or any portion of the Bonds for an equal aggregate Principal Amount of Bonds registered in the name of such nominee or nominees of DTC. No person other than DTC or its nominee shall be entitled to receive from the Authority or the Trustee either a Bond or any other evidence of ownership of the Bonds, or any right to receive any payment in respect thereof unless DTC or its nominee shall transfer record ownership of all or any portion of the Bonds on the registration books maintained by the Trustee, in connection with discontinuing the book entry system or otherwise.

So long as the Bonds or any portion thereof are registered in the name of DTC or any nominee thereof, all payments of the principal or redemption price of or interest on such Bonds shall be made to DTC or its nominee in New York Clearing House or equivalent next day funds on the dates provided for such payments under this Indenture. Each such payment to DTC or its nominee shall be valid and effective to fully discharge all liability of the Authority or the Trustee with respect to the principal or redemption price of or interest on the Bonds to the extent of the sum or sums so paid. In the event of the redemption of less than all of the Bonds Outstanding, the Trustee shall not require surrender by DTC or its nominee of the Bonds so redeemed, but DTC or its nominee may retain such Bonds and make an appropriate notation on the Bond certificate as to the amount of such partial redemption; provided that, in each case the Trustee shall request, and DTC shall deliver to the Trustee, a written confirmation of such partial redemption and thereafter the records maintained by the Trustee shall be conclusive as to the amount of the Bonds which have been redeemed.

The Authority and the Trustee may treat DTC or its nominee as the sole and exclusive Owner of the Bonds registered in its name for the purposes of payment of the principal or redemption price of or interest on the Bonds, selecting the Bonds or portions thereof to be redeemed, giving any notice permitted or required to be given to Bondholders under this Indenture, registering the transfer of Bonds, obtaining any consent or other action to be taken by Bondholders and for all other purposes whatsoever; and neither the Authority nor the Trustee shall be affected by any notice to the contrary. Neither the Authority nor the Trustee shall have any responsibility or obligation to any participant in DTC, any person claiming a beneficial ownership interest in the Bonds under or through DTC or any such participant, or any other person which is not shown on the registration books of the Trustee as being a Bondholder, with respect to either: (i) the Bonds; or (ii) the accuracy of any records maintained by DTC or any such participant; or (iii) the payment by DTC or any such participant of any amount in respect of the principal or redemption price of or interest on the Bonds; or (iv) any notice which is permitted or required to be given to Bondholders under this Indenture; or (v) the selection by



DTC or any such participant of any person to receive payment in the event of a partial redemption of the Bonds; or (vi) any consent given or other action taken by DTC as Bondholder.

So long as the Bonds or any portion thereof are registered in the name of DTC or any nominee thereof, all notices required or permitted to be given to the Bondholders under this Indenture shall be given to DTC as provided in the Representation Letter between the Authority and DTC (the "DTC Representation Letter"), in such form as is acceptable to the Trustee, the Authority and DTC.

In connection with any notice or other communication to be provided to Bondholders pursuant to this Indenture by the Authority or the Trustee with respect to any consent or other action to be taken by Bondholders, DTC shall consider the date of receipt of notice requesting such consent or other action as the record date for such consent or other action, provided that the Authority or the Trustee may establish a special record date for such consent or other action. The Authority or the Trustee shall give DTC notice of such special record date not fewer than fifteen (15) calendar days in advance of such special record date to the extent possible.

At or prior to the issuance of the Bonds, the Authority and the Trustee shall execute or signify their approval of the DTC Representation Letter. Any successor Trustee shall, in its written acceptance of its duties under this Indenture, agree to take any actions necessary from time to time to comply with the requirements of the DTC Representation Letter.

The book-entry system for registration of the ownership of the Bonds may be discontinued at any time if either: (i) DTC determines to resign as securities depository for the Bonds; or (ii) the Authority provides thirty (30) days' notice of such discontinuation to the Trustee and DTC that continuation of the system of book-entry transfers through DTC (or through a successor securities depository) is not in the best interests of the Authority. Upon occurrence of either such event, the Authority may attempt to establish a securities depository book-entry relationship with another securities depository. If the Authority does not do so, or is unable to do so, and after the Authority has notified DTC and upon surrender to the Trustee of the Bonds held by DTC, the Authority will issue and the Trustee will authenticate and deliver the Bonds in registered certificate form in denominations of \$5,000 and integral multiples thereof (or such other denominations as are applicable to a Series as set forth in a Supplemental Indenture), at the expense of the Authority, to such persons, and in such maturities and Principal Amounts, as may be designated by DTC, but without any liability on the part of the Authority or the Trustee for the accuracy of such designation. Whenever DTC requests the Authority or the Trustee to do so, the Authority or the Trustee shall cooperate with DTC in taking appropriate action after reasonable notice to arrange for another securities depository to maintain custody of certificates evidencing the Bonds.

### ARTICLE III

#### AUTHENTICATION AND DELIVERY OF BONDS

Section 3.01 Purposes of Bonds. The Authority may issue Additional Bonds from time to time under this Indenture. Bonds may be issued (a) to pay Costs, (b) to refund

Bonds or any other Indebtedness (including Senior Debt or Subordinate Debt or other debt not secured by the Revenues), (c) to pay costs of issuance, (d) to fund reserves and/or pay costs associated with Capitalized Interest or terminating Qualified Interest Rate Swap Agreements, or (e) for a combination of such purposes. The provisions in this Article III relating to the issuance of Bonds do not apply to the issuance of the 2017A Bonds, the 2017B Bonds or the 2017C Bonds, which bonds were issued in compliance with the requirements of the Existing Senior Indenture.

In the event that any Policy Costs are due and owing at the time of issuance of the Additional Bonds, for the purpose of the debt tests required by Section 3.02 hereof, Revenues of the Authority shall be reduced by the amount of any Policy Costs then due and owing.

No Additional Bonds may be issued without the prior written consent of a Bond Insurer if any Policy Costs are past due and owing to the Bond Insurer.

Section 3.02 Conditions for Issuing Bonds. Before the issuance and authentication of any Series of Bonds by the Trustee, there shall be filed with the Trustee:

(a) In connection with the initial execution of this Indenture:

(i) A certified copy of this Indenture;

(ii) A Counsel's Opinion, subject to customary exceptions and qualifications, substantially to the effect that this Indenture has been duly authorized, executed and delivered to the Trustee and is a valid, binding and enforceable obligation of the Authority.

(b) A certified copy of a Supplemental Indenture which (1) shall include: (A) provisions authorizing the issuance, fixing the Principal Amount and setting forth the details of such Bonds, including their date, the interest rate or rates and the manner in which the Bonds are to bear and pay interest (including whether such Bonds constitute Capital Appreciation Bonds, Capital Appreciation and Income Bonds or Current Interest Capital Appreciation Bonds), the principal and Interest Payment Dates of the Bonds; the purposes for which such Bonds are being issued, the manner of numbering of such Bonds, the Series designation, the denominations, the maturity dates and principal maturities, the Principal Amounts required to be redeemed pursuant to any mandatory redemption provisions or the manner for determining such Principal Amounts, any provisions for optional or extraordinary redemption before maturity, and any provisions regarding the Common Debt Service Reserve Requirement or Separate Series Debt Service Reserve Requirement; and (B) provisions for the application of the proceeds of such Bonds; and (2) may include: (A) provisions for Credit Facilities and for other Funds and Accounts to be established with respect to such Bonds; (B) provisions necessary or expedient for the issuance and administration of Bonds bearing interest at a variable rate or other manner of bearing interest, including remarketing provisions, liquidity facility provisions and provisions for establishing the variable rate and converting to a fixed rate; (C) provisions for entering into credit enhancement devices permitted by Commonwealth law; and (D) such other provisions as the Authority may deem appropriate.

(c) A certified copy of applicable Resolution of the Board authorizing, as required by law, the issuance, sale, award, execution and delivery of such Bonds and, in the case of a Series of Bonds issued to refund Indebtedness, calling for redemption or payment of the Indebtedness to be refunded, fixing any redemption date and authorizing any required notice of redemption in accordance with the provisions of this Indenture.

(d) A certificate signed by an Authorized Representative of the Authority and dated the date of such issuance, to the effect that:

(i) Either (A) upon and immediately following such issuance, no Event of Default has occurred which has not been cured or waived, and no event or condition exists which, with the giving of notice or lapse of time or both, would become an Event of Default or (B) if any such event or condition is happening or existing, specifying such event or condition, stating that the Authority will act with due diligence to correct such event or condition after the issuance of such Bonds, and describing in reasonable detail the actions to be taken by the Authority toward such correction; and

(ii) All required approvals, limitations, conditions and provisions precedent to the issuance of such Series of Bonds have been obtained, observed, met and satisfied.

(e) A Counsel's Opinion, subject to customary exceptions and qualifications, substantially to the effect that the Supplemental Indenture for such Series of Bonds has been duly authorized, executed and delivered, is binding on the Authority and complies in all respects with the requirements of this Indenture.

(f) An opinion of Bond Counsel, subject to customary exceptions and qualifications, substantially to the effect that the issuance of such Bonds has been duly authorized, that such Bonds are valid and binding limited obligations of the Authority, and with respect to Bonds to be issued on a tax-exempt basis that the interest on such Bonds is excludable from gross income for purposes of Federal income taxation.

(g) If a Series of Bonds are issued to pay Costs, the following:

(i) (A) if the Bonds are Common Debt Service Reserve Secured Bonds, evidence that upon issuance of such Bonds, the Common Debt Service Reserve Requirement will be fully funded, or (B) if the Bonds are Separate Series Debt Service Reserve Secured Bonds, evidence that, upon issuance of such Bonds, the Separate Series Debt Service Reserve Requirement for such Bonds will be fully funded or will be funded in accordance with the requirements of the applicable Supplemental Indenture; and

(ii) A certificate of (A) a Qualified Independent Consultant, stating that based on the Authority's financial records for a Test Period, the Authority would have been able to meet the Rate Covenant in Section 7.01, taking into account (i) the maximum Annual Debt Service on the proposed Series of Additional Bonds in the current or any future Fiscal Year, (ii) the additional Net Revenues from the rates, fees and other charges adjusted to reflect any rate increases that had not been in effect throughout the Test Period but that have been approved by and can be implemented by the Authority at the time of the delivery of the proposed Series of Additional Bonds to go into effect within

the following five years; and (iii) additional Net Revenues that the Authority may realize from the addition to the System of the assets it proposes to finance through the issuance of the proposed Series of Additional Bonds or other funding sources within the following five years or (B) the Authorized Representative of the Authority stating that based on the Authority's financial records for a Test Period, the Authority has met the Rate Covenant in Section 7.01, taking into account the maximum Annual Debt Service on the proposed Series of Additional Bonds. In making the certifications required under this paragraph, the Authorized Representative of the Authority or the Qualified Independent Consultant, as applicable, shall determine and utilize the Additional Indebtedness Test Net Revenues in place of the Rate Covenant Net Revenues in determining whether the Authority would have been able to meet the Rate Covenant in Section 7.01.

(h) Except in the case of the 2017A Bonds, the 2017 B Bonds and the 2017C Bonds, if any Bonds are issued to refund any Indebtedness, the following:

(i) Evidence that the Authority has made provision as required by this Indenture for the payment or redemption of all Indebtedness to be refunded;

(ii) A certificate of an Authorized Representative of the Authority demonstrating that the proposed refunding will not result in an increase in the Annual Debt Service payable on all Indebtedness in any Fiscal Year. If the proposed refunding will result in an increase in the Annual Debt Service payable on all Indebtedness in any Fiscal Year, then the issuance of that Series of Additional Bonds shall be subject to the same requirements as the issuance of a Series of Additional Bonds to pay Costs under Section 3.02(g)(ii).

(i) A request and authorization of the Authority, signed by an Authorized Representative of the Authority, to the Trustee to authenticate and deliver such Bonds to the purchaser upon payment to the Trustee of a specified sum plus accrued interest to the date of delivery.

Except for the requirements of subsection (d) of this Section (which may be waived by the purchasers of such Bonds by an instrument or concurrent instruments in writing signed by such purchasers), none of the requirements in this Section may be waived without the consent of the holders of not less than a majority in aggregate Principal Amount of the Outstanding Bonds.

### Section 3.03 Other Senior Parity Indebtedness.

(a) The Authority may incur or refinance Other Senior Parity Indebtedness provided that:

(1) the documents relating to the Other Senior Parity Indebtedness acknowledge that such debt constitutes Other Senior Parity Indebtedness under this Indenture and is subject to the applicable terms and conditions hereof as if it were Bonds, and specify the amounts and due dates of Annual Debt Service with respect to the Other Senior Parity Indebtedness;

(2) the requirements of Sections 3.02(g) or 3.02(h), as appropriate, have been met as if the Other Senior Parity Indebtedness was an additional Series of Bonds;

(3) the Trustee receives written notice of the issuance of the Other Senior Parity Indebtedness and the material terms and conditions thereof and the Trustee shall register the holder as owner thereof as such on its books and records, and

(4) the Trustee receives a Counsel's Opinion that the documents creating the Other Senior Parity Indebtedness have been duly authorized, executed and delivered on behalf of the Authority and constitute valid, binding and enforceable obligations.

(b) The Authority shall fulfill its obligations under all contracts or agreements creating Other Senior Parity Indebtedness as they may exist from time to time.

Section 3.04 Subordinate Debt of Authority. In addition to the foregoing and in addition to any subordinate pledge granted by the Authority to a Bond Insurer in connection with a Debt Service Reserve Fund Policy, the Authority may incur or assume Subordinate Debt provided that:

(1) the security for such debt is subordinate to the lien of and security interests granted by this Indenture; and

(2) any agreement for the repayment of such subordinate debt and any instrument evidencing or securing such subordinate debt shall provide: (i) that an event of default thereunder may be an event of default under this Indenture, and (ii) that, notwithstanding the occurrence of any event of default in respect of any subordinate debt, the lender shall not be entitled to exercise any rights or remedies with respect to the Revenues until and unless the Trustee shall have instituted proceedings to exercise its rights pursuant to Article VIII hereof.

Section 3.05 Covenant as to Prior Lien Debt. The Authority will not incur or assume any debt which will be secured by a lien on the Revenues which will be prior to the lien granted by the terms of this Indenture.

Section 3.06 Deposit of Bond Proceeds. Upon receipt of the proceeds of any Series of Bonds issued under this Indenture, such moneys shall be deposited to a Clearing Fund for such Bonds and shall be disbursed for the purposes and in the amounts set forth in the closing certificate of the Authority executed on the date of issuance of such Bonds. To the extent it is determined on or before the first day of the month after the date of issuance of such Bonds that any remaining moneys in such fund will not be necessary to pay costs of issuance, such moneys shall be transferred to the Debt Service Fund and applied to pay interest on such Bonds on the next Interest Payment Date for such Bonds.

## ARTICLE IV

### REDEMPTION OF BONDS

#### Section 4.01 Redemption of Bonds.

The Bonds of any Series issued under the provisions of this Indenture shall be subject to redemption, in whole or in part, and at such times and prices as may be provided in the Supplemental Indenture pursuant to which such Bonds are issued, which Supplemental Indenture shall include provisions for extraordinary redemption in accordance with Section 7.10 hereof. The Bonds of any Series to be called for redemption shall be selected as provided in the applicable Supplemental Indenture. The Trustee shall treat each Bond of a denomination greater than the minimum denomination authorized in the applicable Supplement Indenture as can be obtained by dividing the Bond's actual Principal Amount by such minimum denomination.

Section 4.02 Notice of Redemption. Whenever the Authority shall redeem all or part of the Bonds, it shall cause a written notice of intention to redeem, signed in the name of the Authority by an Authorized Representative of the Authority to be sent, by the Trustee by first class mail to each registered Owner of the Bonds to be redeemed at the last address of said registered Owner appearing upon the registration books not less than twenty (20) days or more than sixty (60) days before the redemption date (unless the applicable Supplemental Indenture provides for other timing for the notice). Failure to mail any such notice shall not affect the validity of the proceeding for redemption. Such notice shall specify the information set forth in the next following paragraph. The notice shall further state that, from and after such redemption date, interest thereon will cease to accrue. Simultaneously with the mailing of notice to Bondholders, the Trustee shall notify a Bond Insurer of any redemption, other than mandatory sinking fund redemption, of Bonds being insured by a Bond Insurer. In the case of an optional redemption, the notice may, at the Authority's discretion, state (1) that it is conditioned upon the deposit of moneys, in an amount equal to the amount necessary to effect the redemption, with the Trustee no later than the redemption date or (2) that the Authority retains the right to rescind such notice at any time prior to the scheduled redemption date if the Authority delivers a certificate of an Authorized Representative of the Authority to the Trustee instructing the Trustee to rescind the redemption notice (in either case, a "Conditional Redemption"), and such notice and optional redemption shall be of no effect if such monies are not so deposited or if the notice is rescinded as described below.

In addition to the foregoing, the redemption notice shall contain with respect to each Bond being redeemed, (1) the CUSIP number as provided in Section 4.04 hereof, (2) the date of issue; (3) the interest rate, (4) the maturity date, and (5) any other descriptive information determined by the Trustee to be needed to identify the Bonds. If a redemption is a Conditional Redemption, the notice shall so state. The Trustee also shall send each notice of redemption to (i) any Rating Service then rating the Bonds to be redeemed; (ii) all of the registered clearing agencies known to the Trustee to be in the business of holding substantial amounts of bonds of a type similar to the Bonds; and (iii) one or more national information services that disseminate notices of redemption of bonds such as the Bonds, such services to be identified by the Trustee.

Any Conditional Redemption may be rescinded in whole or in part at any time prior to the redemption date if the Authority delivers a certificate of an Authorized Representative of the Authority to the Trustee instructing the Trustee to rescind the redemption notice. The Trustee shall give prompt notice of such rescission to the affected Bondholders. Any Bonds subject to Conditional Redemption where redemption has been rescinded shall remain Outstanding, and the rescission shall not constitute an Event of Default. Further, in the case of a Conditional Redemption, the failure of the Authority to make funds available in part or in whole on or before the redemption date shall not constitute an Event of Default.

Section 4.03 Nonpresentment of Bonds. Notice having been given in the manner hereinbefore provided in this Article and irrevocable instructions having been given to the Trustee to pay said Bonds or portions thereof and cash equal to the redemption price of said Bonds and the interest accrued thereon to the date of redemption having been deposited in trust with the Trustee on or prior to the date set for redemption, the Bonds so called for redemption shall become due and payable on the redemption date so designated, and interest on such Bonds shall cease to accrue from such redemption date, whether such Bonds are presented for redemption or not. The Principal Amount of all Bonds so called for redemption, together with the premium, if any, and accrued interest thereon, shall be paid by the Trustee, upon presentation and surrender thereof.

Section 4.04 CUSIP Numbers. The Trustee shall use the "CUSIP" numbers assigned to the Bonds, if then generally in use, in notices of redemption of Bonds as a convenience to Bondholders; provided that any such notice shall state that no representation is made as to the correctness of such numbers either as printed on the Bonds or as contained in any notice of redemption and that reliance may only be placed on the identification numbers established under the Indenture.

## ARTICLE V

### CONSTRUCTION FUND

Section 5.01 Construction Fund. There is hereby created a special fund known as the "Construction Fund", which shall be held in trust by the Trustee. Money shall be deposited to the Construction Fund pursuant to the provisions of Article II and from any other sources identified by the Authority. To the extent Costs of a Construction Project are paid for from Bonds, the Authority must deposit the construction proceeds of the Bonds in the Construction Fund and must follow the provisions of this Article V. To the extent the Authority is self-funding Costs from other than proceeds of Bonds, the Authority may use moneys in the Revenue Fund and the Operating Fund to pay such Costs, and the Authority need not use the Construction Fund or follow the provisions of this Article V.

Payment of the Costs of a Construction Project shall be made from the Construction Fund. A special account shall be created and identified for each such Construction Project, although funds, at the written direction of the Authority, may be transferred from one such account in the Construction Fund to another account in such Fund. On the date of issuance of Bonds to finance in whole or in part a Construction Project, the moneys directed, in writing, by the Authority to be transferred from the Clearing Fund shall be deposited into the

Construction Fund or an account therein. All moneys on deposit in the Construction Fund shall be held in Trust by the Trustee as security under this Indenture and disbursed by the Trustee pursuant to this Section 5.01 in payment of the Costs of the Construction Project. Before each such withdrawal and payment of the Costs of the Construction Project from the Construction Fund by the Trustee, the Authority shall deliver to the Trustee the following:

(a) A requisition, signed by any two of the Chairperson or Vice Chairperson or Secretary or Assistant Secretary or the Executive Director or the Chief Financial Officer or the Director of Finance of the Authority, or signed by such other person or persons who is or are authorized to do so pursuant to a Resolution of the Board, stating in respect of each payment to be made:

- (1) the item number of the payment;
- (2) the name and address of the person to whom payment is due;
- (3) the amount to be paid and the Construction Fund from which payment is to be made;
- (4) the purpose for which the obligation was incurred;
- (5) that obligations in the stated amount have been incurred by the Authority and that each item thereof is a proper part of the Cost of the Construction Project and has not been paid;
- (6) that there has not been filed with or served upon the Authority notice of any lien, right to lien or attachment upon, or claim affecting the right to receive payment of any of the moneys payable to any persons named in such requisition;
- (7) that such requisition contains no items representing payment on account of any retained percentage which the Authority is on the date of such certificate entitled to retain;
- (8) that neither the Authority nor any of its officers or members has received any discount, rebate, commission, fee, proceeds from insurance or other abatement which is not reflected on the requisition in connection with any such expenditures or indebtedness; and
- (9) that no part of any such item has been included in any previous requisition for the withdrawal of moneys from the Construction Fund; and

(b) Except to the extent to which a requisition relates to financing costs, a certificate signed by the Consulting Engineer approving such requisition and certifying that each item to be paid as set forth in such requisition constitutes an obligation which has been properly incurred as part of the Cost of the Construction Project and is then due and unpaid.



Upon the receipt of each such requisition and the accompanying certificate, the Trustee shall pay to the persons named in such requisition, the respective amounts stated therein to be due to such persons.

Investment earnings on the amounts on deposit in the Construction Fund shall be retained in the Construction Fund unless the Authority directs the Trustee, in writing, to transfer such earnings to the Debt Service Fund.

Any moneys remaining in the Construction Fund after all amounts due in respect of the Construction Project shall have been paid (including any Costs of any amendment or revision of the Construction Project pursuant to Section 5.02 below), which fact shall be evidenced to the Trustee by delivery of a certificate of an Authorized Representative of the Authority to that effect, shall be transferred by the Trustee to the Revenue Fund and applied as directed in writing by the Authority; with respect to such application, the Authority will obtain an opinion of Bond Counsel that such application in and of itself will not adversely affect the exclusion from gross income of interest on the Series of Bonds issued to fund such Construction Project. If an Event of Default pursuant to Section 8.01(a) or (b) occurs, and only to the extent that no other available moneys are held under this Indenture, the Trustee shall transfer moneys from the Construction Fund to the Debt Service Fund to pay principal and interest on the Bonds.

All requisitions received by the Trustee pursuant to Section 5.01(a) may be relied upon without investigation or inquiry by and shall be retained in the possession of the Trustee for a period of five (5) years, subject at all times to the inspection of the Authority, its agents and representatives, and any other person authorized by a certificate of an Authorized Representative of the Authority.

Section 5.02 Amendment of Construction Project. The Authority may from time to time amend or revise a Construction Project with the approval of the Consulting Engineer, but only if the Authority shall have first delivered to the Trustee (i) a written statement describing the proposed amendments and revisions, (ii) a Resolution of the Board approving the proposed amendments and revisions, (iii) a certificate signed by the Consulting Engineer setting forth the general effect of such proposed amendments and revisions and certifying in his opinion that such proposed amendments and revisions are in the best interests of the Authority, and (iv) an opinion of Bond Counsel that such amendment or revision in and of itself will not adversely affect the exclusion from gross income of interest on the Series of Bonds issued to fund such Construction Project.

Section 5.03 Contract Security. All contracts which provide for the furnishing of material or the doing of work with regard to a Construction Project shall be in compliance with all federal and state statutes, rules and regulations and shall be subject to the approval of the Consulting Engineer. The Authority will require each person with whom it may contract for construction to furnish a performance security and a labor and materialmen's security each for not less than 100% of the full amount of the contract entered into with such person or such greater or lesser amount as may be required by applicable law, and to carry such insurance as may be required by law and as may be recommended by the Consulting Engineer. The proceeds of any such performance security shall forthwith, upon the receipt thereof by the Authority, be deposited to the credit of the applicable Construction Fund or account therein and applied toward

the completion of the construction covered by the contract in connection with which such performance security shall have been furnished except that any such proceeds as shall constitute liquidated damages for delay shall be deposited to the credit of the Revenue Fund.

## ARTICLE VI

### REVENUES, FUNDS AND INVESTMENTS

Section 6.01 Funds and Accounts. In addition to the Construction Fund established in Section 5.01 hereof, there are hereby established the following Funds and Accounts to be held by the Authority or the Trustee, as applicable:

(1) Revenue Fund to be held by the Authority in one or more Authorized Depositories, subject to the lien of this Indenture;

(2) Operating Fund to be held by the Authority in one or more Authorized Depositories, not subject to the lien of this Indenture;

(3) Debt Service Fund, in which there shall be established an Interest Account, a Principal Account and a Sinking Fund Account, and a separate subaccount in each such Account with respect to (i) all Series of Common Debt Service Reserve Secured Bonds and (ii) each Series of Separately Secured Debt Service Reserve Fund Bonds; and (iii) Other Senior Parity Indebtedness, to be held by the Trustee, subject to the lien of this Indenture;

(4) Debt Service Reserve Fund to be held by the Trustee, subject to the lien of this Indenture, in which there shall be established (1) a Series Debt Service Reserve Account for all Series of Common Debt Service Reserve Secured Bonds, and (2) as applicable, a Series Debt Service Reserve Account for each Series of Bonds that has a Separate Series Debt Service Reserve Requirement;

(5) Operating Reserve Fund to be held by the Authority in one or more Authorized Depositories, subject to the lien of this Indenture;

(6) Subordinate Debt Service Fund to be held by the Trustee, subject to the lien of this Indenture;

(7) Subordinate Debt Service Reserve Fund to be held by the Trustee, subject to the lien of this Indenture;

(8) Rate Stabilization Fund to be held by the Authority in one or more Authorized Depositories, subject to the lien of this Indenture;

(9) Redemption Fund to be held by the Trustee, subject to the lien of this Indenture; and

(10) Rebate Fund to be held by the Trustee, but is not subject to the lien of this Indenture.

Section 6.02 Disposition of Revenues. All Revenues and all other amounts received by the Authority from any source (except as otherwise provided herein) shall be deposited in the Revenue Fund to be held by the Authority in one or more Authorized Depositories; provided, however, that upon an Event of Default, the Authority will transfer all amounts in all Authority held funds (other than the Operating Fund) to the Trustee, and the Trustee shall hold such moneys in trust for the beneficiaries hereunder. If and when the Event of Default is cured, such moneys shall be returned by the Trustee to the Authority.

The Authority shall transfer from the Revenue Fund to the Operating Fund from time to time the amounts needed to pay Current Expenses.

On the 20<sup>th</sup> day of each month (or, if such day is not a Business Day, then on the last Business Day prior to the 20<sup>th</sup> day of each month) (the “Disbursement Date”), Net Revenues shall be disbursed by the Authority in the following order (except that the payments into the Interest Account, the Principal Account and the Sinking Fund Account of the Debt Service Fund shall be on a parity with each other):

(1) To the Debt Service Fund:

(a) To the subaccounts established for each Series of Bonds or Other Senior Parity Indebtedness in the Interest Account, monthly, on the Disbursement Date, an amount equal to the amount of interest falling due on or before the 20<sup>th</sup> day of the following month, as set forth in the applicable Supplemental Indentures with respect to each Series of Bonds or Other Senior Parity Indebtedness (including Periodic Payments with respect to Qualified Interest Rate Swap Agreements); provided, however, that if such Other Senior Parity Indebtedness is evidenced by documents other than a Supplemental Indenture, to the related interest accounts set forth therein, as applicable; and such deposits shall be adjusted to give credit for any other available money then in such interest account or subaccount or otherwise available and designated to be used for such purpose. Moneys in the Interest Account shall be used to pay interest due on any Interest Payment Date (including any redemption date other than a mandatory sinking fund redemption date) related to such Series of Bonds or Other Senior Parity Indebtedness, as applicable.

(b) To the subaccounts established for each Series of Bonds or Other Senior Parity Indebtedness in the Principal Account and Sinking Fund Account, monthly, on the Disbursement Date, an amount equal to the principal and sinking fund redemption amounts payable on or before the 20<sup>th</sup> day of the following month, or if principal is payable once per year on the Series of Bonds or Other Senior Parity Indebtedness, then an amount equal to one half (½) of the principal or sinking fund payments due within the next seven months, and the other one half (½) when due by the 20<sup>th</sup> day of the following month, all as shall be necessary to ensure deposits for the payment in full of principal on the next principal payment date or sinking fund redemption date, as set forth in the applicable Supplemental Indentures with respect to each Series of Bonds or Other

Senior Parity Indebtedness; provided, however, that if such Other Senior Parity Indebtedness is evidenced by documents other than a Supplemental Indenture, to the related principal and sinking fund accounts set forth therein, as applicable; and such deposits shall be adjusted to give credit for any other available money then in the principal or sinking fund account or subaccount or otherwise available and designated to be used for such purpose. Moneys in the Principal Account shall be used to pay principal required to be paid on any principal payment date related to such Series of Bonds or Other Senior Parity Indebtedness, as applicable. Moneys in the Sinking Fund Account shall be used to pay the amount required for mandatory sinking fund redemption on the applicable redemption date (including any redemption date other than a mandatory sinking fund redemption date) related to such Series of Bonds or Other Senior Parity Indebtedness, as applicable.

(2) To the Debt Service Reserve Fund the amounts, if any, required to be deposited pursuant to (i) Section 6.07(b) hereof, to restore the amount on deposit in each Series Debt Service Reserve Account to the related Series Debt Service Reserve Requirement or to reimburse the provider of any Credit Facility deposited in the Debt Service Reserve Fund, and (ii) a Supplemental Indenture, to fund a Series Debt Service Reserve Account to the applicable Separate Series Debt Service Reserve Requirement or Common Debt Service Reserve Requirement, and such amounts shall be transferred to the appropriate Series Debt Service Reserve Account.

(3) To the Subordinate Debt Service Fund, the amount equal to the deposits to such funds and accounts required by the related indenture or other documents evidencing such debt, which amounts shall be used to pay principal and interest or other amounts owing on Subordinate Debt. To the extent that the Subordinate Debt is issued pursuant to Subordinate Debt documents, applicable amounts shall be transferred to the respective Subordinate Debt fiduciary. In addition, to the extent that moneys on deposit in the Debt Service Fund are insufficient to make the required interest and principal payments on Senior Debt, moneys in the Subordinate Debt Service Fund shall be used, prior to any withdrawal from the Debt Service Reserve Fund, to cure any such deficiencies, but only after withdrawals from the Revenue Fund, the Operating Reserve Fund and any Subordinate Debt Service Reserve Fund, in that order, for that purpose.

(4) To Subordinate Debt Service Reserve Fund with respect to each Subordinate Debt issue the amounts, if any, necessary to restore the amount on deposit therein to the related Subordinate Debt Service Reserve Requirement. To the extent that the Subordinate Debt is issued pursuant to Subordinate Debt documents, applicable amounts shall be transferred to the respective Subordinate Debt fiduciary.

(5) To any Counterparty, any and all payments owed by the Authority on or before the 20<sup>th</sup> day of the following month under its Qualified Interest Rate Swap Agreement, other than Periodic Payments.

(6) To the Operating Reserve Fund the amounts, if any, necessary to restore the amounts on deposit therein to the Operating Reserve Requirement. Such amounts shall be funded within 24 months of withdrawal by depositing in such fund 1/24 of the Operating Reserve Requirement on each Disbursement Date after such withdrawal, if necessary. Moneys in the Operating Reserve Fund shall be used to pay, to the extent necessary, Current Expenses of the Authority.

(7) To the City, any amounts owed to the City on or before the 20<sup>th</sup> day of the following month under the Cooperation Agreement.

(8) Any moneys remaining in the Revenue Fund after all deposits and transfers required by subsections (1) through (7) of this Section have been made on the Disbursement Date shall be applied as follows: to the extent that moneys on deposit in the Debt Service Fund are insufficient to make the required interest and principal payments on Senior Debt, (i) moneys in the Revenue Fund shall be transferred to the Debt Service Fund, and then (ii) there shall be withdrawals from the Operating Reserve Fund, the Subordinate Debt Service Fund, any Subordinate Debt Service Reserve Fund, and the Debt Service Reserve Fund, in that order, to cure any such deficiencies. If not needed for that purpose, moneys in the Revenue Fund may be used for any authorized purpose, including but not limited to transfers in an amount that an Authorized Representative of the Authority may determine, in his discretion, to transfer to the Rate Stabilization Fund for rate stabilization purposes, or to the Debt Service Fund to be used to redeem Bonds as herein provided for deposit in any Account therein, or to the Operating Fund to pay Costs of Construction Projects or Capital Additions. Additionally, moneys remaining in the Revenue Fund to the extent all transfers required by subsections (1) through (7) of this Section have been made, shall be applied for any lawful purpose of the Authority.

Notwithstanding anything in this Indenture to the contrary, at any time that the Authority is required to make transfers pursuant to subsections (1) through (7) of this Section, and there are insufficient Net Revenues to make all required transfers pursuant to such subsections, the Authority, after paying Current Expenses, shall make the transfers in the order set forth above first from Net Revenues, then from any other legally available monies.

In the event this Section requires transfers to the Debt Service Fund or the Debt Service Reserve Fund from any Fund held by the Authority, the Authority shall effect that transfer to the Trustee in accordance with this Section.

The Authority's obligation to repay any Policy Costs to a Bond Insurer related to the Debt Service Reserve Fund shall have the same priority and be paid in the same manner from the Revenue Fund as the obligation to maintain and refill the Debt Service Reserve Fund. Repayment of Policy Costs shall commence in the first month following each draw on the Debt Service Reserve Fund Policy, and each such monthly payment shall be in an amount at least equal to one-twelfth of the aggregate of the Policy Costs related to such draw.

The Authority's obligation to repay any Policy Costs to a Bond Insurer related to the Subordinate Debt Service Reserve Fund shall have the same priority and be paid in the same

manner from the Revenue Fund as the obligation to maintain and refill the Subordinate Debt Service Reserve Fund. Repayment of Policy Costs shall commence in the first month following each draw on the Subordinate Debt Service Reserve Fund Policy, and each such monthly payment shall be in an amount at least equal to one-twelfth of the aggregate of the Policy Costs related to such draw.

The Trustee shall provide for a mandatory sinking fund redemption of any Term Bonds in accordance with the schedules set forth in the Supplemental Indenture for such Bonds; provided, however, that on or before the 45th day next preceding any such sinking fund payment date, the Authority may:

- (i) deliver to the Trustee for cancellation Term Bonds of the maturity required to be redeemed on such sinking fund payment date in any aggregate Principal Amount desired; or
- (ii) instruct the Trustee, in writing, to apply a credit against the Authority's next sinking fund redemption obligation for any such Term Bonds that previously have been redeemed (other than through the operation of the sinking fund) and canceled but not theretofore applied as a credit against any sinking fund redemption obligation.

Upon the occurrence of any of the events described in the subsections (i) or (ii) above, the Trustee shall credit against the Authority's sinking fund redemption obligation on the next sinking fund payment date the amount of such Term Bonds so delivered or previously redeemed. Any Principal Amount of such Term Bonds in excess of the Principal Amount required to be redeemed on such sinking fund payment date shall be similarly credited in such order as may be determined by the Authority against future payments to the Sinking Fund Account and shall similarly reduce the Principal Amount of the Term Bonds of the applicable Series to be redeemed on the next sinking fund payment date. Within seven days of receipt of such Term Bonds or instructions to apply as a credit, any amounts remaining in the Sinking Fund Account in excess of the amount required to fulfill the remaining required sinking fund redemption obligation on the next sinking fund payment date shall be used in such manner as determined at the direction of the Authority.

In the event the amount on deposit in the Interest Account on any Interest Payment Date exceeds the amount required to pay interest on the Senior Debt on the next Interest Payment Date, the Authority shall, if the amount on deposit in any Series Debt Service Reserve Account is less than the applicable Series Debt Service Reserve Requirement, transfer such excess to any Series Debt Service Reserve Account to the extent of such deficiency (on a *pro rata* basis if funds are not sufficient to cause the Series Debt Service Reserve Requirement to be fully funded at the Common Debt Service Reserve Requirement or Separate Series Debt Service Reserve Requirement), and otherwise retain any remaining excess in the Interest Account or transfer any remaining excess to the related Principal Account to be credited against subsequent required deposits thereto, as determined by the Authority.

In the event the amount on deposit in the Principal Account or Sinking Fund Account on any principal or mandatory redemption payment date exceeds the amount required on such date to pay Bonds at maturity or to redeem Term Bonds pursuant to mandatory sinking fund requirements, the Authority shall, if the amount on deposit in any Series Debt Service Reserve

Account is less than the applicable Series Debt Service Reserve Requirement, transfer such excess to the Series Debt Service Reserve Account to the extent of such deficiency (on a *pro rata* basis if funds are not sufficient to cause the Series Debt Service Reserve Requirement to be fully funded at the Common Debt Service Reserve Requirement or Separate Series Debt Service Reserve Requirement), and otherwise retain such excess in the Principal Account or transfer such excess to the Interest Account to be credited against subsequent required deposits thereto, as determined by the Authority.

Section 6.03 Operating Fund. The Authority shall promptly pay out of the Operating Fund its Current Expenses as the same shall become due. All withdrawals or payments from the Operating Fund shall be made in accordance with the procedures of the Authority. If all transfers required under subsections (1) through (7) of Section 6.02 have been made, the Authority may pay from the Operating Fund the Costs of Construction Projects or Capital Additions.

Section 6.04 Debt Service Fund. The Authority shall deposit and the Trustee shall apply the amounts required to be deposited in the Debt Service Fund on the applicable dates pursuant to the provisions of this Indenture including in any Supplemental Indenture for the purpose of paying the interest on and principal of Bonds and Other Senior Parity Indebtedness.

Section 6.05 Subordinate Debt Service Fund. The Authority shall deposit and the Trustee shall apply the amounts required to be deposited on the applicable dates pursuant to the provisions of this Indenture and any documents related to the Subordinate Debt for the purpose of paying the interest on and principal of Subordinate Debt.

Section 6.06 Operating Reserve Fund. Moneys in the Operating Reserve Fund shall be used by the Authority to pay, to the extent necessary, Current Expenses of the Authority. Such moneys shall also be used to make up for deficiencies in certain other funds as described in Section 6.02(6) hereof. To the extent that moneys on deposit in the Debt Service Fund are insufficient to make the required interest and principal payments on Senior Debt, moneys in the Operating Reserve Fund shall be used, prior to any withdrawal from any Subordinate Debt Service Reserve Fund, the Subordinate Debt Service Fund, and then the Debt Service Reserve Fund, in that order, to cure any such deficiencies, but only after withdrawals from the Revenue for that purpose.

Section 6.07 Debt Service Reserve Fund.

The Series Debt Service Reserve Account maintained for all Common Debt Service Reserve Secured Bonds shall be funded at all times to the Common Debt Service Reserve Requirement, and all other Series Debt Service Reserve Accounts shall be funded at all times to the applicable Separate Series Debt Service Reserve Requirement as set forth in a Supplemental Indenture. Amounts in each Series Debt Service Reserve Account shall be used to pay debt service on the related Series of Bonds and related Other Senior Parity Indebtedness on the date such debt service is due if insufficient funds for that purpose are available in the related Series subaccount in the Interest Account and the related Series subaccount in the Principal Account (but only to the extent amounts in such subaccounts are less than the amounts required). Amounts in each Series Debt Service Reserve Account shall be pledged to Holders of the Bonds

and Other Related Parity Indebtedness Parties secured by such Series Debt Service Reserve Account.

The Authority shall withdraw from the Revenue Fund and deposit into the Debt Service Reserve Fund:

(a) on the dates specified in this Indenture or any Supplemental Indenture, the amounts required to be deposited on such dates to the credit of the applicable accounts of the Debt Service Reserve Fund; and

(b) if a deficiency exists in any account of the Debt Service Reserve Fund, on the dates specified in this Indenture or a Supplemental Indenture, such amounts as will be sufficient to repair any deficiencies in such account of the Debt Service Reserve Fund in not more than twenty-four equal monthly payments.

In lieu of or in addition to cash or investments, at any time the Authority may cause to be deposited to the credit of the Debt Service Reserve Fund any form of Credit Facility, including a Debt Service Reserve Fund Policy, in the amount of all or a portion of the Debt Service Reserve Fund, irrevocably payable to the Trustee as beneficiary for the Holders of the respective Series of Bonds, provided that the Trustee has received evidence satisfactory to it that the provider of the Credit Facility has a credit rating in one of the three highest credit rating categories by two Rating Agencies.

If a disbursement is made pursuant to any Credit Facility, the Authority shall either (a) reinstate the maximum limits of such Credit Facility, or (b) deposit to the credit of the Debt Service Reserve Fund moneys in the amount of the disbursement made under such Credit Facility from available Net Revenues. To the extent such moneys are still insufficient, then the Authority shall transfer to the Trustee from any legally available moneys the amount of such deficiency as soon as practicable and in any event within 24 months by depositing one-twenty-fourth of the required amount each month.

Amounts, if any, released from any Debt Service Reserve Fund upon deposit to the credit of such Debt Service Reserve Fund of a Credit Facility shall, upon designation by an Authorized Representative of the Authority, accompanied by an opinion of Bond Counsel that such use in and of itself will not adversely affect the exclusion from gross income of interest on the respective Series of Bonds, be transferred (a) to the Debt Service Fund and used to pay interest on, principal of or to redeem such Bonds, or (b) to the Authority to be used to pay all or any portion of the Costs designated by the Authority and approved by Bond Counsel.

On or within five days after each Reserve Determination Date, the Trustee shall determine if the balance on deposit in each applicable account of the Debt Service Reserve Fund was, as of the Reserve Determination Date, at least equal to the applicable Debt Service Reserve Requirement. In making such determination, any obligations in the Debt Service Reserve Fund shall be valued in accordance with Section 6.12.

In the event the amount on deposit in the Debt Service Reserve Fund exceeds the applicable Debt Service Reserve Fund Requirement, the Trustee shall (a) transfer such excess to the Debt Service Fund to be used to pay interest and principal on Bonds on the next Interest



Payment Date, and (b) transfer such excess to the Authority to be used to pay all or any portion of Costs designated by the Authority and approved by Bond Counsel; provided, however, that if an Authorized Representative of the Authority calls for a Reserve Determination Date in connection with the refunding and/or defeasance of a Series of Bonds, then the Trustee is authorized to take such refunding and/or defeasance into account in valuing the Debt Service Reserve Fund securing such Series of Bonds and is further authorized to apply the amount of any surplus arising from such valuation to reduce the amount of the refunding bonds and/or to provide for the defeasance of the Bonds in such manner as the Authorized Representative of the Authority may direct.

The Trustee shall ascertain the necessity for a claim upon a Debt Service Reserve Fund Policy and provide notice to the Bond Insurer of any such claim in accordance with the Debt Service Reserve Fund Policy at least two Business Days prior to each Interest Payment Date. The Trustee shall without any direction from the Authority, transfer moneys from the Debt Service Reserve Fund to the Debt Service Fund or to any sinking, purchase or analogous fund to the extent that the moneys in the Debt Service Fund or any sinking, purchase or analogous fund may on any Interest Payment Date be insufficient to make the payments for which the Debt Service Fund or any sinking, purchase or analogous fund was established as the same shall become due. If and to the extent that cash has been deposited into the Debt Service Reserve Fund in addition to a Debt Service Reserve Fund Policy, all such cash shall be used (or investments purchased with such cash shall be liquidated and the proceeds applied as required) prior to any drawing under the Debt Service Reserve Fund Policy, and repayment of any Policy Costs shall be made prior to replenishment of any such cash amounts.

If, in addition to the Debt Service Reserve Fund Policy, any other reserve fund substitute instrument ("Additional Reserve Fund Policy") is provided, drawings on the Debt Service Reserve Fund Policy and any such Additional Reserve Fund Policy, and of repayment of Policy Costs and reimbursement of amounts due under the Additional Reserve Policy, shall be made on a pro rata basis (calculated by reference to maximum amounts available thereunder) after applying all cash available in the Debt Service Reserve Fund and prior to replenishment of any such cash draws, respectively.

If the Authority shall fail to pay any Policy Costs in accordance with the provisions of this Indenture, the Bond Insurer shall be entitled to exercise any and all remedies under this Indenture other than (i) acceleration of the maturity of the Bonds, or (ii) remedies which would adversely affect Bondholders.

The Trustee shall notify the Bond Insurer of any withdrawal from the Debt Service Reserve Fund due to a deficiency in any other fund or of any deficiency in the Debt Service Reserve Fund due to market fluctuation of the investments held therein.

Section 6.08 Rate Stabilization Fund. The Rate Stabilization Fund authorized by Section 6.01(8) shall be held by the Authority at one or more Authorized Depositories in a Fund separate and apart from all other Funds and Accounts of the Authority and payments therefrom shall be made as hereinafter provided. Moneys may be transferred by an Authorized Representative of the Authority to the Rate Stabilization Fund from the Revenue Fund as provided in Section 6.02 as determined by the Authorized Representative of the Authority. At

any time the Authority shall transfer from the Rate Stabilization Fund to the Revenue Fund an amount determined by an Authorized Representative of the Authority.

Section 6.09 Redemption Fund. The Authority may transfer to the Trustee for deposit to the credit of the Redemption Fund such amounts as it may elect for the purchase of Bonds or redemption of Bonds at the option of the Authority and the Trustee shall apply such moneys to the redemption of Bonds in the amounts directed, in writing, by the Authority. Upon any such purchase or redemption, the Trustee shall transfer from the Debt Service Fund to the Redemption Fund any amount deposited in the Debt Service Fund with respect to interest on the Bonds being redeemed and shall pay the interest due on the redemption date out of such moneys.

Section 6.10 Rebate Fund. The Rebate Fund is established with the Trustee separate and apart from the pledge of this Indenture. The Trustee shall make deposits to and disbursements from the Rebate Fund upon directions furnished by the Authority. The Authority will retain a Qualified Independent Consultant, experienced in preparing rebate reports, to assist the Authority with respect to rebate requirements related to the Bonds. The Trustee has undertaken no duty, and is under no obligation to calculate any amount due with respect to such rebate, to verify amounts contained in any written request or direction, or to make such payments.

Section 6.11 Other Funds and Accounts. The Authority may establish in each Supplemental Indenture such other Funds and Accounts as the Authority determines to be desirable.

Section 6.12 Authorized Investments. At the written direction of the Authority, signed by any two of its Chairperson or Vice Chairperson or Secretary or Assistant Secretary or Executive Director or Chief Financial Officer or Director of Finance, or signed by such other person or persons who is or are authorized to do so pursuant to a Resolution of the Board, a certified copy of which shall be on file with the Trustee, moneys to the credit of the following Funds shall be invested by the Trustee in the following securities:

(a) Obligations of the United States of America or any of its agencies or instrumentalities backed by the full faith and credit of the United States of America; and short term obligations of the United States Government or its agencies or instrumentalities.

(b) Deposits in savings accounts or time deposits or share accounts of institutions insured by the Federal Deposit Insurance Corporation or the National Credit Union Share Investment Fund to the extent such accounts are so insured and for any amounts above the insured maximum if the approved collateral as provided by law shall be pledged by the depository (including pursuant to Pennsylvania Act 72 of 1971, as amended).

(c) Obligations, participations or other instruments of any Federal agency, instrumentality or United States government-sponsored enterprise, including those issued or fully guaranteed as the principal and interest by Federal agencies, instrumentalities or United States government-sponsored enterprises, if the debt obligations are rated at least "A" or its equivalent by at least two Rating Agencies.

(d) Repurchase agreements with respect to United States Treasury bills or obligations, participations or other instruments of or guaranteed by the United States or any Federal agency, instrumentality or United States government-sponsored enterprise.

(e) Negotiable certificates of deposit or other evidences of deposit, with a remaining maturity of three years or less, issued by a nationally or State-chartered bank, a Federal or State savings and loan association or a State-licensed branch of a foreign bank. For obligations with a maturity of one year or less, the debt obligations of the issuing institution or its parent must be rated in the top short-term rating category by at least two Rating Agencies. For obligations with a maturity in excess of one year, the senior debt obligations of the issuing institution or its parent must be rated at least "A" or its equivalent by at least two Rating Agencies.

(f) Bills of exchange or time drafts drawn on and accepted by a commercial bank, otherwise known as bankers' acceptances, if the bankers' acceptances do not exceed 180 days' maturity and the accepting bank is rated in the top short-term category by at least two Rating Agencies.

(g) Commercial paper issued by corporations or other business entities organized in accordance with Federal or State law, with a maturity not to exceed 270 days, if the issuing corporation or business entity is rated in the top short-term category by at least two Rating Agencies.

(h) Shares of an investment company registered under the Investment Company Act of 1940 (54 Stat. 789, 15 U.S.C. § 80a-1 et seq.) whose shares are registered under the Securities Act of 1933 (48 Stat. 74, 15 U.S.C. § 77a et seq.), if all of the following conditions are met: (1) the investments of the company are the authorized investments under this definition; (2) the investment company is managed in accordance with 17 CFR 270-2a7 (relating to money market funds); and (3) the investment company is rated in the highest category by a Rating Agency.

(i) Savings or demand deposits placed in accordance with the following conditions: (1) the money is initially deposited and invested through a federally insured institution having a place of business in the Commonwealth which is selected by the Authority; (2) the selected institution arranges for the redeposit of the money in savings or demand deposits in one or more financial institutions insured by the Federal Deposit Insurance Corporation for the account of the Authority; the full amount of principal and any accrued interest of each such deposit is insured by the Federal Deposit Insurance Corporation; and (4) on the same date that the money is redeposited pursuant to paragraph (2), the selected institution receives an amount of deposits from customers of other financial institutions equal to or greater than the amount of money initially invested through the selected institution by the Authority.

All investments shall mature or shall be subject to withdrawal, as the case may be, not later than the date required for the operation of such Fund and in no event later than the date or the number of months or years after the date of such investment or deposit as specified in the following columns:

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<u>Fund</u>	<u>Period of Investment</u>
Revenue Fund	Such dates as may be specified by the Authority to permit it to meet its obligations to be paid therefrom.
Operating Fund	Such dates as may be specified by the Authority to permit it to meet its obligations to be paid therefrom.
Construction Fund	Such dates as may be specified by the Authority to permit it to meet its obligations to be paid therefrom.
Debt Service Fund	Not later than one day prior to the next interest or principal payment date.
Debt Service Reserve Fund	Not later than 5 years from the date of investment.
Operating Reserve Fund	Not later than 1 year from the date of investment.
Subordinate Debt Service Fund	Not later than one day prior to the next interest or principal payment date.
Subordinate Debt Service Reserve Fund	Not later than 5 years from the date of investment.
Rate Stabilization Fund	Not later than 1 year from the date of investment.
Redemption Fund	Not later than the day prior to the redemption date with respect to which such deposit has been made.
Rebate Fund	Such dates as may be specified by the Authority to permit it to meet its obligations to be paid therefrom.

In any such case, the full purchase price (including accrued interest and premiums, if any) of obligations, shall be paid out of the Fund for which the investment was made. Upon a like direction by the Authority, or whenever the moneys in said Funds are to be applied and paid out pursuant to any provisions of this Indenture, or, whenever the Trustee shall deem such action to be advisable, the Trustee shall sell all or any part of the obligations in which the moneys in one or more such Funds shall be invested or withdraw moneys from such accounts or certificates of deposit, and the proceeds of such sale or the amount of such withdrawal shall be deposited to the credit of the respective Fund or Funds. Interest and income derived from any such investments or deposits shall be held and transferred as follows, unless otherwise directed by the Authority:

- (a) Revenue Fund – remain in that fund;

- (b) Operating Fund – remain in that fund;
- (c) Construction Fund – remain in that fund;
- (d) Debt Service Fund - remain in that fund;
- (e) Debt Service Reserve Fund - remain in that fund to make up any deficiency therein; otherwise, transferred to Revenue Fund;
- (f) Operating Reserve Fund - remain in that account to make up any deficiency therein; otherwise, transferred to Revenue Fund;
- (g) Subordinate Debt Service Fund - remain in that fund;
- (h) Subordinate Debt Service Reserve Fund - remain in that fund to make up any deficiency therein; otherwise, transferred to Revenue Fund;
- (i) Rate Stabilization Fund – remain in that fund;
- (j) Redemption Fund - transferred to Revenue Fund; and
- (k) Rebate Fund - remain in that fund.

Any loss resulting from any such investment shall be charged to the respective Fund or Funds, for which such investment was made. Obligations purchased as an investment of any of said Funds shall be deemed at all times to be a part of such Fund. The Trustee shall not be liable or responsible for any loss resulting from any investment made in accordance with the provisions of this Section or resulting from any sale by the Trustee of such investment made in accordance with instructions from the Authority.

Cash in each of the Funds and accounts therein and all certificates of deposit, repurchase agreements and investment agreements all as referred to in this Article, to the extent that the same is not insured or guaranteed by the Federal Deposit Insurance Corporation or other Federal agency, shall be continuously secured by a pledge of securities described in (a) and/or (b) of Section 6.12 hereof having an aggregate market value, exclusive of accrued interest in the case of certificates of deposit and including accrued interest in the case of repurchase agreements or other investment agreements, at all times at least equal to 100% (or 102 % in the case of repurchase agreements or investment agreements) of the balance on deposit (including interest earned in the case of repurchase agreements or investment agreements) in such Fund or account. Such securities shall be held by a Trustee or agent satisfactory to the Authority and to the Trustee. In the event the Authority determines that the market value of such security is determined by the Trustee to be less than the required amount, the Authority shall provide written instructions to Trustee to obtain additional security.

All Authorized Investments (except investment agreements) shall be valued by the Trustee as frequently as deemed necessary by a Bond Insurer, but not less often than annually, at the market value thereof, exclusive of accrued interest.

No later than 20 days before each Interest Payment Date, the Trustee shall advise the Authority of the amount of interest credited and to be credited to the Debt Service Fund prior to the next Interest Payment Date to enable the Authority to determine the amount to be transferred from the Revenue Fund on such Interest Payment Date.

Ratings of authorized investments shall be determined at the time of purchase of such authorized investments and the Trustee shall have no responsibility to monitor the ratings thereof. The Trustee may make any and all such investments through its own investment department or that of its affiliates or subsidiaries, and may charge its ordinary and customary fees for such trades, including cash sweep account fees. In the absence of investment instructions from the Authority, the Trustee shall not be responsible or liable for keeping the moneys held by it hereunder fully invested in authorized investments. The Trustee is not required to provide brokerage confirmations so long as the Trustee provides periodic statements that include investment activity to the Authority; provided that such statement is not required if (i) the Trustee is willing to provide broker confirmations or (ii) the investments permitted in the transaction are limited solely to investments for which brokerage confirmations are never issued or issued only at closing (i.e., state and local government obligations).

Section 6.13 Transfer of Funds and Accounts. On the First Effective Date, moneys in any Funds and Accounts in the Existing Senior Indenture maintaining the same name in this Indenture shall remain in such Funds and Accounts. The moneys in the Operation and Maintenance Account shall be transferred to the Operation Account hereunder. The moneys in the Renewal and Replacement Fund and the Depreciation Reserve Account shall be transferred to the Revenue Fund.

## ARTICLE VII

### RATE COVENANT AND PARTICULAR COVENANTS

#### Section 7.01 Authority Rate Covenant.

(a) From the First Effective Date through the Tested Fiscal Year (as hereinafter defined) ending December 31, 2018, the Rate Covenant set forth in Section 7.01 of the Existing Senior Indenture shall remain in effect. This means that in 2018, the Authority will calculate whether the Rate Covenant in Section 7.01 of the Existing Senior Indenture was complied with in the 2017 Fiscal Year, and in 2019, the Authority will calculate whether the Rate Covenant in Section 7.01 of the Existing Senior Indenture was complied with in the 2018 Fiscal Year.

(b) Beginning on January 1, 2019 and thereafter, the Rate Covenant set forth in 7.01(c) below shall be in effect. This means that in 2020, the Authority will calculate whether the Rate Covenant in Section 7.01(c) below was complied with in the 2019 Fiscal Year.

(c) The Authority shall fix, charge and collect such rates, fees and other charges for the use of and the services furnished by the System and shall, from time to time and as often as shall appear necessary, revise such rates, fees and other charges so as to satisfy all of the following three independent requirements:

(i) Rate Covenant Net Revenues shall be sufficient in each Fiscal Year (the "Tested Fiscal Year") to pay (A) Annual Debt Service on Senior Debt in such Fiscal Year, (B) any amount necessary to be deposited in any Series Debt Service Reserve Account to restore the amount on deposit therein to the applicable Series Debt Service Reserve Requirement, (C) Annual Debt Service on Subordinate Debt in such Fiscal Year (including reserves in connection therewith and the required restoration thereof), (D) any amount required to be deposited in the Operating Reserve Fund to cause the required balance therein to equal the Operating Reserve Requirement, and (E) all other amounts which the Authority may by law or contract be obligated to pay; and

(ii) Rate Covenant Net Revenues in each Fiscal Year shall equal not less than: (A) 125% of the Annual Debt Service with respect to Senior Debt for such Fiscal Year; plus (B) 110% of the aggregate Annual Debt Service with respect to Subordinate Debt for such Fiscal Year; and

(iii) Rate Covenant Net Revenues, excluding transfers from the Rate Stabilization Fund to the Revenue Fund (as provided in Section 6.08 hereof) and the proceeds of Grants, shall equal not less than 100% of Annual Debt Service on Senior Debt and Subordinate Debt for such Fiscal Year.

The Authority shall test for compliance with this Section 7.01(c) within 120 days after the end of each Fiscal Year.

(d) If, subject to the provisions of subsection (e) below, the Rate Covenant Net Revenues are less than the amounts specified in (c) above, the Authority must take appropriate action under the law and subsection (f) below within its powers to revise the Authority's rates, fees and other charges or the method of operation of the System in order to satisfy the foregoing requirements in the next Fiscal Year following the Tested Fiscal Year.

(e) For purposes of this Section, the Authority shall not be deemed to have failed to comply with the Rate Covenant and shall not be required to implement the procedures set forth in subsection (d) hereof, if an Authorized Representative of the Authority certifies in writing that the Rate Covenant Net Revenues the Authority would have received in the Tested Fiscal Year would have been sufficient to meet the requirements of subsection (c) hereof if the Revenues for the Tested Fiscal Year were determined by giving effect for the entire Tested Fiscal Year to any increase or decrease in rates, fees, rentals or other charges already authorized by the Authority to be implemented on a date that is within 120 days after the end of the Tested Fiscal Year.

(f) If the Authority fails to comply with the Rate Covenant, the Authority shall promptly request a Qualified Independent Consultant to submit a written report and recommendations with respect to increases in the Authority's rates, fees and other charges and improvements in the operations of and the services rendered by the System and the Authority's accounting and billing procedures necessary to bring the Authority into compliance with the Rate Covenant. Any failure to meet the Rate Covenant will not constitute an Event of Default under this Indenture if within 180 days after the end of the Tested Fiscal Year, (1) the report and recommendations of the Qualified Independent Consultant shall be filed with the Authority, and (2) the Authority shall revise its rates, fees and charges, and alter its operations and services to

conform with the report and recommendations of the Qualified Independent Consultant to the extent permitted by law. Notwithstanding clause (2) in the prior sentence, to the extent that the Authority's rates are governed by an external regulatory body, an Event of Default will not be deemed to have occurred if the Authority files with said regulatory body within 180 days after the end of the Tested Fiscal Year a petition to revise its rates, fees and charges to a level sufficient to achieve compliance with the Rate Covenant in future years. If, in response to such petition, the regulatory body establishes rates, fees and charges, within 180 days of the date the petition is filed, that are expected by the Authority to achieve future compliance with the Rate Covenant, then an Event of Default will not have occurred. If, in response to such petition, the regulatory body (a) does not establish rates fees and charges within 180 days of the petition being filed or (b) establishes rates, fees and charges that are not expected by the Authority to achieve future compliance with the Rate Covenant, then an Event of Default will have occurred.

(g) If the Authority fails to make a deposit required by Section 6.02 to the Interest Account or the Principal Account (or the Sinking Fund Account, as applicable), or if there is a deficiency in the Debt Service Reserve Fund for which the Authority has not made required restoration payments for three consecutive months, the Authority shall promptly request a Qualified Independent Consultant to submit a written report and recommendations with respect to increases in the Authority's rates, fees and other charges and improvements in the operations of and the services rendered by the System and the Authority's accounting and billing procedures necessary to bring the Authority into compliance with the Rate Covenant. The report and recommendations shall be filed with the Authority within 60 days from the date of discovery of failure to make the required deposits, and within 90 days from the receipt of such report, the Authority shall revise its rates, fees and charges, and alter its operations and services to conform with the report and recommendations of the Qualified Independent Consultant to the extent permitted by law.

Section 7.02 Principal and Interest; Cancellation. The Authority will punctually pay the principal of (and premium, if any) and interest on each of the Bonds issued hereunder and secured hereby on the dates, at the places and in the manner specified herein and in said Bonds. All Bonds paid, redeemed or purchased, shall be cancelled by the Trustee. All such Bonds so cancelled may at any time be destroyed by the Trustee.

Section 7.03 No Extension of Payment. The Authority will not directly or indirectly extend or assent to the extension of the time of payment of any claim for interest upon any of the Bonds by purchasing or funding such claim or by any other arrangement, and, in case the time for payment of any such claim for interest shall be extended, such claim shall not be entitled, in case of any default hereunder, to the benefits of this Indenture, or to any payment out of the assets of the Authority, except subject to the prior payment of the principal of all Bonds issued and Outstanding hereunder, and of such portion of the accrued interest thereon as shall not be represented by such extended claims.

Section 7.04 Appointment of Trustee. The Authority hereby irrevocably appoints the Trustee as its agent to maintain an office or agency at its corporate trust office in the City, where Bonds may be presented for registration and transfer and where notices, presentations and demands in respect to the Bonds, or of this Indenture, may be served. The Trustee shall not be under any liability to the Authority or to any other corporation or person in



respect of any such presentation, demand or notice. The Authority shall have the right to appoint a Paying Agent to perform any of the Trustee's duties hereunder with respect to the authentication, transfer, exchange or payment of the Bonds hereunder.

Section 7.05 Corporate Existence. The Authority is duly authorized under its certificate of incorporation and all applicable laws to issue the Bonds and execute and deliver this Indenture and to pledge the Revenues pledged hereby, and all corporate action on its part to that end has been duly and validly taken; this Indenture is and will be a legal, binding and enforceable instrument in accordance with its terms except to the extent that the enforcement of the remedies provided for herein may be limited by bankruptcy laws or the Act; and the Bonds are and will be valid and binding obligations of the Authority entitled to the benefits and security of this Indenture. The Authority will at all times preserve and protect the security of the Bonds and the rights of the Trustee and the Bondholders hereunder.

Section 7.06 Compliance with Act; Maintenance of Existence. The Authority will at all times comply with the laws of the Commonwealth applicable to the Authority, particularly the Act and its amendments and supplements, and it will take such actions and proceedings as may be required, from time to time, to preserve its corporate existence, rights and franchises.

Section 7.07 Liens; Sale of Assets. So long as any of the Bonds secured hereby are Outstanding, none of the Revenues shall be used for any purpose other than as provided in this Indenture, and no contract or contracts will be entered into or any action taken by which the rights of the Trustee or of the Bondholders might be impaired or diminished.

The Authority will not voluntarily create or permit to be created any debt, lien or charge on a parity with (except pursuant to Section 3.03 hereof) or having priority over the lien of this Indenture upon any of the Revenues pledged hereby or any other revenues or other amounts at any time pledged for the payment of the Bonds. The Authority will not sell or otherwise dispose of or encumber the System or any part thereof except as herein otherwise having provided. No sale or other disposition of fixed properties having a fair market value in excess of One Million Dollars (\$1,000,000) shall be made unless the Consulting Engineer shall first have filed his certificate with the Authority and the Trustee recommending such sale or other disposition of said fixed properties and shall have stated in such certificate that the sale or other disposition of said properties is in the best interests of the Authority and will not impair the security of the Bonds and the retention of said properties is not necessary for the efficient operation of the System. If, after receiving the certificate of the Consulting Engineer, the Authority determines to sell or otherwise dispose of said fixed properties, it shall by Resolution of the Authority adopted by a majority vote of a quorum of the Board, authorize such sale or other disposition and shall file a certified copy of such Resolution of the Authority with the Trustee.

The proceeds from such sale or other disposition of any such fixed properties shall be deposited in the Revenue Fund.

The Authority may from time to time sell or otherwise dispose of property other than fixed property included in the System if the Authority shall determine that the sale or other

disposition of such property is in the best interests of the Authority and will not impair the security of the Bonds and the retention of said properties is not necessary for the efficient operation of the System. The proceeds from the sale or other disposition of such property shall be deposited in the Revenue Fund.

In case the Authority shall have acquired any property constituting part of the System within or after the period for which any calculation of Net Revenues is made there shall be included in ascertaining the Net Revenues for such period, the net earnings or net losses, as the case may be, of such property for the whole of such period to the extent the same may not have been otherwise included. The net earnings or net losses, as the case may be, of such property for the period preceding its acquisition by the Authority shall be computed as if such property had been operated by the Authority during such period. If within or after the period for which any such calculation is made, the Authority shall have disposed of any property constituting part of the System, then the net earnings or net losses, as the case may be, of such property for the whole of such period shall be excluded, to the extent the same may not have been otherwise excluded, in ascertaining the Net Revenues for such period. If the rates, rents and charges during all or any part of the period for which any such calculation is made shall be different from the rates, rents and charges which are in effect at the time such calculation is made, there shall be added to or deducted from the Net Revenues so calculated, any increase or decrease of the Revenues for such period which would result from the computation of such Revenues on the basis of the rates, rents and charges in effect at the date of said calculation, rather than the rates, rents and charges which were actually in effect during that period.

Section 7.08 Payment of Taxes and other Governmental Charges. The Authority will pay all taxes, assessments and other governmental charges lawfully imposed upon its properties or the Revenues when the same shall become due as well as all lawful claims for labor, material and supplies, which, if unpaid, might by law become a lien or charge on the System or the Revenues or any part thereof prior to or on a parity with the lien hereof, or which might impair the security of this Indenture, so that the priority and security of this Indenture shall be preserved, provided that nothing in this Section contained shall require the Authority to pay and discharge any such tax, assessment, charge or claim so long as the validity thereof shall be contested in good faith by appropriate proceedings diligently conducted (unless and until foreclosure, distraint, sale or other similar proceedings shall have been commenced) and if such reserves or other appropriate provisions, if any, as shall be required by generally accepted accounting principles shall have been made therefor.

Section 7.09 Insurance of System. The Authority will at all times cause all the property of the System which is of a character usually insured by persons operating properties of a similar nature to be properly insured and kept insured by a reputable insurance company or companies against loss or damage by fire or other hazards to the extent that such properties are usually insured by persons operating properties of a similar nature in the same or similar localities. All policies shall be so written that the Trustee will be notified of cancellation or amendment at least fifteen (15) days prior to the effective date of such cancellation or amendment. In case the Trustee shall at any time notify the Authority in writing that it disapproves of any insurance company issuing a policy of insurance covering any one or more such risks, the Authority will forthwith affect other insurance with companies satisfactory to the Trustee.

All such policies shall be for the benefit of the Trustee and the Authority as their interests may appear. All policies shall provide that claims in excess of \$5,000,000 shall be made payable to the Trustee and shall be deposited with the Trustee and the Trustee shall have the sole right to receive the proceeds of such policies and to collect and receipt for claims in excess of \$5,000,000 thereunder. The Trustee may accept as conclusive the adjustment of any loss or losses by the Authority and any insurance company. The proceeds of all such policies paid to the Trustee shall be held by it as additional security hereunder until paid out by it as herein provided. All claims of \$5,000,000 or less shall be paid to the Authority.

Section 7.10 Damage, Destruction or Condemnation of System; Application of Proceeds. In the event of any damage to the System covered by insurance or condemnation or taking by eminent domain of any part of the System for which the cost of repair or replacement shall exceed \$5,000,000, the proceeds shall be deposited in the Revenue Fund and the Authority shall promptly notify the Trustee and file with the Trustee a Consulting Engineer's certificate stating whether, in the signer's opinion, it is practicable and advantageous to repair or replace the damaged or condemned property. If the certificate states that repair or replacement is practicable and advantageous, the Consulting Engineer shall, if appropriate, prepare and file with the Trustee plans and specifications therefor with an estimate of the cost thereof, and the insurance or condemnation proceeds, if any, shall be transferred to the Operating Fund and applied thereto. If the certificate states that the repair or replacement is not practical and advantageous, the proceeds shall be remain deposited in the Revenue Fund or, at the option of the Authority, be transferred to the Redemption Fund for the extraordinary redemption of Bonds as hereinafter provided.

The Bonds are subject to redemption without premium at any time, in whole or in part, within a maturity by lot, by the Authority upon the occurrence of any condemnation or taking or damage or injury of the nature set forth in this Article, from the proceeds collected as a result of such damage, injury or taking. In all cases of redemption under this Section, including redemptions resulting from the damage, destruction or condemnation of equipment, the Authority shall cause to be filed with the Trustee the certificate of the Consulting Engineer referred to above, determining that repair, reconstruction or replacement is not practicable, desirable or financially feasible. In the event that less than all of the Bonds outstanding are to be redeemed, the Authority shall furnish to the Trustee a Consulting Engineer's Certificate stating (i) that the property forming a part of the System that was damaged or injured or taken by such condemnation proceedings is not essential to the operation of the System and that the continued operation of the remaining System will not, in the signer's opinion, adversely affect the security of the Bonds remaining outstanding after such redemption, or (ii) that the System has been restored to a condition substantially equivalent to its condition prior to the occurrence of such damage, injury or condemnation, and that continued operation of the System will not, in the signer's opinion, adversely affect the security of the Bonds remaining outstanding after such redemption. For purposes of this Section 7.10, the term Consulting Engineer shall also include an employee of the City or the Authority who is otherwise qualified to act as Consulting Engineer under this Indenture.

Section 7.11 Employment of Consulting Engineer; Reports. The Authority will employ a Consulting Engineer to perform such duties as are imposed on the Consulting Engineer by the provisions of this Indenture.

It shall be the duty of the Consulting Engineer, in addition to the other duties prescribed elsewhere in this Indenture, to prepare and file with the Authority and with the Trustee on or before thirty days prior to the beginning of each Fiscal Year thereafter, a report setting forth the following:

(a) Advice and recommendations as to the proper maintenance, repair and operation of the System during the next Fiscal Year and an estimate of the amounts of money that should be expended for such purposes;

(b) Advice and recommendations as to the Capital Additions that should be made during the next Fiscal Year, and an estimate of the amount of money that is recommended for such purposes; and

(c) Whether the properties of the System have been maintained in good repair and sound operating condition and the Consulting Engineer's estimate of the amount, if any, required to place such properties in such condition and the details of such expenditures and the approximate time required therefor.

Section 7.12 Adoption of Annual Budget. The Authority covenants that it will on or before each December 31, prior to the beginning of each Fiscal Year thereafter, prepare and adopt a budget of Current Expenses for the next Fiscal Year, which budget shall contain an estimate of the Revenues to be derived for the period covered by such budget, and a copy of such budget shall be promptly filed with the Trustee and each Bond Insurer. Any budget may be amended from time to time by the Authority and such amended budget shall be promptly filed with the Trustee and each Bond Insurer. The annual budget shall also be filed, if and when required under a Continuing Disclosure Undertaking, with the EMMA system of the MSRB. Filing of the annual budget with EMMA and placement of the annual budget on the Authority's website with notice provided to the Trustee and Bond Insurer will constitute compliance with this section.

Until the adoption of the annual budget of Current Expenses for a particular Fiscal Year, the budget for the preceding Fiscal Year shall be deemed to be in force for such particular Fiscal Year.

Section 7.13 Maintenance of System. The Authority will at all times maintain or cause to be maintained the System and every part thereof in good repair, working order and condition, will continuously operate the same and will, from time to time, make or cause to be made all needful and proper repairs, renewals and replacements so that the aggregate efficiency and capacity of the System shall at no time be unreasonably impaired or reduced.

Section 7.14 Employment of Independent Auditor; Annual Financial Report. Authority covenants that it has employed and will continue to employ an Independent Auditor to perform such duties as are imposed on the Independent Auditor by this Indenture.

The Authority has caused an accurate system of accounts to be installed as recommended by its Independent Auditor. The Authority will keep proper books of record and accounts in which complete and correct entries shall be made of all its dealings and transactions in accordance with generally accepted accounting principles, consistently applied. On or before

May 1 of each year, the Authority will furnish to the Trustee and each Bond Insurer, and to any Holder of any of the Bonds, at the written request of such Holder, a copy of its audit report for the preceding Fiscal Year. The Authority shall also file said audit report, if and when required under a Continuing Disclosure Undertaking, with the EMMA system of the MSRB. Filing of said audit with EMMA and placement of said audit on the Authority's website with notice provided to the Trustee and Bond Insurer will constitute compliance with this section. Said audit report shall, in each instance, have been prepared by an Independent Auditor after having made an audit of the Authority's books and accounts pertaining to the System for such year and shall include therein for the year in question a statement as to whether the schedule of rates then in effect complies with the covenants contained in Section 7.01.

Section 7.15 Advances by Trustee. If the Authority shall fail to perform any of the covenants contained in this Article, the Trustee or any Bondholder through the Trustee may, but has no duty to, make advances to perform the same on behalf of the Authority, but shall be under no duty so to do; and all sums so advanced shall be at once repayable by the Authority and shall bear interest at the Prime Rate until paid, and shall be secured hereby, having the benefit of a lien hereby created on a parity with the Bonds, but no such advances shall be deemed to relieve the Authority from any default hereunder.

Section 7.16 Further Assurances. The Authority shall execute and deliver such further instruments and do such further acts as may be necessary or proper to carry out more effectually the purposes of this Indenture and the transfer to any new trustee of the estate, powers, instruments or funds held in trust hereunder. The Authority shall, on an ongoing basis, execute and deliver all documents and make or cause to be made all filings and recordings necessary or desirable in order to perfect, preserve and protect the interest of the Trustee in the Trust Estate to the extent possible under applicable law. The Trustee shall not be responsible for and makes no representation as to the legality, effectiveness or sufficiency of any security document or for the creation, perfection, priority or protection of any lien securing the Bonds. The Trustee shall not be responsible for filing any financing or continuation statement or recording any documents or instruments in any public office at any time or otherwise for perfecting or maintaining the perfection of any lien or security interest in the trust estate it being understood that the Authority shall be obligated to make such filings on behalf of the Trustee and provide a copy of the filed initial financing statement to the Trustee.

Section 7.17 Construction of Construction Projects; Operation of System. The Authority covenants that upon the completion of any Construction Project it will operate and maintain the same as a part of the System. The Authority further covenants that it will operate the System in an efficient and economical manner.

Section 7.18 Covenant Against Encumbrances. The Authority further covenants that it will duly observe and comply with all valid requirements of any governmental authority relative to the System, that it will not create or suffer to be created any lien or charge upon the System or any part thereof, other than as provided in this Indenture, and that it will pay or cause to be discharged, or will make adequate provision to satisfy and discharge all lawful claims and demands for labor, materials, supplies or other objects which, if unpaid, might by law become a lien upon the System or any part thereof or the Revenues; provided, however, that nothing contained in this Section shall require the Authority to pay or cause to be discharged, or make

provisions for, any such lien or charge so long as the validity thereof shall be contested in good faith and by appropriate legal proceedings.

Section 7.19 Use of Revenues. The Authority covenants and agrees that, so long as any of the Bonds secured hereby shall be Outstanding, none of the Revenues will be used for any purpose other than as provided in this Indenture, and that no contract or contracts will be entered into or any action taken to impair or diminish the rights of Holders of the Bonds.

Section 7.20 No Free Service. Except as provided in Section 7.01 hereof, the Authority will not render or cause to be rendered any free services of any nature by the facilities of the System nor will any preferential rates be established for users of the same class, excluding (a) as provided in the Cooperation Agreement, the rates, fees or charges for services rendered to the City including its departments, agencies and instrumentalities and the Authority's reimbursement of the City for equalization payments made by the City to a private utility which serves customers in a portion of the City, and (b) the provision to several municipalities of conveyance without charge of storm water and sanitary sewer flows through Authority trunk lines to the Allegheny County Sanitary Authority.

Section 7.21 Failure of Customers to Pay; Enforcement of Collections. The Authority will diligently enforce and collect the rates, fees and other charges from customers for the services of the System; will take all steps, actions and proceedings for the enforcement and collections of such rates, fees and charges as shall become delinquent to the full extent permitted or authorized by law; and will maintain accurate records with respect thereto. All such rates, fees, charges and revenues herein pledged shall, as collected, be held in trust to be applied as provided in this Indenture and not otherwise.

Section 7.22 Covenants with Bond Insurers, Letter Credit Banks, Liquidity Facility Issuer, etc. The Authority may make such covenants and agreements in a Supplemental Indenture and related documents as it may determine to be appropriate with any Bond Insurer, Letter of Credit Bank, Liquidity Facility Issuer, or other financial institution that agrees to insure or to provide credit or liquidity support to enhance the security or the value of any Bonds.

Section 7.23 Internal Revenue Code and Other Covenants. The Authority hereby covenants with the registered Owners, from time to time, of the Bonds that no part of the proceeds of the Bonds or of any moneys on deposit with the Trustee hereunder will be used, at any time, directly or indirectly, in a manner which, if such use had been reasonably expected on the date of issuance of the Bonds, would have caused the Bonds to be arbitrage bonds within the meaning of Section 148 of the Code, and that it will comply with the requirements of that section and the regulations throughout the term of the Bonds. In the event the Authority is of the opinion that it is necessary to restrict or limit the yield on the investment of any moneys paid to or held by the Trustee to comply with the covenants herein set forth, the Authority shall issue to the Trustee a written certificate to such effect, with appropriate instructions, and the Trustee shall thereupon take such action in accordance with such certificate and instructions. The Authority's covenants set forth in any Tax Regulatory Certificate are incorporated herein.

## ARTICLE VIII

### EVENTS OF DEFAULT AND REMEDIES

Section 8.01 Events of Default. Each of the following events is hereby declared an "Event of Default" for any Bond issued hereunder:

(a) failure by the Authority to pay the principal of, or the premium (if any) payable upon the redemption of, any Bond when due and payable either at maturity, declaration, or by proceedings for redemption, or otherwise (no effect being given to payments made under a Bond Insurance Policy); or

(b) failure by the Authority to pay any installment of interest on any Bond when due and payable (no effect being given to payments made under a Bond Insurance Policy); or

(c) the entry of an order or decree appointing a receiver or receivers of the System or of the Revenues with the consent or acquiescence of the Authority, or, if such order or decree shall have been entered without the acquiescence or consent of the Authority, the failure of the Authority to cause such order or decree to be vacated or discharged or stayed on appeal within ninety (90) days after entry; or

(d) the institution of any proceeding with the consent or acquiescence of the Authority for the purpose of effecting a composition between the Authority and its creditors, or for the purpose of adjusting the claims of such creditors pursuant to any Federal or Commonwealth statute now or hereafter enacted, if the claims of such creditors are under any circumstances payable out of the Revenues, or if such proceeding shall have been instituted without the consent or acquiescence of the Authority, the failure of the Authority to have such proceeding withdrawn, or any order entered therein vacated or discharged, within ninety (90) days after the institution of such proceeding or the entry of such order; or

(e) the entry of a final judgment against the Authority, which judgment constitutes or could result in a lien or charge upon the System or the Revenues, or which materially and adversely affects the ownership, control or operation of the System, if such judgment shall not be discharged within ninety (90) days from the entry thereof, or if an appeal shall not be taken therefrom, or from the order, decree or process upon which or pursuant to which such judgment was granted or entered, in such manner as to conclusively set aside the execution or levy under such judgment, order, decree or process, or the enforcement thereof; or

(f) the failure or refusal of the Authority to comply with any provisions of the Act applicable to the Authority, or the rendering of the Authority, for any reason, incapable of fulfilling its obligations hereunder or thereunder; or

(g) the failure of the Authority to observe any other covenant, condition or agreement of the Authority contained in the Bonds or in this Indenture and the continuation of such failure for a period of sixty (60) days after written notice of such failure from the Trustee, which may give such notice in its discretion and shall give such notice at the written request of the Holders of not less than twenty-five per centum (25%) in aggregate Principal Amount of the Bonds then outstanding, provided that, the failure of the Authority to meet the rate covenant set forth in

Section 7.01 hereof shall not constitute an Event of Default hereunder, and provided further that if such failure is not capable of being remedied within sixty (60) days after such notice, no Event of Default shall exist if the Authority commences the actions necessary for the cure of such failure within such sixty (60) day period and diligently pursues such actions thereafter; or

(h) failure by the Authority to pay principal of, or the premium (if any) payable upon the redemption of any Subordinate Debt when due and payable either at maturity, or otherwise or to pay any installment of interest on any Subordinate Debt when due and payable (no effect being given to payments made under a Bond Insurance Policy); or

(i) the Trustee shall have received written notice from a Letter of Credit Bank that an Event of Default shall have occurred under the Reimbursement Agreement, with a direction from the Letter of Credit Bank to the Trustee to accelerate the principal and interest on the respective Series of Bonds secured by such Letter of Credit Bank's Letter of Credit; or

(j) any acceleration of the payment of principal of any Series of Bonds or the payment of Reimbursement Obligations pursuant to Section 8.02 shall have occurred; or

(k) failure by the Authority to pay the principal of any Reimbursement Obligation when due or within any applicable grace period, if any, set forth in the applicable Reimbursement Agreement; or

(l) failure by the Authority to pay any installment of interest on any Reimbursement Obligation when due or within any applicable grace period, if any, set forth in the applicable Reimbursement Agreement.

The Trustee shall (i) provide immediate notice to each Bond Insurer of the occurrence of an Event of Default under clause (a), (b), (i) or (j) above and (ii) provide notice to each Bond Insurer of any other Event of Default known to the Trustee within thirty (30) days of the Trustee's knowledge thereof.

Section 8.02 Acceleration of Principal. Upon the occurrence and continuance of any Event of Default described in Section 8.01, the Trustee may, and at the written request of Bondholders of not less than 25% in Principal Amount of the Bonds then Outstanding, shall by written notice to the Authority, declare the Bonds to be immediately due and payable, whereupon they shall, without further action, become and be immediately due and payable, anything in this Indenture or in the Bonds to the contrary notwithstanding, and the Trustee shall give notice thereof to the Authority and shall give notice thereof by certified mail to all Holders of Outstanding Bonds.

A Bond Insurer or a Letter of Credit Bank securing a Series of Bonds, provided the Bond Insurer or Letter of Credit Bank is not in default under its Bond Insurance Policy or Letter of Credit, may exercise all rights of the Bondholders of such Series under this Article VIII, including without limitation giving notice, making a request, giving a direction or giving a waiver under Section 8.01(g), Section 8.02, Section 8.03, Section 8.04 and Section 8.08. That is, the Bond Insurer or Letter of Credit Bank may, in such cases, vote the Bonds of the Bondholders of the Series secured by such Bond Insurer or Letter of Credit Bank, as the case may be. If a Series of Bonds is both insured by a Bond Insurance Policy and secured by a Letter of Credit, the



Bond Insurer shall exercise such rights not the Letter of Credit Bank. In any such cases, the Trustee shall not take direction by the Owners of the Bonds of such Series.

In addition, the Trustee shall be entitled to exercise any or all of the remedies granted to a trustee or under a Bond Insurance Policy, a Credit Facility or the Act.

The above provision, however, is subject to the condition that if, after the principal of said Bonds shall have been so declared to be due and payable, all arrears of interest, if any, upon the Bonds and interest on overdue installments of interest at the rate of interest specified therein, and the principal of all Bonds which have matured other than by reason of such declaration, shall have been paid by the Authority, and the Authority shall also have performed all other things in respect to which it may have been in default hereunder, and shall have paid the reasonable charges of the Trustee and its counsel and of the Holders of said Bonds, including reasonable attorneys' fees paid or incurred, then, and in every such case, the Holders of not less than a majority in aggregate Principal Amount of the Bonds then outstanding, by written notice to the Authority and to the Trustee, may waive such default and its consequences and such waiver shall be binding upon the Trustee and upon all Holders of Bonds issued hereunder; but no such waiver shall extend to or affect any subsequent default or impair any rights or remedy consequent thereon.

Section 8.03 Remedies of Trustee and Bondholders; Rights of Entry. Subject to Sections 8.02 and 9.06, upon the happening and during the continuance of any event of default specified in Section 8.01, then and in every such case, the Trustee may and, upon written request of the Holders of not less than twenty-five per centum (25%) in aggregate Principal Amount of the Bonds then Outstanding, shall enter into and upon and take possession of the System and each and every part thereof as for a condition broken and may exclude the Authority, its agents and employees and all persons claiming under them wholly therefrom and have, hold, use, operate, manage and control the same and each and every part thereof, and in the name of the Authority or otherwise as the Trustee shall deem best, conduct the business thereof and exercise all the rights and powers of the Authority with respect to the System and use all its then existing property, assets and franchises for that purpose and out of the Revenues, maintain, restore, insure and keep insured, the System against such hazards as are ordinarily insured against by a person operating a water, stormwater and sewer system similar to the System and from time to time may make all such necessary or proper repairs as to it may seem expedient, and establish, levy, maintain and collect such rates, rents and charges in connection with the System as it may deem necessary, proper, desirable and reasonable, and collect and receive all Revenues, and after deducting therefrom the expenses of operation, maintenance and repair and all expenses incurred hereunder and all other proper outlays herein authorized and all such payments which may be made for insurance and other proper charges, including just and reasonable compensation for its own services, and for the services of such attorneys, agents and employees as it may, in the exercise of its discretion, employ for any of the purposes aforesaid, the Trustee shall apply the rest and residue of the moneys received by it, as well as all cash and investments held by the Trustee in any fund hereunder, subject to the provisions hereof with respect to claims for principal and interest, to the payment of the principal of and interest on the Bonds. Whenever all that is due upon such Bonds and installments of interest and under any of the terms of this Indenture shall have been paid or deposited with the Trustee and all defaults made good, the

Trustee in possession shall surrender possession to the Authority, its successors or assigns. However, the same right of entry shall exist upon any subsequent default or defaults.

Section 8.04 Judicial Action. In case of the breach of any of the covenants or conditions of this Indenture, the Trustee shall have the right and power to take appropriate judicial proceedings for the enforcement of its rights and the rights of the Bondholders hereunder, including, as appropriate, an action in mandamus. Upon the happening of an event of default hereunder, the Trustee may either after entry, or without entry, proceed by suit or suits, actions or special proceedings at law or in equity to enforce its rights and the rights of the Bondholders hereunder, and it shall be obligatory upon the Trustee to take action to that end, either by such proceedings or by the exercise of its powers with respect to entry or otherwise, as it may determine, upon being requested to do so by the Holders of twenty-five per centum (25%) in aggregate Principal Amount of the Bonds then Outstanding hereunder and upon being indemnified as hereinafter provided.

No remedy by the terms of this Indenture conferred upon or reserved to the Trustee or to the Bondholders is intended to be exclusive of any other remedy, but each and every such remedy shall be cumulative and shall be in addition to any other remedy given hereunder or now or hereafter existing at law or in equity or by statute.

The Holders of a majority in aggregate Principal Amount of the Bonds then Outstanding hereunder, at any time, by an instrument in writing executed and delivered to the Trustee, may reasonably direct the method and place of conducting all proceedings to be taken for the enforcement of any of the rights of the Bondholders; provided that such direction shall not be otherwise than in accordance with the provisions of law or of this Indenture.

Section 8.05 Payments by Authority. The Authority covenants that if any default shall be made in the payment of the principal of or interest on any Bond hereby secured when the same shall become payable, the Authority will pay to the Trustee, upon demand, for the benefit of the Holders of the Bonds so in default, the whole amount then due and payable for principal and interest, with interest upon the overdue principal and upon the overdue installments of interest at the rate of interest specified in the Bonds from the date of default to the date of payment; and in case the Authority shall fail to pay the same forthwith upon such demand, the Trustee in its own name and as trustee of an express trust shall be entitled to sue for and to recover judgment for the whole amount so due and unpaid.

Section 8.06 Application of Moneys. Any moneys received by the Trustee or by any receiver from the operation of the System, shall, after payment of the costs and expenses of the operation thereof, be applied,

First: to the payment of the fees, counsel fees and expenses of the Trustee and of the receivers, if any, and all costs and disbursements allowed by the court, if there be any court action.

Second: to the payment of the whole amount of principal and interest which shall then be owing or unpaid upon the Bonds, or to the payment of the whole amount of any Reimbursement Obligations which shall then be owing or unpaid, then to the payment of such

principal and interest or Reimbursement Obligations ratably, without preference or priority of principal over interest or Reimbursement Obligations, Reimbursement Obligations over principal or interest or of interest over principal or Reimbursement Obligations or of any installment of interest over any other installment of interest and without preference or priority of any such payments over Periodic Payments (such principal and interest on Bonds, amounts owing under Reimbursement Obligations and Periodic Payments to be paid ratably).

Third: to the payment of the surplus, if any, to the Authority, or to whoever is lawfully entitled to receive the same or as a court of competent jurisdiction may direct.

Section 8.07 Trustee's Rights. Any right of action under this Indenture, or under any of the Bonds, may be enforced by the Trustee without the possession of any of the Bonds or the production thereof on any trial or other proceedings relative thereto and any such suit or proceeding instituted by the Trustee shall be brought in its name as Trustee and any recovery of judgment shall be for the equal benefit of the registered Owners of the Bonds in respect of which such judgment shall have been recovered, subject to the provisions hereof with respect to extended claims for interest.

Section 8.08 Limitations on Bondholders. No Holder of any Bonds shall have any right to institute any suit, action, or proceeding in equity or at law for the enforcement of this Indenture or for the execution of any trust hereof or for the appointment of a receiver or to exercise any other remedy hereunder, unless such Holder shall have previously given to the Trustee written notice of an event of default and of the continuance thereof as hereinbefore provided nor unless also the Holders of at least twenty-five per centum (25%) in aggregate Principal Amount of the Bonds then Outstanding hereunder shall have made written request of the Trustee and shall have offered it reasonable opportunity either to proceed to exercise the powers hereinbefore granted or to institute such action, suit or proceeding in its own name nor unless also they shall have offered to the Trustee adequate security and indemnity against the costs, expenses and liability to be incurred therein or thereby; and such notification, request and offer of indemnity are hereby declared in every such case at the option of the Trustee to be conditions precedent to the execution of the powers and trusts of this Indenture or for the appointment of a receiver or for any other remedy hereunder; it being understood and intended that no one or more holders or registered Owners of the Bonds shall have any right in any manner whatsoever to affect, disturb or prejudice the lien of this Indenture by his own or their action or to enforce any right hereunder except in the manner herein provided, and that all such proceedings at law or in equity shall be instituted, had and maintained in the manner herein provided and for the benefit of all Holders of outstanding Bonds, subject to the provisions hereof with respect to claims for interest.

Subject to the following paragraph, nothing in this Article shall, however, affect or impair the right of any Bondholder which is absolute and unconditional, to enforce the payment of the principal and interest of such Bondholder's Bonds, or the obligation of the Authority which is also absolute and unconditional, to pay the principal of and interest on each of the Bonds issued hereunder to the respective holders or registered Owners thereof at the time and place in said Bonds expressed.

Section 8.09 Waiver by Authority. The Authority may waive any period of grace provided for in this Article.

Section 8.10 Waiver of Default; Delay or Omission of Trustee. No waiver of any default hereunder, whether by the Trustee, a Bond Insurer or the Bondholders shall extend to or shall affect any subsequent default or shall impair any rights or remedies consequent thereon. No delay or omission of the Trustee, a Bond Insurer or of any Holders of Bonds hereby secured to exercise any right or power accruing upon any default shall impair any such right or power or shall be construed to be a waiver of any such default, or acquiescence therein; and every right, power and remedy given by this Indenture to the Trustee, a Bond Insurer or to the Bondholders may be exercised from time to time and as often as may be deemed expedient by the Trustee, the Bond Insurer or in an appropriate case, by the Bondholders.

In case the Trustee shall have proceeded to enforce any right under this Indenture by entry or otherwise, and such proceedings shall have been discontinued or abandoned for any reason, or shall have been determined adversely to the Trustee, then and in every such case the Authority and the Trustee shall be restored to their former positions and rights hereunder with respect to the pledged revenues, and all rights, remedies and powers of the Trustee shall continue as if no such proceedings had been taken.

Section 8.11 Appointment of Receiver. Subject to Section 8.02, as provided by the Act, as amended, the Trustee shall be entitled as a matter of right to the appointment of a receiver, and the Trustee, the Bondholders, the Bond Insurer of any Bonds, any receiver so appointed and any Letter of Credit Bank then supporting any Series of Bonds with a Letter of Credit shall have all such rights and powers and shall be subject to such limitations and restrictions as are contained in the Act.

Section 8.12 Limitation on Rights to Transfer. It is expressly understood and agreed that nothing in the provisions of the Bonds or in this Indenture shall be taken to authorize the Trustee, or any receiver appointed hereunder to operate and maintain the System, or to sell, assign, mortgage or otherwise dispose of any of the assets of whatever kind and character belonging to the Authority.

Section 8.13 Issuer of Bond Insurance Policy as Subrogee of Holders of Bonds.  
Any Bond delivered to the Bond Insurer pursuant to the Bond Insurance Policy shall be deemed to continue to be Outstanding under and secured by this Indenture.

## ARTICLE IX

### CONCERNING THE TRUSTEE

Section 9.01 Acceptance of Trust. The Trustee shall, prior to an Event of Default, and after the curing of all Events of Default which shall have occurred, perform such duties and only such duties as are specifically set forth in this Indenture and shall not be liable except for the performance of such duties and obligations as are specifically set forth in this Indenture, and no implied covenants or obligations shall be read into this Indenture against the Trustee, as the case may be. The Trustee shall, during the existence of any Event of Default

(which has not been cured), exercise such of the rights and powers vested in it by this Indenture, and use the same degree of care and skill in their exercise, as prudent persons would exercise or use under the circumstances in the conduct of their own affairs. The Trustee shall not be liable to the parties hereto or deemed in breach or default hereunder if and to the extent its performance hereunder is prevented by reason of force majeure. The term “force majeure” means an occurrence that is beyond the control of the Trustee and could not have been avoided by exercising due care. Force majeure shall include acts of God, terrorism, war, riots, strikes, floods, earthquakes, epidemics or other similar occurrences.

Section 9.02 Responsibility for Statements in Indenture or Bonds. The recitals of fact herein and in the Bonds contained, except only the Trustee's certificate of authentication upon the Bonds, shall be taken as the statements of the Authority and the Trustee assumes no responsibility for the correctness of the same. The Trustee makes no representations as to the validity or sufficiency of this Indenture or the due execution or acknowledgment thereof on the part of the Authority or in respect of the Bonds issued hereunder, and the Trustee shall incur no responsibility in respect of such matter.

Section 9.03 Maintenance of Insurance. The Trustee shall be under no obligation to effect or maintain insurance or to renew any policies of insurance or to inquire as to the adequacy of any insurance or for responsibility of insurers, or to report, make or file claims or proofs of loss for any loss or damage insured against or which may occur or to keep itself advised or informed as to the payment of any insurance premiums, taxes or assessments or to see to or require such payment to be made nor shall the Trustee be under any liability for the failure of the Authority to effect or renew any insurance; but the Trustee may, in its discretion, do any or all of the matters and things in this Section set forth, or require the same to be done.

Section 9.04 Disposition of Bonds and Proceeds. The Trustee shall be under no responsibility or duty with respect to the disposition of the Bonds authenticated and delivered hereunder or the application of the proceeds of any of the Bonds or of any other moneys deposited with it and withdrawn in the manner provided in this Indenture.

Section 9.05 Agents of Trustee; Responsibility for Default of Agents. The Trustee may execute any of the trusts or powers hereof and perform any duty hereunder by or through its attorneys or agents, and it shall not be answerable or accountable for any act, default, neglect or misconduct of any such attorney or agent, if reasonable care has been exercised in his appointment and retention, nor shall the Trustee be otherwise answerable or accountable under any circumstances whatever in connection with the Trust, except for its own gross negligence or willful misconduct.

Section 9.06 Indemnity; No Duty to Notice Default. The Trustee shall be under no obligation or duty to perform any act which would involve it in expense or liability or to institute or defend any suit in respect hereof unless properly indemnified against such expense or liability to its satisfaction. The Trustee shall not be required to take notice, or be deemed to have knowledge, of any default of the Authority hereunder, except a default pursuant to Section 8.01(a) or (b), and may conclusively assume that there has been no such default unless and until it shall have been specifically notified in writing of such default by the Authority or the Holders of not less than twenty-five per centum (25%) in aggregate Principal Amount of the

Bonds then Outstanding hereunder. The Trustee shall provide each Bond Insurer with immediate notice of a default pursuant to Section 8.01(a) or (b) and, within thirty (30) days of the Trustee's knowledge thereof, any other default known to the Trustee. The Trustee shall not be under any obligation to take any action in respect of any default or otherwise, or to institute, appear in or defend any suit or other proceeding in connection therewith or to ascertain or inquire as to the performance of any of the covenants or agreements herein contained on the part of the Authority, unless requested in writing so to do by the Holders of not less than twenty-five per centum (25%) in aggregate Principal Amount of the Bonds then Outstanding hereunder and indemnified to its satisfaction but this provision shall not affect any discretionary power herein given to the Trustee. The Trustee shall, however, take actions pursuant to Section 13.02 hereof, as required therein.

The foregoing provisions are intended only for the protection of the Trustee, and shall not affect any discretion or power given by any provision of this Indenture to the Trustee to take action in respect to any default without such notice or request from the Bondholders or without such security or indemnity. The Trustee may, at any time in its discretion, require of the Authority full information and advice as to the performance of any of the covenants, conditions and agreements, and may further make or cause to be made independent investigations at the expense of the Authority, concerning the affairs of the Authority insofar as such affairs are related to the System.

Section 9.07 Right to Rely Upon Documents. The Trustee shall be protected and shall incur no liability in relying, acting or proceeding in good faith upon any notice, resolution, request, consent, order, certificate, report, opinion, bond, telephonic notice, facsimile transmission, waiver, statement, affidavit, voucher, appraisal, application or other paper or document believed by it to be genuine and to have been signed, passed or presented by the proper person or authority, or to have been prepared and furnished pursuant to the provisions of this Indenture, and before acting upon any of the same the Trustee shall not be bound to make any investigation into the matters stated therein.

The Trustee may consult with legal counsel to be selected and employed by it and the opinion of such counsel shall be full and complete authorization and protection in respect of any action taken or suffered by it hereunder in good faith and in accordance with the opinion of such counsel.

The Trustee shall not be bound to recognize any person as the Holder of a Bond Outstanding hereunder unless and until his Bond is submitted to the Trustee for inspection, if required, and his title thereto satisfactorily established, if disputed.

Whenever in the administration of the trusts imposed upon it by this Indenture the Trustee shall deem it necessary or desirable that a matter be proved or established prior to taking or suffering any action hereunder, such matter (unless other evidence in respect thereof be herein specifically prescribed) may be deemed to be conclusively proved and established by a certificate of the Authority, and such certificate shall be full warrant to the Trustee for any action taken or suffered in good faith under the provisions of this Indenture in reliance upon such Certificate, but in its discretion the Trustee may, in lieu thereof, accept other evidence of such matter or may require such additional evidence as it may deem reasonable.

Any action taken, or omitted to be taken, by the Trustee in good faith pursuant to this Indenture upon the request or authority or consent of any person who, at the time of making such request or giving such authority or consent, is a Bondholder, shall be conclusive and binding upon all future Bondholders and upon Bonds executed and delivered in exchange therefore or in place thereof. The permissive right of the Trustee to do things enumerated in this Indenture shall not be construed as a duty.

The Trustee shall have no responsibility, opinion or liability with respect to any information statement or recital found in any official statement or other disclosure material, prepared or distributed with respect to the issuance of the Bonds, except for information provided by the Trustee.

Section 9.08 Trustee Compensation; Indemnification of Trustee. The Authority shall, out of the Revenues, pay to the Trustee, from time to time, reasonable compensation for all services rendered hereunder, and shall also reimburse the Trustee for all of its reasonable expenses, charges and other disbursements and those of its attorneys, agents and employees, incurred in and about the administration and execution of the trusts hereby created, and the performance of its powers and duties hereunder, and the Trustee shall have a lien on the Revenues therefor, prior and superior to the lien of the Bonds issued hereunder. The Authority further covenants and agrees to protect, exonerate, defend, indemnify and save the Trustee and its officers, directors, employees and agents (collectively, the “Indemnitees”) harmless from and against any and all liabilities, losses, damages, fines, suits, actions, demands, penalties, costs and expenses, including out-of-pocket, incidental expenses, legal fees and expenses, the allocated costs and expenses of in-house counsel and legal staff and the costs and expenses of defending or preparing to defend against any claim (“Losses”) that may be imposed on, incurred by, or assessed against, the Indemnitees or any of them for following any instruction or other direction upon which the Trustee is authorized to rely pursuant to the terms of this Indenture. In addition to and not in limitation of the immediately preceding sentence, the Authority also covenants and agrees to indemnify and hold the Indemnitees and each of them harmless from and against any and all Losses that may be imposed on, incurred by, or asserted against the Indemnitees or any of them in connection with or arising out of the Trustee’s performance, as applicable, under the Indenture provided that such party has not acted with negligence or engaged in willful misconduct. The provisions of this Section shall survive the termination of this Indenture and the resignation or removal of the Trustee.

Section 9.09 Trustee's Right to Make Advances. If the Authority shall fail to perform any of the covenants or agreements contained in this Indenture, the Trustee may, in its discretion and without notice to the Bondholders, at any time and from time to time, make advances to effect performance of the same on behalf of the Authority, but the Trustee shall be under no obligation so to do; and any and all moneys paid or advanced by the Trustee for any such purpose, together with interest thereon at the rate equal to 102% of the Prime Rate in effect at the time of such advance, shall be a lien in favor of the Trustee upon the Revenues prior and superior to the lien of the Bonds issued hereunder; but no such advance shall operate to relieve the Authority from any default hereunder. Nothing herein shall be construed to require the Trustee to expend its own funds.

Section 9.10 Right to Own and Deal in Bonds. The Trustee may become the Owner of Bonds issued hereunder and secured hereby, with the same rights it would have if it were not Trustee. The Trustee may also engage in, or be interested in any financial or other transaction with the Authority and may act as depositary for and permit any of its officers or directors to act as a member of, or in any other capacity with respect to, any committee formed to protect the rights of Bondholders or to effect or aid any reorganization growing out of the enforcement of the Bonds or this Indenture, whether or not any such committee shall represent the Holders of a majority in Principal Amount of the Bonds Outstanding hereunder.

Section 9.11 Construction of Provisions of Indenture. The Trustee may construe any of the provisions of this Indenture insofar as the same may appear to be ambiguous or inconsistent with any other provisions hereof; and any construction of any such provisions hereof by the Trustee in good faith shall be binding upon the Bondholders.

Section 9.12 Resignation or Replacement of Trustee. The Trustee may resign on its motion or may be removed at any time by an instrument or instruments in writing signed by (1) the Authority, provided no Event of Default has occurred and is continuing or (2) the Holders of not less than fifty percent (50%) of the Principal Amount of Bonds then Outstanding, if an Event of Default has occurred and is continuing. No such resignation or removal shall become effective unless and until a successor Trustee (or temporary successor trustee as provided below) has been appointed and has assumed the trusts created hereby. Written notice of such resignation or removal shall be given to each Holder of a Bond then Outstanding to the address then reflected on the books of the Trustee and such resignation or removal shall take effect upon the appointment, qualification and acceptance of a successor Trustee. A successor Trustee may be appointed at the direction of the Authority, or if the Authority shall fail to appoint a successor Trustee, a successor Trustee may be appointed at the direction of the Holders of not less than fifty percent (50%) in aggregate Principal Amount of Bonds Outstanding. In the event a successor Trustee has not been appointed and qualified within sixty (60) days of the date notice of resignation or removal is given, the Trustee or any Bondholders may apply to any court of competent jurisdiction for the appointment of a temporary successor Trustee to act until such time as a successor is appointed as above provided. No resignation or removal of the Trustee shall be effective until a successor has been appointed and has accepted the duties of the Trustee hereunder.

Every successor shall always be a bank or trust company in good standing, qualified to act hereunder, and having a combined capital, surplus and undivided profits of not less than Fifty Million Dollars (\$50,000,000). Any successor appointed hereunder shall execute, acknowledge and deliver to the Authority an instrument accepting such appointment hereunder, and thereupon such successor shall, without any further act, deed or conveyance, become vested with all the estates, properties, rights, powers and trusts of its predecessor in the trust hereunder with like effect as if originally named as Trustee herein; but the Trustee retiring shall, nevertheless, on the written demand of its successor, execute and deliver an instrument conveying and transferring to such successor, upon the trusts herein expressed, all the estates, properties, rights, powers and trusts of the predecessor, who shall duly assign, transfer and deliver to the successor all properties and moneys held by it under this Indenture. Should any instrument in writing from the Authority be required by any successor for more fully and certainly vesting in and confirming to it all of such estates, properties, rights, powers and trusts,



the Authority shall, on request of such successor, make, execute, acknowledge and deliver the deeds, conveyances and necessary instruments in writing.

The notices herein provided for shall be given by mailing a copy thereof to the registered Owners at their addresses as the same shall last appear on the Bond register. A copy shall be provided to each Bond Insurer.

The instruments evidencing the resignation or removal of the Trustee and the appointment of a successor hereunder together with all instruments provided for in this Section shall be filed and/or recorded by the successor Trustee in each recording office, if any, where this Indenture shall have been filed and/or recorded.

Section 9.13 Successor Trustee by Merger. Any bank or trust company having power to execute the trusts of this Indenture and otherwise qualified to act as Trustee hereunder, with or into which the Trustee may be merged or consolidated or any such bank or trust company resulting from any merger or consolidation to which the Trustee shall be a party, shall be the successor trustee under this Indenture, without the execution or filing of any paper or the performance of any further act on the part of any other parties hereto, anything herein to the contrary notwithstanding.

Section 9.14 Appointment of Paying Agent. The Authority may appoint a successor Paying Agent or a co-paying agent at any time upon written notice to each Bond Insurer and the Trustee.

Section 9.15 Trustee to Notify S&P and Moody's. The Trustee hereby agrees to notify S&P and Moody's of (i) any change of the Trustee, (ii) any change in the Bond Insurance Policy, and (iii) any mandatory redemption of Bonds other than mandatory sinking fund redemption. Notices shall be sent to Moody's Investors Service, 7 World Trade Center, 250 Greenwich Street, New York, New York 10007, Attention: Municipal Department/Structured Finance Group.

## ARTICLE X

### CONCERNING THE HOLDERS OF THE BONDS

Section 10.01 Execution of Instruments. Whenever in this Indenture it is provided that the Holders of a specified percentage or a majority of the Bonds Outstanding hereunder may take any action (including the making of any demand or request, the giving of any notice, consent or waiver or the taking of any other action) the fact that at the time of taking any such action the Holders of such specified percentage or majority have joined therein may be evidenced by any instrument or any number of instruments of similar tenor executed by Bondholders in person or by agent or proxy appointed in writing.

Section 10.02 Proof of Ownership. Subject to the provisions of Article IX, proof of the execution of any instrument by a Bondholder or his agent or proxy and proof of the holding by any persons of any of the Bonds shall be sufficient if made in the following manner:

(1) The fact and date of the execution by any such persons of any instrument may be proved by the certificate of any notary public or other officer authorized to take acknowledgments of deeds to be recorded in any State within the United States, that the person executing such instrument acknowledged to him the execution thereof, or by an affidavit of a witness to such execution sworn to before any such notary or other such officer; and

(2) The ownership of Bonds may be proved by the registration books for such Bonds maintained by the Authority at the Principal Office of the Trustee.

The Trustee and any Paying Agent may require such additional proof of any matter referred to in this Section as it shall deem necessary or may accept such other proof as it may deem appropriate.

## ARTICLE XI

### AMENDMENTS AND MODIFICATIONS

Section 11.01 Waivers and Supplemental Indentures Not Requiring Consent of Bondholders. In addition to any Supplemental Indenture otherwise authorized by this Indenture, the Authority, and the Trustee may, from time to time and at any time, enter into such indentures or agreements supplemental hereto as shall not be inconsistent with the terms and provisions hereof and which shall not adversely affect the rights of the Holders of the Bonds Outstanding hereunder (which supplemental indentures or agreements shall thereafter form a part thereof) for the following purposes:

(a) to cure any ambiguity, formal defect or omission in this Indenture or any Supplemental Indenture; or

(b) to grant or confer upon the Trustee for the benefit of the Bondholders any additional rights, remedies, powers, authority or security that may lawfully be granted to or conferred upon the Bondholders, or the Trustee; or

(c) to add to the covenants and agreements of the Authority in this Indenture contained, other covenants and agreements thereafter to be observed, or to surrender any right or power herein reserved to or conferred upon the Authority; or

(d) to modify any of the provisions of this Indenture or to relieve the Authority of any of the obligations, conditions or restrictions contained in this Indenture, provided that such modification or relief shall not, by the express terms of the particular Supplemental Indenture, become effective until all Bonds Outstanding on the date of the execution and delivery of such Supplemental Indenture shall no longer be Outstanding; or

(e) to make such provision in regard to matters or questions arising under the Indenture as may be necessary or desirable and not inconsistent with the Indenture; or

(f) to close this Indenture against, or to restrict, in addition to the limitations and restrictions herein contained, the issue of Additional Bonds hereunder, by imposing additional conditions and restrictions to be thereafter observed, whether applicable in respect to all Bonds issued and to be issued hereunder or in respect of one or more Series of Bonds, or otherwise; or

(g) to modify, amend or supplement this Indenture in such manner as required to permit the Authority to comply with the provisions of the Code relating to the rebate to the United States of America of earnings derived from the investment of the proceeds of Bonds, provided that such modification, amendment or supplement does not materially adversely affect the Holders of all Outstanding Bonds; or

(h) to modify, amend or supplement this Indenture in such manner as may be required by a Rating Agency to maintain or enhance its rating on the Bonds, provided that such modification, amendment or supplement does not materially adversely affect the Holders of all Outstanding Bonds; or

(i) to modify, amend or supplement this Indenture to implement any covenants or agreements contemplated by Section 7.22; or

(j) to authorize the issuance of, to describe the terms of, and to secure one or more Series of Additional Bonds pursuant to Article III; or

(k) to amend any agreement with a securities depository relating to a book-entry system to be maintained with respect to any Bonds; or

(l) to modify, amend or supplement this Indenture in any manner that the Trustee concludes is not materially adverse to the Holders of all Outstanding Bonds; or

(m) to modify, amend or supplement the exhibits to this Indenture containing Bond Insurer provisions, provided the Authority and the Bond Insurers consent to such modifications, amendments or supplements.

Section 11.02 Supplemental Indentures Requiring Consent of Bondholders. With the consent, evidenced as provided in Section 10.01, of the Holders of not less than the Approval Amount or, in the case one or more but less than all of the Series of the Bonds then Outstanding are affected, then, in addition, with the consent of the Holders of the Approval Amount of each Series so affected, and with the consent of any guarantor of principal and interest of any Series of Bonds issued under a supplemental Indenture, the Authority and the Trustee may from time to time and at any time enter into an Indenture or Indentures Supplemental hereto for the purpose of eliminating any of the provisions of this Indenture or of any Supplemental Indenture or of modifying in any manner the rights of the Holders of the Bonds so affected; provided, however, that no such supplemental Indenture shall (i) extend the fixed maturity date of any Bond, or reduce the Principal Amount thereof, or reduce the rate or extend the time of payment of interest thereon, or reduce any premium payable upon the redemption thereof, without the consent of the Holder of each Bond so affected, or (ii) permit the creation by the Authority of any lien prior to the lien of this Indenture upon any part of the Revenues, or reduce the Approval Amount, without the consent of the Holders of all Bonds then Outstanding. It shall not be necessary for

the consent of the Bondholders under this Section to approve the particular form of any proposed Supplemental Indenture, but it shall be sufficient if such consent shall approve the substance thereof. Nothing herein contained, however, shall be construed as making necessary the approval by the Bondholders of the execution of any Supplemental Indenture or agreement as authorized in Section 11.01.

Section 11.03 Authorization to Trustee; Opinion of Counsel. The Trustee shall join with the Authority in the execution of any Supplemental Indenture which the Authority is authorized to execute under the provisions of Section 11.01 or Section 11.02 upon the delivery by the Authority to the Trustee of the following:

(a) (i) A certified copy of a Resolution of the Board authorizing such Supplemental Indenture and requesting the execution thereof by the Trustee and (ii) evidence of consent to such amendment by any party whose consent is required hereunder;

(b) An opinion of counsel (i) to the effect that the Authority and the Trustee are authorized to enter into such Supplemental Indenture by the provisions of Section 11.01 and that all other conditions precedent have been satisfied, or (ii) to the effect that the Authority and the Trustee are authorized to enter into such Supplemental Indenture by the provisions of Section 11.02, that the consent of the Bondholders required has been secured and is evidenced by specified documents meeting the requirements of Section 10.01, and that all other conditions precedent have been satisfied; and

(c) If the opinion of counsel shall state that the Authority and the Trustee are authorized to enter into such Supplemental Indenture by the provisions of Section 11.02, the documents evidencing the consent of the Bondholders as specified in said opinion;

provided, however, that the Trustee shall not be obligated to join in any such Supplemental Indenture which, in its opinion, adversely affects its own duties, rights or immunities under the Indenture.

Section 11.04 Effectiveness of Amendments, Modifications. Upon the execution of any Supplemental Indenture pursuant to the provisions of this Article, the Indenture shall be and be deemed to be modified and amended in accordance therewith and the respective rights, limitations of rights, obligations, duties and immunities under this Indenture of the Trustee, the Authority and the Holders of Bonds shall thereafter be determined, exercised and enforced hereunder subject in all respect to such modifications and amendments, and all the terms and conditions of any such Supplemental Indenture shall be and be deemed to be part of the terms and conditions of this Indenture for any and all purposes. The Authority shall provide each Bond Insurer with a full transcript of all proceedings relating to the execution of any supplement or amendment to this Indenture. The Authority shall provide Moody's and S&P with a notice of each amendment to this Indenture and a copy thereof at least fifteen (15) days in advance of its execution.

## ARTICLE XII

### DISCHARGE OF INDENTURE

Section 12.01 Release of Indenture. If the Authority, its successors or assigns, shall pay or cause to be paid unto the Holders of all Bonds Outstanding hereunder the principal and interest to become due thereon and the premium thereon, if any, at the times and in the manner stipulated therein, then this Indenture and the estate and rights hereby granted shall cease, determine and be void, and thereupon the Trustee shall, upon the request of the Authority, deliver to the Authority such instruments as shall be requisite to satisfy the lien hereof, and reconvey to the Authority the estate and title hereby conveyed, and assign and deliver to the Authority any property at the time subject to the lien of this Indenture which may then be in the possession of the Trustee; but the Trustee shall take any such action only upon the receipt of an officer's certificate and an opinion of counsel, each stating in substance that in the opinion of the respective signers all conditions precedent provided for in this Indenture relating to such release, cancellation and discharge have been complied with. In addition, this Indenture shall not be discharged until all Policy Costs owing to any Bond Insurer shall have been paid in full.

Bonds for the payment or redemption of which there shall have been deposited with the Trustee cash or Defeasance Obligations (which shall mean direct non-callable obligations of the United States of America and securities fully and unconditionally guaranteed as to the timely payment of principal and interest by the United States of America, to which direct obligation or guarantee the full faith and credit of the United States of America has been pledged, Refcorp interest strips, CATS, TIGRS, STRPS, or defeased municipal bonds rated "AAA" by S&P or "Aaa" by Moody's, any combination thereof or any other security approved by the applicable Bond Insurer), the principal of and interest on which when due, will, without reinvestment of principal or interest, provide sufficient moneys to pay the Bonds in full at maturity or the date fixed for redemption, shall be deemed to be paid within the meaning of this Article. In the event of an advance refunding, the Authority shall cause to be delivered a verification report of a Qualified Independent Consultant experienced in delivering verification reports. For purposes of determining whether any Outstanding Variable Rate Indebtedness is deemed paid and discharged pursuant to this Article XII, such Variable Rate Indebtedness shall be deemed to bear interest at the maximum rate of interest such Variable Rate Indebtedness may bear pursuant to the applicable Supplemental Indenture.

The release, cancellation and discharge of this Indenture, however, shall be without prejudice to the right of the Trustee to be paid any compensation then due to it hereunder and to be protected and saved harmless by the Authority from any and all losses, liabilities, costs and expenses, including counsel fees, at any time incurred by the Trustee hereunder or connected with any Bond issued hereunder, of and from which, if this Indenture had not been released, cancelled and discharged, the Authority would have been obligated by the terms of this Indenture to protect and save the Trustee harmless, and the Authority hereby covenants to protect and save the Trustee harmless of and from such losses, liabilities, costs and expenses.

If any Bond shall not be presented for payment when the principal thereof shall become due, either at maturity or otherwise, or at the date fixed for the redemption thereof, and if the Authority shall have deposited with the Trustee, for the purpose, or left with it in trust if

previously so deposited, funds sufficient to pay the principal of such Bond (and the premium, if any payable upon the redemption thereof), together with all interest due thereon, to the date of maturity thereof or to the date fixed for redemption thereof, for the benefit of the Holder or Holders thereof, respectively, all liability of the Authority to the Holder of such Bond for the payment of the principal thereof, the interest thereon, and the premium, if any, shall forthwith cease, determine and be completely discharged, and thereupon it shall be the duty of the Trustee, to hold said fund or funds, without liability for interest thereon, for the benefit of the Holder of such Bond who shall thereafter be restricted exclusively to said fund or funds for any claim of whatsoever nature on his part under this Indenture or on, or with respect to, said Bond.

Any moneys deposited with the Trustee, by the Authority, pursuant to the terms of this Indenture, for the payment or redemption of Bonds which remain unclaimed by the Holders of the Bonds for five (5) years after the date of maturity or the date fixed for redemption, as the case may be, shall upon the written request of the Authority if the Authority is not at that time, to the knowledge of the Trustee, in default hereunder be paid to the Authority. Thereafter, such Holders of the Bonds shall thereafter look only to the Authority for payment and then only to the extent of the amounts so received without interest thereon.

### ARTICLE XIII

#### MISCELLANEOUS

Section 13.01 Limitation of Rights, Remedy or Claim. With the exception of rights herein expressly conferred, nothing in this Indenture, expressed or implied, is intended or shall be construed to confer upon, or to give to, any person or corporation, other than the parties hereto and the Holders of the Bonds outstanding hereunder, any rights, remedy or claim under or by reason of this Indenture or any covenant, condition or stipulation hereof; and all the covenants, stipulations, promises and agreements in this Indenture contained by and on behalf of the Authority shall be for the sole and exclusive benefit of the parties hereto, and of the Holders of the Bonds Outstanding hereunder.

Section 13.02 Notices to Rating Agencies. The Authority shall instruct the Trustee to give notice to the Rating Agencies upon an occurrence of any of the following that relates to the Bonds:

- (i) expiration of any credit enhancement;
- (ii) termination of any credit enhancement;
- (iii) extension of any credit enhancement;
- (iv) substitution of any credit enhancement;
- (v) redemption;
- (vi) acceleration;
- (vii) conversion;

- (viii) changes in bond documents;
- (ix) changes in any credit facility;
- (x) changes in Trustee and/or any remarketing agent; or
- (xi) defeasance.

Section 13.03 Invalidity of Provisions. If any one or more of the covenants or agreements provided in this Indenture on the part of the Authority or the Trustee to be performed should be finally determined by a court of competent jurisdiction to be contrary to law, then such covenant or covenants or agreement or agreements shall be null and void and shall be deemed separable from the remaining covenants and agreements, and shall in no way affect the validity of the Indenture.

Section 13.04 Governing Law. This Indenture shall be deemed to be and shall be construed as a Pennsylvania contract and wherever enforced shall be construed in accordance with the laws of the Commonwealth.

Section 13.05 Limitation of Liability. No covenant, agreement or obligation contained in the Bonds or in this Indenture shall be deemed to be the covenant, agreement or obligation of any member, agent or employee of the Authority in his individual capacity and neither the members of the Board of the Authority nor any official executing the Bonds shall be liable personally on the Bonds or be subject to any personal liability or accountability by reason of the issuance thereof.

Section 13.06 Execution in Counterparts. This Indenture may be executed in multiple counterparts, each of which shall be regarded for all purposes as an original; but such counterparts shall constitute but one and the same instrument.

Section 13.07 Payment on Saturday, Sunday or Legal Holiday. If any case where the date of maturity of interest on or principal of any Bond or the date fixed for redemption or tender of any Bond shall be a Saturday, Sunday or a legal holiday or a day on which banking institutions in the Commonwealth are authorized by law to close, then payment of such interest or principal and premium, if any, need not be made on such date but may be made on the next succeeding Business Day not a Saturday, Sunday nor a legal holiday nor a day upon which banking institutions are authorized by law to close, with the same force and effect as if made on the date of maturity or the date fixed for redemption, and no interest shall accrue for the period after such date.

Section 13.08 Notices. Except as otherwise expressly provided in this Indenture, or in any Indenture supplemental hereto, any request, opinion, consent, demand, notice, order, appointment, or other direction required or permitted to be made or given by the Authority, shall be deemed to have been sufficiently made or given if executed on behalf of the Authority by its Chairperson or Vice Chairperson or Secretary or Assistant Secretary or Executive Director or Chief Financial Officer or Director of Finance, or signed by such other person or persons who is or are authorized to do so pursuant to a Resolution of the Board.

Any notice to or demand upon the Trustee may be served, presented, or made at the Principal Office of the Trustee at The Bank of New York Mellon Trust Company, N.A., 500 Ross Street, 12<sup>th</sup> Floor, Pittsburgh, PA 15262, Attention: Corporate Trust Administration. Any notice to or demand upon the Authority shall be deemed to have been sufficiently given or served by the Trustee for all purposes, by being sent by certified or registered United States mail, postage prepaid, to the Authority at The Pittsburgh Water and Sewer Authority, 1200 Penn Avenue, Pittsburgh, Pennsylvania 15222, Attention: Executive Director or at such other address as may be filed in writing by the Authority with the Trustee.

The Trustee shall have the right to accept and act upon instructions, including funds transfer instructions ("Instructions") given pursuant to this Indenture and delivered using Electronic Means; provided, however, that the Authority shall provide to the Trustee an incumbency certificate listing Authorized Representatives of the Authority to provide such Instructions and containing specimen signatures of such Authorized Representatives of the Authority, which incumbency certificate shall be amended by the Authority whenever a person is to be added or deleted from the listing. If the Authority elects to give the Trustee Instructions using Electronic Means and the Trustee in its discretion elects to act upon such Instructions, the Trustee's understanding of such Instructions shall be deemed controlling. The Authority understands and agrees that the Trustee cannot determine the identity of the actual sender of such Instructions and that the Trustee shall conclusively presume that directions that purport to have been sent by an Authorized Representative of the Authority listed on the incumbency certificate provided to the Trustee have been sent by such Authorized Representative of the Authority. The Authority shall be responsible for ensuring that only Authorized Representatives of the Authority transmit such Instructions to the Trustee and that the Authority and all Authorized Representatives of the Authority are solely responsible to safeguard the use and confidentiality of applicable user and authorization codes, passwords and/or authentication keys upon receipt by the Authority. The Trustee shall not be liable for any losses, costs or expenses arising directly or indirectly from the Trustee's reliance upon and compliance with such Instructions notwithstanding such directions conflict or are inconsistent with a subsequent written instruction. The Authority agrees: (i) to assume all risks arising out of the use of Electronic Means to submit Instructions to the Trustee, including without limitation the risk of the Trustee acting on unauthorized Instructions, and the risk of interception and misuse by third parties; (ii) that it is fully informed of the protections and risks associated with the various methods of transmitting Instructions to the Trustee and that there may be more secure methods of transmitting Instructions than the method(s) selected by the Authority; (iii) that the security procedures (if any) to be followed in connection with its transmission of Instructions provide to it a commercially reasonable degree of protection in light of its particular needs and circumstances; and (iv) to notify the Trustee immediately upon learning of any compromise or unauthorized use of the security procedures.

"Electronic Means" shall mean the following communications methods: S.W.I.F.T., e-mail, facsimile transmission, secure electronic transmission containing applicable authorization codes, passwords and/or authentication keys issued by the Trustee, or another method or system specified by the Trustee as available for use in connection with its services hereunder.

Section 13.09 Binding Effect of Covenants. All the covenants, promises and agreements in this Indenture contained by or on behalf of the Authority, or by or on behalf of the



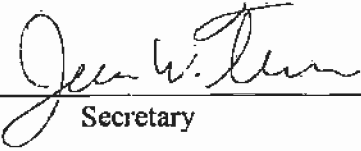
Trustee shall bind and inure to the benefit of their respective successors and assigns, whether so expressed or not.

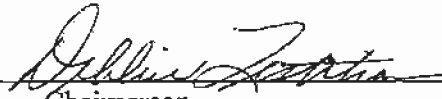
Section 13.10 Provisions Related to Bond Insurance and Reserve Policies. The provisions related to bond insurance set forth in Exhibit A hereto are incorporated herein by reference as if fully set forth herein. The provisions related to reserve policies set forth in Exhibit B hereto are incorporated herein by reference as if fully set forth herein.

IN WITNESS WHEREOF, The Pittsburgh Water and Sewer Authority, party of the first part, has caused this Amended and Restated Trust Indenture to be executed by its Chairperson or its Vice Chairperson and its corporate seal to be hereunto impressed and attested by its Secretary or its Assistant Secretary, and The Bank of New York Mellon Trust Company, N.A., party of the second part, in evidence of its acceptance of the trusts hereby created, has caused this Indenture to be executed by one of its authorized officers.

ATTEST:

THE PITTSBURGH WATER AND  
SEWER AUTHORITY

  
\_\_\_\_\_  
Secretary

By   
\_\_\_\_\_  
Chairperson

[SEAL]

THE BANK OF NEW YORK MELLON  
TRUST COMPANY, N.A., as Trustee

By \_\_\_\_\_  
Authorized Officer  
Title: \_\_\_\_\_

IN WITNESS WHEREOF, The Pittsburgh Water and Sewer Authority, party of the first part, has caused this Amended and Restated Trust Indenture to be executed by its Chairperson or its Vice Chairperson and its corporate seal to be hereunto impressed and attested by its Secretary or its Assistant Secretary, and The Bank of New York Mellon Trust Company, N.A., party of the second part, in evidence of its acceptance of the trusts hereby created, has caused this Indenture to be executed by one of its authorized officers.

ATTEST:

THE PITTSBURGH WATER AND  
SEWER AUTHORITY

\_\_\_\_\_  
Secretary

By \_\_\_\_\_  
Chairperson

[SEAL]

THE BANK OF NEW YORK MELLON  
TRUST COMPANY, N.A., as Trustee

By Rhonda J. Brannon  
Authorized Officer  
Title: Vice President

## EXHIBIT A

### PROVISIONS RELATED TO BOND INSURANCE

The provisions set forth in this Exhibit A shall, with respect to Bonds insured by Assured Guaranty Municipal Corp., or any successor thereto or assignee thereof, apply to such Bonds notwithstanding any other provision of this Indenture to the contrary. The provisions set forth in this Exhibit A shall, with respect to Bonds insured by National Public Finance Guarantee Corporation ("National"), or any successor thereto or assignee thereof, apply to such Bonds notwithstanding any other provision of this Indenture to the contrary.

- (a) "Bond Insurance Policy" shall mean the insurance policy issued by the Insurer guaranteeing the scheduled payment of principal of and interest on the Insured Bonds when due. "Insured Bonds" shall mean the Bonds insured by the Insurer". "Insurer" shall mean, with respect to Bonds insured by Assured Guaranty Municipal Corp.: Assured Guaranty Municipal Corp., a New York stock insurance company, or any successor thereto or assignee thereof; "Insurer" shall mean, with respect to Bonds insured by National: National Public Finance Guarantee Corporation, or any successor thereto or assignee thereof. "Related Document" shall have the meaning set forth in paragraph (h) below.
- (b) The prior written consent of the Insurer shall be a condition precedent to the deposit of any credit instrument provided in lieu of a cash deposit into the Debt Service Reserve Fund, if any, except for a credit instrument provided by the Insurer. Amounts on deposit in the Debt Service Reserve Fund shall be applied solely to the payment of debt service due on the Bonds secured by the Debt Service Reserve Fund.
- (c) The Insurer shall be deemed to be the sole holder of the Insured Bonds for the purpose of exercising any voting right or privilege or giving any consent or direction or taking any other action that the holders of the Insured Bonds are entitled to take pursuant to the Indenture pertaining to (i) defaults and remedies and (ii) the duties and obligations of the Trustee. In furtherance thereof and as a term of the Indenture and each Insured Bond, the Trustee (solely with respect to the Insured Bonds) and each Insured Bondholder appoint the Insurer as their agent and attorney-in-fact and agree that the Insurer may at any time during the continuation of any proceeding by or against the Authority under the United States Bankruptcy Code or any other applicable bankruptcy, insolvency, receivership, rehabilitation or similar law (an "Insolvency Proceeding") direct all matters relating to such Insolvency Proceeding (to the extent of their voting rights with respect to the Insured Bonds), including without limitation, (A) all matters relating to any claim or enforcement proceeding in connection with an Insolvency Proceeding (a "Claim"), (B) the direction of any appeal of any order relating to any Claim, (C) the posting of any surety, supersedeas or performance bond pending any such appeal, and (D) the right to vote to accept or reject any plan of adjustment. In addition, the Trustee (solely with respect to the Insured Bonds) and each Insured Bondholder delegate and assign to the Insurer, to the fullest extent permitted by law, the rights of the Trustee and each Insured Bondholder in the conduct of any Insolvency Proceeding, including, without limitation, all rights of any party to an adversary proceeding or action with respect to any court order issued in connection with

any such Insolvency Proceeding. Remedies granted in Section 8.04 of the Indenture include mandamus.

- (d) Acceleration of the Bonds is permitted under the Indenture. As set forth in paragraph (c) above, the Insurer is deemed to be the sole holder of the Insured Bonds for purposes of voting on acceleration. In the event the maturity of the Insured Bonds is accelerated, the Insurer shall not be obligated to pay any accelerated amount but may elect, in its sole discretion, to pay accelerated principal and interest accrued, on such principal to the date of acceleration (to the extent unpaid by the Authority) and the Trustee shall be required to accept such amounts. Upon payment of such accelerated principal and interest accrued to the acceleration date as provided above, the Insurer's obligations under the Bond Insurance Policy with respect to such Insured Bonds shall be fully discharged.
- (e) No grace period for a covenant default shall exceed sixty (60) days or be extended for more than sixty (60) days, without the prior written consent of the Insurer. No grace period shall be permitted for payment defaults.
- (f) The Insurer is a third party beneficiary to the Indenture.
- (g) Upon the occurrence of an extraordinary optional, special or extraordinary mandatory redemption in part, the selection of Insured Bonds to be redeemed shall be subject to the approval of the Insurer. The exercise of any provision of the Indenture which permits the purchase of Insured Bonds in lieu of redemption shall require the prior written approval of the Insurer if any Insured Bond so purchased is not cancelled upon purchase.
- (h) Any amendment, supplement, modification to, or waiver of, the Indenture or any other transaction document, including any underlying security agreement (each a "Related Document"), that requires the consent of Bondowners or adversely affects the rights and interests of the Insurer shall be subject to the prior written consent of the Insurer.
- (i) The rights granted to the Insurer under the Indenture or any other Related Document to request, consent to or direct any action are rights granted to the Insurer in consideration of its issuance of the Bond Insurance Policy. Any exercise by the Insurer of such rights is merely an exercise of the Insurer's contractual rights and shall not be construed or deemed to be taken for the benefit, or on behalf, of the holders of the Insured Bonds, and such action does not evidence any position of the Insurer, affirmative or negative, as to whether the consent of the owners of the Insured Bonds or any other person is required in addition to the consent of the Insurer.
- (j) Only (1) cash, (2) non-callable direct obligations of the United States of America ("Treasuries"), (3) evidences of ownership of proportionate interests in future interest and principal payments on Treasuries held by a bank or trust company as custodian, under which the owner of the investment is the real party in interest and has the right to proceed directly and individually against the obligor and the underlying Treasuries are not available to any person claiming through the custodian or to whom the custodian may be obligated, (4) subject to the prior written consent of the Insurer, pre-refunded municipal

obligations rated "AAA" and "Aaa" by S&P and Moody's, respectively, or (5) subject to the prior written consent of the Insurer, securities eligible for "AAA" defeasance under then existing criteria of S&P or any combination thereof, shall be used to effect defeasance of the Insured Bonds unless the Insurer otherwise approves.

To accomplish defeasance, the Authority shall cause to be delivered to the Insurer (i) a report of an independent firm of nationally recognized certified public accountants or such other accountant or financial firm as shall be acceptable to the Insurer ("Accountant") verifying the sufficiency of the escrow established to pay the Insured Bonds in full on the maturity or redemption date ("Verification"), (ii) an Escrow Deposit Agreement (which shall be acceptable in form and substance to the Insurer), (iii) an opinion of nationally recognized bond counsel to the effect that the Insured Bonds are no longer "Outstanding" under the Indenture and (iv) a certificate of discharge of the Trustee with respect to the Insured Bonds; each Verification and defeasance opinion shall be acceptable in form and substance, and addressed, to the Authority, Trustee and Insurer. The Insurer shall be provided with final drafts of the above-referenced documentation not less than five business days prior to the funding of the escrow.

Insured Bonds shall be deemed "Outstanding" under the Indenture unless and until they are in fact paid and retired or the above criteria are met.

- (k) Amounts paid by the Insurer under the Bond Insurance Policy shall not be deemed paid for purposes of the Indenture and the Insured Bonds relating to such payments shall remain Outstanding and continue to be due and owing until paid by the Authority in accordance with the Indenture. The Indenture shall not be discharged unless all amounts due or to become due to the Insurer have been paid in full or duly provided for.
- (l) Each of the Authority and Trustee covenant and agree to take such action (including, as applicable, filing of UCC financing statements and continuations thereof) as is necessary from time to time to preserve the priority of the pledge of the Trust Estate under applicable law.
- (m) Claims Upon the Bond Insurance Policy and Payments by and to the Insurer.

If, on the third Business Day prior to the related scheduled interest payment date or principal payment date ("Payment Date") there is not on deposit with the Trustee, after making all transfers and deposits required under the Indenture, moneys sufficient to pay the principal of and interest on the Insured Bonds due on such Payment Date, the Trustee shall give notice to the Insurer and to its designated agent (if any) (the "Insurer's Fiscal Agent") by telephone or telecopy of the amount of such deficiency by 12:00 noon, New York City time, on such Business Day. If, on the second Business Day prior to the related Payment Date, there continues to be a deficiency in the amount available to pay the principal of and interest on the Insured Bonds due on such Payment Date, the Trustee shall make a claim under the Bond Insurance Policy and give notice to the Insurer and the Insurer's Fiscal Agent (if any) by telephone of the amount of such deficiency, and the allocation of such deficiency between the amount required to pay interest on the Bonds

and the amount required to pay principal of the Insured Bonds, confirmed in writing to the Insurer and the Insurer's Fiscal Agent by 12:00 noon, New York City time, on such second Business Day by filling in the form of Notice of Claim and Certificate delivered with the Bond Insurance Policy.

The Trustee shall designate any portion of payment of principal on Insured Bonds paid by the Insurer, whether by virtue of mandatory sinking fund redemption, maturity or other advancement of maturity, on its books as a reduction in the principal amount of Insured Bonds registered to the then current Insured Bondholder, whether DTC or its nominee or otherwise, and shall issue a replacement Insured Bond to the Insurer, registered in the name of Assured Guaranty Municipal Corp. or National, as the case may be, in a principal amount equal to the amount of principal so paid (without regard to authorized denominations); provided that the Trustee's failure to so designate any payment or issue any replacement Insured Bond shall have no effect on the amount of principal or interest payable by the Authority on any Insured Bond or the subrogation rights of the Insurer.

The Trustee shall keep a complete and accurate record of all funds deposited by the Insurer into the Policy Payments Account (defined below) and the allocation of such funds to payment of interest on and principal of any Insured Bond. The Insurer shall have the right to inspect such records at reasonable times upon reasonable notice to the Trustee.

Upon payment of a claim under the Bond Insurance Policy, the Trustee shall establish a separate special purpose trust account for the benefit of Insured Bondholders referred to herein as the "Policy Payments Account" and over which the Trustee shall have exclusive control and sole right of withdrawal. The Trustee shall receive any amount paid under the Bond Insurance Policy in trust on behalf of Insured Bondholders and shall deposit any such amount in the Policy Payments Account and distribute such amount only for purposes of making the payments for which a claim was made. Such amounts shall be disbursed by the Trustee to Insured Bondholders in the same manner as principal and interest payments are to be made with respect to the Insured Bonds under the sections hereof regarding payment of Insured Bonds. It shall not be necessary for such payments to be made by checks or wire transfers separate from the check or wire transfer used to pay debt service with other funds available to make such payments. Notwithstanding anything herein to the contrary, the Authority agrees to pay to the Insurer (i) a sum equal to the total of all amounts paid by the Insurer under the Bond Insurance Policy (the "Insurer Advances"); and (ii) interest on such Insurer Advances from the date paid by the Insurer until payment thereof in full, payable to the Insurer at the Late Payment Rate per annum (collectively, the "Insurer Reimbursement Amounts"). "Late Payment Rate" means the lesser of (a) the greater of (i) the per annum rate of interest, publicly announced from time to time by JPMorgan Chase Bank at its principal office in The City of New York, as its prime or base lending rate (any change in such rate of interest to be effective on the date such change is announced by JPMorgan Chase Bank) plus 3%, and (ii) the then applicable highest rate of interest on the Insured Bonds and (b) the maximum rate permissible under applicable usury or similar laws limiting interest rates. The Late Payment Rate shall be computed on the basis of the actual number of days elapsed over a

year of 360 days. The Authority hereby covenants and agrees that the Insurer Reimbursement Amounts are secured by a lien on and pledge of the Trust Estate and payable from such Trust Estate on a parity with debt service due on the Insured Bonds.

Funds held in the Policy Payments Account shall not be invested by the Trustee and may not be applied to satisfy any costs, expenses or liabilities of the Trustee. Any funds remaining in the Policy Payments Account following an Insured Bond payment date shall promptly be remitted to the Insurer.

- (n) The Insurer shall, to the extent it makes any payment of principal of or interest on the Insured Bonds, become subrogated to the rights of the recipients of such payments in accordance with the terms of the Bond Insurance Policy (which subrogation rights shall also include the rights of any such recipients in connection with any Insolvency Proceeding). Each obligation of the Authority to the Insurer under the Related Documents shall survive discharge or termination of such Related Documents.
- (o) The Authority shall pay or reimburse the Insurer any and all charges, fees, costs and expenses that the Insurer may reasonably pay or incur in connection with (i) the administration, enforcement, defense or preservation of any rights or security in any Related Document; (ii) the pursuit of any remedies under the Indenture or any other Related Document or otherwise afforded by law or equity, (iii) any amendment, waiver or other action with respect to, or related to, the Indenture or any other Related Document whether or not executed or completed, or (iv) any litigation or other dispute in connection with the Indenture or any other Related Document or the transactions contemplated thereby, other than costs resulting from the failure of the Insurer to honor its obligations under the Bond Insurance Policy. The Insurer reserves the right to charge a reasonable fee as a condition to executing any amendment, waiver or consent proposed in respect of the Indenture or any other Related Document.
- (p) After payment of reasonable expenses of the Trustee, the application of funds realized upon default shall be applied to the payment of expenses of the Authority only after the payment of past due and current debt service on the Insured Bonds and amounts required to restore the Debt Service Reserve Fund to the Reserve Requirement.
- (q) The Insurer shall be entitled to pay principal or interest on the Insured Bonds that shall become Due for Payment but shall be unpaid by reason of Nonpayment by the Authority (as such terms are defined in the Bond Insurance Policy) and any amounts due on the Insured Bonds as a result of acceleration of the maturity thereof in accordance with the Indenture, whether or not the Insurer has received a Notice of Nonpayment (as such terms are defined in the Bond Insurance Policy) or a claim upon the Bond Insurance Policy.
- (r) The notice address of the Insurer Assured Guaranty Municipal Corp. is: Assured Guaranty Municipal Corp., 1633 Broadway, New York, New York 10019, Attention: Managing Director – Surveillance, Re: Policy No. \_\_, Telephone: (212) 974-0100; Telecopier: (212) 339-3556. In each case in which notice or other communication refers



to an Event of Default, then a copy of such notice or other communication shall also be sent to the attention of the Deputy General Counsel – Public Finance and shall be marked to indicate "URGENT MATERIAL ENCLOSED." The notice address of the Insurer National: National Public Finance Guarantee Corporation, 1 Manhattanville Road, Suite 301, Purchase, NY 10577, Attention: Insured Portfolio Management, Telephone: 914-273-4545, Facsimile: 914-765-3164.

- (s) The Insurer shall be provided with the following information by the Authority or Trustee, as the case may be:
- (i) Annual audited financial statements within 180 days after the end of the Authority's fiscal year (together with a certification of the Authority that it is not aware of any default or Event of Default under the Indenture), and the Authority's annual budget within 30 days after the approval thereof together with such other information, data or reports as the Insurer shall reasonably request from time to time;
  - (ii) Notice of any draw upon the Debt Service Reserve Fund within two Business Days after knowledge thereof other than (i) withdrawals of amounts in excess of the Debt Service Reserve Requirement and (ii) withdrawals in connection with a refunding of Insured Bonds;
  - (iii) Notice of any default under the Indenture known to the Trustee or Authority within five Business Days after knowledge thereof;
  - (iv) Prior notice of the advance refunding or redemption of any of the Insured Bonds, including the principal amount, maturities and CUSIP numbers thereof;
  - (v) Notice of the resignation or removal of the Trustee and bond registrar and the appointment of, and acceptance of duties by, any successor thereto;
  - (vi) Notice of the commencement of any proceeding by or against the Authority commenced under the United States Bankruptcy Code or any other applicable bankruptcy, insolvency, receivership, rehabilitation or similar law (an "Insolvency Proceeding");
  - (vii) Notice of the making of any claim in connection with any Insolvency Proceeding seeking the avoidance as a preferential transfer of any payment of principal of, or interest on, the Insured Bonds;
  - (viii) A full original transcript of all proceedings relating to the execution of any amendment, supplement, or waiver to the Related Documents;

- (ix) All reports, notices and correspondence to be delivered to holders of Insured Bonds under the terms of the Related Documents; and
- (x) To the extent that the Authority has entered into a continuing disclosure agreement, covenant or undertaking with respect to the Bonds, all information furnished pursuant to such agreements shall also be provided to the Insurer, simultaneously with the furnishing of such information. The Authority shall also provide the Insurer with copies of all amendments, modifications, supplements and restatements relating to such documents.
- (xi) So long as the 1998B Bonds remain Outstanding, the Authority shall provide National with written notice of its intent to issue any type of variable rate security (including, without limitation, variable rate obligations, floating rate notes and auction rate securities) no later than 15 days prior to execution of the documentation relating to the proposed variable rate securities (the "Proposed Securities"). The Authority shall also provide National with drafts of the documentation relating to the Proposed Securities promptly upon the written request of National.
- (t) The Insurer shall have the right to receive such additional information as it may reasonably request.
- (u) The Authority will permit the Insurer to discuss the affairs, finances and accounts of the Authority or any information the Insurer may reasonably request regarding the security for the Bonds with appropriate officers of the Authority and will use commercially reasonable efforts to enable the Insurer to have access to the facilities, books and records of the Authority on any business day upon reasonable prior notice.
- (v) The Trustee shall notify the Insurer of any failure of the Authority to provide notices, certificates and other information under the transaction documents.
- (w) Notwithstanding satisfaction of the other conditions to the issuance of Additional Bonds set forth in the Indenture, no such issuance may occur (1) if an Event of Default (or any event which, once all notice or grace periods have passed, would constitute an Event of Default) exists unless such default shall be cured upon such issuance and (2) unless the Debt Service Reserve Fund is fully funded at the Debt Service Reserve Requirement (including the proposed issue) upon the issuance of such Additional Bonds, in either case unless otherwise permitted by the Insurer. In addition, so long as the 1998B Bonds are Outstanding, without the prior written consent of the National, no issuance of Balloon Indebtedness or Tender Indebtedness may occur unless the maturity date of such indebtedness is 2031 or later. In addition, so long as the 1998B Bonds are Outstanding, without the prior written consent of National, no issuance of Interim Indebtedness may occur unless (1) the principal amount of the Interim Indebtedness does not exceed \$100,000,000; or (2) the Interim Indebtedness is Subordinate Debt.

- (x) In determining whether any amendment, consent, waiver or other action to be taken, or any failure to take action, under the Indenture would adversely affect the security for the Insured Bonds or the rights of the holders of Insured Bonds, the Trustee shall consider the effect of any such amendment, consent, waiver, action or inaction as if there were no Bond Insurance Policy.
- (y) No contract shall be entered into or any action taken by which the rights of the Insurer or security for or sources of payment of the Bonds may be impaired or prejudiced in any material respect except upon obtaining the prior written consent of the Insurer.
- (z) If the Bonds are issued for refunding purposes, there shall be delivered an opinion of Bond Counsel addressed to the Insurer (or a reliance letter relating thereto), or a certificate of discharge of the trustee for the Refunded Bonds, to the effect that, upon the making of the required deposit to the escrow, the legal defeasance of the Refunded Bonds shall have occurred. If the Refunded Bonds are insured by Assured Guaranty Municipal Corp., at least three business days prior to the proposed date for delivery of the Policy with respect to the Refunding Bonds, the Insurer shall also receive (i) the verification letter, of which the Insurer shall be an addressee, by an independent firm of certified public accountants or other financial firm which is either nationally recognized or otherwise acceptable to the Insurer, of the adequacy of the escrow established to provide for the payment of the Refunded Bonds in accordance with the terms and provisions of the Escrow Deposit Agreement, and (ii) the form of an opinion of Bond Counsel addressed to the Insurer (or a reliance letter relating thereto) to the effect that the Escrow Deposit Agreement is a valid and binding obligation of the parties thereto, enforceable in accordance with its terms (such Escrow Deposit Agreement shall provide that no amendments are permitted without the prior written consent of the Insurer). An executed copy of each of such opinion and reliance letter, if applicable, or Trustee's discharge certificate, as the case may be, shall be forwarded to the Insurer prior to delivery of the Bonds.
- (aa) Any interest rate exchange agreement ("Swap Agreement") entered into by the Authority shall meet the following conditions: (i) the Swap Agreement must be entered into to manage interest costs related to, or a hedge against (a) assets then held, or (b) debt then outstanding, or (iii) debt reasonably expected to be issued within the next twelve (12) months, and (ii) the Swap Agreement shall not contain any leverage element or multiplier component greater than 1.0x unless there is a matching hedge arrangement which effectively off-sets the exposure from any such element or component. Unless otherwise consented to in writing by the Insurer, any uninsured net settlement, breakage or other termination amount then in effect shall be subordinate to debt service on the Bonds and on any debt on parity with the Bonds. The Authority shall not terminate a Swap Agreement unless it demonstrates to the satisfaction of the Insurer prior to the payment of any such termination amount that such payment will not cause the Authority to be in default under the Related Documents, including but not limited to, any monetary obligations thereunder.

## EXHIBIT B

### PROVISIONS RELATED TO RESERVE POLICIES

The provisions set forth in this Exhibit B shall, with respect to Reserve Policies issued by Assured Guaranty Municipal Corp., or any successor thereto or assignee thereof ("AGM") related to Bonds issued under this Indenture, apply to such Reserve Policies notwithstanding any other provision of this Indenture to the contrary.

(a) The prior written consent of AGM shall be a condition precedent to the deposit of any credit facility (other than a credit facility provided by AGM) (a "Credit Facility") credited to the Debt Service Reserve Fund established for the Bonds (the "Reserve Fund") in lieu of a cash deposit into the Reserve Fund. Amounts drawn under the Reserve Policy shall be available only for the payment of scheduled principal and interest on the Bonds when due.

(b) The Authority shall repay any draws under the Reserve Policy and pay all related reasonable expenses incurred by AGM and shall pay interest thereon from the date of payment by AGM at the Late Payment Rate. "Late Payment Rate" means the lesser of (x) the greater of (i) the per annum rate of interest, publicly announced from time to time by JPMorgan Chase Bank at its principal office in the City of New York, as its prime or base lending rate ("Prime Rate") (any change in such Prime Rate to be effective on the date such change is announced by JPMorgan Chase Bank) plus 5% (3% to the extent AGM is the bond insurer of the related Bonds), and (ii) the then applicable highest rate of interest on the Bonds and (y) the maximum rate permissible under applicable usury or similar laws limiting interest rates. The Late Payment Rate shall be computed on the basis of the actual number of days elapsed over a year of 360 days. In the event JPMorgan Chase Bank ceases to announce its Prime Rate publicly, Prime Rate shall be the publicly announced prime or base lending rate of such national bank as AGM shall specify. If the interest provisions of this subparagraph (b) shall result in an effective rate of interest which, for any period, exceeds the limit of the usury or any other laws applicable to the indebtedness created herein, then all sums in excess of those lawfully collectible as interest for the period in question shall, without further agreement or notice between or by any party hereto, be applied as additional interest for any later periods of time when amounts are outstanding hereunder to the extent that interest otherwise due hereunder for such periods plus such additional interest would not exceed the limit of the usury or such other laws, and any excess shall be applied upon principal immediately upon receipt of such moneys by AGM, with the same force and effect as if the Authority had specifically designated such extra sums to be so applied and AGM had agreed to accept such extra payment(s) as additional interest for such later periods. In no event shall any agreed-to or actual exaction as consideration for the indebtedness created herein exceed the limits imposed or provided by the law applicable to this transaction for the use or detention of money or for forbearance in seeking its collection.

Repayment of draws and payment of expenses and accrued interest thereon at the Late Payment Rate (collectively, "Policy Costs") shall be made from all available funds and shall commence in the first month following each draw, and each such monthly payment shall be in an amount at least equal to 1/12 of the aggregate of Policy Costs related to such draw.

Amounts in respect of Policy Costs paid to AGM shall be credited first to interest due, then to the expenses due and then to principal due. As and to the extent that payments are made to AGM on account of principal due, the coverage under the Reserve Policy will be increased by a like amount, subject to the terms of the Reserve Policy. The obligation to pay Policy Costs shall be secured by a valid lien on all revenues and other collateral pledged as security for the Bonds (subject only to the priority of payment provisions set forth under the Indenture).

All cash and investments in the Reserve Fund shall be transferred to the Debt Service Fund for payment of debt service on Bonds before any drawing may be made on the Reserve Policy or any other Credit Facility credited to the Reserve Fund in lieu of cash. Payment of any Policy Costs shall be made prior to replenishment of any such cash amounts. Draws on all Credit Facilities (including the Reserve Policy) on which there is available coverage shall be made on a pro-rata basis (calculated by reference to the coverage then available thereunder) after applying all available cash and investments in the Reserve Fund. Payment of Policy Costs and reimbursement of amounts with respect to other Credit Facilities shall be made on a pro-rata basis prior to replenishment of any cash drawn from the Reserve Fund. For the avoidance of doubt, "available coverage" means the coverage then available for disbursement pursuant to the terms of the applicable alternative credit instrument without regard to the legal or financial ability or willingness of the provider of such instrument to honor a claim or draw thereon or the failure of such provider to honor any such claim or draw.

(c) Upon a failure to pay Policy Costs when due or any other breach of the terms of this Exhibit B, AGM shall be entitled to exercise any and all legal and equitable remedies available to it, including those provided under the Indenture, other than (i) acceleration of the maturity of the Bonds or (ii) remedies which would adversely affect owners of the Bonds.

(d) The Indenture shall not be discharged until all Policy Costs owing to AGM shall have been paid in full. The Authority's obligation to pay such amounts shall expressly survive payment in full of the Bonds.

(e) The Authority shall include any Policy Costs then due and owing AGM in the calculation of the additional bonds test and the rate covenant in the Indenture.

(f) The Indenture shall require the Trustee to ascertain the necessity for a claim upon the Reserve Policy in accordance with the provisions of subparagraph (b) hereof and to provide notice to AGM in accordance with the terms of the Reserve Policy at least two business days prior to each date upon which interest or principal is due on the Bonds. Where deposits are required to be made by the Authority with the Trustee to the debt service fund for the Bonds more often than semi-annually, the Trustee shall be instructed to give notice to AGM of any failure of the Authority to make timely payment in full of such deposits within two business days of the date due.

(g) The Authority will pay or reimburse AGM any and all reasonable charges, fees, costs, losses, liabilities and expenses which AGM may pay or incur, including, but not limited to, reasonable fees and expenses of attorneys, accountants, consultants and auditors and reasonable costs of investigations, in connection with (i) any accounts established to facilitate payments

under the Reserve Policy, (ii) the administration, enforcement, defense or preservation of any rights in respect of the Indenture or any document executed in connection with the Bonds (the "Related Documents"), including defending, monitoring or participating in any litigation or proceeding (including any bankruptcy proceeding in respect of the Authority) relating to the Indenture or any other Related Document, any party to the Indenture or any other Related Document or the transactions contemplated by the Related Documents, (iii) the foreclosure against, sale or other disposition of any collateral securing any obligations under the Indenture or any other Related Document, if any, or the pursuit of any remedies under the Indenture or any other Related Document, to the extent such costs and expenses are not recovered from such foreclosure, sale or other disposition, (iv) any amendment, waiver or other action with respect to, or related to the Indenture, the Reserve Policy or any other Related Document whether or not executed or completed, or (v) any action taken by AGM to cure a default or termination or similar event (or to mitigate the effect thereof) under the Indenture or any other Related Document; costs and expenses shall include a reasonable allocation of compensation and overhead attributable to time of employees of AGM spent in connection with the actions described in clauses (ii) through (v) above. AGM reserves the right to charge a reasonable fee as a condition to executing any amendment, waiver or consent proposed in respect of the Indenture or any other Related Document. Amounts payable by the Authority hereunder shall bear interest at the Late Payment Rate from the date such amount is paid or incurred by AGM until the date AGM is paid in full.

(h) The obligation of the Authority to pay all amounts due to AGM shall be an absolute and unconditional obligation of the Authority and will be paid or performed strictly in accordance with the provisions of this Exhibit B, irrespective of (i) any lack of validity or enforceability of or any amendment or other modifications of, or waiver with respect to the Bonds, the Indenture or any other Related Document, or (ii) any amendment or other modification of, or waiver with respect to the Reserve Policy; (iii) any exchange, release or non-perfection of any security interest in property securing the Bonds, the Indenture or any other Related Documents; (iv) whether or not such Bonds are contingent or matured, disputed or undisputed, liquidated or unliquidated; (v) any amendment, modification or waiver of or any consent to departure from the Reserve Policy, the Indenture or all or any of the other Related Documents; (vi) the existence of any claim, setoff, defense (other than the defense of payment in full), reduction, abatement or other right which the Authority may have at any time against the Trustee or any other person or entity other than the Insurer, whether in connection with the transactions contemplated herein or in any other Related Documents or any unrelated transactions; (vii) any statement or any other document presented under or in connection with the Reserve Policy proving in any and all respects invalid, inaccurate, insufficient, fraudulent or forged or any statement therein being untrue or inaccurate in any respect; or (viii) any payment by the Insurer under the Reserve Policy against presentation of a certificate or other document which does not strictly comply with the terms of the Reserve Policy.

(i) The Authority shall fully observe, perform, and fulfill each of the provisions (as each of those provisions may be amended, supplemented, modified or waived with the prior written consent of the Insurer) of the Indenture applicable to it, each of the provisions thereof being expressly incorporated into this Exhibit B by reference solely for the benefit of AGM as if set forth directly herein. No provision of the Indenture or any other Related Document shall be

amended, supplemented, modified or waived, without the prior written consent of AGM, in any material respect or otherwise in a manner that could adversely affect the payment obligations of the Authority hereunder or the priority accorded to the reimbursement of Policy Costs under the Indenture. The Insurer is hereby expressly made a third party beneficiary of the Indenture and each other Related Document

(j) The Authority covenants to provide to AGM, promptly upon written request, any information regarding the Bonds or the financial condition and operations of the Authority as reasonably requested by AGM. The Authority will permit AGM to discuss the affairs, finances and accounts of the Authority or any information AGM may reasonably request regarding the security for the Bonds with appropriate officers of the Authority and will use commercially reasonable efforts to enable AGM to have access to the facilities, books and records of the Authority on any business day upon reasonable prior notice.

Notices and other information to AGM shall be sent to the following address (or such other address as AGM may designate in writing): Assured Guaranty Municipal Corp., 1633 Broadway, New York, New York 10019, Attention: Managing Director – Surveillance, Re: Policy No. \_\_\_\_\_

**TAB**

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## VIII. RATE STRUCTURE AND COST OF SERVICE

VIII.1. Provide a complete, fully allocated, cost of service study if an interval of 3 years has passed between a previous cost of service study and the historic test year date of the current filing. The cost of service study shall provide the necessary data to determine if the water or wastewater rate structure is fair and equitable to all classifications of water or wastewater customers (including public and private fire protection customers) and reflects, as nearly as possible, the cost of providing the service. The study shall correspond to the test year proposed revenue requirements (future test year only, if used). Summaries of conclusions and all back-up calculations shall be made part of the submission of the cost of service study, and shall include the following:

- a. A description of the allocation methods used. A comparison of the allocated cost of service by class with the present and proposed revenues. A cost of service schedule showing the rate of return produced by present and proposed rates by class of service.
- b. Indicate if the method used for establishing the allocation factors in the cost of service study deviates from the previous study submitted in the last rate case. If yes, indicate which allocation factors were changed and discuss the reason for the changes.
- c. Supply the average day, the maximum day and the maximum hour deliveries to the system adjusted for storage for the historic test year and 2 prior years. Also provide workpapers, analyses, comparative data or other documentation supporting the estimated maximum day and peak hour demands by customer class reflected in the company's cost of service study.
- d. Explain thoroughly the methodology employed if the company distinguishes between transmission and distribution or collection mains in its allocation of costs.
- e. Provide a detailed explanation of how storage is utilized to meet base, maximum day and maximum hour demands.
- f. Provide workpapers, calculations and supporting documentation which develop the equivalent meters and equivalent service line weights reflected in the company's cost of service study.
- g. Provide all workpapers and supporting documentation for the fire flow requirement and duration utilized in the cost of service study.

**VIII. RATE STRUCTURE AND COST OF SERVICE**

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

i. Provide a calculation of the company's base cost of water or wastewater per unit of consumption or usage.

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

**RESPONSE:**

Please refer to the direct testimony and accompanying exhibits of Harold J. Smith for the above filing requirement.

**VIII. RATE STRUCTURE AND COST OF SERVICE**

VIII.2. Provide a listing of negotiated special rate contracts which includes a comparison of revenues under special rate contracts and under tariff rates. Provide the cost of service treatment of any deficiency in revenues resulting from the negotiated special rate contracts. Special rates are defined as rates not contained in the currently effective tariff.

**RESPONSE:**

Please see attached.

PWSA provides service under negotiated special rate contracts to seven wholesale customers. In the cost of service, deficiencies in wholesale revenues are treated as an adjustment to the retail water revenue requirement. For additional information please refer to the direct testimony and accompanying exhibits of Harold J. Smith.

**Pittsburgh Water & Sewer Authority**  
**Wholesale & Contract Customers - Current Contract vs. Proposed Tariff Rates**

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
Wholesale/Contract Customers	Description	Meters	Fixed Charges	Volume Charges	2020 Charges at Current Rates	2021 Charges at Contract Rates	2021 Charges at Proposed Tariff Wholesale Rates	Difference
<b>Aspinwall</b>	Wholesale services to Allegheny; No minimum charge; Escalated by Inflation	2 - 6" Meter 1 - 8" Meter	\$ 0.00/mo	\$ 3.40/kgal	240,088	242,213	689,918	(447,705)
<b>Fox Chapel</b>	Wholesale water services to Fox Chapel; 6-tier decreasing block rate; Escalated by Overall User Charge Increase	1 - 8" Meter 1 - 10" or Larger Meter	\$ 4,589.90/mo	0-15,000k: \$3.74 15,000k-30,000k: \$2.96 30,000k-75,000k: \$2.69 75,000k-120,000k: \$2.62 120,000k-180,000k: \$2.58 > 180,000k: \$2.52	1,966,755	2,279,125	6,080,223	(3,801,098)
<b>Hampton (1)</b>	Wholesale water services to Hampton; 3-tier decreasing block rate; Escalated by Overall User Charge Increase	2 - 4" Meters 1 - 10" Meter	\$ 0.00/mo	0-5,000k: \$6.65 5,000k-25,000k: \$4.10 25,000k-50,000k: \$2.36	-	-	133,469	(133,469)
<b>PAWC (1)</b>	Wholesale services to PAWC; 548kgal Allowance; Escalated by Inflation	1 - 10" or Larger Meter	\$ 6,515.43/mo	\$ 6.74/kgal	78,185	78,967	104,124	(25,157)
<b>RSRV - 10"</b>	Wholesale services to Reserve (10" meter); No Allowance; Escalated by agreed-upon amount	1 - 10" or Larger Meter	\$ 3,354.94/mo	\$ 3.89/kgal	436,698	458,159	944,525	(486,365)
<b>RSRV - 6"</b>	Wholesale services to Reserve (6" meter); 175kgal Allowance; Escalated by agreed-upon amount	2 - 6" Meters	\$ 1,193.56/mo	\$ 3.89/kgal	67,147	70,474	137,767	(67,293)
<b>Sharpsburg (1)</b>	Wholesale services to Sharpsburg; 175kgal Allowance; Escalated by Overall User Charge Increase	1 - 10" or Larger Meter	n/a	\$ 8.55/kgal	-	-	104,124	(104,124)
<b>Westview (1)</b>	Wholesale services to Westview (4 meters); 175kgal Allowance; Escalated by Overall User Charge Increase	4 - 6" Meters	\$ 2,554.23/mo	\$ 8.55/kgal	122,603	142,097	140,030	2,067

**\$ (5,063,144)**

(1) Denotes customer that exhibits "Emergency" usage characteristics. No usage is forecasted for these customers. If PWSA renegotiates these contracts, a fixed charge would be proposed by PWSA to capture "Readiness-to-Serve" costs. As such, charges in Column H for these customers include a retail minimum charge based on each customer's meter(s). Actual charges would be contingent upon negotiation.

**TAB**

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## Pittsburgh Water and Sewer Authority's Base Rate Filing

**IX. QUALITY OF SERVICE**

IX.1. Indicate whether the company is in violation of any provision of the Pennsylvania Safe Drinking Water Act (SDWA) or any rule, regulation or order, or any condition of any permit, variance or exemption granted by the Pennsylvania Department of Environmental Protection (PA-DEP), or its predecessor.

a. Provide information indicating whether the company is in compliance with SDWA provisions at 25 Pa. Code § 109.407 regarding general public notification requirements:

(i) Provide a copy of each public notification given in accordance with this section, since the last rate proceeding.

(ii) Provide a detailed explanation of all actions taken to remedy an acute violation, and to comply with the requirements prescribed by a variance or exemption.

(iii) State whether any fines or penalties were assessed by PA-DEP, and indicate the amounts paid by the company.

b. Provide the most recent copies of all annual consumer confidence reports Issued pursuant to SDWA Amendments of 1996 since the last rate proceeding.

(i) Provide any annual consumer confidence reports which reflect violations of State and Federal safe drinking water requirements.

(ii) Explain how these violations were resolved.

**RESPONSE:**

PWSA received a Consent Order and Agreement for Violations of the Safe Drinking Water Act on November 17, 2017 relating to Lead Action Level Exceedances and Failure to Treat as Permitted. PWSA has introduced orthophosphate, a corrosion control treatment, for the system as well as implemented a successful lead service line replacement program.

a. PWSA is in compliance with all public notification requirements. PWSA has provided the following notifications to the public (see below and attached).

i. PWSA had the following Public Notifications in 2019:

LCR Exceedance	1.22.2019
LCR Exceedance	7.23.2019
Loss of Positive Water Pressure	2.16.2019

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**IX. QUALITY OF SERVICE**

Loss of Positive Water Pressure	2.26.2019
Loss of Positive Water Pressure	5.21.2019
Loss of Positive Water Pressure	6.7.2019
Loss of Positive Water Pressure	6.21.2019
Loss of Positive Water Pressure	7.12.2019
Loss of Positive Water Pressure	8.13.2019
Loss of Positive Water Pressure	10.12.2019
Loss of Positive Water Pressure	11.27.2019
Loss of Positive Water Pressure	12.28.2019

- ii. PWSA received an Administrative Order from the DEP on October 25, 2017. This order requires PWSA to address the following items: Apply for the use of UV disinfection at the Membrane Filtration Plant, Replace the cover on Lanpher Reservoir, Ensure Reliability of Bruecken Pump Station, Install Pressure Sensors in the Distribution System, and Provide the Department with a detailed list of Capital Improvement Projects. PWSA is working with the DEP and is responding as required. PWSA and the DEP have weekly Coordination Meetings to strengthen the working relationship and address concerns as they arise.

In addition, the PWSA entered into the Consent Order and Agreement (COA) with the Pennsylvania Department of Environment (DEP) related to "Violations of the Pennsylvania Safe Drinking Water Act and the Rules and Regulations Promulgated Pursuant Thereto" for the Clearwell Response Projects on September 6, 2019. This order requires PWSA to address the following: Clearwell bypass system, replacement of the Clearwell, and the related projects that will facilitate replacement of the Clearwell, including: Highland 2 Reservoir Cover and Liner; Rising Main #3 and Rising Main #4 Rehabilitation or Repair; Aspinwall Pump Station to Lanpher Rising Main; and the Aspinwall Pump Station and Bruecken Pump Station Rehabilitations.

- iii. PWSA was required to pay fines related to the Consent Order and Agreement for Violations of the Safe Drinking Water Act on November 17, 2017 relating to Lead Action Level Exceedances and Failure to Treat as Permitted.

Pittsburgh Water and Sewer Authority's Base Rate Filing

**IX. QUALITY OF SERVICE**

b. Please see attached.

i. Please see attached.

ii. Not applicable.



## Pittsburgh Water and Sewer Authority's Base Rate Filing

**IX. QUALITY OF SERVICE**

IX.2. Indicate whether the company is in compliance with 52 Pa. Code, § 65.6(a) regarding normal operating pressure standards, and with 52 Pa. Code, § 65.6(d) regarding pressure surveys at regular intervals.

- a. Provide details on any water pressure problems, lasting longer than 5 days, which had occurred since the last rate proceeding in any part of the water transmission and distribution system.
- b. Describe any action taken on a temporary basis, and the long term solutions developed to address any water pressure problems.

**RESPONSE:**

PWSA provides water service in compliance with 52 Pa. Code, § 65.6(a) over more than 95% of its service territory, during normal operating periods. The design of PWSA's system is such that some areas (less than 5%) experience higher or lower pressures routinely, outside of those provided in 52 Pa. Code, § 65.6(a). During non-normal operating periods, such as when there is a main break or a facility is out of service, PWSA may not be able to meet 52 Pa. Code, § 65.6(a) in larger portions of the system. PWSA has developed a pressure and flow monitoring program to address these issues.

- a. PWSA has recently installed pressure monitors throughout the system.
- b. PWSA is currently working with DEP to review data from the pressure sensors in the distribution system. From there they will develop a plan to address problems individually.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**IX. QUALITY OF SERVICE**

**IX.3. Provide support to demonstrate that water or wastewater service is being furnished on a continuous basis by supplying a summary of the company's records of each service interruption greater than 24 hours since the last rate proceeding.**

**RESPONSE:**

PWSA has had approximately 10 events resulting in a loss of service greater than 24 hours in 2019. However, no event impacted 2,500 or more customers, or 5% of total customers.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**IX. QUALITY OF SERVICE**

IX.4. Provide a discussion of the company's policy, or provide a copy of the policy if in written form, on tracking and responding to customer complaints.

- a. Provide a summary report demonstrating the company's compliance with 52 Pa. Code, § 65.3 regarding the full and prompt investigation of service or facility complaints and the recordkeeping requirements of such complaints.

**RESPONSE:**

When a PWSA representative is notified that a customer is unsatisfied with their service or with the information provided to them, the representative will request the customer's authorization to initiate an Inquiry regarding the matter and will respond to that Inquiry within three business days. The matter is then escalated to a PWSA Senior Representative who contacts the customer and attempts to resolve the customer's Inquiry during that contact by providing additional information or taking additional action. If the customer is still not satisfied, the Inquiry becomes a Dispute. In the Dispute process, the customer's information is forwarded to the PWSA Compliance group to investigate, using reasonable methods under the given circumstances. Within thirty days, a member of the Compliance group will contact the customer to review the full Dispute investigation, supporting documentation, and all information available for the customer to make an informed judgement. At that time, the customer is offered a copy of the Utility Report, which details the account history and investigation. The Utility Report also provides the contact information for the Pennsylvania Public Utility Commission, should the customer wish to appeal the matter further. If the customer indicates that they are satisfied with PWSA's response, or the customer does not respond to the findings within fifteen days, the matter is considered resolved.

- a. Please see attached.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**IX. QUALITY OF SERVICE**

IX.5. Indicate whether the company is in compliance with 52 Pa. Code, § 65.4(b) regarding complete and current mapping of the entire distribution or collection system.

**RESPONSE:**

PWSA has a partial GIS of its distribution and collection systems, as well as historical paper maps and plans of most facilities. PWSA continues to develop a more complete GIS. Plans for GIS enhancements have been included in the Compliance Plan submission.

Pittsburgh Water and Sewer Authority's Base Rate Filing

**IX. QUALITY OF SERVICE**

IX.6. Provide a summary report demonstrating the company's efforts in water conservation, since the last rate proceeding, pursuant to 52 Pa. Code, § 65.20.

**RESPONSE:**

Plans for conservation activities have been included in the Compliance Plan submission.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**IX. QUALITY OF SERVICE**

IX.7. Provide a discussion of the company's policy regarding meter requirements, replacements and testing. State if the company's procedures are in compliance with 52 Pa. Code, § 65.8(b).

a. Provide meter test records as required in 52 Pa. Code, § 65.8(c) for the 50 meters most recently removed from service.

b. Provide a discussion of the company's policy and history of compliance with 52 Pa. Code, § 65.9 regarding adjustment of bills for meter error within the last year.

**RESPONSE:**

In Section 509.6 of PWSA's prior tariff, currently The Pittsburgh Water and Sewer Authority Rules and Regulations, PWSA does provide meter tests at a customer's request. However, the Authority will only perform a meter test at no charge if the meter passes testing.

PWSA implemented a meter replacement program to comply with these provisions, which was included in its Compliance Plan filing.

a. PWSA maintains records containing meter testing information.

b. With respect to 52 Pa. Code § 65.9(a), PWSA's recent practice has been to credit disputed usage for meters with test results in excess of 106% accuracy. With respect to 52 Pa. Code § 65.9(b), PWSA does not assess any charges outside of the cost of the meter test for slow meters. With respect to 52 Pa. Code § 65.9(c), PWSA does not assess any charges for non-registering meters. PWSA has developed a plan for compliance with 52 Pa. Code § 65.9 and has included additional information in the Compliance Plan.

## IMPORTANT INFORMATION ABOUT LEAD IN YOUR DRINKING WATER

### ESTE INFORME CONTIENE INFORMACIÓN IMPORTANTE ACERCA DE SU AGUA POTABLE. HAGA QUE ALGUIEN LO TRADUZCA PARA USTED, O HABLE CON ALGUIEN QUE LO ENTIENDA.

The Pittsburgh Water and Sewer Authority (PWSA) has found elevated levels of lead in tap water samples in some homes (see reverse for detailed summary of sample results). Elevated levels of lead can cause serious health problems. **Please read this information closely to see what you can do to reduce lead in your drinking water.**

A lead level of 20 parts per billion (ppb) was reported at the 90<sup>th</sup> percentile for compliance samples collected during the monitoring period of July 1, 2018 to December 31, 2018. This lead value is greater than the action level of 15 ppb.

#### What does this mean?

Under the authority of the Safe Drinking Water Act, the U. S. Environmental Protection Agency (EPA) set the action level for lead in drinking water at 15 ppb. This means utilities must ensure that water from the customer's tap does not exceed this level in at least 90 percent of the homes sampled (represents the 90<sup>th</sup> percentile value). An action level exceedance is not a violation but triggers other requirements that include water quality parameter monitoring, corrosion control treatment, source water monitoring, public education, and lead service line replacement.

Lead is rarely found in the source of a public water supply. Rather, it enters tap water through the corrosion of a home's service line or plumbing materials.

#### What happened? What was done?

Due to elevated levels of lead in water detected in some homes, PWSA is required by the Pennsylvania Department of Environmental Protection (DEP) to conduct lead and copper compliance sampling every six months. Samples are taken from homes that have lead service lines or lead in their internal plumbing. For the second half of 2018, PWSA received 161 samples from 161 homes. All 161 samples were included in PWSA's 90<sup>th</sup> percentile calculation. The 90<sup>th</sup> percentile lead level for these homes is 20 ppb, which exceeds the EPA 15 ppb action level. Results of the samples are summarized on the reverse side of this notice. The next round of compliance samples will be completed by June 30, 2019.

PWSA adds anti-corrosion chemicals at the treatment plant to help to address this problem. A comprehensive water quality study determined that using orthophosphate instead of the current treatment will improve corrosion control and reduce lead levels. PWSA is in the process of installing the equipment necessary to add orthophosphate and expects it to be applied in early spring 2019. PWSA will also continue to (1) test tap water for lead, (2) educate customers about lead, and (3) replace any lead service lines it owns and will work with customers who want to replace lead service lines that they own. Since corrosion happens in service lines and interior plumbing that contain lead, water providers cannot take care of the entire problem.

#### What are the health effects of lead?

EPA provides for the following notice in 40 C.F.R. § 141.85:

*Health effects of lead.* Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and can interfere with the production of red blood cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants, young children, and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones, and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development.

Additional sources of information on health effects of lead, including the Centers for Disease Control and Prevention, are listed below.

#### What should I do?

- **If you have specific health concerns, consult your health care provider.**
- **Steps you can take to reduce exposure to lead in drinking water:**
  - **Run your water to flush out lead.** If you haven't used your water for several hours, run your cold tap for at least one minute before cooking or drinking. Homes with longer lead water service lines may require flushing for a longer period of time.

- **Use cold water for cooking and preparing baby formula.** Do not cook with or drink water from the hot water tap. Do not use water from the hot water tap to make baby formula.
- **Do not boil water to remove lead.** Boiling water will not reduce lead.
- **Look for alternative sources or treatment of water.** The NSF Water Fact Kit includes specific information about filtering lead in drinking water at: [www.nsf.org](http://www.nsf.org). Coupons for NSF-certified filters can be found at [lead.pgh2o.com/resources/lead-filters-and-other-products](http://lead.pgh2o.com/resources/lead-filters-and-other-products).
- **If you would like your tap water tested for lead,** You can request a kit at [pgh2o.com/leadform](http://pgh2o.com/leadform) or call 412.255.8987. You may also contact private labs for testing. More information on testing can be found at our website at [lead.pgh2o.com](http://lead.pgh2o.com).
- **Identify if your plumbing fixtures contain lead.** There are lead check swabs that can detect lead on plumbing surfaces such as solder and pipes. These swabs can be purchased at plumbing and home improvement stores. Consider having lead-containing pipes and fixtures replaced, or use the precautions listed above.
- **Contact PWSA if you decide to replace your lead service line.** Depending on household income, customers may be eligible to have their lead water service line replaced at no cost.
- **Get your child's blood tested.** If you think your child may have been exposed to lead, talk to your doctor about testing your child. Allegheny County requires all children to be tested for lead exposure at approximately 9-12 months, and again at 24 months.

For more information, please visit [lead.pgh2o.com](http://lead.pgh2o.com) or contact the PWSA at 412-255-8987.

*Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.*

This notice is being sent to you by The Pittsburgh Water and Sewer Authority.

PWS ID#: 5020038

**For more information:**

Visit [lead.pgh2o.com](http://lead.pgh2o.com) or call us at 412-255-8987 to find out additional information on lead.

For more information on reducing lead exposure around your home and the health effects of lead:

- EPA's website at: [www.epa.gov/lead](http://www.epa.gov/lead),
- DEP's website at: [www.dep.pa.gov/Citizens/My-Water/PublicDrinkingWater/Pages/Lead-in-Drinking-Water.aspx](http://www.dep.pa.gov/Citizens/My-Water/PublicDrinkingWater/Pages/Lead-in-Drinking-Water.aspx)
- Centers for Disease Control's website at: [www.cdc.gov/nceh/lead/tips/water.htm](http://www.cdc.gov/nceh/lead/tips/water.htm),
- Allegheny County Health Department's website at [www.achd.net/lead](http://www.achd.net/lead),
- Call the National Lead Information Center at 800-424-LEAD, or
- Contact your health care provider.

**Sample results:**

Results for the compliance sampling, analyzed by an independent, accredited laboratory and submitted to DEP, are as follows:

- 73 have a lead concentration of less than 5.0 ppb
- 51 are between 5.0 and 9.9 ppb
- 13 are between 10.0 and 14.9 ppb
- 6 are between 15.0 and 19.9 ppb
- 15 are between 20 and 49.9 ppb
- 3 are higher than 50 ppb

In addition to the compliance sampling, PWSA has also been conducting analyses of tap samples requested by customers. These samples are not limited to homes that have, or are expected to have, lead service lines or plumbing.

Date distributed: 1/22/2019



## IMPORTANT INFORMATION ABOUT LEAD IN YOUR DRINKING WATER

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The Pittsburgh Water and Sewer Authority (PWSA) has found elevated levels of lead in tap water samples in some homes (see reverse for detailed summary of sample results). Elevated levels of lead can cause serious health problems. **Please read this information closely to see what you can do to reduce lead in your drinking water.**

A lead level of 17.52 parts per billion (ppb) was reported at the 90<sup>th</sup> percentile for compliance samples collected during the monitoring period of January 1, 2019 to June 30, 2019. This lead value is greater than the action level of 15 ppb.

### **What does this mean?**

Under the authority of the Safe Drinking Water Act, the U. S. Environmental Protection Agency (EPA) set the action level for lead in drinking water at 15 ppb. This means utilities must ensure that water from the customer's tap does not exceed this level in at least 90 percent of the homes sampled (represents the 90th percentile value). An action level exceedance is not a violation but triggers other requirements that include water quality parameter monitoring, corrosion control treatment, source water monitoring, public education, and lead service line replacement.

Lead is rarely found in the source of a public water supply. Rather, it enters tap water through the corrosion of a home's service line or plumbing materials.

### **What happened? What was done?**

Due to elevated levels of lead in water detected in some homes, PWSA is required by the Pennsylvania Department of Environmental Protection (DEP) to conduct lead and copper compliance sampling every six months. Samples are taken from homes that have lead service lines or lead in their internal plumbing. For the first half of 2019, PWSA received 176 samples from 174 homes (two of the sites submitted two samples). All 176 samples were included in PWSA's 90<sup>th</sup> percentile calculation. The 90<sup>th</sup> percentile lead level for these homes is 17.52 ppb, which exceeds the EPA 15 ppb action level. Results of the samples are summarized on the reverse side of this notice. The next round of compliance samples will be completed by December 31, 2019.

PWSA started applying the corrosion control additive orthophosphate to the drinking water in April 2019. Orthophosphate takes time to move throughout the system and create a protective barrier in lead service lines. Our team of water quality experts have been closely monitoring lead levels throughout the system since its addition and have found that since orthophosphate has been added, lead levels in water samples have been generally trending downward. PWSA will also continue to (1) test tap water for lead, (2) educate customers about lead, and (3) replace lead service lines it owns and will work with customers who want to replace lead service lines that they own. Since corrosion happens in service lines and interior plumbing that contain lead, water providers cannot take care of the entire problem.

### **What are the health effects of lead?**

EPA provides for the following notice in 40 C.F.R. § 141.85:

*Health effects of lead.* Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and can interfere with the production of red blood cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants, young children, and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones, and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development.

Additional sources of information on health effects of lead, including the Centers for Disease Control and Prevention, are listed below.

### **What should I do?**

- **If you have specific health concerns, consult your health care provider.**
- **Steps you can take to reduce exposure to lead in drinking water:**
  - **Run your water to flush out lead.** If you haven't used your water for several hours, run your cold tap for at least one minute before cooking or drinking. Homes with longer lead water service lines may require flushing for a longer period of time.

- **Use cold water for cooking and preparing baby formula.** Do not cook with or drink water from the hot water tap. Do not use water from the hot water tap to make baby formula.
- **Do not boil water to remove lead.** Boiling water will not reduce lead.
- **Look for alternative sources or treatment of water.** The NSF Water Fact Kit includes specific information about filtering lead in drinking water at: [www.nsf.org](http://www.nsf.org). Coupons for NSF-certified filters can be found at [lead.pgh2o.com/resources/lead-filters-and-other-products](http://lead.pgh2o.com/resources/lead-filters-and-other-products).
- **If you would like your tap water tested for lead,** You can request a kit at [pgh2o.com/leadform](http://pgh2o.com/leadform) or call 412.255.8987. You may also contact private labs for testing. More information on testing can be found at our website at [lead.pgh2o.com](http://lead.pgh2o.com).
- **Identify if your plumbing fixtures contain lead.** There are lead check swabs that can detect lead on plumbing surfaces such as solder and pipes. These swabs can be purchased at plumbing and home improvement stores. Consider having lead-containing pipes and fixtures replaced, or use the precautions listed above.
- **Contact PWSA if you decide to replace your lead service line.** Depending on household income, customers may be eligible to have their lead water service line replaced at no cost.
- **Get your child's blood tested.** If you think your child may have been exposed to lead, talk to your doctor about testing your child. Allegheny County requires all children to be tested for lead exposure at approximately 9-12 months, and again at 24 months.

For more information, please visit [lead.pgh2o.com](http://lead.pgh2o.com) or contact the PWSA at 412-255-8987.

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- DEP's website at: [www.dep.pa.gov/Citizens/My-Water/PublicDrinkingWater/Pages/Lead-in-Drinking-Water.aspx](http://www.dep.pa.gov/Citizens/My-Water/PublicDrinkingWater/Pages/Lead-in-Drinking-Water.aspx)
- Centers for Disease Control's website at: [www.cdc.gov/nceh/lead/tips/water.htm](http://www.cdc.gov/nceh/lead/tips/water.htm),
- Allegheny County Health Department's website at [www.achd.net/lead](http://www.achd.net/lead),
- Call the National Lead Information Center at 800-424-LEAD, or
- Contact your health care provider.

**Sample results:**

Results for the compliance sampling, analyzed by an independent, accredited laboratory and submitted to DEP, are as follows:

- 113 have a lead concentration of less than 5.0 ppb
- 29 are between 5.0 and 9.9 ppb
- 14 are between 10.0 and 14.9 ppb
- 6 are between 15.0 and 19.9 ppb
- 8 are between 20 and 49.9 ppb
- 6 are higher than 50 ppb

In addition to the compliance sampling, PWSA has also been conducting analyses of tap samples requested by customers. These samples are not limited to homes that have, or are expected to have, lead service lines or plumbing.

Date distributed: 7/26/2019

**DRINKING WATER WARNING**  
**BOIL YOUR WATER BEFORE USING**

**HIERVAN EL AGUA ANTES DE USARLA.**  
**ESTE INFORME CONTIENE INFORMACION MUY IMPORTANTE SOBRE SU AGUA DE BEBER.**  
**TRADUZCALO O HABLE CON ALGUIEN QUE LO ENTIENDA BIEN.**

**The Pittsburgh Water and Sewer Authority May Be At Increased Risk From Microbial Contamination.**

We routinely monitor the conditions in the distribution system. On February 15, 2019 at approximately 9:30 p.m., PWSA experienced a loss of positive water pressure due a 16-inch water main break on the Duck Hollow Trail in Hazelwood, causing low and no water pressure for localized customers in portions of Hazelwood, Swisshelm Park, and a small portion of Greenfield in the City of Pittsburgh. The break was isolated, and work to return the main to service began at approximately 9:30 p.m. February 15.

A loss of positive water pressure is a signal of the existence of conditions that could allow contamination to enter the distribution system through back-flow by back-pressure or back-siphonage. As a result, there is an increased chance that the water may contain disease-causing organisms.

**What should I do?**

**Until further notice**, customers who live in the impacted areas should take the following steps before using tap water for drinking, making ice, brushing teeth, washing dishes, and food preparation:

- 1. Flush your water tap by running water for 1 minute or longer, then**
- 2. Boil water for 1 minute, and let it cool before consumption.**

Flushing water brings in fresh water from the main and boiling fresh water kills any bacteria and other organisms that can enter the water.

*Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites, which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.*

These symptoms, however, are not caused only by organisms in drinking water, but also by other factors. If you experience any of these symptoms and they persist, you may want to seek medical advice.

People with severely compromised immune systems, infants, and some elderly may be at increased risk. These people should seek advice about drinking water from their health care providers. General guidelines on ways to lessen the risk of infection by microbes are available from EPA's Safe Drinking Water Hotline at 1 (800) 426-4791.

**What happened? What is being done?**

**The main break was isolated, and PWSA began to restore pressure at approximately 9:30 p.m. February 16, 2019. PWSA is also conducting testing to confirm adequate disinfectant levels and verify that the water is safe to consume.**

For more information, please contact: PWSA Customer Service/Dispatch at 412-255-2423

*Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.*

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**The Pittsburgh Water and Sewer Authority May Be At Increased Risk From Microbial Contamination.**

We routinely monitor the conditions in the distribution system. On February 26, 2019 at approximately 1:30 p.m., PWSA experienced a loss of positive water pressure due a 16-inch water main break on Shaler Street in Duquesne Heights, causing low and no water pressure for localized customers in portions of the Crafton Heights, Duquesne Heights, Elliott, Mt. Washington, Ridgemont, and Westwood neighborhoods in the City of Pittsburgh. The break was isolated, and work to return the main to service began at approximately 3:00 p.m. February 26.

A loss of positive water pressure is a signal of the existence of conditions that could allow contamination to enter the distribution system through back-flow by back-pressure or back-siphonage. As a result, there is an increased chance that the water may contain disease-causing organisms.

**What should I do?**

**Until further notice**, customers who live in the impacted areas should take the following steps before using tap water for drinking, making ice, brushing teeth, washing dishes, and food preparation:

- 1. Flush your water tap by running water for 1 minute or longer, then**
- 2. Boil water for 1 minute, and let it cool before consumption.**

Flushing water brings in fresh water from the main and boiling fresh water kills any bacteria and other organisms that can enter the water.

*Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites, which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.*

These symptoms, however, are not caused only by organisms in drinking water, but also by other factors. If you experience any of these symptoms and they persist, you may want to seek medical advice.

People with severely compromised immune systems, infants, and some elderly may be at increased risk. These people should seek advice about drinking water from their health care providers. General guidelines on ways to lessen the risk of infection by microbes are available from EPA's Safe Drinking Water Hotline at 1 (800) 426-4791.

**What happened? What is being done?**

**The main break was isolated, and PWSA began to restore pressure at approximately 3:00 p.m. February 26, 2019. PWSA is also conducting testing to confirm adequate disinfectant levels and verify that the water is safe to consume.**

For more information, please contact: PWSA Customer Service/Dispatch at 412-255-2423

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**The Pittsburgh Water and Sewer Authority May Be At Increased Risk From Microbial Contamination.**

We routinely monitor the conditions in the distribution system. On May 21, 2019 at approximately 7:30 p.m., PWSA experienced a loss of positive water pressure due a 36-inch water main break on Smallman Street in the Strip District, causing low and no water pressure for localized customers in portions of the Ridgemon and Westwood neighborhoods in the City of Pittsburgh. The break was isolated, and work to return the main to service began at approximately 8:30 p.m. on May 21.

A loss of positive water pressure is a signal of the existence of conditions that could allow contamination to enter the distribution system through back-flow by back-pressure or back-siphonage. As a result, there is an increased chance that the water may contain disease-causing organisms.

**What should I do?**

**Until further notice**, customers who live in the impacted areas should take the following steps before using tap water for drinking, making ice, brushing teeth, washing dishes, and food preparation:

- 1. Flush your water tap by running water for 1 minute or longer, then**
- 2. Boil water for 1 minute, and let it cool before consumption.**

Flushing water brings in fresh water from the main and boiling fresh water kills any bacteria and other organisms that can enter the water.

*Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites, which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.*

These symptoms, however, are not caused only by organisms in drinking water, but also by other factors. If you experience any of these symptoms and they persist, you may want to seek medical advice.

People with severely compromised immune systems, infants, and some elderly may be at increased risk. These people should seek advice about drinking water from their health care providers. General guidelines on ways to lessen the risk of infection by microbes are available from EPA's Safe Drinking Water Hotline at 1 (800) 426-4791.

**What happened? What is being done?**

**The main break was isolated, and PWSA began to restore pressure at approximately 8:30 p.m. May 21, 2019. PWSA is also conducting testing to confirm adequate disinfectant levels and verify that the water is safe to consume.**

For more information, please contact: PWSA Customer Service/Dispatch at 412-255-2423

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**The Pittsburgh Water and Sewer Authority May Be At Increased Risk From Microbial Contamination.**

We routinely monitor the conditions in the distribution system. On June 6, 2019 at approximately 11:30 p.m., PWSA experienced a loss of positive water pressure due a 6-inch water main break on Seigel Street in Millvale, causing low and no water pressure for localized customers in portions of the Borough of Millvale. The break was isolated, and work to return the main to service began at approximately 2:00 p.m. on June 7.

A loss of positive water pressure is a signal of the existence of conditions that could allow contamination to enter the distribution system through back-flow by back-pressure or back-siphonage. As a result, there is an increased chance that the water may contain disease-causing organisms.

**What should I do?**

**Until further notice**, customers who live in the impacted areas should take the following steps before using tap water for drinking, making ice, brushing teeth, washing dishes, and food preparation:

- 1. Flush your water tap by running water for 1 minute or longer, then**
- 2. Boil water for 1 minute, and let it cool before consumption.**

Flushing water brings in fresh water from the main and boiling fresh water kills any bacteria and other organisms that can enter the water.

*Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites, which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.*

These symptoms, however, are not caused only by organisms in drinking water, but also by other factors. If you experience any of these symptoms and they persist, you may want to seek medical advice.

People with severely compromised immune systems, infants, and some elderly may be at increased risk. These people should seek advice about drinking water from their health care providers. General guidelines on ways to lessen the risk of infection by microbes are available from EPA's Safe Drinking Water Hotline at 1 (800) 426-4791.

**What happened? What is being done?**

**The main break was isolated, and PWSA began to restore pressure at approximately 2:00 p.m. June 7, 2019. PWSA is also conducting testing to confirm adequate disinfectant levels and verify that the water is safe to consume.**

For more information, please contact: PWSA Customer Service/Dispatch at 412-255-2423

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**The Pittsburgh Water and Sewer Authority May Be At Increased Risk From Microbial Contamination.**

We routinely monitor the conditions in the distribution system. On June 21, 2019, at approximately 2:00 p.m., PWSA experienced a loss of positive water pressure due an 8-inch water main break on Sandusky Street in Central Northside, causing low and no water pressure for customers on Sandusky Street between Fountain Street and Hemlock Street; and McKirdy Way between Sandusky Street and Loraine Street. The break was isolated, and work to return the main to service began at approximately 3:30 p.m. on June 21.

A loss of positive water pressure is a signal of the existence of conditions that could allow contamination to enter the distribution system through back-flow by back-pressure or back-siphonage. As a result, there is an increased chance that the water may contain disease-causing organisms.

**What should I do?**

**Until further notice**, customers who live in the impacted areas should take the following steps before using tap water for drinking, making ice, brushing teeth, washing dishes, and food preparation:

- 1. Flush your water tap by running water for 1 minute or longer, then**
- 2. Boil water for 1 minute, and let it cool before consumption.**

Flushing water brings in fresh water from the main and boiling fresh water kills any bacteria and other organisms that can enter the water.

*Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites, which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.*

These symptoms, however, are not caused only by organisms in drinking water, but also by other factors. If you experience any of these symptoms and they persist, you may want to seek medical advice.

People with severely compromised immune systems, infants, and some elderly may be at increased risk. These people should seek advice about drinking water from their health care providers. General guidelines on ways to lessen the risk of infection by microbes are available from EPA's Safe Drinking Water Hotline at 1 (800) 426-4791.

**What happened? What is being done?**

**The main break was isolated, and PWSA began to restore pressure at approximately 3:30 p.m. June 21, 2019. PWSA is also conducting testing to confirm adequate disinfectant levels and verify that the water is safe to consume.**

For more information, please contact: PWSA Customer Service/Dispatch at 412-255-2423

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**The Pittsburgh Water and Sewer Authority May Be At Increased Risk From Microbial Contamination.**

We routinely monitor the conditions in the distribution system. On July 12, 2019 at approximately 12:30 p.m., PWSA experienced a loss of positive water pressure due a 4-inch water main break on Hansen Street in Millvale, causing low and no water pressure for localized customers on Hansen Street in the Borough of Millvale. The break was isolated, and work to return the main to service began at approximately 2:00 p.m. on July 12.

A loss of positive water pressure is a signal of the existence of conditions that could allow contamination to enter the distribution system through back-flow by back-pressure or back-siphonage. As a result, there is an increased chance that the water may contain disease-causing organisms.

**What should I do?**

**Until further notice**, customers who live in the impacted areas should take the following steps before using tap water for drinking, making ice, brushing teeth, washing dishes, and food preparation:

- 1. Flush your water tap by running water for 1 minute or longer, then**
- 2. Boil water for 1 minute, and let it cool before consumption.**

Flushing water brings in fresh water from the main and boiling fresh water kills any bacteria and other organisms that can enter the water.

*Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites, which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.*

These symptoms, however, are not caused only by organisms in drinking water, but also by other factors. If you experience any of these symptoms and they persist, you may want to seek medical advice.

People with severely compromised immune systems, infants, and some elderly may be at increased risk. These people should seek advice about drinking water from their health care providers. General guidelines on ways to lessen the risk of infection by microbes are available from EPA's Safe Drinking Water Hotline at 1 (800) 426-4791.

**What happened? What is being done?**

**The main break was isolated, and PWSA began to restore pressure at approximately 2:00 p.m. July 12, 2019. PWSA is also conducting testing to confirm adequate disinfectant levels and verify that the water is safe to consume.**

For more information, please contact: PWSA Customer Service/Dispatch at 412-255-2423

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**The Pittsburgh Water and Sewer Authority May Be At Increased Risk From Microbial Contamination.**

We routinely monitor the conditions in the distribution system. On August 13, 2019 at approximately 2:00 a.m., PWSA experienced a loss of positive water pressure due to a break on a section of 12-inch water main on the 1500 block of Lincoln Avenue, causing low and no water pressure for localized customers in Lincoln-Lemington and a portion of Homewood North in the City of Pittsburgh. The break was isolated, and work to return the main to service began at approximately 11:00 a.m. on August 13.

A loss of positive water pressure is a signal of the existence of conditions that could allow contamination to enter the distribution system through back-flow by back-pressure or back-siphonage. As a result, there is an increased chance that the water may contain disease-causing organisms.

**What should I do?**

**Until further notice**, customers who live in the impacted areas should take the following steps before using tap water for drinking, making ice, brushing teeth, washing dishes, and food preparation:

- 1. Flush your water tap by running water for 1 minute or longer, then**
- 2. Boil water for 1 minute, and let it cool before consumption.**

Flushing water brings in fresh water from the main and boiling fresh water kills any bacteria and other organisms that can enter the water.

*Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites, which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.*

These symptoms, however, are not caused only by organisms in drinking water, but also by other factors. If you experience any of these symptoms and they persist, you may want to seek medical advice.

People with severely compromised immune systems, infants, and some elderly may be at increased risk. These people should seek advice about drinking water from their health care providers. General guidelines on ways to lessen the risk of infection by microbes are available from EPA's Safe Drinking Water Hotline at 1 (800) 426-4791.

**What happened? What is being done?**

**The main break was isolated at approximately 11:00 a.m., and PWSA completed repairs and restored pressure to all impacted customers at approximately 3:00 p.m. on August 13, 2019. PWSA is also conducting testing to confirm adequate disinfectant levels and verify that the water is safe to consume.**

For more information, please contact: PWSA Customer Service/Dispatch at 412-255-2423

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**The Pittsburgh Water and Sewer Authority May Be At Increased Risk From Microbial Contamination.**

We routinely monitor the conditions in the distribution system. On October 12, 2019, at approximately 3:30 p.m., PWSA experienced a loss of positive water pressure due to a break on a section of 16" water main on Virginia Avenue at Kearsarge Street, causing low and no water pressure for localized customers in the Ridgemont, Westwood, and Elliott neighborhoods in the City of Pittsburgh. The break was isolated, and work to return the main to service began at approximately 6:40 p.m. on October 12.

A loss of positive water pressure is a signal of the existence of conditions that could allow contamination to enter the distribution system through back-flow by back-pressure or back-siphonage. As a result, there is an increased chance that the water may contain disease-causing organisms.

**What should I do?**

**Until further notice**, customers who live in the impacted areas should take the following steps before using tap water for drinking, making ice, brushing teeth, washing dishes, and food preparation:

- 1. Flush your water tap by running water for 1 minute or longer, then**
- 2. Boil water for 1 minute, and let it cool before consumption.**

Flushing water brings in fresh water from the main and boiling fresh water kills any bacteria and other organisms that can enter the water.

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**What happened? What is being done?**

**The main break was isolated, and PWSA began to restore pressure at approximately 8:00 p.m. on October 12, 2019. PWSA is also conducting testing to confirm adequate disinfectant levels and verify that the water is safe to consume.**

For more information, please contact: PWSA Customer Service/Dispatch at 412-255-2423

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**The Pittsburgh Water and Sewer Authority May Be At Increased Risk From Microbial Contamination.**

We routinely monitor the conditions in the distribution system. On November 27, 2019, at approximately 6:30 a.m., PWSA experienced a loss of positive water pressure due to a break on a section of 12-inch water main on McCandless Avenue, causing low and no water pressure for localized customers in the Upper Lawrenceville neighborhood in the City of Pittsburgh. Work began to return the main to service at approximately 8:30 a.m. on November 27<sup>th</sup>.

A loss of positive water pressure is a signal of the existence of conditions that could allow contamination to enter the distribution system through back-flow by back-pressure or back-siphonage. As a result, there is an increased chance that the water may contain disease-causing organisms.

**What should I do?**

**Until further notice**, customers who live in the impacted areas should take the following steps before using tap water for drinking, making ice, brushing teeth, washing dishes, and food preparation:

- 1. Flush your water tap by running water for 1 minute or longer, then**
- 2. Boil water for 1 minute, and let it cool before consumption.**

Flushing water brings in fresh water from the main and boiling fresh water kills any bacteria and other organisms that can enter the water.

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**What happened? What is being done?**

**PWSA crews continue to work on isolating the break to make repairs. PWSA will also conduct testing to confirm adequate disinfectant levels and verify that the water is safe to consume.**

For more information, please contact: PWSA Customer Service/Dispatch at 412-255-2423

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**The Pittsburgh Water and Sewer Authority May Be At Increased Risk From Microbial Contamination.**

We routinely monitor the conditions in the distribution system. On December 28, 2019 at approximately 10:00 p.m., PWSA experienced a loss of positive water pressure due a 6-inch water main break on the Rosecrest Place in Stanton Heights, causing low and no water pressure for localized customers in portions of Stanton Heights in the City of Pittsburgh. The break was isolated, and work to return the main to service began at approximately 10:00 p.m. December 28.

A loss of positive water pressure is a signal of the existence of conditions that could allow contamination to enter the distribution system through back-flow by back-pressure or back-siphonage. As a result, there is an increased chance that the water may contain disease-causing organisms.

**What should I do?**

**Until further notice**, customers who live in the impacted areas should take the following steps before using tap water for drinking, making ice, brushing teeth, washing dishes, and food preparation:

- 1. Flush your water tap by running water for 1 minute or longer, then**
- 2. Boil water for 1 minute, and let it cool before consumption.**

Flushing water brings in fresh water from the main and boiling fresh water kills any bacteria and other organisms that can enter the water.

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People with severely compromised immune systems, infants, and some elderly may be at increased risk. These people should seek advice about drinking water from their health care providers. General guidelines on ways to lessen the risk of infection by microbes are available from EPA's Safe Drinking Water Hotline at 1 (800) 426-4791.

**What happened? What is being done?**

**The main break was isolated, and PWSA began to restore pressure at approximately 10:00 p.m. December 28, 2019. PWSA will also begin to conduct testing to confirm adequate disinfectant levels and verify that the water is safe to consume.**

For more information, please contact: PWSA Customer Service/Dispatch at 412-255-2423

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# The Pittsburgh Water and Sewer Authority's Annual Drinking Water Quality Report 2018



PA Public Water Supply ID No. 5020038

*Our mission is to provide you with a high quality, dependable, and ample supply of drinking water. We want you to understand the efforts we make to continually improve the water treatment process and to protect our water resources. We are committed to ensuring the quality of your water. If you have any questions about the report, please contact our Water Treatment Plant at 412.782.7552.*

We want customers to be informed about their water. The Water Quality Report and additional information are available on our website; [pgh2o.com](http://pgh2o.com). Additional copies may be obtained by calling Customer Service at 412.255.2423. If you want to learn more, please attend any of our regularly scheduled Board of Directors meetings typically held on the fourth Friday of every month at 1200 Penn Avenue, Pittsburgh, PA, 15222. More information can be found at [pgh2o.com/board](http://pgh2o.com/board).

PWSA provides water and sewer service to more than 300,000 customers throughout the City of Pittsburgh and surrounding areas. We are the largest combined water and sewer authority in Pennsylvania producing an average of 70 million gallons of water daily. In addition, PWSA provides bulk water sales to Reserve Township, Fox Chapel Borough, and Aspinwall Borough, along with being interconnected to several other regional water systems for emergency purposes. The PWSA drinking water system contains approximately 965 miles of water lines, five reservoirs and 11 tanks with a storage capacity of 455 million gallons of water.

**Este informe contiene información importante acerca de su agua potable. Haga que alguien lo traduzca para usted, ó hable con alguien que lo entienda. (This report contains important information about your drinking water. Have someone translate it for you, or speak with someone who understands it.)**



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@pgh2o

## A Message From the Executive Director

Dear Pittsburgh,

Thank you for the opportunity to serve you. Make no mistake: Pittsburgh's water systems are YOUR water systems. Generations of Pittsburghers before us built them for you. You own them. We work to make our systems meet your expectations.

We are hard at work rebuilding and upgrading the drinking water, stormwater, and sewer systems that will make future generations of Pittsburghers proud. Our goals for PWSA include transparency, accountability, reliability, affordability, and more. We are not naïve – as a water utility, we have fallen short in the past. Our water systems were neglected for decades, starved of needed investment to keep them better maintained and modernized. However, we're embarking on a new chapter in our story, with new leadership, a new commitment to our customers, and new plans to move us into the future.

As you will read in this report, our water quality in 2018 met or surpasses all Federal and State drinking water requirements. This year, we upgraded our water treatment by adding a corrosion inhibitor called orthophosphate. We expect that orthophosphate will protect customers by reducing corrosion from service lines



and plumbing made of lead. In addition, we're replacing thousands of lead service lines across our service area to further reduce lead levels. You can read more about orthophosphate on page five of this report.

We are primed to invest significantly in our water systems so we can provide safe, reliable water and sewer service, resilience against flooding and natural disasters, improved water quality, and a healthier environment. We want Pittsburgh to take pride in our water. You own these systems, and they have served us well for more than a century. With renewed vision and leadership, we will restore PWSA to serve the public for the next century. We are your neighbors as well as public servants who work for you, so please let us know how we are doing when we see you around town. We want to get this right. This is our water, and our future.

Sincerely,

A handwritten signature in blue ink that reads "Robert A. Weimar". The signature is fluid and cursive, with a long, sweeping underline.

Robert A. Weimar  
Executive Director



# Where Does Your Water Come from and How is it Treated?

PWSA draws its water from the Allegheny River. We do not use ground or well water. On average, 70 million gallons of water are treated each day at our drinking water treatment plant. The plant is capable of producing over 100 million gallons of water per day. The treatment process takes three full days and consists of three separate stages:

## STAGE 1: Clarification

River water passes through a process called “clarification,” in which silts and clays are removed. This stage involves the addition of treatment chemicals (coagulants) which form clumped particles called “floc,” which are then physically removed by gravity sedimentation.

## STAGE 2: Filtration

The clarified water next passes slowly through anthracite and sand filters in order to remove the fine particles and microorganisms.

## STAGE 3: Disinfection

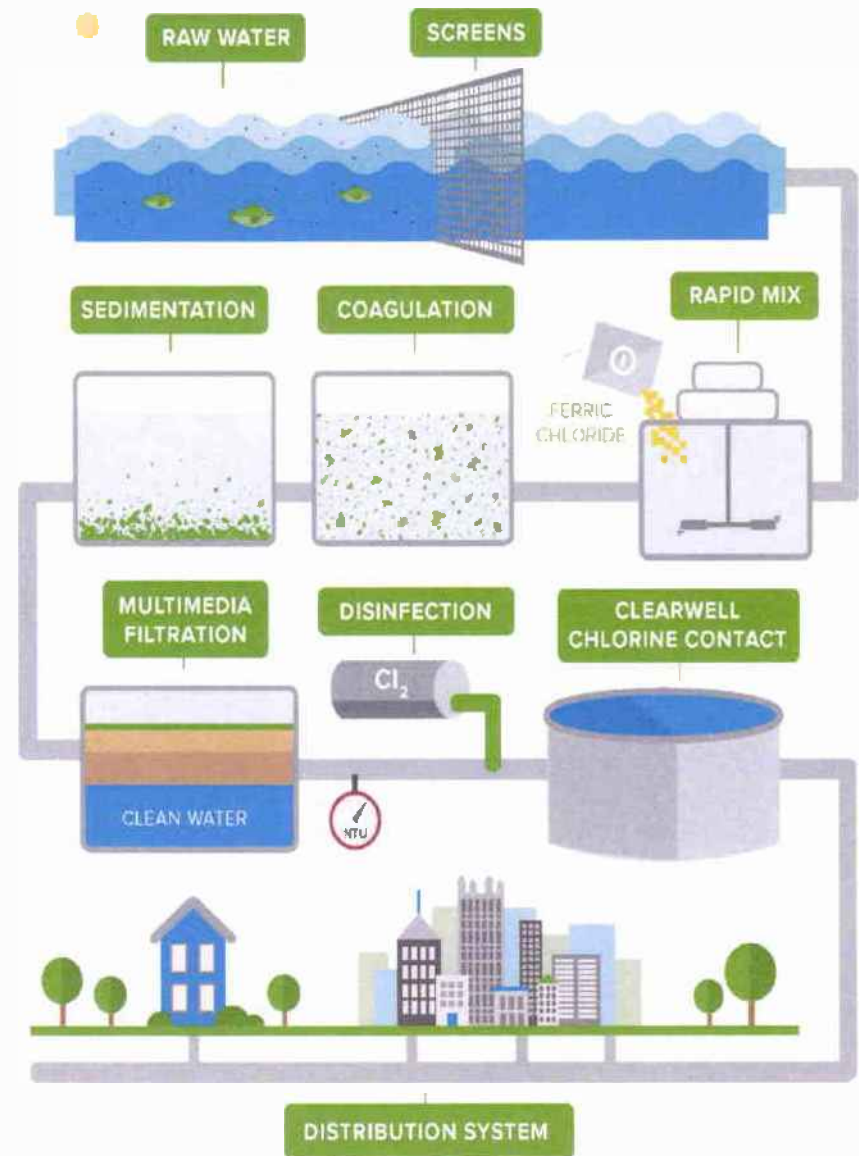
The filtered water is treated with chlorine to ensure removal of any harmful microorganisms. During this process, several additional chemicals are added to complete treatment. These include sodium carbonate to adjust the pH of the water and fluoride to prevent cavities.

# Secondary Treatment of Reservoir Water

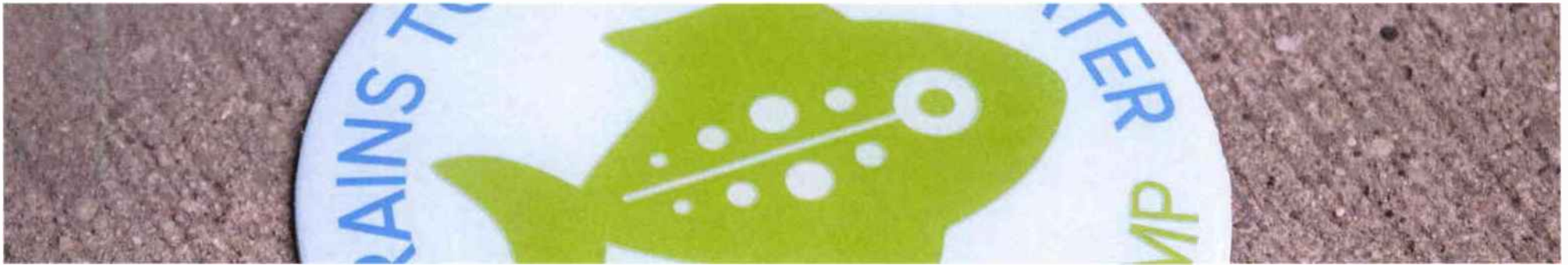
In addition to our primary water treatment plant located near Aspinwall, PWSA operates a secondary treatment plant known as the Microfiltration Plant in Highland Park.

All of the water stored in the open-air Highland Reservoir #1 is originally treated in our primary plant. Then, before the Highland Reservoir #1 water is distributed to the public, it is retreated in our secondary plant. This membrane filtration plant utilizes state-of-the-art microfiltration and chlorination to remove any impurities that may have entered the water during storage in the reservoir.

## PGH<sub>2</sub>O WATER TREATMENT PROCESS







## Stormwater

Stormwater pollution affects water quality. PWSA draws water from the Allegheny River. Anything that enters a storm sewer is ultimately released, untreated, into the rivers and streams. In addition to the Allegheny River being used as the source of our drinking water, it is also used for swimming, boating, and fishing.

The PWSA system is made up of sanitary, dedicated stormwater, and combined sewers. All new development is required to have separate storm sewers. As an older city, only about 25 percent of the system has separate storm sewers.

Residents can help prevent stormwater pollution by doing the following:

### Dispose of trash properly.

Don't litter. You can help reduce cost and keep our rivers clean by properly disposing of waste.

### Consider where you wash your car.

If you're washing your car in the driveway, all the soap is running into the street and may enter the storm sewers and eventually end up in the river.

### Properly dispose of pet waste.

If pet waste is not properly disposed of during rain events, the bacteria may enter the storm sewers and eventually end up in the river.

### Use fertilizer sparingly.

During rain events, fertilizer runs down the street and may enter the storm sewers and eventually end up in the river. Don't fertilize before a rain storm.

### Stop oil leaks immediately.

Leaking oil runs down the street and may enter the storm sewers and eventually end up in the river. Check for oil leaks regularly and dispose of oil properly.

## Who Monitors and Ensures the Quality of Water?

PWSA continuously monitors your drinking water in accordance with Federal and State regulations.

On pages 7 - 11, the tables show our monitoring results for the period of January 1, 2018, to December 31, 2018. While we conducted more than 100,000 analyses for approximately 100 different chemical and microbial constituents last year, we only found detectable levels of the contaminants listed in the water quality tables. It should be noted that none of the test results exceeded federal or state maximum contaminant levels (MCLs).

## Source Water Protection

PWSA's source water protection plan is approved by the Pennsylvania Department of Environmental Protection (PADEP). This report identifies the most likely sources of pollution affecting the Allegheny River.

These include accidental release of contaminants from industrial processes; cumulative impact of discharge from power plants; cumulative release of petroleum products from pipeline ruptures; stormwater runoff from lands adjacent to the river and Combined Sewer Overflows (CSOs). A summary of the Source Water Assessment is available on the PADEP website at [dep.state.pa.us](http://dep.state.pa.us).

PWSA realizes the importance of protecting our source water and is actively involved with organizations that aid the Authority in accomplishing this goal. PWSA is a member of River Alert Information Network (RAIN), which is an early-warning spill detection monitoring network along the Allegheny, Monongahela, and their tributaries. For more information please visit their site at [rainmatters.org](http://rainmatters.org). PWSA is also a member of the Ohio River Valley Water Sanitation Commission (ORSANCO) and is enrolled in their organic detection program. For more information please visit their site at [orsanco.org](http://orsanco.org).



## Should You Be Concerned About Lead?

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead found in drinking water is primarily from materials and components associated with water service lines and plumbing inside private property.

PWSA recently tested 161 pre-selected sites in its service area that have lead service lines or plumbing (Tier 1 sites). EPA has established an action level for lead of 15 parts per billion (ppb). This means that water providers must ensure that water from the customer's tap does not exceed this level in at least 90 percent of the homes sampled. The action level is the concentration of a contaminant which, if exceeded, triggers treatment or other requirements that include water quality parameter monitoring, corrosion control treatment, source water monitoring, public education, and lead service line replacement. An action level exceedance is not a violation. While a majority of those sites sampled resulted in no detection of lead or amounts less than the action level, 15 percent of the sites exceeded the action level. One of the 15 samples that exceeded the action level is calculated to be the 90th percentile test result. For this set of tests, that number is 20 ppb. Another set of tests will be completed by June 30, 2019. PWSA is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components in your home. More information on lead in drinking water can be found at [lead.pgh2o.com](http://lead.pgh2o.com).

### Steps you can take to reduce exposure to lead in drinking water

- **Run your water to flush out lead.** If you haven't used your water for several hours, run your cold tap for at least one minute before cooking or drinking. Homes with longer lead water service lines may require flushing for a longer period of time
- **Use cold water for cooking and preparing baby formula.** Do not cook with or drink water from the hot water tap. Do not use water from the hot water tap to make baby formula. Lead dissolves more easily in hot water
- **Do not boil water to remove lead.** Boiling water will not reduce lead.
- **Look for alternative sources or treatment of water.** The The NSF Water Fact Kit includes specific information about filtering lead in drinking water at: [nsf.org](http://nsf.org). Coupons for NSF-certified filters can be found at [lead.pgh2o.com/resources/lead-filters-and-other-products](http://lead.pgh2o.com/resources/lead-filters-and-other-products).
- **Identify if your plumbing fixtures contain lead.** There are lead check swabs that can detect lead on plumbing surfaces, such as solder and pipes. These swabs can be purchased at plumbing and home improvement stores. Consider having lead-containing pipes and fixtures replaced, or use the precautions listed above.

### Identify if your plumbing fixtures contain lead

Consider having lead-containing pipes and fixtures replaced, and contact us at 412.255.8987 for information about coordinating removal of the PWSA-owned portion of the service line. We offer free private lead service line replacements for customers who are at or below 250 percent of the Federal Poverty Level. Funds for this program are available from a settlement of an enforcement action between PWSA and the PADEP. Customers can contact Dollar Energy Fund at 866.762.2348 to apply.

PWSA offers residential water customers a free test for lead. You can request a kit at [pgh2o.com/leadform](http://pgh2o.com/leadform) or call 412.255.8987. You may also contact private labs for testing. More information on testing can be found at our website at [lead.pgh2o.com](http://lead.pgh2o.com).

### Orthophosphate

PWSA started applying the corrosion control additive orthophosphate to the drinking water in April 2019. The decision to use orthophosphate comes after an extensive, year-long study conducted by local and international water quality experts as well as comprehensive regulatory approvals from the PADEP. PWSA expects that orthophosphate will reduce corrosion from water services lines made of lead.

Orthophosphate is a food-grade additive that forms a protective layer inside of lead service lines, creating a barrier between the lead pipes and the water flowing through them. It is approved by the Environmental Protection Agency (EPA) and used in water systems across the world, including sections of the City of Pittsburgh served by Pennsylvania American Water Company.



**A protective layer of Orthophosphate forms to prevent pipe corrosion.**



**Lack of corrosion control allows lead to leach from pipes into water.**

Orthophosphate will create a protective barrier in lead pipes to reduce lead levels in drinking water

## What Does PWSA Test for?

In general, the sources of all drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

### Contaminants that may be present in source or raw water include:

- **Microbial contaminants** such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- **Inorganic contaminants** such as salts and metals, which can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- **Pesticides and herbicides** which may come from a variety of sources, such as agriculture, urban stormwater runoff, and residential uses.
- **Organic chemical contaminants** including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, can come from gas stations, urban stormwater runoff, and septic systems.
- **Radioactive contaminants** which can be naturally-occurring or the result of oil and gas production and mining activities.

In order to assure that tap water is safe to drink, the EPA and PADEP regulate the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration (FDA) and PADEP regulations establish limits for contaminants in bottled water, which must provide the same protection for public health.

PWSA tests for contaminants that may be present in the source water prior to treatment. Results of the tests enables PWSA to adjust the treatment process in order to maximize the reduction and removal of contaminants. Tests are also conducted during the treatment process and on the finished water. Additional samples for testing are collected on a regular basis from our storage facilities, various points in the distribution network, and customers' taps.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline at 1.800.426.4791.

## Long Term Surface Water Enhancement Treatment Rule Round 2 (LT2)

Cryptosporidium is a microbial pathogen found in surface water throughout the U.S. Although filtration removes Cryptosporidium, the most commonly-used filtration methods cannot guarantee 100 percent removal. Our monitoring indicates the presence of these organisms in our source water. Current test methods do not allow us to determine if the organisms are dead or if they are capable of causing disease. Ingestion of Cryptosporidium may cause cryptosporidiosis, an abdominal infection. Symptoms of infection include nausea, diarrhea and abdominal cramps. Most healthy individuals can overcome the disease within a few weeks. However, immuno-compromised people are at greater risk of developing life-threatening illness. We encourage immuno-compromised individuals to consult their doctor regarding appropriate precautions to take to avoid infection. Cryptosporidium must be ingested to cause disease, and it may be spread through means other than drinking water.

Table 1: Test Results for Cryptosporidium in Allegheny River

CONTAMINANT	RESULT (OOCYSTS/L)	DATE SAMPLED	DATE ANALYZED
Cryptosporidium	0.190	1/19/2017	1/30/2017
Cryptosporidium	0.000	2/21/2017	2/27/2017
Cryptosporidium	0.000	3/21/2017	3/23/2017

### Special Information for Immuno-Compromised Individuals

*Some people may be more vulnerable to contaminants in drinking water than others.*

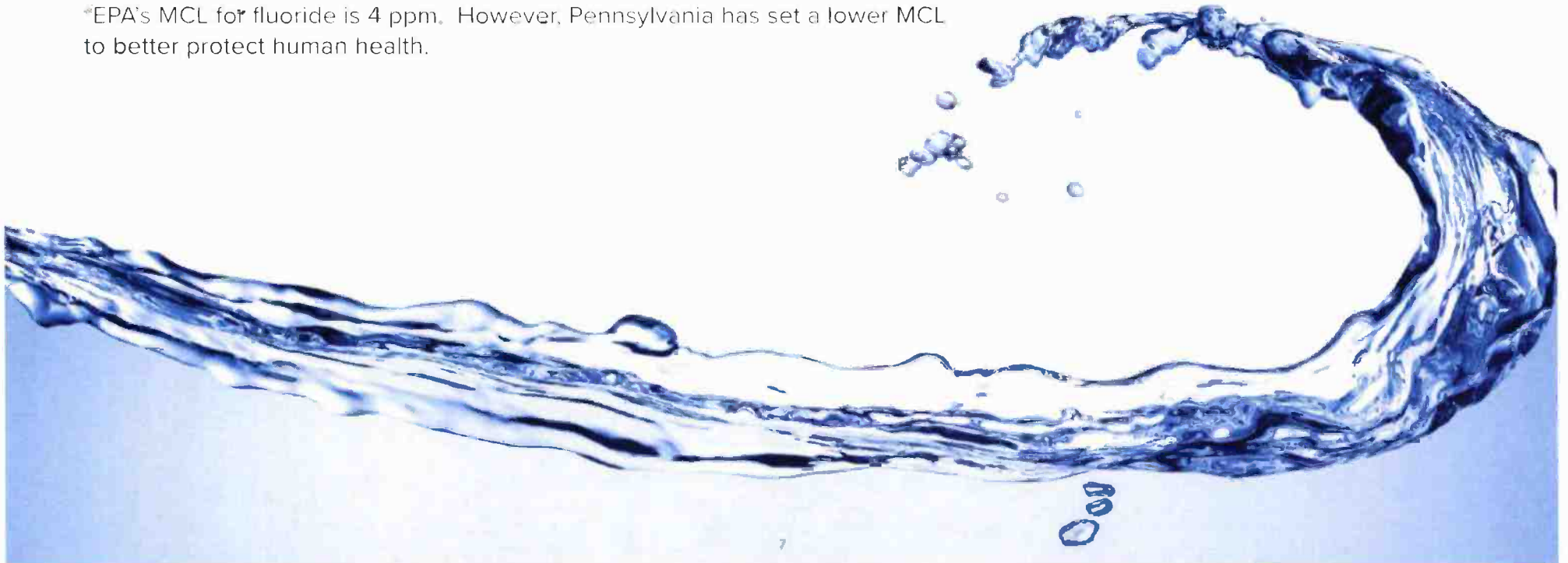
*Immuno-compromised persons, such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants may be particularly at risk from infections.*

*These people should seek advice about drinking water from their health care providers. Environmental Protection Agency (EPA) and Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline at 1.800.426.4791.*

TABLE 1: Detected Sample Results

CHEMICAL CONTAMINANTS: WATER TREATMENT PLANT								
Contaminant	MCL in CCR Units	MCLG	Level Detected	Range of Detections	Units	Sample Date	Violation Y/N	Sources of Contamination
Free Chlorine	4	MRDLG= 4	0.85	0.61-1.1	ppm	2018	N	Water additive used to control microbes
Calcium	-	-	22	19-26	ppm	2018	-	-
Fluoride	2*	4	0.73	-	ppm	2018	N	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories
Nitrate	10	10	0.64	0.5-0.74	ppm	2018	N	Runoff from fertilizer use; Leaching from septic tank sewage; Erosion of natural deposits

\*EPA's MCL for fluoride is 4 ppm. However, Pennsylvania has set a lower MCL to better protect human health.





## Unregulated Contaminant Monitoring Rule 4 (UCMR4)

Unregulated contaminants are those for which EPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to assist EPA in determining the occurrence of unregulated contaminants in drinking water and whether future regulation is warranted. Any unregulated contaminants detected are reported in the following list. For additional information and data visit: [www.epa.gov/dwucmr/fourth-unregulated-contaminant-monitoring-rule](http://www.epa.gov/dwucmr/fourth-unregulated-contaminant-monitoring-rule), or call the Safe Drinking Water Hotline at (800) 426-4791.

The Pittsburgh Water and Sewer Authority detects for:

CHEMICAL CONTAMINANTS: UCMR4 ALLEGHENY RIVER								
Contaminant	MCL in CCR Units	MCLG	Level Detected	Range of Detections	Units	Sample Date	Violation Y/N	Sources of Contamination
Bromide	-	-	42.7	-	ppb	2018	N/A	-
Total Organic Carbon	-	-	2.66	-	ppm	2018	N/A	Naturally present in the environment

CHEMICAL CONTAMINANTS: UCMR4 DISTRIBUTION								
Contaminant	MCL in CCR Units	MCLG	Level Detected	Range of Detections	Units	Sample Date	Violation Y/N	Sources of Contamination
Bromochloroacetic Acid	-	-	4.4	2.1 – 4.4	ppb	2018	N/A	
Bromodichloroacetic Acid	-	-	3.6	1.2 – 3.6	ppb	2018	N/A	
Chlorodibromoacetic Acid	-	-	0.81	0.4 – 0.81	ppb	2018	N/A	
Dibromoacetic Acid	-	-	1.1	0.31 – 1.1	ppb	2018	N/A	
Dichloroacetic Acid	-	-	8.7	5.3 – 8.7	ppb	2018	N/A	
Monobromoacetic Acid	-	-	0.89	0.32 – 0.89	ppb	2018	N/A	
Trichloroacetic Acid	-	-	11	6.6 - 11	ppb	2018	N/A	

## Chemical Contaminants

### CHEMICAL CONTAMINANTS: DISTRIBUTION SYSTEM

Contaminant	MCL in CCR Units	MCLG	Level Detected	Range of Detections	Units	Sample Date	Violation Y/N	Sources of Contamination
Free Chlorine	4	MRDLG=4	0.56	0-2.8	ppm	2018	N	Water additive used to control microbes
Calcium	-	-	21	16-26	ppm	2018	N	-
HAA5	60	N/A	18	1-27	ppb	2018	N	By-product of drinking water disinfection
TTHM	80	N/A	49	15-123	ppb	2018	N	By-product of drinking water chlorination

### ENTRY POINT DISINFECTANT RESIDUAL

Contaminant	Minimum Disinfectant Residual	Lowest Level Detected	Range of Detections	Units	Sample Date	Violation Y/N	Sources of Contamination
Chlorine	0.2	0.481	1.16	ppm	2018	N	Water additive used to control microbes.

### LEAD AND COPPER

Contaminant	Action Level (AL)	MCLG	90 <sup>th</sup> Percentile Value	Units	# of Sites Above AL of Total Sites	Violation Y/N	Sources of Contamination
Lead (Jan-Jun 2018)	15	0	10	ppb	5 out of 106	N	Corrosion of household plumbing; Erosion of natural deposits.
Copper (Jan-Jun 2018)	1.3	1.3	0	ppm	0 out of 106	N	Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservatives
Lead (Jul-Dec 2018)	15	0	20	ppb	22 out of 161	N	Corrosion of household plumbing; Erosion of natural deposits.
Copper (Jul-Dec 2018)	1.3	1.3	0	ppm	0 out of 161	N	Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservatives

## Microbial Contaminants Tables

MICROBIAL: LT2 ALLEGHENY RIVER								
Contaminant	MCL in CCR Units	MCLG	Level Detected	Range of Detections	Units	Sample Date	Violation Y/N	Sources of Contamination
Cryptosporidium	-	-	0.190	-	Oocysts /L	2017	N/A	Naturally present in the environment

MICROBIAL (RELATED TO ASSESSMENTS/CORRECTIVE ACTIONS REGARDING TC POSITIVE RESULTS)					
Contaminants	TT	MCLG	Assessments/ Corrective Actions	Violation Y/N	Sources of Contamination
Total Coliform Bacteria	Any system that has failed to complete all the required assessments or correct all identified sanitary defects, is in violation of the treatment technique requirement	N/A	See detailed description under "Detected Contaminants Health Effects Language and Corrective Actions" section	N	Naturally present in the environment.

MICROBIAL (RELATED TO E. COLI)					
Contaminants	MCL	MCLG	Positive Sample(s)	Violation Y/N	Sources of Contamination
<i>E. coli</i>	Routine and repeat samples are total coliform-positive and either is <i>E. coli</i> -positive or system fails to take repeat samples following <i>E. coli</i> -positive routine sample or system fails to analyze total coliform-positive repeat sample for <i>E. coli</i> .	0	0	N	Human and animal fecal waste.
Contaminants	TT	MCLG	Assessments/ Corrective Actions	Violation Y/N	Sources of Contamination
<i>E. coli</i>	Any system that has failed to complete all the required assessments or correct all identified sanitary defects, is in violation of the treatment technique requirement	N/A	See description under "Detected Contaminants Health Effects Language and Corrective Actions" section	N	Human and animal fecal waste.



## Contaminants Tables

TURBIDITY						
Contaminant	MCL	MCLG	Level Detected	Sample Date	Violation Y/N	Source of Contamination
Turbidity	TT=1 NTU for a single measurement	0	0.352	6/19/18	N	Soil runoff
	TT= at least 95% of monthly samples $\leq$ 0.3 NTU		N/A	N/A	N	

TOTAL ORGANIC CARBON (TOC)					
Contaminant	Range of % Removal Required	Range of percent removal achieved	Number of quarters out of compliance	Violation Y/N	Sources of Contamination
TOC	35%	45 – 51%	0	N	Naturally present in the environment



A Source Water Assessment of PWSA's intake water (located on the Allegheny River) was completed in 2010 by the PADEP. The Assessment has found that our source water is potentially most susceptible to road deicing materials, accidental spills along railroad tracks, and leaks from submerged pipelines and storage tanks. Overall, the Allegheny River Watershed has a moderate risk of significant contamination. Summary reports are available on the PADEP website at: [www.depgreenport.state.pa.us/eLibrary/GetFolder?FolderID=4492](http://www.depgreenport.state.pa.us/eLibrary/GetFolder?FolderID=4492) and then selecting "Pittsburgh Water and Sewer Authority.pdf" file in the list or by writing to the PADEP at 400 Waterfront Dr., Pittsburgh, PA 15222. Complete reports were distributed to municipalities, water supplier, local planning agencies and PADEP regional Office, Records management Unit at 412.442.4217.

## Other Violations

1. In 2018, PWSA received late reporting violations for the second quarter of Total Alkalinity. The monitoring was conducted correctly, but the results were reported late to the DEP.
2. Because the test results for lead have exceeded the action level of 15 ppb in some sets of tests, PWSA has been required to replace 7% of system-owned lead service lines per year, starting on July 1, 2016. (See discussion of lead on page 5). PWSA did not replace the required number of lines by June 30, 2017 and June 30, 2018. In November of 2017, PWSA entered into a Consent Order and Agreement with PADEP that set revised deadlines for the replacement requirements for these years. PWSA replaced more than the required number of lines by the revised deadlines, June 30, 2018 and December 31, 2018.

## Abbreviations & Definitions

### (ND) Non-Detect

Laboratory analysis indicates that the contaminant is not present at a detectable level.

### (ppm or mg/L) Parts Per Million or Milligrams Per Liter

One part per million corresponds to one minute in two years or a single penny in \$10,000.

### (ppb or µg/L) Parts Per Billion or Micrograms Per Liter

One part per billion corresponds to one minute in 2000 years or a single penny in \$10,000,000.

### (Mrem/year) Millirems Per Year

A measure of radiation absorbed by the body.

### (pCi/L) Picocuries Per Liter

A measure of radioactivity.

### (NTU) Nephelometric Turbidity Unit

Measurement of the clarity of water. Turbidity in excess of 5 NTU becomes just barely noticeable to the average person.

### (AL) Action Level

The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

### (TT) Treatment Technique

A required process intended to reduce the level of a contaminant in drinking water.

### (N/A) Non-Applicable

Does not apply.

### (MCLG) Maximum Contaminant Level Goal

The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

### (MCL) Maximum Contaminant Level

The highest level of a contaminant allowed in drinking water. MCLs are set as close to the MCLGs as feasible, using the best available treatment technology.

### (MRDLG) Maximum Residual Disinfectant Level Goal

The level of drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

### (MRDL) Maximum Residual Disinfectant Level

The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

### (MinRDL) Minimum Residual Disinfectant Level

The minimum level of residual disinfectant required at the entry point to the distribution system.

### Level 1 Assessment

A Level 1 assessment is a study of the water system to identify potential problems and determine (if possible) why total coliform bacteria have been found in our water system.

### Level 2 Assessment

A Level 2 assessment is a very detailed study of the water system to identify potential problems and determine (if possible) why an *E. coli* MCL violation has occurred and/or why total coliform bacteria have been found in our water system on multiple occasions.





## What Do the Results Mean?

We are proud that your drinking water meets or surpasses all Federal and State requirements. We have learned through our monitoring and testing that some constituents have been detected but are below the recommended minimum contaminant level (MCL) and therefore meet the regulatory requirements.

## Stay Informed

Update your contact information and stay informed. It's important that your contact information is up to date so that we can notify you about planned construction, water emergencies, extended water outages, and provide other safety information. PWSA encourages all customers to provide updated contact information by going to our website at [pgh20.com](http://pgh20.com) and selecting "Update Contact Info" or by calling PWSA Customer Service at 412.255.2423. This information ensures that we are able to make direct contact in the event of an emergency.



**TAB**

**13**

**X. BALANCE SHEET**

X.1. Provide a comparative balance sheet for the historic test year-end and the preceding year-end.

**RESPONSE:**

Please see 53.52.c.2.

**X. BALANCE SHEET**

X.2. Provide a detail of other physical property, investments in affiliated companies and other investments.

**RESPONSE:**

PWSA is currently in compliance with 52 Pa. Code, § 65.16 System of Accounts. PWSA has mapped the current Chart of Accounts to provide reports and other required financial information in conformity with the most recent Uniform System of Accounts for Class A Water Utilities.

**X. BALANCE SHEET**

X.3. Provide the amounts and purpose of special cash accounts as of the historic test year-end.

**RESPONSE:**

PWSA does not have any special cash accounts.

**X. BALANCE SHEET**

X.4. Describe the nature and amounts of notes receivable, accounts receivable from associated companies, and any other receivables, other than customers' accounts, greater than 15% of the total. Limit the explanation to variances greater than \$10,000.

**RESPONSE:**

PWSA does not have any notes receivable or accounts receivable from associated companies. Other receivables account for 10.03% of total receivables balance with the rest attributable to billed and unbilled water, wastewater, and wastewater treatment charges from customers.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**X. BALANCE SHEET**

X.5. Provide the amount of accumulated reserve for uncollectible accounts, method and rate of accrual, amounts accrued and amounts written-off in each of the last 3 years.

**RESPONSE:**

PWSA maintains a reserve for uncollectible accounts. This reserve, based on an analytical review of outstanding accounts and historical collection data, is recognized coincident with recognition of revenue. PWSA has rights to utilize collection agencies, service terminations, liens, and real property sales to protect its interests, limit further losses, and motivate payments from delinquent customers. Due to this leverage, PWSA's current policy is not to write off bad debts. The table below shows the amounts accrued over the last three years.

	<b>Per Books 12/31/2017</b>	<b>Per Books 12/31/2018</b>	<b>Unaudited 12/31/2019</b>
Water & Sewer Conveyance	\$22,007,645	\$19,746,025	\$21,114,602
Sewer Treatment	11,853,005	10,609,311	11,341,158
<b>Total</b>	<b>\$33,860,650</b>	<b>\$30,355,336</b>	<b>\$32,455,761</b>



**X. BALANCE SHEET**

X.6. Provide a list of prepayments and give an explanation of special prepayments.

**RESPONSE:**

Please see the table below.

<b>Prepaid Expense</b>	<b>Amount</b>	<b>Paid</b>	<b>Cost Period</b>
Prepaid Postage Level One	224,104.70	Dec 2019	2020
Prepaid Postage Pitney	40,000.00	Dec 2019	2020
Cogsdale Licensing	268,177.66	Dec 2019	2020
Microsoft Licensing	138,674.94	Dec 2019	2020
Sensus Annual Fee	35,437.50	Mar 2019	3 months of 2020
<b>Total</b>	<b>706,394.80</b>		

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**X. BALANCE SHEET**

X.7. Break down and explain in detail any significant items, greater than 15% of the total, in the current assets account listed on the balance sheet. Limit the explanation to variances greater than \$10,000.

**RESPONSE:****Cash and Cash Equivalents****2018: \$46,920,000**

The Authority's cash and cash equivalents are considered to be cash on hand, demand deposits, and all highly liquid investments, both restricted and unrestricted, with maturity of three months or less at date of purchase.

**Accounts Receivable: Water and Wastewater Treatment****2018: \$29,363,000**

Accounts receivables consist of monies owed to PWSA for services provided. Customers are billed on a monthly billing cycle by the Authority based on actual or estimated meter readings. The Authority recognizes unbilled accounts receivable for water service provided prior to year-end that is billed during the following year. Accounts receivable, both billed and unbilled, are divided by water (which includes wastewater conveyance) and wastewater treatment. Accounts receivable are presented net of a reserve for uncollectible amounts

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**X. BALANCE SHEET**

X.8. Explain in detail, including the amount and purpose, the deferred asset accounts that currently operate to affect or will at a later date affect the operating account supplying:

- a. Origin of these accounts.
- b. Probable changes to this account in the near future.
- c. Amortization of these accounts currently charged to operations or to be charged in the near future.

**RESPONSE:**

PWSA maintains various swap agreements that represent deferred outflows and/or inflows. The follow excerpts have been extracted from PWSA's 2017 Financial Statements and Required Supplementary and Supplementary Information.

- a. During fiscal year 2017, the Authority restructured three pay-fixed, receive-variable interest rate swap contracts. The original interest rate swaps were effective June 12, 2008. Beginning December 28, 2017, the Authority will make semi-annual interest payments on the 1st of each March and September through September 1, 2039 (two swaps); and, September 1, 2040 (for one swap), respectively. The Counterparties make monthly interest payments on the 1st of each calendar month, which begin February 2018 through September 1, 2039 for two of the swaps; and, September 1, 2040 for one swap.

The intention of the 2017 swaps restructuring is to effectively change the Authority's variable interest rate on the \$216,720,000, Water and Sewer System First Lien Revenue Refunding Bonds Series C of 2017 with notional amounts of \$71,225,000, \$72,747,500, and \$72,747,500 to fixed rates of 3.8255%, 3.770%, and 3.7835%, respectively. The bonds will accrue interest at a weekly rate that is determined by a remarketing agent on each effective rate date. The interest rate on the bonds may not exceed 12%. Per the interest rate swap agreements, the Authority will receive 70% of one-month LIBOR.

The interest payments on the interest rate swaps are calculated based on notional amounts, all of which reduce beginning on September 2032, so that the notional amounts approximate the principal outstanding on the respective bonds. The interest rate swaps expire consistent with the final maturity of the respective bonds.

- b. The Water and Sewer System First Lien Revenue Refunding Bonds Series C of 2017 were issued with a mandatory tender date of December 1, 2020. A mandatory tender requires that the Authority purchase the bonds on the tender date with proceeds from a remarketing, which could be from another public offering or a private bank loan. The outcome of this transaction

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**X. BALANCE SHEET**

could impact this account in the near future. However, there is no way to determine what the impact will be until after the transaction is completed.

- c. During the years ended December 31, 2017 and 2016, the Authority paid \$12,512,000 and \$13,418,000, respectively, fixed and received \$2,467,000 and \$1,227,000, respectively, variable related to their outstanding swap agreements.

Current period changes in fair value for the interest rate swaps that are accounted for as hedges are recorded on the statements of net position as an adjustment to deferred outflows. Additionally, current period changes in fair value for the interest rate swap accounted for as an investment is recorded on the statements of revenues, expenses, and changes in net position as a component of investment income.

Through the use of derivative instruments such as interest rate swaps, the Authority is exposed to a variety of risks, including credit risk, interest rate risk, termination risk, basis risk, and rollover risk. A detailed description, valuation, and amortization, and associated risks can be found in PWSA's 2017 Audit report (FR VII.15).

**X. BALANCE SHEET**

X.9. Explain the nature of accounts payable to associated companies. Provide a breakdown by category.

**RESPONSE:**

PWSA has no associated companies.

**X. BALANCE SHEET**

X.10. Provide breakdown and explanation of other deferred credits as to their origin and disposition policy, for example, amortization.

**RESPONSE:****Deferred Charge on Refunding**

The Authority has recorded a deferred charge on refunding, which is shown as a deferred outflow of resources on the statements of net position.

<b>Balance at 12/31/2017</b>	<b>Additions</b>	<b>Amortization</b>	<b>Balance at 12/31/2018</b>
\$ 110,326,000	\$ 0	\$ 7,792	\$ 102,534,000

**Interest Rate Swaps**

The aggregate change in fair value during the year for hedging derivatives is reported on the statement of net position as a deferred outflow and swap borrowing and the investment derivative is considered an ineffective hedging derivative, whereby the change in fair value will be reported as a change in fair value of swap on the statement of revenues, expenses and changes in net position. A detailed description, valuation, and amortization, and associated risks can be found in PWSA's 2018 Audit report (FR VII.15).

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**X. BALANCE SHEET**

X.11. Provide an explanation and method of funding of any reserves, other than depreciation and bad debt appearing on historic balance sheet.

**RESPONSE:****Operating Reserve Fund****2018 Audit: \$15,792,000**

PWSA is required by the 2017 Trust Indenture to maintain and fully fund an operating reserve. Per the indenture, monies in the Operating Reserve Fund can be used by PWSA to pay for the Current Expenses of the Authority. To the extent the Debt Service Fund is insufficient to make the required interest in principals on Senior Debt, monies in the operating reserve fund can be used. PWSA is required to maintain one sixth (1/6<sup>th</sup>) of the Current Expenses reflected in the most recent annual audited financial statements of the Authority. PWSA funds this reserve using cash generated from operations and has included a deposit in the FPPTY revenue requirement

**X. BALANCE SHEET**

X.12. Provide an analysis of unappropriated retained earnings for the historic test year and 2 preceding years.

**RESPONSE:**

PWSA does not have unappropriated retained earnings. Any revenues collected in excess of system costs are deposited into cash account for payment of future operating and non-operating costs.



**X. BALANCE SHEET**

X.13. Describe the purpose of any advances made by the company to its parent corporation and describe all terms and conditions associated with such advances, including an estimate of future advances or repayments that are expected to occur.

**RESPONSE:**

Not applicable.

**TAB**

**14**

Pittsburgh Water and Sewer Authority's Base Rate Filing

**XI. OTHER DATA**

XI.1. Provide the company's monthly balance sheets and income statements for each month of the historic and future test year.

**RESPONSE:**

Please see schedules attached.

Pittsburgh Water and Sewer Authority's Base Rate Filing

**XI. OTHER DATA**

XI.2. Supply a copy of internal and independent audit reports of the historic test year and prior calendar year, noting any exceptions and recommendations and disposition thereof.

**RESPONSE:**

Please refer to FR VII.15 for the December 31, 2018 and 2017 audited financial statements.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**XI. OTHER DATA**

XI.3. Provide all monthly or quarterly, or both, budget variance reports to management, or the board of directors, or both, submitted during the past year. Please provide the most recent detailed budget variance report which the company compiled, and update as additional reports are issued.

**RESPONSE:**

Please see attached.

Pittsburgh Water and Sewer Authority's Base Rate Filing

**XI. OTHER DATA**

XI.4. Provide a copy of the company's most recent operating and capital budgets.

**RESPONSE:**

Please see attached.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**XI. OTHER DATA**

XI.5. Provide a schedule that shows the percentage of unaccounted for water for the test year and 2 prior years. Describe how this amount was determined and explain any steps taken to reduce unaccounted for water. Provide a similar analysis of infiltration for wastewater utilities.

**RESPONSE:**

PWSA has had significant problems with high levels of unaccounted for water and with sewer infiltration. Estimates for unaccounted for water are in excess of 50%. PWSA has developed a plan to accurately meter production and pumping and storage locations as part of a comprehensive non-revenue water reduction plan. PWSA is also developing a plan to reduce inflow and infiltration. Additional details on the plan are included in the Compliance Plan.

## Pittsburgh Water and Sewer Authority's Base Rate Filing

**XI. OTHER DATA**

XI.6. Provide a corporate history (include the dates of original incorporation, subsequent mergers, or acquisitions, or both). Indicate all counties and cities and other governmental subdivisions to which service is provided, including service areas outside the state, and the total population in the area served.

**RESPONSE:**

Please see attached.



## Pittsburgh Water and Sewer Authority's Base Rate Filing

**XI. OTHER DATA****PWSA Corporate History**

*Published in the Official Statement for Water and Sewer System First Lien Revenue Bonds, Series A of 2019, Water and Sewer System Subordinate Revenue Refunding bonds, Series B of 2019*  
Official Statement

The Authority is a body corporate and politic organized and existing under the Act pursuant to resolution No. 36 of the Council of the City of Pittsburgh (the "City"), duly enacted on February 6, 1984, approved by the Mayor on February 8, 1984, and effective February 16, 1984. The Secretary of the Commonwealth of Pennsylvania approved the Authority's Articles of Incorporation and issued a Certificate of Incorporation on February 17, 1984. Articles of Amendment were approved and a Certificate of Amendment was issued by the Pennsylvania Department of State on December 11, 1989, to include, among authorized projects, low head dams and facilities for generating surplus electric power. Articles of Amendment were approved and a Certificate of Amendment was issued by the Pennsylvania Department of State on May 9, 2008, to extend the term of existence of the Authority to May 21, 2045.

Under its Articles of Incorporation, the Authority is specifically authorized to acquire, hold, construct, finance, improve, maintain, operate, own and lease, either as lessor or lessee, projects of the following kinds and character: sewers, sewer systems or parts thereof, waterworks, water supply works, and water distribution systems, low head dams and facilities for generating surplus power.

The System provides water to approximately 81,000 customers or 84% of the total population in the geographic boundaries of the City. The Authority provides wastewater collection and transmission service to almost the entire City, estimated at 306,000 residents. The System does not include wastewater treatment facilities; such facilities are the responsibility of Allegheny County Sanitary Authority ("ALCOSAN"), a separate and distinct legal entity.

The Authority operates and maintains a 117 million gallon per day (MGD) rapid sand type treatment plant, a 26 MGD microfiltration plant, approximately 964 miles of water mains, over 32,000 valves and fire hydrants, 1 raw water pump station, 10 finished water pump stations, 4 in-ground reservoirs, 10 storage tanks, approximately 1,220 miles of sanitary, storm and combined sewers, 29,000 manholes, 30,000 catch basins and inlets, 38 combined sewer overflow outfalls, 185 storm outfalls, and four wastewater pump stations.

**Pittsburgh Water & Sewer Authority**  
**Monthly Income Statements - HTY (2019)**

Monthly Profit / Loss	Per Books 1/31/2019	Per Books 2/28/2019	Per Books 3/31/2019	Per Books 4/30/2019	Per Books 5/31/2019	Per Books 6/30/2019	Per Books 7/31/2019	Per Books 8/31/2019	Per Books 9/30/2019	Per Books 10/31/2019	Per Books 11/30/2019	Per Books 12/31/2019
<b>REVENUES</b>												
Utility Revenue	\$ (17,503,821)	\$ (17,517,706)	\$ (18,634,520)	\$ (19,975,259)	\$ (18,541,527)	\$ (21,711,417)	\$ (22,483,363)	\$ (20,788,037)	\$ (23,977,001)	\$ (22,913,975)	\$ (20,633,780)	\$ (17,970,877)
Fee Revenue	(625,594)	(72,494)	(272,036)	(514,679)	(486,430)	(390,048)	(333,603)	(213,409)	(116,198)	(148,812)	(1,867,305)	(404,279)
Misc Revenue	(64,676)	4,439	(370,995)	(50,849)	(107,894)	(37,589)	(45,902)	(56,736)	(45,951)	(52,654)	(41,010)	(84,007)
Interest Income (NonTrust)	-	-	-	-	-	-	-	-	-	-	-	-
Interest Income (Trust)	(75,204)	(28,944)	(75,337)	(66,359)	(67,071)	(67,477)	(67,167)	(50,403)	(93,622)	(47,518)	(41,482)	(38,280)
Other Income	(10,000)	-	-	(36,567)	(353,188)	(433,025)	3,157,175	(722,931)	(646,805)	(926,691)	(50,000)	(2,829,858)
Gain/Loss on Asset Disposal	-	-	-	-	-	-	-	-	-	-	-	-
Revenues Total	<u>\$ (18,279,296)</u>	<u>\$ (17,614,706)</u>	<u>\$ (19,352,889)</u>	<u>\$ (20,643,713)</u>	<u>\$ (19,556,110)</u>	<u>\$ (22,639,556)</u>	<u>\$ (19,772,860)</u>	<u>\$ (21,831,516)</u>	<u>\$ (24,879,576)</u>	<u>\$ (24,089,649)</u>	<u>\$ (22,633,578)</u>	<u>\$ (21,327,300)</u>
<b>EXPENSES</b>												
Salaries & Benefits												
Salaries Expense	\$ 2,235,985	\$ 1,630,910	\$ 1,563,979	\$ 1,602,868	\$ 1,658,357	\$ 1,646,904	\$ 2,524,901	\$ 1,682,011	\$ 1,711,611	\$ 1,687,368	\$ 1,710,195	\$ 2,168,395
Other Employee Expenses	820,277	535,145	407,121	471,611	522,248	504,699	571,364	554,963	529,233	540,198	519,252	695,166
Salaries & Benefits Total	3,056,261	2,166,054	1,971,100	2,074,479	2,180,605	2,151,602	3,096,265	2,236,975	2,240,843	2,227,566	2,229,447	2,863,560
Direct Operating Expenses												
Chemical Costs	131,423	435,463	306,333	501,814	330,842	477,484	350,374	265,473	525,643	286,644	473,033	393,790
Equipment Costs	224,044	714,532	1,151,161	503,182	285,077	549,065	388,928	312,446	300,878	511,992	170,148	868,912
Material Costs	53,142	38,133	50,814	48,781	28,193	30,004	47,063	48,567	43,905	44,202	21,765	71,478
Operating Contracts	6,849,798	5,954,860	6,770,830	7,623,684	5,790,657	7,934,959	7,596,936	7,675,095	8,633,861	8,527,592	7,673,899	9,017,427
Repairs and Maintenance	515,750	295,534	279,718	176,134	162,761	516,485	954,742	1,018,728	762,903	1,168,840	638,841	3,244,310
Misc Direct Operating Costs	43,014	33,788	69,472	67,118	11,580	28,223	65,079	371,953	121,820	63,330	76,180	96,505
Inventory Exp - Castings	-	-	-	149,754	13,733	11,165	(44,588)	9,262	5,404	16,224	52,517	6,094
Inventory Exp - Clarifier	-	-	-	-	-	-	-	-	-	-	-	-
Inventory Exp - Equipment	4,945	4,584	2,684	14,228	3,841	4,459	18,737	10,086	9,703	1,660	44,140	2,990
Inventory Exp - Hardware	67,331	31,373	8,388	271,544	43,527	28,801	115,999	76,195	52,881	58,597	91,262	41,681
Inventory Exp - Heavy Equip	(643)	17	-	828	-	18	-	366	-	24	778	2,474
Inventory Exp - Misc	5,551	3,149	5,499	21,179	4,968	24,705	17,079	5,755	14,315	6,795	24,026	7,111
Inventory Exp - Parts	(1,826)	6,226	8,606	20,481	17,530	5,649	21,237	8,685	10,822	25,107	32,543	15,140
Inventory Exp - Pipe	2,168	1,476	3,216	47,999	6,175	5,069	7,801	19,659	16,508	24,499	54,971	57,786
Inventory Exp - Valves	168	2,193	(2,781)	81,055	27,512	20,322	(15,235)	82,253	19,599	19,621	14,681	8,615
Direct Operating Expenses Total	7,894,864	7,521,326	8,653,940	9,527,782	6,726,397	9,636,407	9,524,152	9,904,523	10,518,241	10,755,127	9,368,782	13,834,311
General & Administrative												
Admin Fees	80,056	84,074	73,855	112,107	30,171	35,796	150,455	69,930	71,697	84,695	80,093	83,606
Freight and Postage	40,654	28,129	115,904	7,978	2,980	144,919	26,681	42,777	107,863	27,536	4,073	120,534
Leases and Rent	90,637	100,700	238,263	83,282	103,874	92,538	83,737	98,366	92,759	146,956	85,241	31,915
Professional Services	592,818	816,161	1,199,777	455,515	1,152,967	1,150,686	3,801,239	1,570,473	1,755,033	1,526,226	1,106,228	5,087,542
Supplies	20,642	69,921	53,418	22,145	44,804	41,909	40,322	46,619	54,470	69,888	60,127	53,291
Travel and Training	7,532	6,063	5,023	6,561	19,863	6,103	33,147	6,404	4,042	11,929	81,297	8,632
Utility Expense	347,751	369,584	484,190	412,994	418,645	367,889	394,986	345,175	374,335	424,863	432,982	552,102
Admin Misc	50,660	174,413	54,036	63,901	18,820	17,794	9,239	285,021	(63,310)	41,966	231,261	14,619,992
General & Administrative Total	1,230,750	1,649,044	2,224,465	1,164,484	1,792,125	1,857,634	4,539,806	2,464,764	2,396,889	2,334,059	2,081,301	20,557,616
Other Expenses												
Other Expenses - City	-	4,007,008	-	-	-	-	-	-	-	-	-	(2,016,358)
Other Expenses - Non-City	186,758	260,406	262,660	183,526	37,154	82,839	56,310	36,201	89,085	37,867	97,090	8,073
Depreciation Expense	1,500,348	1,500,309	1,500,282	1,500,257	1,500,225	1,500,225	1,500,225	1,500,225	1,500,225	1,500,183	1,498,940	1,508,791
Interest Expense	3,104,569	3,119,769	3,093,810	3,179,200	3,129,997	3,531,815	2,718,457	2,465,352	2,646,051	3,278,245	3,292,678	5,179,009
Other Expenses Total	4,791,675	8,887,492	4,856,751	4,862,983	4,667,376	5,114,879	4,274,992	4,001,778	4,235,361	4,816,295	4,888,708	4,679,515
Expenses Total	<u>\$ 16,973,551</u>	<u>\$ 20,223,917</u>	<u>\$ 17,706,256</u>	<u>\$ 17,629,728</u>	<u>\$ 15,366,503</u>	<u>\$ 18,760,523</u>	<u>\$ 21,435,214</u>	<u>\$ 18,608,040</u>	<u>\$ 19,391,334</u>	<u>\$ 20,133,048</u>	<u>\$ 18,568,239</u>	<u>\$ 41,935,002</u>
(Profit) / Loss	\$ (1,305,745)	\$ 2,609,211	\$ (1,646,633)	\$ (3,013,985)	\$ (4,189,606)	\$ (3,879,034)	\$ 1,662,355	\$ (3,223,476)	\$ (5,488,242)	\$ (3,956,601)	\$ (4,065,339)	\$ 20,607,702

**Pittsburgh Water & Sewer Authority**  
**Monthly Income Statements - FTY (2020)**

<b>Monthly Profit / Loss</b>	<b>Per Books 1/31/2020</b>
<b>REVENUES</b>	
Utility Revenue	\$ (19,053,818)
Fee Revenue	(200,886)
Misc Revenue	(49,019)
Interest Income (NonTrust)	-
Interest Income (Trust)	(35,079)
Other Income	(985,053)
Gain/Loss on Asset Disposal	-
Revenues Total	<u>\$ (20,323,856)</u>
<b>EXPENSES</b>	
Salaries & Benefits	
Salaries Expense	\$ 1,791,602
Other Employee Expenses	552,446
Salaries & Benefits Total	2,344,048
Direct Operating Expenses	
Chemicals Costs	345,699
Equipment Costs	194,407
Material Costs	36,659
Operating Contracts	6,588,064
Repairs and Maintenance	184,104
Misc Direct Operating Costs	66,154
Inventory Exp - Castings	470
Inventory Exp - Clarifier	-
Inventory Exp - Equipment	6,821
Inventory Exp - Hardware	34,861
Inventory Exp - Heavy Equip	-
Inventory Exp - Misc	4,866
Inventory Exp - Parts	12,251
Inventory Exp - Pipe	46,218
Inventory Exp - Valves	6,322
Direct Operating Expenses Total	7,526,893
General & Administrative	
Admin Fees	91,127
Freight and Postage	6,003
Leases and Rent	224,729
Professional Services	2,110,973
Supplies	80,414
Travel and Training	4,352
Utility Expense	92,430
Admin Misc	48,660
General & Administrative Total	2,658,687
Other Expenses	
Other Expenses - City	-
Other Expenses - Non.City	76,427
Depreciation Expense	1,600,000
Interest Expense	3,774,996
Other Expenses Total	5,451,423
Expenses Total	<u>\$ 17,981,052</u>
(Profit) / Loss	\$ (2,342,804)

**Pittsburgh Water & Sewer Authority**  
**Monthly Balance Sheets - HTY (2019)**

	Per Books 1/31/2019	Per Books 2/28/2019	Per Books 3/31/2019	Per Books 4/30/2019	Per Books 5/31/2019	Per Books 6/30/2019	Per Books 7/31/2019	Per Books 8/31/2019	Per Books 9/30/2019	Per Books 10/31/2019	Per Books 11/30/2019	Per Books 12/31/2019
<b>ASSETS</b>												
Current Assets												
Cash	\$ 45,712,818	\$ 19,924,826	\$ 16,645,563	\$ 13,861,826	\$ 18,087,744	\$ 31,981,182	\$ 32,981,642	\$ 14,167,025	\$ 15,793,330	\$ 16,297,755	\$ 13,359,239	\$ 64,679,734
Short-Term Investments	-	-	-	-	-	-	-	-	-	-	-	-
Accounts Receivable	27,193,181	28,490,994	29,443,003	29,077,614	26,461,392	32,083,064	28,302,780	26,722,638	30,232,804	28,226,064	31,918,027	21,079,128
Inventory	2,080,475	2,210,918	2,252,902	1,836,795	1,971,937	1,979,985	1,973,078	1,952,357	1,981,567	2,019,671	1,664,671	1,597,707
Other Assets	7,776,401	7,752,674	7,749,044	7,609,962	6,759,619	5,635,984	2,986,168	1,111,846	(565,363)	(2,967,307)	(2,968,607)	6,710,559
Current Assets Total	82,762,875	58,379,413	56,090,512	52,386,197	53,280,691	71,680,215	66,243,667	43,953,866	47,442,338	43,576,183	43,973,331	94,067,128
Trusteed Funds												
Trusteed Funds	19,650,210	41,997,516	29,991,267	30,254,060	30,585,127	30,742,194	30,054,323	52,553,289	20,466,849	20,748,573	20,962,647	39,316,355
Trusteed Funds Total	19,650,210	41,997,516	29,991,267	30,254,060	30,585,127	30,742,194	30,054,323	52,553,289	20,466,849	20,748,573	20,962,647	39,316,355
Long-Term Assets												
Construction In Progress	148,250,896	153,099,729	159,334,009	168,613,115	175,483,460	186,265,538	193,016,632	200,572,658	209,072,579	218,375,616	228,714,196	139,334,274
Utility Assets	919,999,192	919,999,192	919,999,192	919,999,192	919,999,192	919,999,192	919,999,192	919,999,192	919,999,192	919,999,192	919,999,192	998,895,442
Accum Depr - Utility Assets	(309,384,208)	(310,828,877)	(312,273,519)	(313,718,135)	(315,162,720)	(316,607,304)	(318,051,889)	(319,496,473)	(320,941,058)	(322,385,601)	(323,828,901)	(308,927,374)
Non-Utility Assets	23,817,579	23,817,579	23,817,579	23,817,579	23,817,579	23,817,579	23,817,579	23,817,579	23,817,579	23,817,579	23,817,579	12,180,991
Accum Depr - Non-Utility Assets	(17,756,953)	(17,812,593)	(17,868,233)	(17,923,873)	(17,979,513)	(18,035,153)	(18,090,793)	(18,146,433)	(18,202,074)	(18,257,714)	(18,313,354)	(6,856,975)
Bond Issue Costs	(1,488)	(1,488)	(1,488)	(1,488)	(1,488)	(1,488)	(1,488)	(1,488)	(1,488)	(1,488)	(1,488)	(1,488)
Long-Term Assets Total	764,925,019	768,273,544	773,007,541	780,786,391	786,156,511	795,438,365	800,689,234	806,745,036	813,744,732	821,547,585	830,387,225	834,624,871
Assets Total	\$ 867,338,104	\$ 868,650,472	\$ 859,089,320	\$ 863,426,649	\$ 870,022,329	\$ 897,860,773	\$ 896,987,225	\$ 903,252,191	\$ 881,653,919	\$ 885,872,342	\$ 895,323,203	\$ 968,008,355
<b>LIABILITIES &amp; EQUITY</b>												
Current Liabilities												
Current Maturities of Long-Term Debt	\$ (23,115,581)	\$ (22,830,730)	\$ (22,545,426)	\$ (22,259,697)	\$ (21,973,585)	\$ (21,692,704)	\$ (21,445,113)	\$ (21,197,158)	\$ (20,948,836)	\$ (20,700,147)	\$ (20,451,091)	\$ (27,021,916)
Accounts Payable	(4,377,524)	(5,761,836)	(5,822,192)	(5,216,964)	(4,893,909)	(6,389,769)	(4,640,492)	(4,615,219)	(7,116,732)	(5,149,090)	(6,855,762)	(4,046,877)
Accrued Payroll	(1,544,085)	(1,755,319)	(1,313,226)	(1,681,467)	(1,622,829)	(1,248,197)	(1,646,851)	(1,626,425)	(1,594,281)	(1,584,306)	(1,137,114)	(989,879)
AP From Trusteed Funds	(6,846,095)	(9,063,170)	1,500,153	(716,922)	(2,933,997)	(5,151,072)	(7,266,413)	(9,381,754)	1,168,887	(1,766,133)	(4,701,153)	(9,618,130)
AP Retainage	-	-	-	-	-	-	-	-	-	-	-	-
Other Current Liabilities	(43,908,551)	(43,998,247)	(43,716,844)	(42,896,519)	(42,594,224)	(41,863,723)	(39,114,188)	(38,282,306)	(37,626,379)	(34,598,708)	(35,857,260)	(44,413,418)
Current Liabilities Total	(79,791,836)	(83,409,302)	(71,897,536)	(72,771,570)	(74,018,543)	(76,345,466)	(74,113,058)	(75,102,861)	(66,117,340)	(63,798,384)	(69,002,380)	(86,090,220)
Long-Term Liabilities												
Long-Term Debt	(784,008,239)	(784,313,859)	(784,619,479)	(785,069,985)	(786,230,470)	(807,864,241)	(810,886,433)	(812,938,509)	(794,838,467)	(797,420,755)	(797,603,494)	(874,200,587)
Other LT Liabilities	(6,591,477)	(6,589,695)	(6,587,913)	(6,586,131)	(6,584,349)	(6,582,567)	(6,580,785)	(6,579,003)	(6,577,221)	(6,575,439)	(6,573,657)	(6,181,506)
Long-Term Liabilities Total	(790,599,716)	(790,903,554)	(791,207,392)	(791,656,116)	(792,814,818)	(814,446,807)	(817,467,218)	(819,517,512)	(801,415,687)	(803,996,194)	(804,177,150)	(880,382,093)
Equity												
Contributed Capital	(5,277,000)	(5,277,000)	(5,277,000)	(5,277,000)	(5,277,000)	(5,277,000)	(5,277,000)	(5,277,000)	(5,277,000)	(5,277,000)	(5,277,000)	(5,277,000)
Net investment in capital assets	10,551,138	10,551,138	10,551,138	10,551,138	10,551,138	10,551,138	10,551,138	10,551,138	10,551,138	10,551,138	10,551,138	10,551,138
Equity Total	5,274,138	5,274,138	5,274,138	5,274,138	5,274,138	5,274,138	5,274,138	5,274,138	5,274,138	5,274,138	5,274,138	5,274,138
Net (Profit) or Loss	(1,305,745)	1,303,466	(343,167)	(3,357,152)	(7,546,758)	(11,425,792)	(9,763,437)	(12,986,913)	(18,475,155)	(22,431,756)	(26,497,095)	(5,889,393)
Liabilities & Equity Total	\$ (866,423,158)	\$ (867,735,251)	\$ (858,173,956)	\$ (862,510,699)	\$ (869,105,982)	\$ (896,943,926)	\$ (896,069,574)	\$ (902,333,148)	\$ (880,734,045)	\$ (884,952,196)	\$ (894,402,487)	\$ (967,087,567)

**Pittsburgh Water & Sewer Authority**  
**Monthly Balance Sheets - FTY (2020)**

FR-XL.1

	<b>Per Books</b>
	<b>1/31/2020</b>
<b>ASSETS</b>	
Current Assets	
Cash	\$ 66,658,777
Short-Term Investments	-
Accounts Receivable	23,845,153
Inventory	1,662,609
Other Assets	4,535,993
Current Assets Total	96,702,533
Trusteed Funds	
Trusteed Funds	39,361,764
Trusteed Funds Total	39,361,764
Long-Term Assets	
Construction.In.Progress	143,437,708
Utility Assets	998,895,442
Accum Depr - Utility Assets	(308,927,374)
Non.Utility Assets	12,180,991
Accum Depr - Non.Utility Assets	(6,856,975)
Bond Issue Costs	(1,488)
Long-Term Assets Total	838,728,304
Assets Total	<u>\$ 974,792,601</u>
<b>LIABILITIES &amp; EQUITY</b>	
Current Liabilities	
Current Maturities of Long-Term Debt	\$ (26,653,544)
Accounts Payable	(5,860,621)
Accrued Payroll	(898,672)
AP From Trusteed Funds	(9,618,130)
AP Retainage	-
Other Current Liabilities	(40,328,271)
Current Liabilities Total	(83,359,238)
Long-Term Liabilities	
Long-Term Debt	(876,372,742)
Other LT Liabilities	(6,181,506)
Long-Term Liabilities Total	(882,554,247)
Equity	
Contributed Capital	(5,277,000)
Net Investment in capital assets	4,661,286
Equity Total	(615,714)
Net (Profit) or Loss	(7,342,804)
Liabilities & Equity Total	<u>\$ (973,872,004)</u>

The Pittsburgh Water and Sewer Authority  
2018 & 2019 Financial Status Update (Cash Basis)  
As of January 31, 2019



	FY 2018			FY 2019			FY 2019			
	Prior Year-to-Date	Current Year-to-Date	YTD Growth	Actual	Forecast	Budget	2019 Difference		Forecast - Budget	
<b>Receipts</b>										
<u>User Charge &amp; Wholesale Receipts</u>										
Subtotal: User Charge & Wholesale Receipts	\$ 11,700,658	\$ 12,153,920	3.9%	\$ 163,733,064	\$ 185,782,957	\$ 183,756,758			\$ 2,026,199	
<u>Other Operating Receipts</u>										
Other Misc. and Fee Operating Receipts	\$ 776,619	\$ 363,460	-53.2%	\$ 4,511,969	\$ 5,325,318	\$ 5,412,936			\$ (87,618)	
ALCOSAN Collections	5,124,844	6,004,660	17.2%	69,376,086	76,844,407	74,971,805			1,872,602	
Subtotal: Other Operating Receipts	\$ 5,901,464	\$ 6,368,120	7.9%	\$ 73,888,055	\$ 82,169,725	\$ 80,384,741			\$ 1,784,984	
<b>Total: Receipts</b>	<b>\$ 17,602,122</b>	<b>\$ 18,522,039</b>	<b>5.2%</b>	<b>\$ 237,621,119</b>	<b>\$ 267,952,681</b>	<b>\$ 264,141,499</b>			<b>\$ 3,811,182</b>	
<b>Revenue Requirements</b>										
<u>Operating Expenses</u>										
Executive Director's Office	381,697	366,757	-3.9%	2,226,219	3,122,936	3,012,463			110,474	
Customer Service	799,507	576,989	-27.8%	7,782,837	6,715,879	7,622,863			(906,984)	
Management Information Systems	207,706	124,565	-40.0%	2,180,850	3,269,920	3,534,194			(264,274)	
Finance	218,361	135,381	-38.0%	3,811,480	4,336,386	4,618,298			(281,912)	
Procurement	27,786	32,369	16.5%	293,718	541,323	577,151			(35,828)	
Human Resources	41,525	326,154	685.4%	402,156	1,640,830	1,434,270			206,560	
Legal	204,820	84,310	-58.8%	3,244,746	2,655,916	2,822,799			(166,883)	
Warehouse	147,252	34,906	-76.3%	2,861,999	389,550	405,818			(16,269)	
External Affairs	47,526	86,969	83.0%	521,885	1,237,121	1,297,622			(60,501)	
Engineering & Construction	366,900	395,357	7.8%	7,040,127	15,459,071	16,640,577			(1,181,506)	
Environmental Compliance	37,614	65,874	75.1%	971,713	4,231,873	4,776,195			(544,323)	
General Administration	5,499	1,934	-64.8%	34,045	34,934	36,000			(1,066)	
Water Quality	110,566	134,630	21.8%	2,173,206	3,525,442	3,825,075			(299,633)	
Water Treatment Plant	1,514,305	1,377,403	-9.0%	16,839,719	20,645,446	21,315,738			(670,292)	
Water Distribution	1,978,426	1,796,651	-9.2%	18,733,620	23,677,077	24,004,868			(327,790)	
Sewer Operations	597,755	1,003,915	67.9%	10,171,195	15,751,690	15,903,795			(152,105)	
Direct Operating Expenses	\$ 6,687,246	\$ 6,544,167	-2.1%	\$ 79,289,514	\$ 107,235,394	\$ 111,827,727			\$ (4,592,333)	
ALCOSAN Expenses	7,086,696	7,733,639	9.1%	70,310,473	75,673,531	75,484,220			189,311	
Co-Op Agreement Op. Expenses - Water	1,787,500	-	n.a.	893,750	3,500,000	3,500,000			-	
Co-Op Agreement Op. Expenses - Sewer	-	-	-	893,750	3,500,000	3,500,000			-	
Non-City Water Subsidy	477,854	186,758	-60.9%	4,131,689	1,508,083	1,700,000			(191,917)	
In-Direct Operating Expenses	\$ 9,352,050.23	\$ 7,920,396.94	-15.3%	\$ 76,229,661.66	\$ 84,181,613.55	\$ 84,184,220.00			\$ (2,606)	
Subtotal: Operating Expenses	\$ 16,039,296	\$ 14,464,564	-9.8%	\$ 155,519,176	\$ 191,417,008	\$ 196,011,947			\$ (4,594,939)	
<u>Debt Service</u>										
Subtotal: Debt Service	\$ 1,079,108	\$ 896,237	-16.9%	\$ 43,777,607	\$ 57,861,675	\$ 58,115,307			\$ (253,632)	
<u>Transfers to Reserves</u>										
Subtotal: Transfers to Reserves	\$ 244,426	\$ 209,249	-14.4%	\$ 2,933,112	\$ 2,510,983	\$ 2,510,983			\$ -	
<b>Total: Revenue Requirements</b>	<b>\$ 17,362,830</b>	<b>\$ 15,570,049</b>	<b>-10.3%</b>	<b>\$ 202,229,894</b>	<b>\$ 251,789,666</b>	<b>\$ 256,638,237</b>			<b>\$ (4,848,571)</b>	
<b>Revenue Surplus / (Deficit)</b>	<b>\$ 239,292</b>	<b>\$ 2,951,990</b>		<b>\$ 35,391,225</b>	<b>\$ 16,163,015</b>	<b>\$ 7,503,262</b>			<b>\$ 8,659,753</b>	

**Financial Metrics\***

	FY 2018	FY 2019	FY 2019
	Actual	Forecast	Budget
Senior Debt Service Coverage	2.64	1.83	1.65
Minimum Requirement	1.25	1.25	1.25
Subordinate Debt Service Coverage	N/A	1.66	1.49
Minimum Requirement	N/A	1.10	1.10
Total Debt Service Coverage	2.08	1.44	1.29
Minimum Requirement	1.10	N/A	N/A
Unrestricted Cash without ALCOSAN Expense	199.03	189.96	173.50
Unrestricted Cash with ALCOSAN Expense	109.04	115.67	104.21
Unrestricted Cash including the Operating Reserve Fund	145.93	149.62	139.72

\*Cash basis estimate. Final audited coverage ratio could be different due to the use of the accrual basis accounting method.





The Pittsburgh Water and Sewer Authority  
2018 & 2019 Financial Status Update (Cash Basis)  
As of February 28, 2019



	FY 2018		FY 2019			FY 2018	FY 2019	FY 2019	2019 Difference
	Prior Year-to-Date	Current Year-to-Date	YTD Growth		Actual	Forecast	Budget	Forecast - Budget	
<b>Receipts</b>									
<u>User Charge &amp; Wholesale Receipts</u>									
Subtotal: User Charge & Wholesale Receipts	\$ 21,264,552	\$ 23,870,820	12.3%	\$	163,733,064	\$ 182,408,672	\$ 183,756,758	\$	(1,348,086)
<u>Other Operating Receipts</u>									
Other Misc. and Fee Operating Receipts	\$ 1,414,544	\$ 431,494	-69.5%	\$	4,511,969	\$ 4,942,274	\$ 5,412,936	\$	(470,662)
ALCOSAN Collections	10,347,799	10,538,879	1.8%	\$	69,376,086	75,221,501	74,971,805	\$	249,696
Subtotal: Other Operating Receipts	\$ 11,762,342	\$ 10,970,373	-6.7%	\$	73,888,055	\$ 80,163,775	\$ 80,384,741	\$	(220,966)
<b>Total: Receipts</b>	<b>\$ 33,026,894</b>	<b>\$ 34,841,193</b>	<b>5.5%</b>	<b>\$</b>	<b>237,621,119</b>	<b>\$ 262,572,447</b>	<b>\$ 264,141,499</b>	<b>\$</b>	<b>(1,569,052)</b>
<b>Revenue Requirements</b>									
<u>Operating Expenses</u>									
Executive Director's Office	684,767	749,690	9.5%		2,226,219	2,937,274	3,012,463		(75,189)
Customer Service	1,386,980	1,182,438	-14.7%		7,782,837	6,830,921	7,622,863		(791,943)
Management Information Systems	298,455	242,684	-18.7%		2,180,850	3,111,236	3,534,194		(422,957)
Finance	399,754	239,606	-40.1%		3,811,480	4,183,238	4,618,298		(435,060)
Procurement	48,231	57,174	18.5%		293,718	524,212	577,151		(52,939)
Human Resources	53,903	363,517	574.4%		402,156	1,154,561	1,434,270		(279,709)
Legal	245,613	310,850	26.6%		3,244,746	2,653,440	2,822,799		(169,359)
Warehouse	244,620	66,506	-72.8%		2,861,999	393,398	405,818		(12,420)
External Affairs	89,162	145,730	63.4%		521,885	1,186,296	1,297,622		(111,325)
Engineering & Construction	970,203	745,041	-23.2%		7,040,127	14,623,692	16,640,577		(2,016,885)
Environmental Compliance	53,230	79,119	48.6%		971,713	3,611,351	4,776,195		(1,164,845)
General Administration	10,682	3,584	-66.4%		34,045	33,584	36,000		(2,416)
Water Quality	333,691	273,465	-18.0%		2,173,206	3,294,138	3,825,075		(530,937)
Water Treatment Plant	3,322,283	2,643,310	-20.4%		16,839,719	20,121,300	21,315,738		(1,194,438)
Water Distribution	3,323,602	3,699,731	11.3%		18,733,620	23,676,348	24,004,868		(328,519)
Sewer Operations	1,222,647	2,371,040	93.9%		10,171,195	16,003,432	15,903,795		99,636
Direct Operating Expenses	\$ 12,687,823	\$ 13,173,485	3.8%	\$	79,289,514	\$ 104,338,422	\$ 111,827,727	\$	(7,489,305)
ALCOSAN Expenses	11,449,490	12,377,236	8.1%		70,310,473	75,520,734	75,484,220		36,514
Co-Op Agreement Op. Expenses - Water	1,787,500	4,007,008	12.1%		893,750	3,503,504	3,500,000		3,504
Co-Op Agreement Op. Expenses - Sewer	-	-	-		893,750	3,503,504	3,500,000		3,504
Non-City Water Subsidy	503,768	447,164	-11.2%		4,131,689	1,389,814	1,700,000		(310,186)
In-Direct Operating Expenses	\$ 13,740,757.51	\$ 16,831,407.97	22.5%	\$	76,229,661.66	\$ 83,917,555.81	\$ 84,184,220.00	\$	(266,664)
Subtotal: Operating Expenses	\$ 26,428,581	\$ 30,004,893	13.5%	\$	155,519,176	\$ 188,255,977	\$ 196,011,947	\$	(7,755,970)
<u>Debt Service</u>									
Subtotal: Debt Service	\$ 12,570,864	\$ 23,864,660	89.8%	\$	43,777,607	\$ 57,521,790	\$ 58,115,307	\$	(593,518)
<u>Transfers to Reserves</u>									
Subtotal: Transfers to Reserves	\$ 488,852	\$ 418,497	-14.4%	\$	2,933,112	\$ 2,510,983	\$ 2,510,983	\$	-
<b>Total: Revenue Requirements</b>	<b>\$ 39,488,297</b>	<b>\$ 54,288,051</b>	<b>37.5%</b>	<b>\$</b>	<b>202,229,894</b>	<b>\$ 248,288,750</b>	<b>\$ 256,638,237</b>	<b>\$</b>	<b>(8,349,487)</b>
<b>Revenue Surplus / (Deficit)</b>	<b>\$ (6,461,403)</b>	<b>\$ (19,446,858)</b>		<b>\$</b>	<b>35,391,225</b>	<b>\$ 14,283,697</b>	<b>\$ 7,503,262</b>	<b>\$</b>	<b>6,780,435</b>

Financial Metrics\*

	FY 2018	FY 2019	FY 2019
	Actual	Forecast	Budget
<b>Senior Debt Service Coverage</b>	<b>2.66</b>	<b>1.79</b>	<b>1.65</b>
Minimum Requirement	1.25	1.25	1.25
<b>Subordinate Debt Service Coverage</b>	<b>N/A</b>	<b>1.61</b>	<b>1.49</b>
Minimum Requirement	N/A	1.10	1.10
<b>Total Debt Service Coverage</b>	<b>2.13</b>	<b>1.41</b>	<b>1.29</b>
Minimum Requirement	1.10	N/A	N/A
<b>Unrestricted Cash without ALCOSAN Expense</b>	<b>199.03</b>	<b>196.68</b>	<b>173.50</b>
<b>Unrestricted Cash with ALCOSAN Expense</b>	<b>109.04</b>	<b>117.78</b>	<b>104.21</b>
<b>Unrestricted Cash including the Operating Reserve Fund</b>	<b>145.93</b>	<b>153.42</b>	<b>139.72</b>

\*Cash basis estimate. Final audited coverage ratio could be different due to the use of the accrual basis accounting method.





The Pittsburgh Water and Sewer Authority  
2018 & 2019 Financial Status Update (Cash Basis)  
As of March 31, 2019



	FY 2018			FY 2019			FY 2019		
	Prior Year-to-Date	Current Year-to-Date	YTD Growth	Actual	Forecast	Budget	2019 Difference		
							Forecast - Budget		
<b>Receipts</b>									
<u>User Charge &amp; Wholesale Receipts</u>									
Subtotal: User Charge & Wholesale Receipts	\$ 35,686,180	\$ 36,801,631	3.1%	\$ 163,733,064	\$ 179,823,131	\$ 183,756,758	\$ (3,933,627)		
<u>Other Operating Receipts</u>									
Other Misc. and Fee Operating Receipts	\$ 1,571,595	\$ 877,805	-44.1%	\$ 4,511,969	\$ 4,937,507	\$ 5,412,936	\$ (475,429)		
ALCOSAN Collections	16,743,887	15,324,820	-8.5%	69,376,086	73,676,851	74,971,805	(1,294,954)		
Subtotal: Other Operating Receipts	\$ 18,315,483	\$ 16,202,625	-11.5%	\$ 73,888,055	\$ 78,614,358	\$ 80,384,741	\$ (1,770,383)		
<b>Total: Receipts</b>	<b>\$ 54,001,662</b>	<b>\$ 53,004,256</b>	<b>-1.8%</b>	<b>\$ 237,621,119</b>	<b>\$ 258,437,489</b>	<b>\$ 264,141,499</b>	<b>\$ (5,704,010)</b>		
<b>Revenue Requirements</b>									
<u>Operating Expenses</u>									
Executive Director's Office	857,183	1,101,706	28.5%	2,226,219	3,140,973	3,012,463	128,510		
Customer Service	2,093,324	1,775,352	-15.2%	7,782,837	6,938,876	7,622,863	(683,987)		
Management Information Systems	428,403	446,246	4.2%	2,180,850	2,971,438	3,534,194	(562,755)		
Finance	691,443	367,997	-46.8%	3,811,480	4,026,982	4,618,298	(591,316)		
Procurement	68,564	83,102	21.2%	293,718	508,697	577,151	(68,454)		
Human Resources	83,347	426,946	412.3%	402,156	1,079,592	1,434,270	(354,678)		
Legal	386,144	984,931	155.1%	3,244,746	3,098,231	2,822,799	275,432		
Warehouse	365,891	347,088	-5.1%	2,861,999	641,735	405,818	235,917		
External Affairs	119,571	211,232	76.7%	521,885	1,163,576	1,297,622	(134,045)		
Engineering & Construction	1,616,458	1,099,944	-32.0%	7,040,127	13,508,194	16,640,577	(3,132,383)		
Environmental Compliance	82,177	314,942	283.2%	971,713	3,390,859	4,776,195	(1,385,336)		
General Administration	14,174	7,058	-50.2%	34,045	34,058	36,000	(1,942)		
Water Quality	797,660	435,497	-45.4%	2,173,206	3,031,701	3,825,075	(793,375)		
Water Treatment Plant	4,701,028	4,050,052	-13.8%	16,839,719	19,763,880	21,315,738	(1,551,858)		
Water Distribution	4,928,150	5,509,950	11.8%	18,733,620	22,602,101	24,004,868	(1,402,767)		
Sewer Operations	1,949,351	3,003,996	54.1%	10,171,195	15,018,277	15,903,795	(885,518)		
Direct Operating Expenses	\$ 19,182,868	\$ 20,166,039	5.1%	\$ 79,289,514	\$ 100,919,171	\$ 111,827,727	\$ (10,908,556)		
ALCOSAN Expenses	17,234,374	18,586,628	7.8%	70,310,473	74,944,171	75,484,220	(540,049)		
Co-Op Agreement Op. Expenses - Water	1,787,500	4,007,008	12.1%	893,750	3,503,504	3,500,000	3,504		
Co-Op Agreement Op. Expenses - Sewer	-	-	-	893,750	3,503,504	3,500,000	3,504		
Non-City Water Subsidy	533,835	709,823	33.0%	4,131,689	1,175,823	1,700,000	(524,177)		
In-Direct Operating Expenses	\$ 19,555,708.97	\$ 23,303,459.40	19.2%	\$ 76,229,661.66	\$ 83,127,002.01	\$ 84,184,220.00	\$ (1,057,218)		
Subtotal: Operating Expenses	\$ 38,738,577	\$ 43,469,498	12.2%	\$ 155,519,176	\$ 184,046,173	\$ 196,011,947	\$ (11,965,774)		
<u>Debt Service</u>									
Subtotal: Debt Service	\$ 13,613,288	\$ 25,208,122	85.2%	\$ 43,777,607	\$ 57,715,382	\$ 58,115,307	\$ (399,925)		
<u>Transfers to Reserves</u>									
Subtotal: Transfers to Reserves	\$ 733,278	\$ 627,746	-14.4%	\$ 2,933,112	\$ 2,510,983	\$ 2,510,983	\$ -		
<b>Total: Revenue Requirements</b>	<b>\$ 53,085,143</b>	<b>\$ 69,305,366</b>	<b>30.6%</b>	<b>\$ 202,229,894</b>	<b>\$ 244,272,539</b>	<b>\$ 256,638,237</b>	<b>\$ (12,365,699)</b>		
Revenue Surplus / (Deficit)	\$ 916,519	\$ (16,301,110)		\$ 35,391,225	\$ 14,164,950	\$ 7,503,262	\$ 6,661,689		

	FY 2018	FY 2019	FY 2019
	Actual	Forecast	Budget
<b>Financial Metrics*</b>			
Senior Debt Service Coverage	2.66	1.79	1.65
Minimum Requirement	1.25	1.25	1.25
Subordinate Debt Service Coverage	N/A	1.61	1.49
Minimum Requirement	N/A	1.10	1.10
Total Debt Service Coverage	2.13	1.41	1.29
Minimum Requirement	1.10	N/A	N/A
Unrestricted Days Cash without ALCOSAN Expense	199.03	202.83	173.50
Unrestricted Days Cash with ALCOSAN Expense	109.04	120.24	104.21
Unrestricted Days Cash including the Operating Reserve Fund	145.93	156.70	139.72

\*Cash basis estimate. Final audited coverage ratio could be different due to the use of the accrual basis accounting method.



The Pittsburgh Water and Sewer Authority  
2018 & 2019 Financial Status Update (Cash Basis)  
As of April 30, 2019



	FY 2018			FY 2019			FY 2019		2019 Difference
	Prior Year-to-Date	Current Year-to-Date	YTD Growth	Actual	Forecast	Budget	Forecast - Budget		
<b>Receipts</b>									
<b>User Charge &amp; Wholesale Receipts</b>									
Subtotal: User Charge & Wholesale Receipts	\$ 48,341,854	\$ 50,742,363	5.0%	\$ 163,733,064	\$ 178,984,727	\$ 183,756,758	\$ (4,772,031)		
<b>Other Operating Receipts</b>									
Other Misc. and Fee Operating Receipts	\$ 2,008,633	\$ 1,443,331	-28.1%	\$ 4,511,969	\$ 5,051,955	\$ 5,412,936	\$ (360,981)		
ALCOSAN Collections	22,580,627	21,768,296	-3.6%	69,376,086	74,090,516	74,971,805	(881,289)		
Subtotal: Other Operating Receipts	\$ 24,589,260	\$ 23,211,626	-5.6%	\$ 73,888,055	\$ 79,142,470	\$ 80,384,741	\$ (1,242,271)		
<b>Total: Receipts</b>	<b>\$ 72,931,114</b>	<b>\$ 73,953,990</b>	<b>1.4%</b>	<b>\$ 237,621,119</b>	<b>\$ 258,127,198</b>	<b>\$ 264,141,499</b>	<b>\$ (6,014,301)</b>		
<b>Revenue Requirements</b>									
<b>Operating Expenses</b>									
Executive Director's Office	1,039,733	1,253,941	20.6%	2,226,219	2,968,346	3,012,463	(44,117)		
Customer Service	2,615,847	2,287,230	-12.6%	7,782,837	6,804,207	7,622,863	(818,657)		
Management Information Systems	558,510	548,889	-1.7%	2,180,850	2,835,682	3,534,194	(698,512)		
Finance	731,407	468,379	-36.0%	3,811,480	2,643,949	4,618,298	(1,974,349)		
Procurement	90,133	110,054	22.1%	293,718	490,216	577,151	(86,935)		
Human Resources	125,824	475,626	278.0%	402,156	1,074,821	1,434,270	(359,449)		
Legal	586,490	1,052,639	79.5%	3,244,746	2,935,693	2,822,799	112,894		
Warehouse	454,296	141,828	-68.8%	2,861,999	407,816	405,818	1,998		
External Affairs	158,106	266,879	68.8%	521,885	1,120,886	1,297,622	(176,736)		
Engineering & Construction	2,577,956	1,381,628	-46.4%	7,040,127	12,423,838	16,640,577	(4,216,739)		
Environmental Compliance	185,286	474,004	155.8%	971,713	3,206,555	4,776,195	(1,569,640)		
General Administration	16,671	9,781	-41.3%	34,045	33,781	36,000	(2,219)		
Water Quality	966,386	592,444	-38.7%	2,173,206	2,870,826	3,825,075	(954,249)		
Water Treatment Plant	6,089,826	5,569,220	-8.5%	16,839,719	19,428,432	21,315,738	(1,887,306)		
Water Distribution	6,325,792	8,114,959	28.3%	18,733,620	23,453,198	24,004,868	(551,670)		
Sewer Operations	2,817,865	3,998,359	41.9%	10,171,195	14,821,789	15,903,795	(1,082,006)		
Direct Operating Expenses	\$ 25,340,129	\$ 26,745,861	5.5%	\$ 79,289,514	\$ 97,520,034	\$ 111,827,727	\$ (14,307,693)		
ALCOSAN Expenses	23,480,212	25,461,346	8.4%	70,310,473	73,684,138	75,484,220	(1,800,082)		
Co-Op Agreement Op. Expenses - Water	1,787,500	4,007,008	12.1%	893,750	3,503,504	3,500,000	3,504		
Co-Op Agreement Op. Expenses - Sewer	-	-	-	893,750	3,503,504	3,500,000	3,504		
Non-City Water Subsidy	1,295,560	893,350	-31.0%	4,131,689	1,330,675	1,700,000	(369,325)		
In-Direct Operating Expenses	\$ 26,563,272	\$ 30,361,704	14.3%	\$ 76,229,662	\$ 82,021,821	\$ 84,184,220	\$ (2,162,399)		
Subtotal: Operating Expenses	\$ 51,903,401	\$ 57,107,565	10.0%	\$ 155,519,176	\$ 179,541,854	\$ 196,011,947	\$ (16,470,093)		
<b>Debt Service</b>									
Subtotal: Debt Service	\$ 14,296,333	\$ 26,130,685	82.8%	\$ 43,777,607	\$ 57,488,077	\$ 58,115,307	\$ (627,230)		
<b>Transfers to Reserves</b>									
Subtotal: Transfers to Reserves	\$ 977,704	\$ 836,994	-14.4%	\$ 2,933,112	\$ 2,510,983	\$ 2,510,983	\$ -		
<b>Total: Revenue Requirements</b>	<b>\$ 67,177,437</b>	<b>\$ 84,075,244</b>	<b>25.2%</b>	<b>\$ 202,229,894</b>	<b>\$ 239,540,914</b>	<b>\$ 256,638,237</b>	<b>\$ (17,097,323)</b>		
<b>Revenue Surplus / (Deficit)</b>	<b>\$ 5,753,677</b>	<b>\$ (10,121,255)</b>		<b>\$ 35,391,225</b>	<b>\$ 18,586,283</b>	<b>\$ 7,503,262</b>	<b>\$ 11,083,022</b>		
<b>Financial Metrics*</b>				<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2019</b>			
				<i>Actual</i>	<i>Forecast</i>	<i>Budget</i>			
<b>Senior Debt Service Coverage</b>				<b>2.66</b>	<b>1.88</b>	<b>1.65</b>			
<i>Minimum Requirement</i>				<i>1.25</i>	<i>1.25</i>	<i>1.25</i>			
<b>Subordinate Debt Service Coverage</b>				<b>N/A</b>	<b>1.70</b>	<b>1.49</b>			
<i>Minimum Requirement</i>				<i>N/A</i>	<i>1.10</i>	<i>1.10</i>			
<b>Total Debt Service Coverage</b>				<b>2.13</b>	<b>1.49</b>	<b>1.29</b>			
<i>Minimum Requirement</i>				<i>1.10</i>	<i>N/A</i>	<i>N/A</i>			
<b>Unrestricted Days Cash without ALCOSAN Expense</b>				<b>199.03</b>	<b>224.29</b>	<b>173.50</b>			
<b>Unrestricted Days Cash with ALCOSAN Expense</b>				<b>109.04</b>	<b>132.24</b>	<b>104.21</b>			
<b>Unrestricted Days Cash including the Operating Reserve Fund</b>				<b>145.93</b>	<b>169.62</b>	<b>139.72</b>			

\*Cash basis estimate. Final audited coverage ratio could be different due to the use of the accrual basis accounting method.





The Pittsburgh Water and Sewer Authority  
2018 & 2019 Financial Status Update (Cash Basis)  
As of May 31, 2019



	FY 2018			FY 2019			FY 2019 Budget	2019 Difference Forecast - Budget
	Prior Year-to-Date	Current Year-to-Date	YTD Growth	FY 2018 Actual	FY 2019 Forecast	FY 2019 Budget		
<b>Receipts</b>								
<u>User Charge &amp; Wholesale Receipts</u>								
Subtotal: User Charge & Wholesale Receipts	\$ 61,370,329	\$ 65,335,033	6.5%	\$ 163,733,064	\$ 181,156,354	\$ 183,756,758	\$ (2,600,404)	
<u>Other Operating Receipts</u>								
Other Misc. and Fee Operating Receipts	\$ 2,245,596	\$ 2,037,789	-9.3%	\$ 4,511,969	\$ 5,195,335	\$ 5,412,936	\$ (217,601)	
ALCOSAN Collections	28,228,874	28,380,767	0.5%	69,376,086	75,635,266	74,971,805	663,461	
Subtotal: Other Operating Receipts	\$ 30,474,470	\$ 30,418,556	-0.2%	\$ 73,888,055	\$ 80,830,601	\$ 80,384,741	\$ 445,860	
<b>Total: Receipts</b>	<b>\$ 91,844,799</b>	<b>\$ 95,753,589</b>	<b>4.3%</b>	<b>\$ 237,621,119</b>	<b>\$ 261,986,955</b>	<b>\$ 264,141,499</b>	<b>\$ (2,154,544)</b>	
<b>Revenue Requirements</b>								
<u>Operating Expenses</u>								
Executive Director's Office	1,205,124	1,379,557	14.5%	2,226,219	2,909,049	3,012,463	(103,414)	
Customer Service	3,032,576	2,759,615	-9.0%	7,782,837	6,778,375	7,622,863	(844,488)	
Management Information Systems	748,898	704,711	-5.9%	2,180,850	2,767,615	3,534,194	(766,579)	
Finance	832,446	836,783	0.5%	3,811,480	2,757,700	4,618,298	(1,860,598)	
Procurement	111,440	135,315	21.4%	293,718	467,481	577,151	(109,670)	
Human Resources	156,075	522,209	234.6%	402,156	1,068,001	1,434,270	(366,269)	
Legal	636,134	1,324,524	108.2%	3,244,746	2,976,487	2,822,799	153,688	
Warehouse	542,380	183,200	-66.2%	2,861,999	421,197	405,818	15,379	
External Affairs	187,392	372,166	98.6%	521,885	1,126,068	1,297,622	(171,554)	
Engineering & Construction	3,107,434	2,037,854	-34.4%	7,040,127	11,681,968	16,640,577	(4,958,609)	
Environmental Compliance	263,316	527,451	100.3%	971,713	2,899,039	4,776,195	(1,877,157)	
General Administration	18,969	11,951	-37.0%	34,045	32,951	36,000	(3,049)	
Water Quality	1,071,978	673,616	-37.2%	2,173,206	2,654,248	3,825,075	(1,170,827)	
Water Treatment Plant	7,270,390	6,633,202	-8.8%	16,839,719	18,733,540	21,315,738	(2,582,198)	
Water Distribution	8,286,941	9,502,188	14.7%	18,733,620	23,161,778	24,004,868	(843,090)	
Sewer Operations	4,252,342	4,838,451	13.8%	10,171,195	14,273,262	15,903,795	(1,630,533)	
Direct Operating Expenses	\$ 31,723,836	\$ 32,442,793	2.3%	\$ 79,289,514	\$ 94,708,759	\$ 111,827,727	\$ (17,118,968)	
ALCOSAN Expenses	28,019,742	29,969,823	7.0%	70,310,473	73,446,584	75,484,220	(2,037,636)	
Co-Op Agreement Op. Expenses - Water	1,787,500	4,007,008	12.1%	893,750	3,503,504	3,500,000	3,504	
Co-Op Agreement Op. Expenses - Sewer	-	-	-	893,750	3,503,504	3,500,000	3,504	
Non-City Water Subsidy	1,956,871	930,504	-52.4%	4,131,689	1,337,154	1,700,000	(362,846)	
In-Direct Operating Expenses	\$ 31,764,113	\$ 34,907,335	9.9%	\$ 76,229,662	\$ 81,790,746	\$ 84,184,220	\$ (2,393,474)	
Subtotal: Operating Expenses	\$ 63,487,948	\$ 67,350,128	6.1%	\$ 155,519,176	\$ 176,499,505	\$ 196,011,947	\$ (19,512,442)	
<u>Debt Service</u>								
Subtotal: Debt Service	\$ 14,911,222	\$ 27,070,707	81.5%	\$ 43,777,607	\$ 57,278,230	\$ 58,115,307	\$ (837,077)	
<u>Transfers to Reserves</u>								
Subtotal: Transfers to Reserves	\$ 1,222,130	\$ 1,046,243	-14.4%	\$ 2,933,112	\$ 2,510,983	\$ 2,510,983	\$ -	
<b>Total: Revenue Requirements</b>	<b>\$ 79,621,301</b>	<b>\$ 95,467,078</b>	<b>19.9%</b>	<b>\$ 202,229,894</b>	<b>\$ 236,288,718</b>	<b>\$ 256,638,237</b>	<b>\$ (20,349,519)</b>	
Revenue Surplus / (Deficit)	\$ 12,223,498	\$ 286,511		\$ 35,391,225	\$ 25,698,237	\$ 7,503,262	\$ 18,194,975	

	Financial Metrics*		
	FY 2018 Actual	FY 2019 Forecast	FY 2019 Budget
<b>Senior Debt Service Coverage</b>	<b>2.66</b>	<b>2.03</b>	<b>1.65</b>
Minimum Requirement	1.25	1.25	1.25
<b>Subordinate Debt Service Coverage</b>	<b>N/A</b>	<b>1.83</b>	<b>1.49</b>
Minimum Requirement	N/A	1.10	1.10
<b>Total Debt Service Coverage</b>	<b>2.13</b>	<b>1.61</b>	<b>1.29</b>
Minimum Requirement	1.10	N/A	N/A
Unrestricted Days Cash without ALCOSAN Expense	199.03	255.58	173.50
Unrestricted Days Cash with ALCOSAN Expense	109.04	149.23	104.21
Unrestricted Days Cash including the Operating Reserve Fund	145.93	187.25	139.72

\*Cash basis estimate. Final audited coverage ratio could be different due to the use of the accrual basis accounting method.



The Pittsburgh Water and Sewer Authority  
2018 & 2019 Financial Status Update (Cash Basis)  
As of June 30, 2019



	FY 2018			FY 2019			FY 2019		2019 Difference
	Prior Year-to-Date	Current Year-to-Date	YTD Growth	Actual	Forecast	Budget	Forecast - Budget		
<b>Receipts</b>									
<u>User Charge &amp; Wholesale Receipts</u>									
Subtotal: User Charge & Wholesale Receipts	\$ 75,281,158	\$ 77,059,933	2.4%	\$ 163,733,064	\$ 176,269,893	\$ 183,756,758	\$ (7,486,865)		
<u>Other Operating Receipts</u>									
Other Misc. and Fee Operating Receipts	\$ 2,358,008	\$ 2,465,206	4.5%	\$ 4,511,969	\$ 5,171,674	\$ 5,412,936	\$ (241,262)		
ALCOSAN Collections	32,539,573	32,761,404	0.7%	69,376,086	73,238,554	74,971,805	(1,733,251)		
Subtotal: Other Operating Receipts	\$ 34,897,582	\$ 35,226,610	0.9%	\$ 73,888,055	\$ 78,410,228	\$ 80,384,741	\$ (1,974,513)		
<b>Total: Receipts</b>	<b>\$ 110,178,740</b>	<b>\$ 112,286,543</b>	<b>1.9%</b>	<b>\$ 237,621,119</b>	<b>\$ 254,680,121</b>	<b>\$ 264,141,499</b>	<b>\$ (9,461,378)</b>		
<b>Revenue Requirements</b>									
<u>Operating Expenses</u>									
Executive Director's Office	1,309,065	1,561,768	19.3%	2,226,219	2,899,975	3,012,463	(112,488)		
Customer Service	3,821,756	3,314,018	-13.3%	7,782,837	6,829,123	7,622,863	(793,740)		
Management Information Systems	805,330	831,231	3.2%	2,180,850	2,670,205	3,534,194	(863,989)		
Finance	1,454,161	1,093,252	-24.8%	3,811,480	2,756,916	4,618,298	(1,861,382)		
Procurement	134,788	161,671	19.9%	293,718	451,009	577,151	(126,142)		
Human Resources	185,347	572,242	208.7%	402,156	1,000,120	1,434,270	(434,150)		
Legal	836,156	1,578,034	88.7%	3,244,746	2,995,922	2,822,799	173,123		
Warehouse	618,484	223,370	-63.9%	2,861,999	432,345	405,818	26,527		
External Affairs	217,947	460,037	111.1%	521,885	1,091,447	1,297,622	(206,175)		
Engineering & Construction	3,628,576	2,611,345	-28.0%	7,040,127	10,706,678	16,640,577	(5,933,899)		
Environmental Compliance	293,884	658,411	124.0%	971,713	2,583,039	4,776,195	(2,193,156)		
General Administration	20,128	12,961	-35.6%	34,045	30,961	36,000	(5,039)		
Water Quality	1,183,191	808,687	-31.7%	2,173,206	2,522,078	3,825,075	(1,302,997)		
Water Treatment Plant	8,054,326	8,078,604	0.3%	16,839,719	18,427,755	21,315,738	(2,887,983)		
Water Distribution	9,652,829	11,543,246	19.6%	18,733,620	23,167,040	24,004,868	(837,828)		
Sewer Operations	4,857,486	6,009,831	23.7%	10,171,195	14,082,309	15,903,795	(1,821,487)		
Direct Operating Expenses	\$ 37,073,454	\$ 39,518,708	6.6%	\$ 79,289,514	\$ 92,646,923	\$ 111,827,727	\$ (19,180,804)		
ALCOSAN Expenses	34,038,586	36,155,330	6.2%	70,310,473	73,021,355	75,484,220	(2,462,865)		
Co-Op Agreement Op. Expenses - Water	1,787,500	4,007,008	12.1%	893,750	3,503,504	3,500,000	3,504		
Co-Op Agreement Op. Expenses - Sewer	-	-	-	893,750	3,503,504	3,500,000	3,504		
Non-City Water Subsidy	2,380,855	1,013,344	-57.4%	4,131,689	1,291,344	1,700,000	(408,656)		
In-Direct Operating Expenses	\$ 38,206,941	\$ 41,175,682	7.8%	\$ 76,229,662	\$ 81,319,706	\$ 84,184,220	\$ (2,864,514)		
Subtotal: Operating Expenses	\$ 75,280,395	\$ 80,694,390	7.2%	\$ 155,519,176	\$ 173,966,629	\$ 196,011,947	\$ (22,045,318)		
<u>Debt Service</u>									
Subtotal: Debt Service	\$ 15,582,707	\$ 28,232,904	81.2%	\$ 43,777,607	\$ 57,290,557	\$ 58,115,307	\$ (824,750)		
<u>Transfers to Reserves</u>									
Subtotal: Transfers to Reserves	\$ 1,466,556	\$ 1,255,492	-14.4%	\$ 2,933,112	\$ 2,510,983	\$ 2,510,983	\$ -		
<b>Total: Revenue Requirements</b>	<b>\$ 92,329,659</b>	<b>\$ 110,182,785</b>	<b>19.3%</b>	<b>\$ 202,229,894</b>	<b>\$ 233,768,170</b>	<b>\$ 256,638,237</b>	<b>\$ (22,870,068)</b>		
<b>Revenue Surplus / (Deficit)</b>	<b>\$ 17,849,082</b>	<b>\$ 2,103,758</b>		<b>\$ 35,391,225</b>	<b>\$ 20,911,951</b>	<b>\$ 7,503,262</b>	<b>\$ 13,408,690</b>		

	Financial Metrics*		
	FY 2018 Actual	FY 2019 Forecast	FY 2019 Budget
<b>Senior Debt Service Coverage</b>	<b>2.66</b>	<b>1.93</b>	<b>1.65</b>
Minimum Requirement	1.25	1.25	1.25
<b>Subordinate Debt Service Coverage</b>	<b>N/A</b>	<b>1.74</b>	<b>1.49</b>
Minimum Requirement	N/A	1.10	1.10
<b>Total Debt Service Coverage</b>	<b>2.13</b>	<b>1.53</b>	<b>1.29</b>
Minimum Requirement	1.10	N/A	N/A
<b>Unrestricted Days Cash without ALCOSAN Expense</b>	<b>199.03</b>	<b>243.61</b>	<b>173.50</b>
<b>Unrestricted Days Cash with ALCOSAN Expense</b>	<b>109.04</b>	<b>141.36</b>	<b>104.21</b>
<b>Unrestricted Days Cash including the Operating Reserve Fund</b>	<b>145.93</b>	<b>179.93</b>	<b>139.72</b>

\*Cash basis estimate. Final audited coverage ratio could be different due to the use of the accrual basis accounting method.



2019 Forecast													
The Pittsburgh Water and Sewer Authority													
2019 Cash Flow Projection (Cash Basis)													
As of June 30, 2019													
Receipts	Actual						Budget						Total
	January	February	March	April	May	June	July	August	September	October	November	December	
<b>Water and Conveyance</b>	\$ 12,153,920	\$ 11,716,900	\$ 12,930,811	\$ 13,940,733	\$ 14,592,670	\$ 11,724,900	17,621,483	15,676,200	17,149,423	16,817,834	16,634,552	15,310,468	\$ 176,269,893
ALCOSAN	6,004,660	4,534,219	4,785,942	6,443,475	6,612,471	4,380,637	7,189,474	6,395,808	6,996,876	6,861,589	6,786,811	6,246,592	73,238,554
DSIC	1,889	(21)	(22)	(2)	135	(221)	-	-	-	-	-	-	1,758
Fees	238,576	72,494	370,995	514,679	486,430	390,048	311,281	311,281	311,281	311,281	311,281	311,281	3,940,910
Misc. Other	122,995	(4,439)	75,337	50,849	107,894	37,589	139,797	139,797	139,797	139,797	139,797	139,797	1,229,006
<b>Total Receipts</b>	\$ 18,522,039	16,319,154	18,163,063	20,949,734	21,799,600	16,532,954	25,262,035	22,523,086	24,597,377	24,130,501	23,872,441	22,008,138	\$ 254,680,121
<b>Cash Disbursements</b>													
<b>Operating Expenses</b>													
Executive Director's Office	\$ 366,757	382,932	352,016	152,236	125,615	182,211	333,528	153,250	151,644	197,539	150,278	351,968	\$ 2,899,975
Customer Service	576,989	605,449	592,914	511,878	472,384	554,403	756,940	473,784	507,260	648,403	503,377	625,341	6,829,123
Management Information Systems	124,565	118,119	203,562	102,643	155,822	126,520	231,426	193,487	249,574	200,055	193,457	770,974	2,670,205
Finance	135,381	104,225	128,391	100,381	368,405	256,469	345,853	235,323	249,800	295,762	275,208	261,719	2,756,916
Procurement	32,369	24,805	25,928	26,953	25,261	26,356	60,793	37,185	42,886	40,853	40,867	66,753	451,009
Human Resources	326,154	37,362	63,429	48,680	46,583	50,033	63,149	48,518	137,881	53,551	50,122	74,658	1,000,120
Legal	84,310	226,540	674,081	67,708	271,885	251,510	247,954	228,339	231,742	229,012	230,574	250,262	2,995,922
Warehouse	34,906	31,600	280,583	(205,260)	41,372	40,170	47,153	31,158	29,039	29,090	29,964	42,571	432,345
External Affairs	86,969	58,761	65,502	55,647	105,288	87,871	125,356	92,072	106,403	89,567	104,185	113,827	1,091,447
Engineering & Construction	395,357	349,684	354,903	281,684	656,226	573,490	1,525,797	1,379,764	1,355,500	1,248,015	1,240,219	1,346,037	10,706,678
Environmental Compliance	65,874	13,245	235,823	159,062	53,447	130,960	368,505	400,610	314,091	330,778	250,116	260,528	2,583,039
General Administration	1,934	1,650	3,474	2,723	2,170	1,010	3,000	3,000	3,000	3,000	3,000	3,000	30,961
Water Quality	134,630	138,835	162,031	156,948	81,171	135,071	302,541	300,264	285,831	265,684	271,131	287,941	2,522,078
Water Treatment Plant	1,377,403	1,265,907	1,406,742	1,519,168	1,063,982	1,445,402	1,788,208	1,700,456	1,763,921	1,621,297	1,672,023	1,803,247	18,427,755
Water Distribution	1,796,651	1,903,081	1,810,219	2,605,009	1,387,229	2,041,058	2,274,980	1,983,332	1,798,161	1,646,052	1,801,336	2,119,934	23,167,040
Sewer Operations	1,003,915	1,367,125	632,955	994,364	840,091	1,171,380	1,455,059	1,389,552	1,368,702	1,374,833	1,321,552	1,162,778	14,082,309
ALCOSAN	7,733,639	4,643,597	6,209,392	6,874,718	4,508,477	6,185,507	6,831,708	4,820,928	6,730,806	7,314,339	4,656,216	6,512,027	73,021,355
Non-City Water Subsidy	186,758	260,406	262,660	183,526	37,154	82,839	29,675	30,675	28,650	128,675	28,675	31,650	1,291,344
City Co-Op Payment	-	4,007,008	-	-	-	-	-	-	-	-	-	3,000,000	7,007,000
Sub Total	\$ 14,464,564	15,540,330	13,464,605	13,638,067	10,242,564	13,344,262	16,791,627	13,501,696	15,354,892	15,716,503	12,822,300	19,085,222	\$ 171,966,630
<b>Debt Service</b>													
Bond Debt Service	\$ 570,556	22,666,621	1,018,032	594,117	613,031	840,561	821,527	22,979,967	821,527	821,527	821,527	821,527	\$ 53,390,521
PennVest Debt Service	325,681	301,802	325,430	328,446	326,991	321,635	328,342	328,342	328,342	328,342	328,342	328,342	3,900,037
Sub Total	\$ 896,237	22,968,423	1,343,462	922,563	940,022	1,162,197	1,149,869	23,308,309	1,149,869	1,149,869	1,149,869	1,149,869	\$ 57,290,557
<b>Transfer to Restricted Funds</b>	\$ 209,249	209,249	209,249	209,249	209,249	209,249	209,249	209,249	209,249	209,249	209,249	209,249	2,510,983
<b>Total Disbursements</b>	\$ 15,570,049	38,718,001	15,017,315	14,769,879	11,391,834	14,715,707	18,150,745	37,019,253	16,714,010	17,075,621	14,181,417	20,444,339	\$ 233,768,170
<b>Surplus / Deficit</b>	2,951,990	(22,398,847)	3,145,748	6,179,855	10,407,766	1,817,247	7,111,290	(14,496,167)	7,883,367	7,054,880	9,691,024	1,563,799	
<b>Annual Surplus/Deficit</b>													
	\$ 20,911,954												
<b>Capital Spending</b>													
Capital Spending (Non PENNVEST)	\$ 5,323,554	4,849,505	6,104,476	8,104,315	5,316,725	6,389,051	13,950,889	12,191,524	13,997,922	20,542,478	21,362,287	26,832,098	\$ 144,964,825
PENNVEST Spending	\$ -	-	131,251	1,175,462	1,554,290	3,669,863	-	-	-	-	-	-	\$ 6,530,866
<b>Total</b>	\$ 5,323,554	4,849,505	6,235,727	9,279,777	6,871,015	10,058,914	13,950,889	12,191,524	13,997,922	20,542,478	21,362,287	26,832,098	\$ 151,495,691
<b>Capital Line of Credit</b>													
Capital Line of Credit Limit	\$ 80,000,000												
Capital Draws	\$ -												
Outstanding Capital Draws	\$ 33,200,000												
Remaining Capital Credit	\$ 46,800,000												
<b>Operating Line of Credit</b>													
Operating Line of Credit Limit	\$ 20,000,000												
Operating Draws	\$ -												
Outstanding Operating Draws	\$ -												
Remaining Operating Credit	\$ 20,000,000												

The Pittsburgh Water and Sewer Authority  
2018 & 2019 Financial Status Update (Cash Basis)  
As of July 31, 2019



	FY 2018			FY 2019			FY 2019			
	Prior Year-to-Date	Current Year-to-Date	YTD Growth	Actual	Forecast	Budget	2019 Difference		Forecast - Budget	
<b>Receipts</b>										
<b>User Charge &amp; Wholesale Receipts</b>										
Subtotal: User Charge & Wholesale Receipts	\$ 89,547,546	\$ 95,396,688	6.5%	\$ 163,733,064	\$ 176,985,165	\$ 183,756,758	\$ (6,771,593)			
<b>Other Operating Receipts</b>										
Other Misc. and Fee Operating Receipts	\$ 2,765,340	\$ 2,844,711	2.9%	\$ 4,511,969	\$ 5,100,101	\$ 5,412,936	\$ (312,835)			
ALCOSAN Collections	39,370,521	40,744,385	3.5%	69,376,086	74,032,061	74,971,805	\$ (939,744)			
Subtotal: Other Operating Receipts	\$ 42,135,861	\$ 43,589,096	3.4%	\$ 73,888,055	\$ 79,132,162	\$ 80,384,741	\$ (1,252,579)			
<b>Total: Receipts</b>	<b>\$ 131,683,407</b>	<b>\$ 138,985,784</b>	<b>5.5%</b>	<b>\$ 237,621,119</b>	<b>\$ 256,117,327</b>	<b>\$ 264,141,499</b>	<b>\$ (8,024,172)</b>			
<b>Revenue Requirements</b>										
<b>Operating Expenses</b>										
Executive Director's Office	1,500,403	1,741,424	16.1%	2,226,219	2,746,102	3,012,463	(266,360)			
Customer Service	4,376,136	4,051,967	-7.4%	7,782,837	6,810,132	7,622,863	(812,731)			
Management Information Systems	966,459	978,326	1.2%	2,180,850	2,585,874	3,534,194	(948,320)			
Finance	1,532,010	1,374,610	-10.3%	3,811,480	2,692,421	4,618,298	(1,925,877)			
Procurement	162,131	196,589	21.3%	293,718	425,134	577,151	(152,017)			
Human Resources	208,155	636,403	205.7%	402,156	1,001,132	1,434,270	(433,138)			
Legal	1,082,176	2,108,367	94.8%	3,244,746	3,278,301	2,822,799	455,502			
Warehouse	699,713	248,812	-64.4%	2,861,999	410,634	405,818	4,816			
External Affairs	255,861	550,702	115.2%	521,885	1,056,756	1,297,622	(240,866)			
Engineering & Construction	4,136,900	3,312,317	-19.9%	7,040,127	9,881,853	16,640,577	(6,758,724)			
Environmental Compliance	350,978	913,370	160.2%	971,713	2,469,493	4,776,195	(2,306,702)			
General Administration	23,531	14,537	-38.2%	34,045	29,537	36,000	(6,463)			
Water Quality	1,422,414	1,036,525	-27.1%	2,173,206	2,447,376	3,825,075	(1,377,699)			
Water Treatment Plant	9,701,420	9,412,132	-3.0%	16,839,719	17,973,074	21,315,738	(3,342,664)			
Water Distribution	11,435,441	13,804,070	20.7%	18,733,620	23,152,884	24,004,868	(851,983)			
Sewer Operations	5,668,502	7,020,800	23.9%	10,171,195	13,638,218	15,903,795	(2,265,577)			
Direct Operating Expenses	\$ 43,522,230	\$ 47,400,952	8.9%	\$ 79,289,514	\$ 90,598,923	\$ 111,827,727	\$ (21,228,804)			
ALCOSAN Expenses	40,729,459	43,099,835	5.8%	70,310,473	73,134,152	75,484,220	(2,350,068)			
Co-Op Agreement Op. Expenses - Water	1,787,500	4,007,008	12.1%	893,750	3,503,504	3,500,000	3,504			
Co-Op Agreement Op. Expenses - Sewer	-	-	-	893,750	3,503,504	3,500,000	3,504			
Non-City Water Subsidy	2,669,735	1,069,654	-59.9%	4,131,689	1,317,979	1,700,000	(382,021)			
In-Direct Operating Expenses	\$ 45,186,694	\$ 48,176,497	6.6%	\$ 76,229,662	\$ 81,459,138	\$ 84,184,220	\$ (2,725,082)			
Subtotal: Operating Expenses	\$ 88,708,924	\$ 95,577,449	7.7%	\$ 155,519,176	\$ 172,058,061	\$ 196,011,947	\$ (23,953,886)			
<b>Debt Service</b>										
Subtotal: Debt Service	\$ 16,306,763	\$ 34,392,671	110.9%	\$ 43,777,607	\$ 62,300,457	\$ 58,115,307	\$ 4,185,150			
<b>Transfers to Reserves</b>										
Subtotal: Transfers to Reserves	\$ 1,710,982	\$ 1,464,740	-14.4%	\$ 2,933,112	\$ 2,510,983	\$ 2,510,983	\$ -			
<b>Total: Revenue Requirements</b>	<b>\$ 106,726,670</b>	<b>\$ 131,434,860</b>	<b>23.2%</b>	<b>\$ 202,229,894</b>	<b>\$ 236,869,502</b>	<b>\$ 256,638,237</b>	<b>\$ (19,768,736)</b>			
<b>Revenue Surplus / (Deficit)</b>	<b>\$ 24,956,738</b>	<b>\$ 7,550,924</b>		<b>\$ 35,391,225</b>	<b>\$ 19,247,825</b>	<b>\$ 7,503,262</b>	<b>\$ 11,744,563</b>			

	Financial Metrics*		
	FY 2018	FY 2019	FY 2019
	Actual	Forecast	Budget
<b>Senior Debt Service Coverage</b>	<b>2.66</b>	<b>2.00</b>	<b>1.65</b>
Minimum Requirement	1.25	1.25	1.25
<b>Subordinate Debt Service Coverage</b>	<b>N/A</b>	<b>1.81</b>	<b>1.49</b>
Minimum Requirement	N/A	1.10	1.10
<b>Total Debt Service Coverage</b>	<b>2.13</b>	<b>1.46</b>	<b>1.29</b>
Minimum Requirement	1.10	N/A	N/A
Unrestricted Days Cash without ALCOSAN Expense	199.03	242.45	173.50
Unrestricted Days Cash with ALCOSAN Expense	109.04	139.40	104.21
Unrestricted Days Cash including the Operating Reserve Fund	145.93	178.40	139.72

\*Cash basis estimate. Final audited coverage ratio could be different due to the use of the accrual basis accounting method.

2019 Forecast													
The Pittsburgh Water and Sewer Authority													
2019 Cash Flow Projection (Cash Basis)													
As of July 31, 2019													
Receipts	Actual						Forecast						Total
	January	February	March	April	May	June	July	August	September	October	November	December	
Water and Conveyance	\$ 12,153,920	\$ 11,716,900	\$ 12,930,811	\$ 13,940,733	\$ 14,592,670	\$ 11,724,900	\$ 18,136,755	\$ 15,676,200	\$ 17,149,423	\$ 16,817,834	\$ 16,634,552	\$ 15,310,468	\$ 176,985,165
ALCOSAN	6,004,660	4,534,219	4,785,942	6,443,475	6,612,471	4,380,637	7,982,981	6,395,808	6,996,876	6,861,589	6,786,811	6,246,592	74,032,061
DSIC	1,889	(21)	(22)	(2)	135	(221)	-	-	-	-	-	-	1,758
Fees	238,576	72,494	370,995	514,679	486,430	390,048	333,603	311,281	311,281	311,281	311,281	311,281	3,963,232
Misc. Other	122,995	(4,439)	75,337	50,849	107,894	37,589	45,902	139,797	139,797	139,797	139,797	139,797	1,135,111
<b>Total Receipts</b>	<b>\$ 18,522,039</b>	<b>16,319,154</b>	<b>18,163,063</b>	<b>20,949,734</b>	<b>21,799,600</b>	<b>16,532,954</b>	<b>26,699,240</b>	<b>22,523,086</b>	<b>24,597,377</b>	<b>24,130,581</b>	<b>23,872,441</b>	<b>22,008,138</b>	<b>\$ 256,117,327</b>
<b>Cash Disbursements</b>													
<b>Operating Expenses</b>													
Executive Director's Office	\$ 366,757	382,932	352,016	152,236	125,615	182,211	179,656	153,250	151,644	197,539	150,278	351,968	\$ 2,746,102
Customer Service	576,989	605,449	592,914	511,878	472,384	554,403	737,950	473,784	507,260	648,403	503,377	625,341	6,810,132
Management Information Systems	124,565	118,119	203,562	102,643	155,822	126,520	147,095	193,487	249,574	200,055	193,457	770,974	2,585,874
Finance	135,381	104,225	128,391	100,381	368,405	256,469	281,358	235,323	249,800	295,762	275,208	261,719	2,692,421
Procurement	32,369	24,805	25,928	26,953	25,261	26,356	34,918	37,185	42,886	40,853	40,867	66,753	425,134
Human Resources	326,154	37,362	63,429	48,680	46,583	50,033	64,161	48,518	137,881	53,551	50,122	74,658	1,001,132
Legal	84,310	226,540	674,081	67,708	271,885	253,510	530,333	228,339	231,742	229,012	230,574	250,267	3,278,301
Warehouse	34,906	31,600	280,583	(205,260)	41,372	40,170	25,442	31,158	29,039	29,090	29,964	42,571	410,634
External Affairs	86,969	58,761	65,502	55,647	105,288	87,871	90,665	92,072	106,403	89,567	104,185	113,827	1,056,756
Engineering & Construction	395,357	349,684	354,903	281,684	656,226	573,490	700,972	1,379,764	1,355,500	1,248,015	1,240,219	1,346,037	9,881,853
Environmental Compliance	65,874	13,245	235,823	159,062	53,447	130,960	254,959	400,610	314,091	330,778	250,116	330,528	2,469,493
General Administration	1,934	1,650	3,474	2,723	2,170	1,010	1,576	3,000	3,000	3,000	3,000	3,000	29,537
Water Quality	134,630	138,835	162,031	156,948	81,171	135,071	227,838	300,264	285,831	265,684	271,131	287,941	2,447,376
Water Treatment Plant	1,377,403	1,265,907	1,406,742	1,519,168	1,063,982	1,445,402	1,333,527	1,700,456	1,763,921	1,621,297	1,672,023	1,803,247	17,973,074
Water Distribution	1,796,651	1,903,081	1,810,219	2,605,009	1,387,229	2,041,058	2,260,824	1,983,332	1,798,161	1,646,052	1,801,336	2,119,934	23,152,884
Sewer Operations	1,003,915	1,367,125	632,955	994,364	840,091	1,171,380	1,010,969	1,389,552	1,368,702	1,374,833	1,321,552	1,162,778	13,638,218
ALCOSAN	7,733,639	4,643,597	6,209,392	6,874,718	4,508,477	6,185,507	6,944,505	4,820,928	6,730,806	7,314,339	4,656,216	6,512,027	73,134,152
Non-City Water Subsidy	186,758	260,406	262,660	183,526	37,154	82,839	56,310	30,675	28,650	128,675	28,675	31,650	1,317,979
City Co-Op Payment	-	4,007,008	-	-	-	-	-	-	-	-	-	3,000,000	7,007,008
Sub Total	\$ 14,464,564	15,540,330	13,464,605	18,638,067	10,242,562	13,344,262	14,883,058	13,501,696	15,354,892	15,916,503	12,822,300	19,085,222	\$ 172,058,062
<b>Debt Service</b>													
Road Debt Service	\$ 370,556	22,666,621	1,018,032	594,117	613,031	840,561	5,870,873	22,979,967	821,527	821,527	821,527	821,527	\$ 58,439,867
PennVEST Debt Service	325,681	301,802	325,430	328,446	326,991	321,635	288,894	328,342	328,342	328,342	328,342	328,342	3,860,590
Sub Total	\$ 696,237	22,968,423	1,343,462	922,563	940,022	1,162,197	6,159,767	23,308,309	1,149,869	1,149,869	1,149,869	1,149,869	\$ 62,300,457
<b>Transfer to Restricted Funds</b>													
	\$ 209,249	209,249	209,249	209,249	209,249	209,249	209,249	209,249	209,249	209,249	209,249	209,249	2,510,983
<b>Total Disbursements</b>	<b>\$ 15,370,049</b>	<b>38,718,001</b>	<b>15,017,315</b>	<b>14,769,879</b>	<b>11,391,834</b>	<b>14,715,707</b>	<b>21,252,025</b>	<b>37,019,254</b>	<b>16,714,010</b>	<b>17,075,621</b>	<b>14,181,418</b>	<b>20,444,340</b>	<b>\$ 236,869,502</b>
<b>Surplus / Deficit</b>	2,951,990	(22,398,847)	3,145,748	6,179,855	10,407,766	1,817,247	5,447,166	(14,496,168)	7,883,367	7,054,880	9,691,023	1,563,798	
<b>Annual Surplus/Deficit</b>													
													<b>\$ 19,247,828</b>
<b>Capital Spending</b>													
Capital Spending (Non PENNVEST)	\$ 5,323,554	4,849,505	6,104,476	8,104,319	5,316,725	6,389,051	4,879,954	12,191,524	13,997,922	20,542,478	21,362,287	26,832,098	\$ 138,893,890
PENNVEST Spending	-	-	131,251	1,175,462	1,554,290	3,669,863	2,594,870	-	-	-	-	-	\$ 9,125,737
Total	\$ 5,323,554	4,849,505	6,235,727	9,279,777	6,871,015	10,058,914	7,474,824	12,191,524	13,997,922	20,542,478	21,362,287	26,832,098	\$ 148,019,626
<b>Capital Line of Credit</b>													
Capital Line of Credit Limit	-	-	-	-	-	-	150,000,000	-	-	-	-	-	
Capital Draws	-	-	-	-	-	-	-	-	-	-	-	-	\$ -
Outstanding Capital Draws	-	-	-	-	-	-	2,000,000	-	-	-	-	-	
Remaining Capital Credit	\$ -	-	-	-	-	-	148,000,000	-	-	-	-	-	
<b>Operating Line of Credit</b>													
Operating Line of Credit Limit	-	-	-	-	-	-	20,000,000	-	-	-	-	-	
Operating Draws	-	-	-	-	-	-	-	-	-	-	-	-	\$ -
Outstanding Operating Draws	-	-	-	-	-	-	-	-	-	-	-	-	
Remaining Operating Credit	\$ -	-	-	-	-	-	20,000,000	-	-	-	-	-	

The Pittsburgh Water and Sewer Authority  
2018 & 2019 Financial Status Update (Cash Basis)  
As of September 30, 2019



	FY 2018			FY 2019			FY 2019		2019 Difference
	Prior Year-to-Date	Current Year-to-Date	YTD Growth	Actual	Forecast	Budget	Forecast - Budget		
<b>Receipts</b>									
<u>User Charge &amp; Wholesale Receipts</u>									
Subtotal: User Charge & Wholesale Receipts	\$ 118,182,834	\$ 125,897,921	6.5%	\$ 163,733,064	\$ 174,660,775	\$ 183,756,758	\$ (9,095,983)		
<u>Other Operating Receipts</u>									
Other Misc. and Fee Operating Receipts	\$ 3,448,364	\$ 3,276,852	-5.0%	\$ 4,511,969	\$ 4,630,086	\$ 5,412,936	\$ (782,850)		
ALCOSAN Collections	50,618,324	53,223,098	5.1%	69,376,086	73,118,090	74,971,805	(1,853,715)		
Subtotal: Other Operating Receipts	\$ 54,066,689	\$ 56,499,950	4.5%	\$ 73,888,055	\$ 77,748,176	\$ 80,384,741	\$ (2,636,565)		
<b>Total: Receipts</b>	<b>\$ 172,249,523</b>	<b>\$ 182,397,871</b>	<b>5.9%</b>	<b>\$ 237,621,119</b>	<b>\$ 252,408,951</b>	<b>\$ 264,141,499</b>	<b>\$ (11,732,548)</b>		
<b>Revenue Requirements</b>									
<u>Operating Expenses</u>									
Executive Director's Office	1,724,666	2,544,691	47.5%	2,226,219	3,244,476	3,012,463	232,013		
Customer Service	5,421,565	5,412,207	-0.2%	7,782,837	7,189,328	7,622,863	(433,536)		
Management Information Systems	1,222,408	1,330,496	8.8%	2,180,850	2,494,982	3,534,194	(1,039,211)		
Finance	2,722,641	2,388,084	-12.3%	3,811,480	3,220,772	4,618,298	(1,397,526)		
Procurement	211,441	246,280	16.5%	293,718	394,753	577,151	(182,398)		
Human Resources	278,231	783,211	181.5%	402,156	961,543	1,434,270	(472,727)		
Legal	1,203,219	2,831,400	135.3%	3,244,746	3,541,252	2,822,799	718,452		
Warehouse	927,201	297,405	-67.9%	2,861,999	399,030	405,818	(6,788)		
External Affairs	346,411	740,504	113.8%	521,885	1,048,083	1,297,622	(249,539)		
Engineering & Construction	5,163,444	4,612,736	-10.7%	7,040,127	8,447,007	16,640,577	(8,193,570)		
Environmental Compliance	452,488	1,150,502	154.3%	971,713	1,991,925	4,776,195	(2,784,271)		
General Administration	29,759	19,544	-34.3%	34,045	28,544	36,000	(7,456)		
Water Quality	1,734,891	1,707,667	-1.6%	2,173,206	2,532,423	3,825,075	(1,292,653)		
Water Treatment Plant	12,566,687	11,960,704	-4.8%	16,839,719	17,057,270	21,315,738	(4,258,468)		
Water Distribution	14,664,982	19,103,902	30.3%	18,733,620	24,671,223	24,004,868	666,356		
Sewer Operations	7,869,755	9,236,235	17.4%	10,171,195	13,095,399	15,903,795	(2,808,397)		
Direct Operating Expenses	\$ 56,539,788	\$ 64,365,567	13.8%	\$ 79,289,514	\$ 90,318,009	\$ 111,827,727	\$ (21,509,718)		
ALCOSAN Expenses	51,467,593	54,067,663	5.1%	70,310,473	72,550,246	75,484,220	(2,933,974)		
Co-Op Agreement Op. Expenses - Water	1,787,500	4,007,008	12.1%	893,750	3,503,504	3,500,000	3,504		
Co-Op Agreement Op. Expenses - Sewer	-	-	-	893,750	3,503,504	3,500,000	3,504		
Non-City Water Subsidy	3,390,600	1,194,940	-64.8%	4,131,689	1,383,940	1,700,000	(316,060)		
In-Direct Operating Expenses	\$ 56,645,693	\$ 59,269,611	4.6%	\$ 76,229,662	\$ 80,941,194	\$ 84,184,220	\$ (3,243,026)		
Subtotal: Operating Expenses	\$ 113,185,481	\$ 123,635,178	9.2%	\$ 155,519,176	\$ 171,259,203	\$ 196,011,947	\$ (24,752,744)		
<u>Debt Service</u>									
Subtotal: Debt Service	\$ 41,433,308	\$ 57,877,834	39.7%	\$ 43,777,607	\$ 61,327,442	\$ 58,115,307	\$ 3,212,134		
<u>Transfers to Reserves</u>									
Subtotal: Transfers to Reserves	\$ 2,199,834	\$ 1,883,237	-14.4%	\$ 2,933,112	\$ 2,510,983	\$ 2,510,983	\$ -		
<b>Total: Revenue Requirements</b>	<b>\$ 156,818,623</b>	<b>\$ 183,396,249</b>	<b>16.9%</b>	<b>\$ 202,229,894</b>	<b>\$ 235,097,628</b>	<b>\$ 256,638,237</b>	<b>\$ (21,540,610)</b>		
<b>Revenue Surplus / (Deficit)</b>	<b>\$ 15,430,900</b>	<b>\$ (998,378)</b>		<b>\$ 35,391,225</b>	<b>\$ 17,311,324</b>	<b>\$ 7,503,262</b>	<b>\$ 9,808,062</b>		

	Financial Metrics*		
	FY 2018 Actual	FY 2019 Forecast	FY 2019 Budget
<b>Senior Debt Service Coverage</b>	<b>2.66</b>	<b>1.94</b>	<b>1.65</b>
Minimum Requirement	1.25	1.25	1.25
<b>Subordinate Debt Service Coverage</b>	<b>N/A</b>	<b>1.75</b>	<b>1.49</b>
Minimum Requirement	N/A	1.10	1.10
<b>Total Debt Service Coverage</b>	<b>2.13</b>	<b>1.44</b>	<b>1.29</b>
Minimum Requirement	1.10	N/A	N/A
Unrestricted Days Cash without ALCOSAN Expense	199.03	235.82	173.50
Unrestricted Days Cash with ALCOSAN Expense	109.04	135.92	104.21
Unrestricted Days Cash including the Operating Reserve Fund	145.93	175.10	139.72

\*Cash basis estimate. Final audited coverage ratio could be different due to the use of the accrual basis accounting method.



2019 Forecast													
The Pittsburgh Water and Sewer Authority													
2019 Cash Flow Projection (Cash Basis)													
As of September 30, 2019													
	Actual							Forecast					Total
Receipts	January	February	March	April	May	June	July	August	September	October	November	December	
Water and Conveyance	\$ 12,153,920	\$ 11,716,900	\$ 12,930,811	\$ 13,940,733	\$ 14,592,670	\$ 11,724,900	\$ 18,336,755	\$ 15,583,786	\$ 14,917,448	\$ 16,817,834	\$ 16,634,552	\$ 15,310,468	\$ 174,660,775
ALCOSAN	6,004,660	4,534,219	4,785,942	6,443,475	6,612,471	4,380,637	7,982,981	6,773,402	5,705,310	6,861,589	6,786,811	6,246,592	73,118,090
DSIC	1,889	(21)	(22)	(2)	135	(221)	-	(152)	-	-	-	-	1,606
Fees	238,576	72,494	370,995	514,679	486,430	390,048	333,603	213,409	116,198	311,281	311,281	311,281	3,670,276
Misc. Other	122,995	(4,439)	75,337	50,849	107,894	37,589	45,902	56,736	45,951	139,797	139,797	139,797	958,204
<b>Total Receipts</b>	<b>\$ 18,522,039</b>	<b>16,319,154</b>	<b>18,163,063</b>	<b>20,949,734</b>	<b>21,799,600</b>	<b>16,532,954</b>	<b>26,699,240</b>	<b>22,627,181</b>	<b>20,784,907</b>	<b>24,130,501</b>	<b>23,872,441</b>	<b>22,008,138</b>	<b>\$ 252,408,951</b>
<b>Cash Disbursements</b>													
<b>Operating Expenses</b>													
Executive Director's Office	\$ 366,757	382,932	352,016	152,236	125,615	182,211	179,656	288,096	515,172	197,539	150,278	351,968	\$ 3,244,476
Customer Service	576,989	605,449	592,914	511,878	472,384	554,403	737,950	718,285	641,955	648,403	503,377	625,341	7,189,328
Management Information Systems	124,565	118,119	203,562	102,643	155,822	126,520	147,095	192,087	160,083	200,055	193,457	770,974	2,494,982
Finance	135,381	104,225	128,391	100,381	368,405	256,469	281,358	756,942	256,532	295,762	275,208	261,719	3,220,772
Procurement	32,369	24,805	25,928	26,953	25,261	26,356	34,918	25,008	24,682	40,853	40,867	66,753	394,753
Human Resources	326,154	37,362	63,429	48,680	46,583	50,033	64,161	89,934	56,875	53,551	50,122	74,658	961,543
Legal	84,310	226,540	674,081	67,708	271,885	253,510	530,333	255,617	467,415	229,012	230,574	250,267	3,541,252
Warehouse	34,906	31,600	280,583	(205,260)	41,372	40,170	25,442	24,263	24,329	29,090	29,964	42,571	399,030
External Affairs	86,969	58,761	65,502	55,647	105,288	87,871	90,665	60,926	128,876	89,567	104,185	113,827	1,048,083
Engineering & Construction	395,357	349,684	354,903	281,684	656,226	573,490	700,972	528,166	772,253	1,248,015	1,240,219	1,346,037	8,447,007
Environmental Compliance	65,874	13,245	235,823	159,062	53,447	130,960	254,959	134,589	102,543	330,778	250,116	260,528	1,991,925
General Administration	1,934	1,650	3,474	2,723	2,170	1,010	1,576	3,015	1,992	3,000	3,000	3,000	28,544
Water Quality	134,630	138,835	162,031	156,948	81,171	135,071	227,838	448,123	223,019	265,684	271,131	287,941	2,532,423
Water Treatment Plant	1,377,403	1,265,907	1,406,742	1,519,168	1,063,982	1,445,402	1,333,527	1,101,140	1,447,432	1,621,297	1,672,023	1,803,247	17,057,270
Water Distribution	1,796,651	1,903,081	1,810,219	2,605,009	1,387,229	2,041,058	2,260,824	3,091,611	2,208,221	1,646,052	1,801,336	2,119,934	24,671,223
Sewer Operations	1,003,915	1,367,125	632,955	994,364	840,091	1,171,380	1,010,969	1,177,147	1,038,288	1,374,833	1,321,552	1,162,778	13,095,399
ALCOSAN	7,733,639	4,643,597	6,209,392	6,874,718	4,508,477	6,185,507	6,944,505	4,718,003	6,249,825	7,314,339	4,656,216	6,512,027	72,550,246
Non-City Water Subsidy	186,758	260,406	262,660	183,526	37,154	82,839	56,310	36,201	89,085	128,675	28,675	31,650	1,383,940
City Co-Op Payment	-	4,007,008	-	-	-	-	-	-	-	-	-	3,000,000	7,007,008
Sub Total	\$ 14,464,564	15,540,330	13,464,605	13,638,067	10,242,564	13,344,262	14,883,059	13,649,153	14,408,576	15,716,503	12,822,300	19,085,222	\$ 177,259,204
<b>Debt Service</b>													
Bond Debt Service	\$ 570,556	22,666,621	1,018,032	594,117	613,031	840,561	5,870,873	22,365,681	537,483	821,527	821,527	821,527	\$ 57,541,537
PennVest Debt Service	325,681	301,802	325,430	328,446	326,991	321,635	288,894	290,193	291,807	328,342	328,342	328,342	3,785,905
Sub Total	\$ 896,237	22,968,423	1,343,462	922,563	940,022	1,162,197	6,159,767	22,655,874	829,289	1,149,869	1,149,869	1,149,869	\$ 61,327,442
<b>Transfer to Restricted Funds</b>													
	\$ 209,249	209,249	209,249	209,249	209,249	209,249	209,249	209,249	209,249	209,249	209,249	209,249	2,510,983
<b>Total Disbursements</b>	<b>\$ 15,570,049</b>	<b>38,718,001</b>	<b>15,017,315</b>	<b>14,769,879</b>	<b>11,391,834</b>	<b>14,715,707</b>	<b>21,252,075</b>	<b>36,514,275</b>	<b>15,447,114</b>	<b>17,075,621</b>	<b>14,181,418</b>	<b>20,444,340</b>	<b>\$ 235,097,628</b>
Surplus / Deficit	2,951,990	(22,398,847)	3,145,748	6,179,855	10,407,766	1,817,247	5,447,166	(13,887,094)	5,337,792	7,054,880	9,691,023	1,563,798	
<b>Annual Surplus/Deficit</b>													<b>\$ 17,311,327</b>
<b>Capital Spending</b>													
Capital Spending (Non PENNVEST)	\$ 5,323,554	4,849,505	6,104,476	8,104,315	5,316,725	6,389,051	4,879,954	5,270,894	5,053,727	20,542,478	21,362,287	26,832,098	\$ 120,029,064
PENNVEST Spending	\$ -	-	131,251	1,175,462	1,554,290	3,669,863	2,594,870	2,321,626	3,326,241	-	-	-	\$ 14,773,603
Total	\$ 5,323,554	4,849,505	6,235,727	9,279,777	6,871,015	10,058,914	7,474,824	7,592,520	8,379,968	20,542,478	21,362,287	26,832,098	\$ 134,802,667
<b>Capital Line of Credit</b>													
Capital Line of Credit Limit	-	-	-	-	-	-	-	-	150,000,000	-	-	-	\$ -
Capital Draws	-	-	-	-	-	-	-	-	-	-	-	-	\$ -
Outstanding Capital Draws	-	-	-	-	-	-	-	-	2,000,000	-	-	-	\$ -
Remaining Capital Credit	\$ -	-	-	-	-	-	-	-	148,000,000	-	-	-	\$ -

The Pittsburgh Water and Sewer Authority  
2018 & 2019 Financial Status Update (Cash Basis)  
As of October 31, 2019



	FY 2018			FY 2019			FY 2019		
	Prior Year-to-Date	Current Year-to-Date	YTD Growth	Actual	Forecast	Budget	2019 Difference		
							Forecast - Budget		
<b>Receipts</b>									
<u>User Charge &amp; Wholesale Receipts</u>									
Subtotal: User Charge & Wholesale Receipts	\$ 135,515,618	\$ 142,619,902	5.2%	\$ 163,733,064	\$ 174,564,922	\$ 183,756,758	\$ (9,191,836)		
<u>Other Operating Receipts</u>									
Other Misc. and Fee Operating Receipts	\$ 3,685,747	\$ 3,478,284	-5.6%	\$ 4,511,969	\$ 4,380,440	\$ 5,412,936	\$ (1,032,496)		
ALCOSAN Collections	58,381,035	61,442,848	5.2%	69,376,086	74,476,251	74,971,805	(495,554)		
Subtotal: Other Operating Receipts	\$ 62,066,782	\$ 64,921,132	4.6%	\$ 73,888,055	\$ 78,856,691	\$ 80,384,741	\$ (1,528,050)		
<b>Total: Receipts</b>	<b>\$ 197,582,400</b>	<b>\$ 207,541,035</b>	<b>5.0%</b>	<b>\$ 237,621,119</b>	<b>\$ 253,421,614</b>	<b>\$ 264,141,499</b>	<b>\$ (10,719,885)</b>		
<b>Revenue Requirements</b>									
<u>Operating Expenses</u>									
Executive Director's Office	1,852,848	3,274,145	76.7%	2,226,219	3,776,391	3,012,463	763,928		
Customer Service	6,338,692	5,877,582	-7.3%	7,782,837	7,006,300	7,622,863	(616,563)		
Management Information Systems	1,444,692	1,474,119	2.0%	2,180,850	2,438,550	3,534,194	(1,095,644)		
Finance	3,056,542	2,630,768	-13.9%	3,811,480	3,167,695	4,618,298	(1,450,603)		
Procurement	234,607	286,285	22.0%	293,718	393,906	577,151	(183,246)		
Human Resources	323,923	824,175	154.4%	402,156	948,956	1,434,270	(485,314)		
Legal	2,426,213	3,141,822	29.5%	3,244,746	3,622,662	2,822,799	799,863		
Warehouse	1,045,733	335,479	-67.9%	2,861,999	408,015	405,818	2,196		
External Affairs	415,402	831,463	100.2%	521,885	1,049,475	1,297,622	(248,147)		
Engineering & Construction	5,753,097	5,082,873	-11.6%	7,040,127	7,669,129	16,640,577	(8,971,448)		
Environmental Compliance	580,216	1,228,365	111.7%	971,713	1,739,009	4,776,195	(3,037,186)		
General Administration	31,716	21,286	-32.9%	34,045	27,286	36,000	(8,714)		
Water Quality	1,868,105	1,885,495	0.9%	2,173,206	2,444,567	3,825,075	(1,380,508)		
Water Treatment Plant	13,914,225	13,426,184	-3.5%	16,839,719	16,901,454	21,315,738	(4,414,284)		
Water Distribution	16,544,974	21,911,622	32.4%	18,733,620	25,832,892	24,004,868	1,828,024		
Sewer Operations	8,659,637	10,708,430	23.7%	10,171,195	13,192,761	15,903,795	(2,711,034)		
Direct Operating Expenses	\$ 64,490,622	\$ 72,940,094	13.1%	\$ 79,289,514	\$ 90,619,047	\$ 111,827,727	\$ (21,208,680)		
ALCOSAN Expenses	59,105,751	61,485,988	4.0%	70,310,473	72,654,231	75,484,220	(2,829,989)		
Co-Op Agreement Op. Expenses - Water	1,787,500	4,007,008	12.1%	893,750	3,503,504	3,500,000	3,504		
Co-Op Agreement Op. Expenses - Sewer	-	-	-	893,750	3,503,504	3,500,000	3,504		
Non-City Water Subsidy	3,575,561	1,232,807	-65.5%	4,131,689	1,293,132	1,700,000	(406,868)		
In-Direct Operating Expenses	\$ 64,468,812	\$ 66,725,803	3.5%	\$ 76,229,662	\$ 80,954,371	\$ 84,184,220	\$ (3,229,849)		
Subtotal: Operating Expenses	\$ 128,959,434	\$ 139,665,897	8.3%	\$ 155,519,176	\$ 171,573,418	\$ 196,011,947	\$ (24,438,529)		
<u>Debt Service</u>									
Subtotal: Debt Service	\$ 42,255,907	\$ 58,310,683	38.0%	\$ 43,777,607	\$ 60,610,421	\$ 58,115,307	\$ 2,495,114		
<u>Transfers to Reserves</u>									
Subtotal: Transfers to Reserves	\$ 2,444,260	\$ 2,092,486	-14.4%	\$ 2,933,112	\$ 2,510,983	\$ 2,510,983	\$ -		
<b>Total: Revenue Requirements</b>	<b>\$ 173,659,601</b>	<b>\$ 200,069,065</b>	<b>15.2%</b>	<b>\$ 202,229,894</b>	<b>\$ 234,694,822</b>	<b>\$ 256,638,237</b>	<b>\$ (21,943,415)</b>		
<b>Revenue Surplus / (Deficit)</b>	<b>\$ 23,922,799</b>	<b>\$ 7,471,970</b>		<b>\$ 35,391,225</b>	<b>\$ 18,726,791</b>	<b>\$ 7,503,262</b>	<b>\$ 11,223,530</b>		

	FY 2018	FY 2019	FY 2019
	Actual	Forecast	Budget
<b>Financial Metrics*</b>			
Senior Debt Service Coverage	2.66	1.95	1.65
Minimum Requirement	1.25	1.25	1.25
Subordinate Debt Service Coverage	N/A	1.76	1.49
Minimum Requirement	N/A	1.10	1.10
Total Debt Service Coverage	2.13	1.47	1.29
Minimum Requirement	1.10	N/A	N/A
Unrestricted Days Cash without ALCOSAN Expense	199.03	240.54	173.50
Unrestricted Days Cash with ALCOSAN Expense	109.04	138.68	104.21
Unrestricted Days Cash including the Operating Reserve Fund	145.93	177.79	139.72

\*Cash basis estimate. Final audited coverage ratio could be different due to the use of the accrual basis accounting method.



The Pittsburgh Water and Sewer Authority  
2018 & 2019 Financial Status Update (Cash Basis)  
As of August 31, 2019



	FY 2018			FY 2019			FY 2019		2019 Difference
	Prior Year-to-Date	Current Year-to-Date	YTD Growth	Actual	Forecast	Budget	Forecast - Budget		
<b>Receipts</b>									
<u>User Charge &amp; Wholesale Receipts</u>									
Subtotal: User Charge & Wholesale Receipts	\$ 104,663,659	\$ 110,980,474	6.0%	\$ 163,733,064	\$ 176,892,751	\$ 183,756,758	\$ (6,864,007)		
<u>Other Operating Receipts</u>									
Other Misc. and Fee Operating Receipts	\$ 3,310,472	\$ 3,114,703	-5.9%	\$ 4,511,969	\$ 4,919,015	\$ 5,412,936	\$ (493,921)		
ALCOSAN Collections	46,503,719	47,517,787	2.2%	69,376,086	74,409,655	74,971,805	\$(562,150)		
Subtotal: Other Operating Receipts	\$ 49,814,191	\$ 50,632,491	1.6%	\$ 73,888,055	\$ 79,328,671	\$ 80,384,741	\$ (1,056,070)		
<b>Total: Receipts</b>	<b>\$ 154,477,850</b>	<b>\$ 161,612,964</b>	<b>4.6%</b>	<b>\$ 237,621,119</b>	<b>\$ 256,221,421</b>	<b>\$ 264,141,499</b>	<b>\$ (7,920,078)</b>		
<b>Revenue Requirements</b>									
<u>Operating Expenses</u>									
Executive Director's Office	1,658,965	2,029,520	22.3%	2,226,219	2,880,948	3,012,463	(131,515)		
Customer Service	4,871,475	4,770,252	-2.1%	7,782,837	7,054,633	7,622,863	(568,230)		
Management Information Systems	1,118,078	1,170,413	4.7%	2,180,850	2,584,473	3,534,194	(949,720)		
Finance	1,765,496	2,131,552	20.7%	3,811,480	3,214,040	4,618,298	(1,404,258)		
Procurement	190,968	221,598	16.0%	293,718	412,958	577,151	(164,193)		
Human Resources	255,025	726,336	184.8%	402,156	1,042,548	1,434,270	(391,722)		
Legal	1,142,626	2,363,984	106.9%	3,244,746	3,305,579	2,822,799	482,780		
Warehouse	797,456	273,075	-65.8%	2,861,999	403,740	405,818	(2,079)		
External Affairs	304,321	611,628	101.0%	521,885	1,025,610	1,297,622	(272,011)		
Engineering & Construction	4,655,821	3,840,483	-17.5%	7,040,127	9,030,255	16,640,577	(7,610,322)		
Environmental Compliance	427,402	1,047,959	145.2%	971,713	2,203,472	4,776,195	(2,572,723)		
General Administration	28,663	17,552	-38.8%	34,045	29,552	36,000	(6,448)		
Water Quality	1,540,661	1,484,648	-3.6%	2,173,206	2,595,235	3,825,075	(1,229,841)		
Water Treatment Plant	10,799,357	10,513,272	-2.6%	16,839,719	17,373,758	21,315,738	(3,941,980)		
Water Distribution	13,221,474	16,895,681	27.8%	18,733,620	24,261,164	24,004,868	256,296		
Sewer Operations	6,453,116	8,197,947	27.0%	10,171,195	13,425,813	15,903,795	(2,477,982)		
Direct Operating Expenses	\$ 49,230,904	\$ 56,295,901	14.4%	\$ 79,289,514	\$ 90,843,779	\$ 111,827,727	\$ (20,983,949)		
ALCOSAN Expenses	45,146,748	47,817,838	5.9%	70,310,473	73,031,227	75,484,220	(2,452,993)		
Co-Op Agreement Op. Expenses - Water	1,787,500	4,007,008	12.1%	893,750	3,503,504	3,500,000	3,504		
Co-Op Agreement Op. Expenses - Sewer	-	-	-	893,750	3,503,504	3,500,000	3,504		
Non-City Water Subsidy	2,965,450	1,105,855	-62.7%	4,131,689	1,323,505	1,700,000	(376,495)		
In-Direct Operating Expenses	\$ 49,899,697	\$ 52,930,701	6.1%	\$ 76,229,662	\$ 81,361,740	\$ 84,184,220	\$ (2,822,480)		
Subtotal: Operating Expenses	\$ 99,130,601	\$ 109,226,602	10.2%	\$ 155,519,176	\$ 172,205,519	\$ 196,011,947	\$ (23,806,429)		
<u>Debt Service</u>									
Subtotal: Debt Service	\$ 40,382,090	\$ 57,048,544	41.3%	\$ 43,777,607	\$ 61,648,022	\$ 58,115,307	\$ 3,532,714		
<u>Transfers to Reserves</u>									
Subtotal: Transfers to Reserves	\$ 1,955,408	\$ 1,673,989	-14.4%	\$ 2,933,112	\$ 2,510,983	\$ 2,510,983	\$ -		
<b>Total: Revenue Requirements</b>	<b>\$ 141,468,099</b>	<b>\$ 167,949,135</b>	<b>18.7%</b>	<b>\$ 202,229,894</b>	<b>\$ 236,364,523</b>	<b>\$ 256,638,237</b>	<b>\$ (20,273,714)</b>		
<b>Revenue Surplus / (Deficit)</b>	<b>\$ 13,009,751</b>	<b>\$ (6,336,170)</b>		<b>\$ 35,391,225</b>	<b>\$ 19,856,898</b>	<b>\$ 7,503,262</b>	<b>\$ 12,353,637</b>		

	FY 2018	FY 2019	FY 2019
	Actual	Forecast	Budget
<b>Financial Metrics*</b>			
Senior Debt Service Coverage	2.66	2.00	1.65
Minimum Requirement	1.25	1.25	1.25
Subordinate Debt Service Coverage	N/A	1.81	1.49
Minimum Requirement	N/A	1.10	1.10
Total Debt Service Coverage	2.13	1.48	1.29
Minimum Requirement	1.10	N/A	N/A
Unrestricted Days Cash without ALCOSAN Expense	199.03	244.08	173.50
Unrestricted Days Cash with ALCOSAN Expense	109.04	140.57	104.21
Unrestricted Days Cash including the Operating Reserve Fund	145.93	179.54	139.72

\*Cash basis estimate. Final audited coverage ratio could be different due to the use of the accrual basis accounting method.



2019 Forecast

The Pittsburgh Water and Sewer Authority  
2019 Cash Flow Projection (Cash Basis)  
As of August 31, 2019

	Actual												Total
	January	February	March	April	May	June	July	August	September	October	November	December	
<b>Receipts</b>													
Water and Conveyance	\$ 12,153,920	\$ 11,716,900	\$ 12,930,811	\$ 13,940,733	\$ 14,592,670	\$ 11,724,900	\$ 18,336,755	\$ 15,583,786	\$ 17,149,423	\$ 16,817,834	\$ 16,634,552	\$ 15,310,468	\$ 176,892,751
ALCOSAN	6,004,660	4,534,219	4,785,942	6,443,475	6,612,471	4,380,637	7,982,981	6,773,402	6,996,876	6,861,589	6,786,811	6,246,592	74,409,655
DSIC	1,889	(21)	(22)	(2)	135	(221)	-	(152)	-	-	-	-	1,606
Fees	238,576	72,494	370,995	514,679	486,430	390,048	333,603	213,409	311,281	311,281	311,281	311,281	3,865,359
Misc. Other	122,995	(4,439)	75,337	50,849	107,894	37,589	45,902	56,736	139,797	139,797	139,797	139,797	1,052,050
<b>Total Receipts</b>	<b>\$ 18,522,039</b>	<b>16,319,154</b>	<b>18,163,063</b>	<b>20,949,734</b>	<b>21,799,600</b>	<b>16,532,954</b>	<b>26,699,240</b>	<b>22,627,181</b>	<b>24,597,377</b>	<b>24,130,501</b>	<b>23,872,441</b>	<b>22,008,138</b>	<b>\$ 286,221,421</b>
<b>Cash Disbursements</b>													
<b>Operating Expenses</b>													
Executive Director's Office	\$ 366,757	382,932	352,016	152,236	125,615	182,211	179,656	288,096	151,644	197,539	150,278	351,968	\$ 2,880,948
Customer Service	576,989	605,449	592,914	511,878	472,384	554,403	737,950	718,285	507,260	648,403	503,377	625,341	7,054,633
Management Information Systems	124,565	118,119	203,562	102,643	155,822	126,520	147,095	192,087	249,574	200,055	193,457	770,974	2,584,473
Finance	135,381	104,225	128,391	100,381	368,405	256,469	281,358	756,942	249,800	295,762	275,208	261,719	3,214,040
Procurement	32,369	24,805	25,928	26,953	25,261	26,356	34,918	25,008	42,886	40,853	40,867	66,753	412,958
Human Resources	326,154	37,362	63,429	48,680	46,583	50,033	64,161	89,934	137,881	53,551	50,122	74,658	1,042,548
Legal	84,310	226,540	674,081	67,708	271,885	253,510	530,333	255,617	231,742	229,012	230,574	250,267	3,305,579
Warehouse	34,906	31,600	280,583	(205,260)	41,372	40,170	25,442	24,263	29,039	29,090	29,964	42,571	403,740
External Affairs	86,969	58,761	65,502	55,647	105,288	87,871	90,665	60,926	106,403	89,567	104,185	113,827	1,025,610
Engineering & Construction	395,357	349,684	354,903	281,684	656,226	573,490	700,972	528,166	1,355,500	1,248,015	1,240,219	1,346,037	9,030,255
Environmental Compliance	65,874	13,245	235,823	159,062	53,447	130,960	254,959	134,589	314,091	330,778	250,116	260,528	2,203,472
General Administration	1,934	1,650	3,474	2,723	2,170	1,010	1,576	3,015	3,000	3,000	3,000	3,000	29,552
Water Quality	134,630	138,835	162,031	156,948	81,171	135,071	227,838	448,123	285,831	265,684	271,131	287,941	2,595,235
Water Treatment Plant	1,377,403	1,265,907	1,406,742	1,519,168	1,063,982	1,445,402	1,333,527	1,101,140	1,763,921	1,621,297	1,672,023	1,803,247	17,373,758
Water Distribution	1,796,651	1,903,081	1,810,219	2,605,009	1,387,229	2,041,058	2,260,824	3,091,611	1,798,161	1,646,052	1,801,336	2,119,934	24,261,164
Sewer Operations	1,003,915	1,367,125	632,955	994,364	840,091	1,171,380	1,010,969	1,177,147	1,368,702	1,374,833	1,321,552	1,162,778	13,425,813
ALCOSAN	7,733,639	4,643,597	6,209,392	6,874,718	4,508,477	6,185,507	6,944,505	4,718,003	6,730,806	7,314,339	4,656,216	6,512,027	73,031,227
Non-City Water Subsidy	186,758	260,406	262,660	183,526	37,154	82,839	56,310	36,201	28,650	128,675	28,675	31,650	1,323,505
City Co-Op Payment	-	4,007,008	-	-	-	-	-	-	-	-	-	3,000,000	7,007,008
Sub Total	\$ 14,464,564	15,540,330	13,464,605	13,638,067	10,242,564	13,344,262	14,883,059	13,649,153	15,354,892	15,716,503	12,822,300	19,085,222	\$ 172,205,520
<b>Debt Service</b>													
Bond Debt Service	\$ 570,556	22,666,621	1,018,032	594,117	613,031	840,561	5,870,873	22,365,681	821,527	821,527	821,527	821,527	\$ 57,825,581
PennVEST Debt Service	325,681	301,802	325,430	320,446	326,991	321,635	288,884	290,199	328,342	328,342	328,342	328,342	3,822,441
Sub Total	\$ 896,237	22,968,423	1,343,462	922,563	940,022	1,162,197	6,159,767	22,655,874	1,149,869	1,149,869	1,149,869	1,149,869	\$ 61,648,022
Transfer to Restricted Funds	\$ 209,249	209,249	209,249	209,249	209,249	209,249	209,249	209,249	209,249	209,249	209,249	209,249	2,510,983
<b>Total Disbursements</b>	<b>\$ 15,570,049</b>	<b>38,718,001</b>	<b>15,017,315</b>	<b>14,769,879</b>	<b>11,397,834</b>	<b>14,715,707</b>	<b>31,252,025</b>	<b>36,514,275</b>	<b>16,714,010</b>	<b>17,075,621</b>	<b>14,181,418</b>	<b>20,444,340</b>	<b>\$ 236,364,523</b>
Surplus / Deficit	2,951,990	(22,398,847)	3,145,748	6,379,855	10,407,766	1,817,247	5,447,166	(13,887,094)	7,883,367	7,054,880	9,691,023	1,563,798	
<b>Annual Surplus/Deficit</b>													<b>\$ 19,556,901</b>
<b>Capital Spending</b>													
Capital Spending (Non PENNVEST)	\$ 5,323,554	4,849,505	6,104,476	8,104,315	5,316,725	6,389,051	4,879,954	5,270,894	8,997,922	20,542,478	21,362,287	26,832,098	\$ 128,973,259
PENNVEST Spending	-	-	131,251	1,175,462	1,554,290	3,669,863	2,594,870	2,321,626	-	-	-	-	\$ 11,447,362
Total	\$ 5,323,554	4,849,505	6,235,727	9,279,777	6,871,015	10,058,914	7,474,824	7,592,520	13,997,922	20,542,478	21,362,287	26,832,098	\$ 140,420,621
<b>Capital Line of Credit</b>													
Capital Line of Credit Limit	-	-	-	-	-	-	-	150,000,000	-	-	-	-	\$ -
Capital Draws	-	-	-	-	-	-	-	-	-	-	-	-	\$ -
Outstanding Capital Draws	-	-	-	-	-	-	-	2,000,000	-	-	-	-	\$ -
Remaining Capital Credit	\$ -	-	-	-	-	-	-	148,000,000	-	-	-	-	\$ -
<b>Operating Line of Credit</b>													
Operating Line of Credit Limit	-	-	-	-	-	-	-	20,000,000	-	-	-	-	\$ -
Operating Draws	-	-	-	-	-	-	-	-	-	-	-	-	\$ -
Outstanding Operating Draws	-	-	-	-	-	-	-	-	-	-	-	-	\$ -
Remaining Operating Credit	\$ -	-	-	-	-	-	-	20,000,000	-	-	-	-	\$ -

The Pittsburgh Water and Sewer Authority  
2018 & 2019 Financial Status Update (Cash Basis)  
As of November 30, 2019



	FY 2018			FY 2019			FY 2019			2019 Difference
	Prior Year-to-Date	Current Year-to-Date	YTD Growth	Actual	Forecast	Budget	Forecast - Budget			
<b>Receipts</b>										
<u>User Charge &amp; Wholesale Receipts</u>										
Subtotal: User Charge & Wholesale Receipts	\$ 150,033,859	\$ 154,626,378	3.1%	\$ 163,733,064	\$ 169,936,846	\$ 183,756,758	\$ (13,819,912)			
<u>Other Operating Receipts</u>										
Other Misc. and Fee Operating Receipts	\$ 3,908,076	\$ 5,386,599	37.8%	\$ 4,511,969	\$ 5,837,677	\$ 5,412,936	\$ 424,741			
ALCOSAN Collections	63,869,864	66,469,893	4.1%	69,376,086	72,716,485	74,971,805	(2,255,320)			
Subtotal: Other Operating Receipts	\$ 67,777,940	\$ 71,856,493	6.0%	\$ 73,888,055	\$ 78,554,163	\$ 80,384,741	\$ (1,830,578)			
<b>Total: Receipts</b>	<b>\$ 217,811,798</b>	<b>\$ 226,482,870</b>	<b>4.0%</b>	<b>\$ 237,621,119</b>	<b>\$ 248,491,008</b>	<b>\$ 264,141,499</b>	<b>\$ (15,650,491)</b>			
<b>Revenue Requirements</b>										
<u>Operating Expenses</u>										
Executive Director's Office	2,049,033	3,412,258	66.5%	2,226,219	3,764,226	3,012,463	751,764			
Customer Service	6,692,580	6,483,581	-3.1%	7,782,837	7,108,922	7,622,863	(513,941)			
Management Information Systems	1,823,073	1,664,286	-8.7%	2,180,850	2,435,260	3,534,194	(1,098,934)			
Finance	3,439,918	2,863,368	-16.8%	3,811,480	3,125,087	4,618,298	(1,493,211)			
Procurement	262,562	323,420	23.2%	293,718	390,173	577,151	(186,978)			
Human Resources	364,648	888,572	143.7%	402,156	963,231	1,434,270	(471,039)			
Legal	2,613,739	3,391,209	29.7%	3,244,746	3,641,476	2,822,799	818,677			
Warehouse	2,812,580	552,266	-80.4%	2,861,999	594,837	405,818	189,019			
External Affairs	466,348	909,306	95.0%	521,885	1,023,133	1,297,622	(274,488)			
Engineering & Construction	6,384,795	5,570,438	-12.8%	7,040,127	6,916,475	16,640,577	(9,724,102)			
Environmental Compliance	785,875	1,386,225	76.4%	971,713	1,646,754	4,776,195	(3,129,442)			
General Administration	31,812	23,649	-25.7%	34,045	26,649	36,000	(9,351)			
Water Quality	1,977,265	2,047,533	3.6%	2,173,206	2,335,474	3,825,075	(1,489,601)			
Water Treatment Plant	15,350,066	15,149,208	-1.3%	16,839,719	16,952,455	21,315,738	(4,363,283)			
Water Distribution	18,580,229	24,311,411	30.8%	18,733,620	26,431,345	24,004,868	2,426,477			
Sewer Operations	10,176,007	11,567,722	13.7%	10,171,195	12,730,501	15,903,795	(3,173,295)			
Direct Operating Expenses	\$ 73,810,529	\$ 80,544,454	9.1%	\$ 79,289,514	\$ 90,085,999	\$ 111,827,727	\$ (21,741,728)			
ALCOSAN Expenses	64,041,175	66,402,361	3.7%	70,310,473	72,914,388	75,484,220	(2,569,832)			
Co-Op Agreement Op. Expenses - Water	1,787,500	4,007,008	12.1%	893,750	3,503,504	3,500,000	3,504			
Co-Op Agreement Op. Expenses - Sewer	-	-	-	893,750	3,503,504	3,500,000	3,504			
Non-City Water Subsidy	3,896,679	1,329,896	-65.9%	4,131,689	1,361,546	1,700,000	(338,454)			
In-Direct Operating Expenses	\$ 69,725,353	\$ 71,739,265	2.9%	\$ 76,229,662	\$ 81,282,942	\$ 84,184,220	\$ (2,901,278)			
Subtotal: Operating Expenses	\$ 143,535,882	\$ 152,283,719	6.1%	\$ 155,519,176	\$ 171,368,941	\$ 196,011,947	\$ (24,643,006)			
<u>Debt Service</u>										
Subtotal: Debt Service	\$ 43,032,533	\$ 58,697,812	36.4%	\$ 43,777,607	\$ 59,847,681	\$ 58,115,307	\$ 1,732,374			
<u>Transfers to Reserves</u>										
Subtotal: Transfers to Reserves	\$ 2,688,686	\$ 2,301,734	-14.4%	\$ 2,933,112	\$ 2,510,983	\$ 2,510,983	\$ -			
<b>Total: Revenue Requirements</b>	<b>\$ 189,257,102</b>	<b>\$ 213,283,266</b>	<b>12.7%</b>	<b>\$ 202,229,894</b>	<b>\$ 233,727,605</b>	<b>\$ 256,638,237</b>	<b>\$ (23,910,632)</b>			
<b>Revenue Surplus / (Deficit)</b>	<b>\$ 28,554,697</b>	<b>\$ 13,199,605</b>		<b>\$ 35,391,225</b>	<b>\$ 14,763,403</b>	<b>\$ 7,503,262</b>	<b>\$ 7,260,141</b>			

*Financial Metrics\**

	FY 2018	FY 2019	FY 2019
	Actual	Forecast	Budget
<b>Senior Debt Service Coverage</b>	<b>2.66</b>	<b>1.85</b>	<b>1.65</b>
Minimum Requirement	1.25	1.25	1.25
<b>Subordinate Debt Service Coverage</b>	<b>N/A</b>	<b>1.67</b>	<b>1.49</b>
Minimum Requirement	N/A	1.10	1.10
<b>Total Debt Service Coverage</b>	<b>2.13</b>	<b>1.41</b>	<b>1.29</b>
Minimum Requirement	1.10	N/A	N/A
<b>Unrestricted Days Cash without ALCOSAN Expense</b>	<b>199.03</b>	<b>226.98</b>	<b>173.50</b>
<b>Unrestricted Days Cash with ALCOSAN Expense</b>	<b>109.04</b>	<b>130.40</b>	<b>104.21</b>
<b>Unrestricted Days Cash including the Operating Reserve Fund</b>	<b>145.93</b>	<b>169.56</b>	<b>139.72</b>

\*Cash basis estimate. Final audited coverage ratio could be different due to the use of the accrual basis accounting method.

**2019 Forecast**

**The Pittsburgh Water and Sewer Authority**  
 2019 Cash Flow Projection (Cash Basis)  
 As of November 30, 2019

	Actual												Forecast	Total
	January	February	March	April	May	June	July	August	September	October	November	December		
<b>Receipts</b>														
<b>Water and Conveyance</b>	\$ 12,153,920	\$ 11,021,853	\$ 12,930,811	\$ 13,940,733	\$ 14,592,670	\$ 11,724,900	\$ 18,336,755	\$ 15,583,786	\$ 14,917,448	\$ 17,417,028	\$ 12,006,475	\$ 15,310,468	\$ 169,936,846	
ALCOSAN	6,004,660	5,229,299	4,785,942	6,443,475	6,612,471	4,380,637	7,982,981	6,773,402	5,705,310	7,524,670	5,027,045	6,246,592	72,716,485	
DSIC	1,889	(54)	(22)	(2)	135	(221)	-	(152)	-	-	-	-	1,572	
Fees	238,576	72,494	370,995	514,679	486,430	390,048	333,603	213,409	116,198	148,812	1,867,305	311,281	5,063,831	
Misc. Other	122,995	(4,439)	75,337	50,849	107,894	37,589	45,902	56,736	45,951	52,654	41,010	139,797	772,274	
<b>Total Receipts</b>	<b>\$ 18,522,039</b>	<b>16,319,154</b>	<b>18,163,063</b>	<b>20,949,734</b>	<b>21,799,600</b>	<b>16,532,954</b>	<b>26,699,240</b>	<b>22,627,181</b>	<b>20,784,907</b>	<b>25,143,164</b>	<b>18,941,836</b>	<b>22,008,138</b>	<b>\$ 248,491,008</b>	
<b>Cash Disbursements</b>														
<b>Operating Expenses</b>														
Executive Director's Office	\$ 366,757	382,932	352,016	152,236	125,615	182,211	179,656	288,096	515,172	729,454	138,113	351,968	\$ 3,764,226	
Customer Service	576,989	605,449	592,914	511,878	472,384	554,403	737,950	718,285	641,955	465,375	605,999	625,341	7,108,922	
Management Information Systems	124,565	118,119	203,562	102,643	155,822	126,520	147,095	192,087	160,083	143,622	190,168	770,974	2,435,260	
Finance	135,381	104,225	128,391	100,381	368,405	281,358	256,942	756,942	256,532	242,684	232,600	281,719	3,125,087	
Procurement	32,369	24,805	25,928	26,953	25,261	26,356	34,918	25,008	24,682	40,005	37,135	66,753	390,173	
Human Resources	326,154	37,362	63,429	48,680	46,583	50,033	64,161	89,934	56,875	40,964	64,397	74,658	963,231	
Legal	84,310	226,540	674,081	67,708	271,885	253,510	530,333	255,617	467,415	310,422	249,388	250,267	3,641,476	
Warehouse	34,906	31,600	280,583	(205,260)	41,372	40,170	25,442	24,263	24,329	38,075	216,787	42,571	594,837	
External Affairs	86,969	58,761	65,502	55,647	105,288	87,871	90,665	60,926	128,876	90,959	77,843	113,827	1,023,133	
Engineering & Construction	395,357	349,684	354,903	281,684	656,226	573,490	700,972	528,166	772,253	470,137	487,565	1,346,037	6,916,475	
Environmental Compliance	65,874	13,245	235,823	159,062	53,447	130,960	254,959	134,589	102,543	77,863	157,860	260,528	1,646,754	
General Administration	1,934	1,650	3,474	2,723	2,170	1,010	1,576	3,015	1,992	1,742	2,363	3,000	26,649	
Water Quality	134,630	138,835	162,031	156,948	81,171	135,071	227,838	448,123	223,019	177,828	162,038	287,941	2,335,474	
Water Treatment Plant	1,377,403	1,265,907	1,406,742	1,519,168	1,063,982	1,445,402	1,333,527	1,101,140	1,447,432	1,465,481	1,723,024	1,803,247	16,952,455	
Water Distribution	1,796,651	1,903,081	1,810,219	2,605,009	1,387,229	2,041,058	2,260,824	3,091,611	2,208,221	2,807,720	2,399,789	2,119,934	26,431,345	
Sewer Operations	1,003,915	1,367,125	632,955	994,364	840,091	1,171,380	1,010,969	1,177,147	1,038,288	1,472,195	859,292	1,162,778	12,730,501	
ALCOSAN	7,733,639	4,643,597	6,209,392	6,874,718	4,508,477	6,185,507	6,944,505	4,718,003	6,249,825	7,418,325	4,916,373	6,512,027	72,914,388	
Non-City Water Subsidy	186,758	260,406	262,660	183,526	37,154	82,839	56,310	36,201	89,085	37,867	97,090	31,650	1,361,546	
City Co-Op Payment	-	4,007,008	-	-	-	-	-	-	-	-	-	3,000,000	7,007,008	
<b>Sub Total</b>	<b>\$ 14,464,564</b>	<b>15,540,330</b>	<b>13,464,605</b>	<b>13,638,067</b>	<b>10,242,564</b>	<b>13,344,262</b>	<b>14,883,059</b>	<b>13,649,153</b>	<b>14,408,576</b>	<b>16,030,719</b>	<b>12,617,823</b>	<b>19,085,222</b>	<b>\$ 171,368,942</b>	
<b>Debt Service</b>														
Bond Debt Service	\$ 570,556	22,666,621	1,018,032	594,137	613,031	840,561	5,870,873	22,365,681	537,483	139,009	91,074	821,527	\$ 56,128,566	
PennVest Debt Service	325,681	301,802	325,430	328,446	326,991	321,635	288,894	290,193	291,807	293,840	296,655	328,342	3,719,115	
<b>Sub Total</b>	<b>\$ 896,237</b>	<b>22,968,423</b>	<b>1,343,462</b>	<b>922,563</b>	<b>940,022</b>	<b>1,162,197</b>	<b>6,159,767</b>	<b>22,655,874</b>	<b>829,289</b>	<b>432,849</b>	<b>387,130</b>	<b>1,149,869</b>	<b>\$ 59,847,681</b>	
<b>Transfer to Restricted Funds</b>	\$ 209,249	209,249	209,249	209,249	209,249	209,249	209,249	209,249	209,249	209,249	209,249	209,249	2,510,983	
<b>Total Disbursements</b>	<b>\$ 15,570,049</b>	<b>38,718,001</b>	<b>15,017,315</b>	<b>14,769,879</b>	<b>11,391,834</b>	<b>14,715,707</b>	<b>21,252,075</b>	<b>36,514,275</b>	<b>15,447,114</b>	<b>16,672,816</b>	<b>13,214,201</b>	<b>20,444,340</b>	<b>\$ 233,727,605</b>	
<b>Surplus / Deficit</b>	2,951,990	(22,398,847)	3,145,748	6,179,855	10,407,766	1,817,247	5,447,166	(13,887,094)	5,337,792	8,470,348	5,727,635	1,563,798		
<b>Annual Surplus/Deficit</b>													<b>\$ 14,763,406</b>	
<b>Capital Spending</b>														
Capital Spending (Non PENNVEST)	\$ 5,323,554	4,849,505	6,104,476	8,104,315	5,316,725	6,389,051	4,879,954	5,270,894	5,053,727	6,726,188	5,973,025	26,832,098	\$ 90,823,513	
PENNVEST Spending	-	-	131,251	1,175,462	1,554,290	3,669,863	2,594,870	2,321,626	3,326,241	2,662,322	3,564,541	-	\$ 21,000,466	
<b>Total</b>	<b>\$ 5,323,554</b>	<b>4,849,505</b>	<b>6,235,727</b>	<b>9,279,777</b>	<b>6,871,015</b>	<b>10,058,914</b>	<b>7,474,824</b>	<b>7,592,520</b>	<b>8,379,968</b>	<b>9,388,510</b>	<b>9,537,566</b>	<b>26,832,098</b>	<b>\$ 111,823,979</b>	
<b>Capital Line of Credit</b>														
Capital Line of Credit Limit	-	-	-	-	-	-	-	-	-	-	-	150,000,000	\$ -	
Capital Draws	-	-	-	-	-	-	-	-	-	-	-	-	\$ -	
Outstanding Capital Draws	-	-	-	-	-	-	-	-	-	-	-	2,000,000	\$ -	
Remaining Capital Credit	-	-	-	-	-	-	-	-	-	-	-	148,000,000	\$ -	

The Pittsburgh Water and Sewer Authority  
 2018 & 2019 Financial Status Update (Cash Basis)  
 As of December 31, 2019



	FY 2018			FY 2019			FY 2019		2019 Difference
	Prior Year-to-Date	Current Year-to-Date	YTD Growth	Actual	Actual	Budget	Actual - Budget		
<b>Receipts</b>									
<u>User Charge &amp; Wholesale Receipts</u>									
Subtotal: User Charge & Wholesale Receipts	\$ 163,733,064	\$ 171,182,397	4.5%	\$ 163,733,064	\$ 171,182,397	\$ 183,756,758	\$	(12,574,361)	
<u>Other Operating Receipts</u>									
Other Misc. and Fee Operating Receipts	\$ 4,511,969	\$ 5,868,943	30.1%	\$ 4,511,969	\$ 5,868,943	\$ 5,412,936	\$	456,007	
ALCOSAN Collections	69,376,086	73,522,941	6.0%	69,376,086	73,522,941	74,971,805	\$	(1,448,864)	
Subtotal: Other Operating Receipts	\$ 73,888,055	\$ 79,391,884	7.4%	\$ 73,888,055	\$ 79,391,884	\$ 80,384,741	\$	(992,857)	
<b>Total: Receipts</b>	<b>\$ 237,621,119</b>	<b>\$ 250,574,281</b>	<b>5.5%</b>	<b>\$ 237,621,119</b>	<b>\$ 250,574,281</b>	<b>\$ 264,141,499</b>	<b>\$</b>	<b>(13,567,218)</b>	
<b>Revenue Requirements</b>									
<u>Operating Expenses</u>									
Executive Director's Office	2,226,219	3,479,233	56.3%	2,226,219	3,479,233	3,012,463	\$	466,770	
Customer Service	7,782,837	7,457,579	-4.2%	7,782,837	7,457,579	7,622,863	\$	(165,285)	
Management Information Systems	2,180,850	2,301,283	5.5%	2,180,850	2,301,283	3,534,194	\$	(1,232,910)	
Finance	3,811,480	3,186,898	-16.4%	3,811,480	3,186,898	4,618,298	\$	(1,431,400)	
Procurement	293,718	370,556	26.2%	293,718	370,556	577,151	\$	(206,593)	
Human Resources	402,156	951,558	136.6%	402,156	951,558	1,434,270	\$	(482,712)	
Legal	3,244,746	3,616,831	11.5%	3,244,746	3,616,831	2,822,799	\$	794,032	
Warehouse	2,861,999	663,281	-76.8%	2,861,999	663,281	405,818	\$	257,463	
External Affairs	521,885	1,080,407	107.0%	521,885	1,080,407	1,297,622	\$	(217,214)	
Engineering & Construction	7,040,127	8,824,994	25.4%	7,040,127	8,824,994	16,640,577	\$	(7,815,584)	
Environmental Compliance	971,713	1,491,438	53.5%	971,713	1,491,438	4,776,195	\$	(3,284,757)	
General Administration	34,045	24,939	-26.7%	34,045	24,939	36,000	\$	(11,061)	
Water Quality	2,173,206	2,254,974	3.8%	2,173,206	2,254,974	3,825,075	\$	(1,570,101)	
Water Treatment Plant	16,839,719	17,099,660	1.5%	16,839,719	17,099,660	21,315,738	\$	(4,216,078)	
Water Distribution	18,733,620	25,251,612	34.8%	18,733,620	25,251,612	24,004,868	\$	1,246,744	
Sewer Operations	10,171,195	11,487,340	12.9%	10,171,195	11,487,340	15,903,795	\$	(4,416,455)	
Direct Operating Expenses	\$ 79,289,514	\$ 89,542,582	12.9%	\$ 79,289,514	\$ 89,542,582	\$ 111,827,727	\$	(22,285,145)	
ALCOSAN Expenses	70,310,473	71,397,509	1.5%	70,310,473	71,397,509	75,484,220	\$	(4,086,711)	
Co-Op Agreement Op. Expenses - Water	1,787,500	4,600,473	28.7%	893,750	2,300,237	3,500,000	\$	(1,199,763)	
Co-Op Agreement Op. Expenses - Sewer	-	-	-	893,750	2,300,237	3,500,000	\$	(1,199,763)	
Non-City Water Subsidy	4,131,689	1,404,861	-66.0%	4,131,689	1,404,861	1,700,000	\$	(295,139)	
In-Direct Operating Expenses	\$ 76,229,662	\$ 77,402,844	1.5%	\$ 76,229,662	\$ 77,402,844	\$ 84,184,220	\$	(6,781,376)	
Subtotal: Operating Expenses	\$ 155,519,176	\$ 166,945,426	7.3%	\$ 155,519,176	\$ 166,945,426	\$ 196,011,947	\$	(29,066,521)	
<u>Debt Service</u>									
Subtotal: Debt Service	\$ 43,777,607	\$ 59,279,766	35.4%	\$ 43,777,607	\$ 59,279,766	\$ 58,115,307	\$	1,164,459	
<u>Transfers to Reserves</u>									
Subtotal: Transfers to Reserves	\$ 2,933,112	\$ 2,510,983	-14.4%	\$ 2,933,112	\$ 2,510,983	\$ 2,510,983	\$	-	
<b>Total: Revenue Requirements</b>	<b>\$ 202,229,894</b>	<b>\$ 228,736,175</b>	<b>13.1%</b>	<b>\$ 202,229,894</b>	<b>\$ 228,736,175</b>	<b>\$ 256,638,237</b>	<b>\$</b>	<b>(27,902,062)</b>	
<b>Revenue Surplus / (Deficit)</b>	<b>\$ 35,391,225</b>	<b>\$ 21,838,106</b>		<b>\$ 35,391,225</b>	<b>\$ 21,838,106</b>	<b>\$ 7,503,262</b>	<b>\$</b>	<b>14,334,845</b>	

Financial Metrics\*

	FY 2018	FY 2019	FY 2019
	Actual	Forecast	Budget
<b>Senior Debt Service Coverage</b>	<b>2.66</b>	<b>1.94</b>	<b>1.65</b>
Minimum Requirement	1.25	1.25	1.25
<b>Subordinate Debt Service Coverage</b>	<b>N/A</b>	<b>1.75</b>	<b>1.49</b>
Minimum Requirement	N/A	1.10	1.10
<b>Total Debt Service Coverage</b>	<b>2.13</b>	<b>1.49</b>	<b>1.29</b>
Minimum Requirement	1.10	N/A	N/A
Unrestricted Days Cash without ALCOSAN Expense	199.03	260.91	173.50
Unrestricted Days Cash with ALCOSAN Expense	109.04	149.33	104.21
Unrestricted Days Cash including the Operating Reserve Fund	145.93	189.52	139.72

\*Cash basis estimate. Final audited coverage ratio could be different due to the use of the accrual basis accounting method.



2019													
The Pittsburgh Water and Sewer Authority													
2019 Cash Flow Projection (Cash Basis)													
As of December 31, 2019													
Actual													
Receipts	January	February	March	April	May	June	July	August	September	October	November	December	Total
Water and Conveyance	\$ 12,153,920	\$ 11,021,853	\$ 12,930,811	\$ 13,940,733	\$ 14,592,670	\$ 11,724,900	\$ 18,336,755	\$ 15,583,786	\$ 14,917,448	\$ 17,417,028	\$ 12,006,475	\$ 16,556,020	\$ 171,182,397
ALCOSAN	6,004,660	5,229,299	4,785,942	6,443,475	6,612,471	4,380,637	7,982,981	6,773,402	5,705,310	7,524,670	5,027,045	7,053,047	73,522,941
DSIC	1,889	(54)	(22)	(2)	135	(221)	-	(152)	-	(7)	-	(80)	1,485
Fees	238,576	72,494	370,995	514,679	486,430	390,048	333,603	213,409	116,198	148,812	1,867,305	404,279	\$ 5,156,829
Misc. Other	122,995	(4,439)	75,337	50,849	107,894	37,589	45,902	56,736	45,951	52,654	41,010	78,152	710,629
<b>Total Receipts</b>	<b>\$ 18,522,039</b>	<b>16,319,154</b>	<b>18,163,063</b>	<b>20,949,734</b>	<b>21,799,600</b>	<b>16,532,954</b>	<b>26,699,240</b>	<b>22,627,181</b>	<b>20,784,907</b>	<b>25,143,156</b>	<b>18,941,836</b>	<b>24,091,418</b>	<b>\$ 250,574,281</b>
<b>Cash Disbursements</b>													
<b>Operating Expenses</b>													
Executive Director's Office	\$ 366,757	382,932	352,016	152,236	125,615	182,211	179,656	288,096	515,172	729,454	138,113	66,974	\$ 3,479,233
Customer Service	576,989	605,449	592,914	511,878	472,384	554,403	737,950	718,285	641,955	465,375	605,999	973,998	7,457,579
Management Information Systems	124,565	118,119	203,562	102,643	155,822	102,643	147,095	192,087	160,083	143,622	190,168	636,997	2,301,283
Finance	135,381	104,225	128,391	100,381	368,405	256,469	281,358	756,942	256,532	242,684	232,600	323,530	3,186,898
Procurement	32,369	24,805	25,928	26,953	25,261	26,356	34,918	25,008	24,682	40,005	37,135	47,136	370,556
Human Resources	326,154	37,362	63,429	48,680	46,583	50,033	64,161	89,934	56,875	40,964	64,397	62,985	951,558
Legal	84,310	226,540	674,081	67,708	271,885	253,510	530,333	255,617	467,415	310,422	249,388	225,622	3,616,831
Warehouse	34,906	31,600	280,583	(205,260)	41,372	40,170	25,442	24,263	24,329	38,075	216,787	111,015	663,281
External Affairs	86,969	58,761	65,502	55,647	105,288	87,871	90,665	60,926	128,876	90,959	77,843	171,101	1,080,407
Engineering & Construction	395,357	349,684	354,903	281,684	656,226	573,490	700,972	528,166	772,253	470,137	487,565	3,254,556	8,824,994
Environmental Compliance	65,874	13,245	235,823	159,062	53,447	130,960	254,959	134,589	102,543	77,863	157,860	105,213	1,491,438
General Administration	1,934	1,650	3,474	2,723	2,170	1,010	1,576	3,015	1,992	1,742	2,363	1,290	24,939
Water Quality	134,630	138,835	162,031	156,948	81,171	135,071	227,838	448,123	223,019	177,828	162,038	207,441	2,254,974
Water Treatment Plant	1,377,403	1,265,907	1,406,742	1,519,168	1,063,982	1,445,402	1,333,527	1,101,140	1,447,432	1,465,481	1,723,024	1,950,451	17,099,660
Water Distribution	1,796,651	1,903,081	1,810,219	2,605,009	1,387,229	2,041,058	2,260,824	3,091,611	2,208,221	2,807,720	2,399,789	940,201	25,251,610
Sewer Operations	1,003,915	1,367,125	632,955	994,364	840,091	1,171,380	1,010,969	1,177,147	1,038,288	1,472,195	859,292	(80,382)	11,487,342
ALCOSAN	7,733,639	4,643,597	6,209,392	6,874,718	4,508,477	6,185,507	6,944,505	4,718,003	6,249,825	7,418,325	4,916,373	4,995,148	71,397,509
Non-City Water Subsidy	186,758	260,406	262,660	183,526	37,154	82,839	56,310	36,201	89,085	37,867	97,090	74,965	1,404,861
City Co-Op Payment	-	4,087,008	-	-	-	-	-	-	-	-	-	593,465	4,600,473
Sub Total	\$ 14,464,564	15,540,330	13,464,605	13,638,067	10,242,564	13,344,262	14,883,059	13,649,153	14,408,576	16,030,719	12,617,823	14,661,706	\$ 166,945,427
<b>Debt Service</b>													
Bond Debt Service	\$ 570,556	22,666,621	1,018,032	594,117	613,031	840,561	5,870,873	22,365,681	537,483	139,009	91,074	300,187	\$ 55,607,236
PennVest Debt Service	325,681	301,802	325,430	328,446	326,991	321,635	288,894	290,193	291,807	293,840	296,055	281,757	3,672,530
Sub Total	\$ 896,237	22,968,423	1,343,462	922,563	940,022	1,162,197	6,159,767	22,655,874	829,289	432,849	387,130	581,954	\$ 59,279,766
<b>Transfer to Restricted Funds</b>													
	\$ 209,249	209,249	209,249	209,249	209,249	209,249	209,249	209,249	209,249	209,249	209,249	209,249	2,510,983
<b>Total Disbursements</b>	<b>\$ 15,570,049</b>	<b>38,718,001</b>	<b>15,017,315</b>	<b>14,769,879</b>	<b>11,391,834</b>	<b>14,715,707</b>	<b>21,252,075</b>	<b>36,514,275</b>	<b>15,447,114</b>	<b>16,672,816</b>	<b>13,214,201</b>	<b>15,452,909</b>	<b>\$ 228,736,175</b>
<b>Surplus / Deficit</b>	<b>2,951,990</b>	<b>(22,398,847)</b>	<b>3,145,748</b>	<b>6,179,855</b>	<b>10,407,766</b>	<b>1,817,247</b>	<b>5,447,166</b>	<b>(13,887,094)</b>	<b>5,337,792</b>	<b>8,470,341</b>	<b>5,727,635</b>	<b>8,638,509</b>	
<b>Annual Surplus/Deficit</b>													<b>\$ 21,838,109</b>
<b>Capital Spending</b>													
Capital Spending (Non PENNVEST)	\$ 5,323,554	4,849,505	6,104,476	8,104,315	5,316,725	6,389,051	4,879,954	5,270,894	5,053,727	6,726,188	5,973,025	19,438,193	\$ 83,429,607
PENNVEST Spending	-	-	131,251	1,175,462	1,554,290	3,669,863	2,594,870	2,321,626	3,326,241	2,662,322	3,564,541	3,535,727	\$ 24,536,193
<b>Total</b>	<b>\$ 5,323,554</b>	<b>4,849,505</b>	<b>6,235,727</b>	<b>9,279,777</b>	<b>6,871,015</b>	<b>10,058,914</b>	<b>7,474,824</b>	<b>7,592,520</b>	<b>8,379,968</b>	<b>9,388,510</b>	<b>9,537,566</b>	<b>22,973,919</b>	<b>\$ 107,965,800</b>
<b>Capital Line of Credit</b>													
Capital Line of Credit Limit	-	-	-	-	-	-	-	-	-	-	-	150,000,000	
Capital Draws	-	-	-	-	-	-	-	-	-	-	-	-	\$ -
Outstanding Capital Draws	-	-	-	-	-	-	-	-	-	-	-	62,500,000	
Remaining Capital Credit	\$ -	-	-	-	-	-	-	-	-	-	-	87,500,000	

Account Type	Category Description	GL Account	GL Description	Monthly Budget	Monthly Actual	Monthly Variance	%	Annual Budget	YTD Budget	YTD Actual	YTD Variance	%	PR YR	PR YR
													Month Actual	YTD Actual
Revenue	Utility Revenue			19,920,135.00	19,053,818.45	(866,316.55)	(4.35%)	254,718,616.00	19,920,135.00	18,093,818.45	(1,826,316.55)	(4.35%)	17,403,821.23	17,307,821.33
	3010	Meter Sales Rev		20,421,193.00	19,690,024.28	(731,168.72)	(3.58%)	264,330,614.00	20,421,193.00	19,690,024.28	(731,168.72)	(3.58%)	18,347,393.27	18,347,393.27
	3020	Meter Sales Ad		(500,000.00)	(729,708.19)	(160,708.19)	28.24%	(10,428,000.00)	(569,000.00)	(729,708.19)	(160,708.19)	28.24%	(931,056.49)	(931,056.49)
	3030	Penalty Int		88,000.00	93,502.36	25,502.36	37.50%	816,000.00	68,000.00	93,502.36	25,502.36	37.50%	88,084.45	88,084.45
	3040	Lien Sales		-	-	-	-	-	-	-	-	-	-	-
		<b>Fee Revenue</b>		<b>681,974.00</b>	<b>200,886.36</b>	<b>(481,087.64)</b>	<b>(68.21%)</b>	<b>4,106,304.34</b>	<b>631,974.00</b>	<b>200,886.36</b>	<b>(431,087.64)</b>	<b>(68.21%)</b>	<b>625,593.85</b>	<b>625,593.85</b>
	3110	Customer Work		-	-	-	-	-	-	-	-	-	-	-
	3115	Dye Testing		13,150.00	12,394.09	(755.91)	(5.75%)	176,842.34	13,150.00	12,394.09	(755.91)	(5.75%)	13,150.00	13,150.00
	3130	Hydrant Line Use		8,500.00	8,118.50	(381.50)	(4.49%)	146,105.00	8,500.00	8,118.50	(381.50)	(4.49%)	3,000.00	3,000.00
	3131	Hydrant Sales		800.00	-	(800.00)	(100.00%)	6,000.00	500.00	-	(500.00)	(100.00%)	-	-
	3140	Lab Test Fees		-	-	-	-	-	-	-	-	-	-	-
	3150	Map Fees		30.00	-	(30.00)	(100.00%)	360.00	30.00	-	(30.00)	(100.00%)	-	-
	3151	Backflow Fee		11,446.00	659.88	(10,786.12)	(94.29%)	79,753.00	11,446.00	659.88	(10,786.12)	(94.29%)	11,446.38	11,446.38
	3152	Meter Sales		6,970.00	5,679.13	(1,290.87)	(18.52%)	89,736.00	6,970.00	5,679.13	(1,290.87)	(18.52%)	6,970.00	6,970.00
	3153	Meter Test Fees		350.00	360.00	10.00	2.86%	5,144.00	350.00	360.00	10.00	2.86%	-	-
	3160	New Connection Fees		-	-	-	-	-	-	-	-	-	-	-
	3162	NSF Fees		3,289.00	1,816.44	(1,472.56)	(44.77%)	39,881.00	3,289.00	1,816.44	(1,472.56)	(44.77%)	3,288.60	3,288.60
	3170	Repair Fees		-	-	-	-	-	-	-	-	-	-	-
	3180	Shut Fees		10,922.00	3,901.24	(7,020.76)	(64.28%)	172,582.00	10,922.00	3,901.24	(7,020.76)	(64.28%)	10,922.30	10,922.30
	3190	Tap Fees		576,817.00	167,957.08	(408,859.92)	(70.88%)	3,389,901.00	576,817.00	167,957.08	(408,859.92)	(70.88%)	576,816.57	576,816.57
		<b>Misc Revenue</b>		<b>91,850.00</b>	<b>49,019.24</b>	<b>(42,830.76)</b>	<b>(46.48%)</b>	<b>1,136,817.00</b>	<b>91,850.00</b>	<b>49,019.24</b>	<b>(42,830.76)</b>	<b>(46.48%)</b>	<b>64,676.35</b>	<b>64,676.35</b>
	3210	Bld Fees		-	-	-	-	-	-	-	-	-	-	-
	3215	Lien Satisfaction Fees		150.00	-	(150.00)	(100.00%)	1,800.00	150.00	-	(150.00)	(100.00%)	-	-
	3216	Lien Filing Fees		-	702.00	702.00	100.00%	-	-	702.00	702.00	100.00%	-	-
	3220	Misc Fees		91,400.00	48,317.24	(43,082.76)	(47.14%)	1,134,817.00	91,400.00	48,317.24	(43,082.76)	(47.14%)	64,676.35	64,676.35
	3223	Misapplied Cust Pmt		-	-	-	-	-	-	-	-	-	-	-
	3225	Sewage Fiche Collections		-	-	-	-	-	-	-	-	-	-	-
	3227	CARC MBIA 07 Buyback		-	-	-	-	-	-	-	-	-	-	-
	3230	Subpoena Fees		-	-	-	-	-	-	-	-	-	-	-
	3235	Witness Fees		-	-	-	-	-	-	-	-	-	-	-
	3291	Sewage Clearing		-	-	-	-	-	-	-	-	-	-	-
	3292	Sewage Treatment Clog		-	-	-	-	-	-	-	-	-	-	-
		<b>Interest Income (NonTrust)</b>		<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
	3310	Int Inc Federated		-	-	-	-	-	-	-	-	-	-	-
	3320	Int Inc Fed Home		-	-	-	-	-	-	-	-	-	-	-
	3350	Int Inc NCB		-	-	-	-	-	-	-	-	-	-	-
		<b>Interest Income (Trust)</b>		<b>-</b>	<b>35,078.77</b>	<b>35,078.77</b>	<b>100.00%</b>	<b>-</b>	<b>-</b>	<b>35,078.77</b>	<b>35,078.77</b>	<b>100.00%</b>	<b>75,204.34</b>	<b>75,204.34</b>
	3405	Int Inc Escrow		-	868.93	868.93	100.00%	-	-	868.93	868.93	100.00%	1,323.45	1,323.45
	3410	Int Inc Cap Int Fund		-	-	-	-	-	-	-	-	-	-	-
	3420	Int Inc Cap Proj Fund		-	1.60	1.60	100.00%	-	-	1.60	1.60	100.00%	2.29	2.29
	3430	Int Inc Clearing Fund		-	-	-	-	-	-	-	-	-	-	-
	3430	Int Inc DebtServ		-	107.55	107.55	100.00%	-	-	107.55	107.55	100.00%	630.27	630.27
	3450	Int Inc DebtServ		-	8,085.45	8,085.45	100.00%	-	-	8,085.45	8,085.45	100.00%	13,110.91	13,110.91
	3460	Int Inc Equip Fund		-	-	-	-	-	-	-	-	-	-	-
	3470	Int Inc Operating Res		-	26,149.10	26,149.10	100.00%	-	-	26,149.10	26,149.10	100.00%	60,361.54	60,361.54
	3475	Int Inc Bond Redemp		-	-	-	-	-	-	-	-	-	-	-
	3495	Unreal G/L Trst Inv		-	(133.86)	(133.86)	(100.00%)	-	-	(133.86)	(133.86)	(100.00%)	(234.33)	(234.33)
		<b>Other Income</b>		<b>-</b>	<b>985,053.42</b>	<b>985,053.42</b>	<b>100.00%</b>	<b>-</b>	<b>-</b>	<b>985,053.42</b>	<b>985,053.42</b>	<b>100.00%</b>	<b>10,000.00</b>	<b>10,000.00</b>
	3505	CapAsset Donated Reimb		-	-	-	-	-	-	-	-	-	-	-
	3510	Capitalized Int Income		-	-	-	-	-	-	-	-	-	-	-
	3520	Fed Grants		-	985,053.42	985,053.42	100.00%	-	-	985,053.42	985,053.42	100.00%	-	-
	3530	Private Grants		-	-	-	-	-	-	-	-	-	-	-
	3540	Energy Rebate		-	-	-	-	-	-	-	-	-	-	-
	3550	Employee Fund		-	-	-	-	-	-	-	-	-	-	-
	3570	Swap FMV		-	-	-	-	-	-	-	-	-	-	-
Revenue Total				20,643,679.00	20,333,854.24	(319,824.76)	(1.55%)	259,941,335.34	20,643,679.00	20,333,854.24	(319,824.76)	(1.55%)	18,779,295.77	18,779,295.77
Expense	Salaries Expense			(4,200,679.66)	(4,791,602.28)	(590,922.62)	(14.07%)	(2,400,879.69)	(4,200,679.66)	(4,791,602.28)	(590,922.62)	(14.07%)	(2,235,994.55)	(2,235,994.55)
	4001	Salary Wages		(1,770,004.19)	(1,255,352.53)	(514,651.66)	(29.08%)	(23,010,054.46)	(1,770,004.19)	(1,255,352.53)	(514,651.66)	(29.08%)	(1,384,995.01)	(1,384,995.01)
	4005	OT Premium Pay		(93,051.40)	(130,599.08)	(37,547.68)	40.25%	(1,209,668.20)	(93,051.40)	(130,599.08)	(37,547.68)	40.25%	(220,498.99)	(220,498.99)
	4010	Shift Differential		(771.27)	(532.45)	(238.82)	(30.96%)	(10,026.54)	(771.27)	(532.45)	(238.82)	(30.96%)	(761.00)	(761.00)
	4015	Semi Skill		(664.30)	(234.00)	(430.30)	(64.77%)	(6,634.88)	(664.30)	(234.00)	(430.30)	(64.77%)	(495.00)	(495.00)
	4020	Pay Adjustments		-	-	-	-	-	-	-	-	-	-	-
	4025	Bonus		(223.59)	-	(223.59)	(100.00%)	(2,906.66)	(223.59)	-	(223.59)	(100.00%)	-	-
	4030	Holiday Pay		(164,801.29)	(156,029.14)	(8,772.15)	(5.33%)	(906,407.15)	(164,801.29)	(156,029.14)	(8,772.15)	(5.33%)	(362,996.70)	(362,996.70)
	4035	Vacation Pay		(102,763.31)	(150,362.21)	(47,598.90)	46.32%	(1,335,923.04)	(102,763.31)	(150,362.21)	(47,598.90)	46.32%	(171,604.27)	(171,604.27)
	4040	Other		(245.06)	-	(245.06)	(100.00%)	(3,185.78)	(245.06)	-	(245.06)	(100.00%)	-	-
	4045	Sick Pay		(2,550.85)	(1,328.43)	(1,222.42)	(47.90%)	(33,161.06)	(2,550.85)	(1,328.43)	(1,222.42)	(47.92%)	(1,000.36)	(1,000.36)
	4050	Personal Time Pay		(53,466.05)	(82,746.24)	(29,280.19)	54.76%	(695,038.62)	(53,466.05)	(82,746.24)	(29,280.19)	54.76%	(77,694.79)	(77,694.79)
	4055	Comp Time Taken		(845.24)	-	(845.24)	(100.00%)	-	-	-	-	-	-	-
	4060	Comp Time Earned		-	-	-	-	-	-	-	-	-	-	-
	4065	Jury Duty		(156.62)	-	(156.62)	(100.00%)	(2,036.08)	(156.62)	-	(156.62)	(100.00%)	-	-
	4070	Military Leave		(270.69)	-	(270.69)	(100.00%)	(3,519.00)	(270.69)	-	(270.69)	(100.00%)	-	-
	4075	Supper Pay		(2,499.08)	(1,423.25)	(1,075.83)	(43.05%)	(32,488.04)	(2,499.08)	(1,423.25)	(1,075.83)	(43.05%)	(1,338.00)	(1,338.00)
	4080	Retirement		(2,040.96)	(1,519.31)	(521.65)	(25.56%)	(26,402.54)	(2,040.96)	(1,519.31)	(521.65)	(25.56%)	(3,932.13)	(3,932.13)
	4081	Paid Parental Leave		(264.06)	(1,727.93)	(1,463.87)	554.37%	(3,432.78)	(264.06)	(1,727.93)	(1,463.87)	554.37%	(1,463.87)	(1,463.87)
	4085	Special		(6,247.44)	(5,676.28)	(571.16)	(9.14%)	(81,216.74)	(6,247.44)	(5,676.28)	(571.16)	(9.14%)	(7,734.31)	(7,734.31)
	4090	Admin Leave		(24.29)	(4,071.43)	(4,047.14)	16661.75%	(315.76)	(24.29)	(4,071.43)	(4,047.14)	16661.75%	-	-

XI.3- January 20 Cash Budget Variance by Dept  
All

Account Type	Category Description	GL Account	GL Description	Monthly Budget	Monthly Actual	Monthly Variance	%	Annual Budget	YTD Budget	YTD Actual	YTD Variance	%	PR YR Month Actual	PR YR YTD Actual
	ADRES		Severance											
<b>Other Employee Expenses</b>				<b>502,914.70</b>	<b>(552,445.94)</b>	<b>(49,531.24)</b>	<b>9.85%</b>	<b>(7,043,331.25)</b>	<b>(502,914.70)</b>	<b>(552,445.94)</b>	<b>(49,531.24)</b>	<b>9.85%</b>	<b>(820,276.87)</b>	<b>(820,276.87)</b>
4110	Fed Ins Contr Act Tx			121,054.53	(108,941.62)	12,112.91	10.01%	1,512,476.40	(121,054.53)	(108,941.62)	12,112.91	10.01%	(136,984.56)	(136,984.56)
4115	Medicare			26,938.58	(25,478.29)	1,460.29	5.42%	(336,759.99)	26,938.58	(25,478.29)	1,460.29	5.42%	(32,036.71)	(32,036.71)
4120	Fed Unemploy Tax												0.94	
4125	State Unemploy Tax			4,166.67		4,166.67	100.00%	(50,000.04)	4,166.67		4,166.67	100.00%	(742.40)	(742.40)
4130	Workers Comp Insur												(269,815.00)	(269,815.00)
4135	Med Health Ins			249,724.07	(338,792.54)	(89,068.47)	35.67%	(4,201,084.12)	249,724.07	(338,792.54)	(89,068.47)	35.67%	(285,968.17)	(285,968.17)
4140	Med Hth Ins Waiver			4,823.52	(6,328.85)	(1,505.33)	31.21%	(78,367.98)	4,823.52	(6,328.85)	(1,505.33)	31.21%	(5,622.29)	(5,622.29)
4145	Short Term Disability			10,678.25	(16,328.34)	(5,650.09)	52.91%	(169,249.02)	10,678.25	(16,328.34)	(5,650.09)	52.91%	(12,896.30)	(12,896.30)
4150	Long Term Disability			(8,285.06)	(2,266.53)	6,018.53	(72.64%)	(55,861.65)	(8,285.06)	(2,266.53)	(6,018.53)	(72.64%)	(26,227.08)	(26,227.08)
4155	Life Ins <50k			2,741.24	(2,951.10)	(209.86)	7.66%	(41,685.45)	2,741.24	(2,951.10)	(209.86)	7.66%	(2,298.45)	(2,298.45)
4160	Accident Death Dismember			400.37	(400.10)	(19.73)	5.19%	(5,929.50)	400.37	(400.10)	(19.73)	5.19%	(313.32)	(313.32)
4165	Dental Ins			9,419.76	(12,836.59)	(3,416.83)	36.27%	(147,852.70)	9,419.76	(12,836.59)	(3,416.83)	36.27%	(11,524.37)	(11,524.37)
4170	Vision Insur			(1,202.84)	(1,145.97)	56.87	(4.73%)	(17,032.66)	(1,202.84)	(1,145.97)	56.87	(4.73%)	(928.76)	(928.76)
4174	Cust Serv Week													
4175	Uniforms			(19,190.00)	(35,050.87)	(15,860.87)	82.65%	(223,227.01)	(19,190.00)	(35,050.87)	(15,860.87)	82.65%	(2,258.72)	(2,258.72)
4180	Tuition Reimburse			46,624.31		46,624.31	100.00%	(223,289.38)	46,624.31		46,624.31	100.00%	(34,413.68)	(34,413.68)
4185	Retirement Benefit			(70.66)	(3,867.14)	(3,796.48)	5372.88%	(874.52)	(70.66)	(3,867.14)	(3,796.48)	5372.88%		
4195	Misc Benefits			2,703.68	1,942.00	(761.68)	(28.17%)	35,319.96	2,703.68	1,942.00	(761.68)	(28.17%)	1,752.00	1,752.00
4199	Payroll Upload Except			(318.52)		318.52	(100.00%)	(2,885.79)	(318.52)		318.52	(100.00%)		
<b>Chemicals Costs</b>				<b>643,747.82</b>	<b>(345,698.52)</b>	<b>298,049.30</b>	<b>(46.30%)</b>	<b>(6,813,739.04)</b>	<b>(643,747.82)</b>	<b>(345,698.52)</b>	<b>298,049.30</b>	<b>(46.30%)</b>	<b>(131,423.28)</b>	<b>(131,423.28)</b>
5005	Alum			(14,826.00)	(21,178.80)	(6,352.80)	42.85%	(14,826.00)	(14,826.00)	(21,178.80)	(6,352.80)	42.85%		
5010	Boiler Chemicals			(1,092.00)	(1,311.00)	(219.00)	20.05%	(13,104.00)	(1,092.00)	(1,311.00)	(219.00)	20.05%		
5015	Calcium Hypochlorite							(12,940.20)						
5020	Cat Fluo TL			(10,343.82)	(25,249.16)	(14,905.34)	144.10%	(124,125.84)	(10,343.82)	(25,249.16)	(14,905.34)	144.10%		
5025	Caustic Soda			(20,800.00)		20,800.00	(100.00%)	(249,600.00)	(20,800.00)		20,800.00	(100.00%)	(55,596.52)	(55,596.52)
5030	Chlorine Cylinders													
5035	Chlorine Rail Car													
5040	Citric Acid			(2,505.00)		2,505.00	(100.00%)	(39,245.00)	(2,505.00)		2,505.00	(100.00%)		
5045	Copper Sulphate													
5050	Ferric Chloride			(153,750.00)	(101,011.99)	52,738.01	(34.30%)	(1,845,000.00)	(153,750.00)	(101,011.99)	52,738.01	(34.30%)		
5055	Hydrofluorosulfic Acid			(3,761.00)	(8,387.27)	(4,626.27)	123.54%	(13,761.00)	(3,761.00)	(8,387.27)	(4,626.27)	123.54%		
5060	Lime			(90,000.00)	(54,595.50)	35,404.50	(39.34%)	(1,080,000.00)	(90,000.00)	(54,595.50)	35,404.50	(39.34%)	(7,393.50)	(7,393.50)
5065	Potassium Permanganate			(120,120.00)		120,120.00	(100.00%)	(480,480.00)	(120,120.00)		120,120.00	(100.00%)		
5070	Powdered Active Carbon			(83,350.00)		83,350.00	(100.00%)	(1,000,200.00)	(83,350.00)		83,350.00	(100.00%)		
5075	Soda Ash			(81,600.00)	(98,816.72)	(17,216.72)	21.10%	(979,200.00)	(81,600.00)	(98,816.72)	(17,216.72)	21.10%	(57,324.78)	(57,324.78)
5080	Sodium Hypochlorite			(51,600.00)	(35,148.08)	16,451.92	(31.88%)	(619,200.00)	(51,600.00)	(35,148.08)	16,451.92	(31.88%)	(11,108.48)	(11,108.48)
5085	Sodium Carbonate Peroxyhydrate							(27,600.00)						
<b>Equipment Costs</b>				<b>(247,972.58)</b>	<b>(194,407.09)</b>	<b>53,565.49</b>	<b>(21.60%)</b>	<b>(1,730,266.02)</b>	<b>(247,972.58)</b>	<b>(194,407.09)</b>	<b>53,565.49</b>	<b>(21.60%)</b>	<b>(24,043.91)</b>	<b>(24,043.91)</b>
5120	Computer Peripherals			(22,595.58)	(22,002.46)	593.12	(2.62%)	(151,034.02)	(22,595.58)	(22,002.46)	593.12	(2.62%)	(81,019.35)	(81,019.35)
5125	Computers Networking			(2,650.00)		2,650.00	(100.00%)	(55,800.00)	(2,650.00)		2,650.00	(100.00%)	(10,980.00)	(10,980.00)
5140	Furniture Fixture			(46,002.00)	(88,675.48)	(42,673.48)	92.76%	(405,800.00)	(46,002.00)	(88,675.48)	(42,673.48)	92.76%		
5145	Grounds Maint			(1,925.00)	(6,118.44)	(4,193.44)	217.84%	(134,700.00)	(1,925.00)	(6,118.44)	(4,193.44)	217.84%	(2,578.75)	(2,578.75)
5147	Lab Equip			(40,000.00)	(5,237.13)	34,762.87	(86.91%)	(40,000.00)	(40,000.00)	(5,237.13)	34,762.87	(86.91%)	(1,666.14)	(1,666.14)
5150	Machinery			(99,000.00)	(22,886.85)	76,113.15	(76.88%)	(825,300.00)	(99,000.00)	(22,886.85)	76,113.15	(76.88%)	(67,894.44)	(67,894.44)
5160	Office Equipment			(35,800.00)	(305.73)	35,494.27	(99.15%)	(35,800.00)	(35,800.00)	(305.73)	35,494.27	(99.15%)	(576.68)	(576.68)
5190	Vehicles			(49,181.00)		49,181.00			(49,181.00)		49,181.00		(59,328.55)	(59,328.55)
<b>Material Costs</b>				<b>(16,559.16)</b>	<b>(14,698.54)</b>	<b>1,860.62</b>	<b>(11.48%)</b>	<b>(654,569.70)</b>	<b>(16,559.16)</b>	<b>(14,698.54)</b>	<b>1,860.62</b>	<b>(11.48%)</b>	<b>(10,064.44)</b>	<b>(10,064.44)</b>
5205	Asphalt Cold Patch			(9,107.70)	(9,066.98)	40.72	(0.45%)	(166,477.90)	(9,107.70)	(9,066.98)	40.72	(0.45%)		
5210	Asphalt Cold-City													
5215	Asphalt Hot-City													
5220	Asphalt Hotmix							(12,600.00)						
5225	Asphalt Patch Bit Sealer													
5227	Brick							(2,000.00)						
5230	Cement Bagged			(1,050.00)	(120.54)	929.46	(88.52%)	(4,361.80)	(1,050.00)	(120.54)	929.46	(88.52%)	(60.00)	(60.00)
5235	Gravel			(500.00)		500.00	(100.00%)	(21,314.00)	(500.00)		500.00	(100.00%)		
5240	Iron Steel Brass			(1,700.00)		1,700.00	(100.00%)	(17,400.00)	(1,700.00)		1,700.00	(100.00%)		
5245	Lumber			(7,000.00)	(1,400.40)	5,599.60	(79.99%)	(28,000.00)	(7,000.00)	(1,400.40)	5,599.60	(79.99%)	(4,910.80)	(4,910.80)
5250	Sand							(12,000.00)					(1,135.77)	(1,135.77)
5255	Slag			(31,500.00)	(26,071.24)	5,428.76	(17.23%)	(378,000.00)	(31,500.00)	(26,071.24)	5,428.76	(17.23%)	(36,471.09)	(36,471.09)
5260	Stone													
5265	Top Soil			(500.00)		500.00	(100.00%)	(12,416.00)	(500.00)		500.00	(100.00%)	(500.00)	(500.00)
<b>Operating Contracts</b>				<b>(7,972,750.78)</b>	<b>(6,588,063.63)</b>	<b>1,384,687.15</b>	<b>(17.37%)</b>	<b>(95,949,342.77)</b>	<b>(7,972,750.78)</b>	<b>(6,588,063.63)</b>	<b>1,384,687.15</b>	<b>(17.37%)</b>	<b>(6,849,798.40)</b>	<b>(6,849,798.40)</b>
8305	Annual Sewer Contract			(350,000.00)	(141,377.44)	208,622.56	(59.61%)	(4,325,000.00)	(350,000.00)	(141,377.44)	208,622.56	(59.61%)	(448,231.44)	(448,231.44)
9310	Boiler Compress Elevtr												(18,293.10)	(18,293.10)
9315	CB Cleaning			(50,000.00)	(53,461.36)	(3,461.36)	6.92%	(600,000.00)	(50,000.00)	(53,461.36)	(3,461.36)	6.92%	(97,175.25)	(97,175.25)
9316	CB Repairs													
9328	Curb Box Repair			(10,000.00)		10,000.00	(100.00%)	(120,000.00)	(10,000.00)		10,000.00	(100.00%)		
9330	Debris Removal			(25,000.00)	(41,127.00)	(16,127.00)	64.51%	(240,000.00)	(25,000.00)	(41,127.00)	(16,127.00)	64.51%	(20,433.25)	(20,433.25)
9335	Drag Bucket													
9340	Dumpster			(2,400.00)	(1,210.00)	1,190.00	(49.58%)	(28,800.00)	(2,400.00)	(1,210.00)	1,190.00	(49.58%)	(2,721.14)	(2,721.14)
9341	Factor Debris Remove Cont			(7,500.00)		7,500.00	(100.00%)	(112,000.00)	(7,500.00)		7,500.00	(100.00%)		
9342	Emergency Water/Line Repair			(232,250.00)		232,250.00	(100.00%)	(3,066,916.68)	(232,250.00)		232,250.00	(100.00%)	(179,033.65)	(179,033.65)
9345	Inspection				(2,400.00)	2,400.00				(2,400.00)	2,400.00		(67,034.84)	(67,034.84)



X1.3- January 20 Cash Budget Variance by Dept  
All

Account Type	Category Description	GL Account	GL Description	Monthly Budget	Monthly Actual	Monthly Variance	%	Annual Budget	YTD Budget	YTD Actual	YTD Variance	%	PR YR Month Actual	PR YR YTD Actual
		5355	Landscape (Grounds)	(13,500.00)	(29,300.00)	(15,800.00)	117.04%	(162,000.00)	(13,500.00)	(29,300.00)	(15,800.00)	117.04%	(19,930.00)	(29,930.00)
		5360	Meters											
		5370	Operating Contract Other	756,033.33	(433,119.30)	322,914.03	(42.71%)	(8,642,500.00)	(756,033.33)	(433,119.30)	322,914.03	(42.71%)	(297,365.70)	(297,365.70)
		5375	Radionuclides											
		5380	Intr- Gov Proj Panther Hollow											
		5383	Sewage Treatment	(6,420,809.12)	(5,830,778.07)	590,031.05	(9.19%)	(77,049,709.44)	(6,420,809.12)	(5,830,778.07)	590,031.05	(9.19%)	(5,634,503.10)	(5,634,503.10)
		5385	Temporary Help											
		5390	Welding	500.00		500.00	(100.00%)	(2,000.00)	(500.00)		500.00	(100.00%)		
		5395	Water Relay DISC											
		5396	Sewer Relay DISC											
			<b>Repairs and Maintenance</b>	<b>(948,220.75)</b>	<b>(184,103.83)</b>	<b>764,116.92</b>	<b>(80.58%)</b>	<b>(12,367,862.36)</b>	<b>(948,220.75)</b>	<b>(184,103.83)</b>	<b>764,116.92</b>	<b>(80.58%)</b>	<b>(515,749.68)</b>	<b>(515,749.68)</b>
		5402	Annual Software Support	(271,174.17)	(49,907.80)	221,266.37	(81.60%)	(1,366,524.40)	(271,174.17)	(49,907.80)	221,266.37	(81.60%)	(22,327.56)	(22,327.56)
		5405	Bldg Property Repairs	(81,114.75)	(7,609.56)	73,505.19	(90.62%)	(2,119,392.00)	(81,114.75)	(7,609.56)	73,505.19	(90.62%)	(27,515.36)	(27,515.36)
		5408	Computer Hardware	(3,922.83)		3,922.83	(100.00%)	(6,737.96)	(3,922.83)		3,922.83	(100.00%)		
		5411	Computer Software Support			(6,000.00)		(6,000.00)						
		5413	Concrete Repairs	(473,000.00)	(120.54)	472,879.46	(99.97%)	(7,334,000.00)	(473,000.00)	(120.54)	472,879.46	(99.97%)	(396,499.83)	(396,499.83)
		5415	Cranes Repairs	(7,500.00)	(3,645.00)	3,855.00	(51.40%)	(65,000.00)	(7,500.00)	(3,645.00)	3,855.00	(51.40%)		
		5417	Electrical Repairs	(5,000.00)	(26,868.25)	(21,868.25)	437.37%	(62,500.00)	(5,000.00)	(26,868.25)	(21,868.25)	437.37%	(3,949.05)	(3,949.05)
		5420	Fence Repairs	(10,000.00)	(254.73)	9,745.27	(97.45%)	(136,000.00)	(10,000.00)	(254.73)	9,745.27	(97.45%)		
		5422	Fence Installation			(30,000.00)		(30,000.00)						
		5427	GIS Hardware Software	(475.00)	(255.70)	219.30	(46.17%)	(5,700.00)	(475.00)	(255.70)	219.30	(46.17%)	(469.41)	(469.41)
		5432	Hardware Repairs											
		5437	Heavy Equip Repair	(20,000.00)	(23,530.75)	(3,530.75)	17.65%	(20,000.00)	(20,000.00)	(23,530.75)	(3,530.75)	17.65%		
		5439	HVAC Plumbing	(5,000.00)	(15,696.49)	(10,696.49)	213.93%	(63,000.00)	(5,000.00)	(15,696.49)	(10,696.49)	213.93%	(4,510.06)	(4,510.06)
		5444	Hydrant A Section											
		5445	Hydrant Misc Parts											
		5447	Hydrant Repair Parts											
		5452	Machinery Repairs	(5,000.00)	(938.02)	4,061.98	(81.24%)	(64,000.00)	(5,000.00)	(938.02)	4,061.98	(81.24%)	(16,365.78)	(16,365.78)
		5457	Office Equip Repairs			(2,000.00)		(2,000.00)						
		5462	Plant Repairs	(100.00)	(17,759.82)	(17,659.82)	17659.82%	(171,200.00)	(100.00)	(17,759.82)	(17,659.82)	17659.82%		
		5467	Power Tool Repairs			(5,000.00)		(5,000.00)						
		5472	Road Repair Plant											
		5475	Scanner											
		5482	Tool Repairs		(120.35)	(120.35)		(4,000.00)		(120.35)	(120.35)		(70.96)	(70.96)
		5484	Hand Tool Repairs	(200.00)		200.00	(100.00%)	(4,400.00)	(200.00)		200.00	(100.00%)		
		5486	Misc Tool Repairs			(2,000.00)		(2,000.00)						
		5488	TV Repairs	(5,000.00)	(5,222.72)	(222.72)	4.45%	(60,000.00)	(5,000.00)	(5,222.72)	(222.72)	4.45%	(19,957.38)	(19,957.38)
		5490	Vector Repairs	(1,000.00)	(2,287.15)	(1,287.15)	128.72%	(12,000.00)	(1,000.00)	(2,287.15)	(1,287.15)	128.72%		
		5491	Vehicle Repairs	(55,000.00)	(975.17)	54,024.83	(98.23%)	(660,000.00)	(55,000.00)	(975.17)	54,024.83	(98.23%)	(124.50)	(124.50)
		5496	Repair Maint Other	(4,734.00)	(28,911.78)	(24,177.78)	510.73%	(107,408.00)	(4,734.00)	(28,911.78)	(24,177.78)	510.73%	(23,959.79)	(23,959.79)
			<b>Misc Direct Operating Costs</b>	<b>(61,650.00)</b>	<b>(66,153.54)</b>	<b>(4,503.54)</b>	<b>7.31%</b>	<b>(654,300.00)</b>	<b>(61,650.00)</b>	<b>(66,153.54)</b>	<b>(4,503.54)</b>	<b>7.31%</b>	<b>(43,013.54)</b>	<b>(43,013.54)</b>
		5570	Testing Misc	(61,650.00)	(66,153.54)	(4,503.54)	7.31%	(654,300.00)	(61,650.00)	(66,153.54)	(4,503.54)	7.31%	(43,013.54)	(43,013.54)
			<b>Inventory Exp - Castings</b>	<b>(144,575.25)</b>	<b>(469.50)</b>	<b>144,105.75</b>	<b>(99.68%)</b>	<b>(753,875.51)</b>	<b>(144,575.25)</b>	<b>(469.50)</b>	<b>144,105.75</b>	<b>(99.68%)</b>		
		6015	Castings Manhole C/BSin	(44,156.93)		44,156.93	(100.00%)	(154,569.31)	(44,156.93)		44,156.93	(100.00%)		
		6025	Castings Risers Lids	(42,548.30)		42,548.30	(100.00%)	(170,193.20)	(42,548.30)		42,548.30	(100.00%)		
		6035	Castings Sewer Inlet	(6,233.92)		6,233.92	(100.00%)	(6,233.92)	(6,233.92)		6,233.92	(100.00%)		
		6060	Castings Water Valve Box	(51,636.10)	(469.50)	51,166.60	(99.09%)	(422,873.08)	(51,636.10)	(469.50)	51,166.60	(99.09%)		
			<b>Inventory Exp - Clarifier</b>											
		6115	Clarifier Part Flocc											
		6120	Clarifier Part Screw											
		6125	Clarifier Part Sludge											
			<b>Inventory Exp - Equipment</b>	<b>(12,150.00)</b>	<b>(6,820.50)</b>	<b>5,329.50</b>	<b>(43.86%)</b>	<b>(115,300.00)</b>	<b>(12,150.00)</b>	<b>(6,820.50)</b>	<b>5,329.50</b>	<b>(43.86%)</b>	<b>(4,944.57)</b>	<b>(4,944.57)</b>
		6200	Inventory-Equip											
		6220	Fire Extinguishers	(2,100.00)		2,100.00	(100.00%)	(4,200.00)	(2,100.00)		2,100.00	(100.00%)		
		6245	Materials Handling	(1,000.00)		1,000.00	(100.00%)	(2,500.00)	(1,000.00)		1,000.00	(100.00%)		
		6280	Safety Equipment	(9,050.00)	(6,820.50)	2,229.50	(24.64%)	(108,600.00)	(9,050.00)	(6,820.50)	2,229.50	(24.64%)	(4,944.57)	(4,944.57)
		6280	Vacuum Chlorinators											
			<b>Inventory Exp - Hardware</b>	<b>(35,825.00)</b>	<b>(34,861.00)</b>	<b>964.00</b>	<b>(2.69%)</b>	<b>(436,600.00)</b>	<b>(35,825.00)</b>	<b>(34,861.00)</b>	<b>964.00</b>	<b>(2.69%)</b>	<b>(67,330.79)</b>	<b>(67,330.79)</b>
		6300	Inventory-Hardware	(1,275.00)	(1,405.04)	(130.04)	10.20%	(15,300.00)	(1,275.00)	(1,405.04)	(130.04)	10.20%	(308.48)	(308.48)
		6315	Fittings	(15,500.00)	(17,812.26)	(2,312.26)	14.92%	(186,000.00)	(15,500.00)	(17,812.26)	(2,312.26)	14.92%	(29,181.80)	(29,181.80)
		6320	Hardware Other	(500.00)		500.00	(100.00%)	(2,000.00)	(500.00)		500.00	(100.00%)		
		6325	Hose Fitting	(1,200.00)	(885.92)	314.08	(26.17%)	(14,400.00)	(1,200.00)	(885.92)	314.08	(26.17%)	(314.00)	(314.00)
		6330	Keys & Locks											
		6335	Lights	(1,100.00)	(14.50)	1,085.50	(98.68%)	(7,900.00)	(1,100.00)	(14.50)	1,085.50	(98.68%)	(367.58)	(367.58)
		6340	Machinery Misc	(795.00)		795.00		(4,000.00)			795.00			
		6345	Meters	(435.03)		435.03				(435.03)			(31,116.69)	(31,116.69)
		6350	Plumbing Inv Exp	(9,000.00)	(485.26)	8,514.74	(94.61%)	(108,000.00)	(9,000.00)	(485.26)	8,514.74	(94.61%)	(1,826.14)	(1,826.14)
		6355	Power Tool Inv Exp		(1,377.09)	(1,377.09)		(10,000.00)		(1,377.09)				
		6360	Tools Inv Exp	(6,250.00)	(11,650.90)	(5,400.90)	86.41%	(77,000.00)	(6,250.00)	(11,650.90)	(5,400.90)	86.41%	(4,216.10)	(4,216.10)
		6365	Hand Tools Inv Exp	(1,000.00)		1,000.00	(100.00%)	(12,000.00)	(1,000.00)		1,000.00	(100.00%)		
			<b>Inventory Exp - Heavy Equip</b>	<b>(500.00)</b>		<b>500.00</b>	<b>(100.00%)</b>	<b>(2,500.00)</b>	<b>(500.00)</b>		<b>500.00</b>	<b>(100.00%)</b>	<b>643.44</b>	<b>643.44</b>
		6420	Backhoe	(500.00)		500.00	(100.00%)	(2,500.00)	(500.00)		500.00	(100.00%)		
			<b>Inventory Exp - Misc</b>	<b>(8,800.00)</b>	<b>(4,865.58)</b>	<b>3,934.42</b>	<b>(44.71%)</b>	<b>(90,850.00)</b>	<b>(8,800.00)</b>	<b>(4,865.58)</b>	<b>3,934.42</b>	<b>(44.71%)</b>	<b>(5,550.75)</b>	<b>(5,550.75)</b>
		6500	Inventory-Misc	(2,000.00)	(2,694.35)	(694.35)	34.72%	(24,000.00)	(2,000.00)	(2,694.35)	(694.35)	34.72%	(578.01)	(578.01)
		6506	Batteries	(700.00)		700.00	(100.00%)	(2,400.00)			700.00	(100.00%)		
		6515	Cleaning	(1,750.00)	(790.19)	959.81	(54.85%)	(16,950.00)	(1,750.00)	(790.19)	959.81	(54.85%)	(2,829.51)	(2,829.51)
		6518	Concrete Accessories	(400.00)		400.00	(100.00%)	(2,900.00)			400.00	(100.00%)		



**XI.3- January 20 Cash Budget Variance by Dept**  
All

Account Type	Category	Description	GL Account	GL Description	Monthly Budget	Sequence Actual	Monthly Variance	%	Annual Budget	YTD Budget	YTD Actual	YTD Variance	%	PA YR Month Actual	PA YR YTD Actual
		6530		Copier Paper	\$ (500.00)	\$ -	\$ 500.00	(100.00)%	\$ (3,750.00)	\$ (500.00)	\$ -	\$ 500.00	(100.00)%	\$ -	\$ -
		6525		Filters	\$ (50.00)	\$ -	\$ 50.00	(100.00)%	\$ (600.00)	\$ (50.00)	\$ -	\$ 50.00	(100.00)%	\$ -	\$ -
		6526		Filters HVAC	\$ (300.00)	\$ -	\$ 300.00	(100.00)%	\$ (1,800.00)	\$ (300.00)	\$ -	\$ 300.00	(100.00)%	\$ -	\$ -
		6530		FirstAid	\$ (1,650.00)	\$ -	\$ 1,650.00	(100.00)%	\$ (16,550.00)	\$ (1,650.00)	\$ -	\$ 1,650.00	(100.00)%	\$ (76.80)	\$ (76.80)
		6540		Lamps	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
		6544		Lubricating Oil	\$ (600.00)	\$ (1,049.72)	\$ (449.72)	74.95%	\$ (6,600.00)	\$ (600.00)	\$ (1,049.72)	\$ (449.72)	74.95%	\$ (295.65)	\$ (295.65)
		6548		Paint Dils Putty Glass	\$ (350.00)	\$ (318.57)	\$ 31.43	(8.98)%	\$ (11,200.00)	\$ (350.00)	\$ (318.57)	\$ (31.43)	(8.98)%	\$ (1,976.79)	\$ (1,976.79)
		6552		Paper Products	\$ (200.00)	\$ -	\$ 200.00	(100.00)%	\$ (2,400.00)	\$ (200.00)	\$ -	\$ 200.00	(100.00)%	\$ -	\$ -
		6555		Pump Oil	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
		6555		Sewer Matls Supplies	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
		6570		Testing Dyes	\$ (200.00)	\$ (12.75)	\$ 187.25	(93.63)%	\$ (1,200.00)	\$ (200.00)	\$ (12.75)	\$ 187.25	(93.63)%	\$ 312.53	\$ 312.53
		6580		Vehicle Oil	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
		6585		Welding Supplies-Inventory	\$ (100.00)	\$ -	\$ 100.00	(100.00)%	\$ (500.00)	\$ (100.00)	\$ -	\$ 100.00	(100.00)%	\$ (106.52)	\$ (106.52)
				Inventory Exp - Parts	\$ (8,250.00)	\$ (12,251.00)	\$ (4,001.00)	48.50%	\$ (89,000.00)	\$ (8,250.00)	\$ (12,251.00)	\$ (4,001.00)	48.50%	\$ 1,826.29	\$ 1,826.29
		6645		Parts Other	\$ (7,750.00)	\$ (5,467.68)	\$ 2,282.32	(29.45)%	\$ (86,000.00)	\$ (7,750.00)	\$ (5,467.68)	\$ 2,282.32	(29.45)%	\$ 1,826.29	\$ 1,826.29
		6680		Yard	\$ (500.00)	\$ (6,783.32)	\$ (6,283.32)	1256.66%	\$ (3,000.00)	\$ (500.00)	\$ (6,783.32)	\$ (6,283.32)	1256.66%	\$ -	\$ -
				Inventory Exp - Pipe	\$ (19,000.00)	\$ (46,217.82)	\$ (27,217.82)	143.25%	\$ (72,000.00)	\$ (19,000.00)	\$ (46,217.82)	\$ (27,217.82)	143.25%	\$ (2,168.40)	\$ (2,168.40)
		6705		Pipe	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
		6710		Pipe Ductile	\$ (15,000.00)	\$ (45,015.72)	\$ (30,015.72)	200.10%	\$ (55,000.00)	\$ (15,000.00)	\$ (45,015.72)	\$ (30,015.72)	200.10%	\$ (1,830.28)	\$ (1,830.28)
		6755		Pipe Plastic	\$ (2,000.00)	\$ 2,000.00	\$ 2,000.00	(100.00)%	\$ (9,000.00)	\$ (2,000.00)	\$ 2,000.00	\$ 2,000.00	(100.00)%	\$ -	\$ -
		6765		Pipe Service Line	\$ (2,000.00)	\$ (1,202.10)	\$ 797.90	(39.90)%	\$ (8,000.00)	\$ (2,000.00)	\$ (1,202.10)	\$ 797.90	(39.90)%	\$ (338.12)	\$ (338.12)
				Inventory Exp - Valves	\$ (15,200.00)	\$ (6,322.27)	\$ 8,877.73	(58.41)%	\$ (239,400.00)	\$ (15,200.00)	\$ (6,322.27)	\$ 8,877.73	(58.41)%	\$ (168.36)	\$ (168.36)
		6805		Valves <12in	\$ -	\$ -	\$ -		\$ (22,000.00)	\$ -	\$ -	\$ -		\$ -	\$ -
		6810		Valves >16in	\$ (10,000.00)	\$ -	\$ 10,000.00	(100.00)%	\$ (100,000.00)	\$ (10,000.00)	\$ -	\$ 10,000.00	(100.00)%	\$ -	\$ -
		6820		Valves GA	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
		6825		Valves Misc	\$ (5,200.00)	\$ (6,322.27)	\$ (1,122.27)	21.58%	\$ (117,400.00)	\$ (5,200.00)	\$ (6,322.27)	\$ (1,122.27)	21.58%	\$ (168.36)	\$ (168.36)
				Admin Fees	\$ (178,797.00)	\$ (91,126.63)	\$ 87,670.37	(49.03)%	\$ (1,570,079.20)	\$ (178,797.00)	\$ (91,126.63)	\$ 87,670.37	(49.03)%	\$ (80,056.38)	\$ (80,056.38)
		7003		Bank Fees	\$ (25,000.00)	\$ (21,138.99)	\$ 3,861.01	(15.44)%	\$ (300,000.00)	\$ (25,000.00)	\$ (21,138.99)	\$ 3,861.01	(15.44)%	\$ (21,349.53)	\$ (21,349.53)
		7005		Certification Fees	\$ (9,570.00)	\$ 9,570.00	\$ 9,570.00	(100.00)%	\$ (36,465.00)	\$ (9,570.00)	\$ 9,570.00	\$ 9,570.00	(100.00)%	\$ -	\$ -
		7010		Membership Fees	\$ (46,711.00)	\$ (15,000.00)	\$ 31,711.00	(67.89)%	\$ (122,557.00)	\$ (46,711.00)	\$ (15,000.00)	\$ 31,711.00	(67.89)%	\$ (7,600.00)	\$ (7,600.00)
		7015		Permits	\$ (61,750.00)	\$ (500.00)	\$ 61,250.00	(99.19)%	\$ (725,475.00)	\$ (61,750.00)	\$ (500.00)	\$ 61,250.00	(99.19)%	\$ (8,413.00)	\$ (8,413.00)
		7020		Registration Fees	\$ -	\$ -	\$ -		\$ (550.00)	\$ -	\$ -	\$ -		\$ -	\$ -
		7030		Licenses	\$ (5,150.00)	\$ 5,150.00	\$ 5,150.00	(100.00)%	\$ (17,632.20)	\$ (5,150.00)	\$ 5,150.00	\$ 5,150.00	(100.00)%	\$ -	\$ -
		7035		Customer CC Fees	\$ (30,616.00)	\$ (54,487.64)	\$ (23,871.64)	77.97%	\$ (367,400.00)	\$ (30,616.00)	\$ (54,487.64)	\$ (23,871.64)	77.97%	\$ (42,693.85)	\$ (42,693.85)
				Freight and Postage	\$ (39,940.00)	\$ (6,002.70)	\$ 33,937.30	(84.97)%	\$ (278,150.00)	\$ (39,940.00)	\$ (6,002.70)	\$ 33,937.30	(84.97)%	\$ (40,654.35)	\$ (40,654.35)
		7105		Freight Hauling	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
		7110		Freight Shipping	\$ (2,200.00)	\$ (6,002.70)	\$ (3,802.70)	172.85%	\$ (26,810.00)	\$ (2,200.00)	\$ (6,002.70)	\$ (3,802.70)	172.85%	\$ (3,306.36)	\$ (3,306.36)
		7115		Postage	\$ (37,740.00)	\$ (37,740.00)	\$ 37,740.00	(100.00)%	\$ (251,700.00)	\$ (37,740.00)	\$ (37,740.00)	\$ 37,740.00	(100.00)%	\$ (37,347.99)	\$ (37,347.99)
				Leases and Rent	\$ (92,178.24)	\$ (224,729.18)	\$ (132,550.94)	143.80%	\$ (1,095,138.88)	\$ (92,178.24)	\$ (224,729.18)	\$ (132,550.94)	143.80%	\$ (90,637.42)	\$ (90,637.42)
		7210		Copier Fax Machine	\$ (7,554.08)	\$ (7,221.99)	\$ 332.09	(4.40)%	\$ (90,648.96)	\$ (7,554.08)	\$ (7,221.99)	\$ 332.09	(4.40)%	\$ (13,321.65)	\$ (13,321.65)
		7215		Equip Rental	\$ (11,966.18)	\$ (24,284.69)	\$ (12,318.51)	102.94%	\$ (132,594.16)	\$ (11,966.18)	\$ (24,284.69)	\$ (12,318.51)	102.94%	\$ (9,109.10)	\$ (9,109.10)
		7255		Office Rent	\$ (72,657.98)	\$ (193,222.50)	\$ (120,564.52)	165.93%	\$ (871,895.76)	\$ (72,657.98)	\$ (193,222.50)	\$ (120,564.52)	165.93%	\$ (68,206.67)	\$ (68,206.67)
		7260		Pagers	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
		7265		Radiolease(City)	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
				Professional Services	\$ (3,143,549.36)	\$ (2,110,977.83)	\$ 1,032,571.53	(32.85)%	\$ (19,890,013.89)	\$ (3,143,549.36)	\$ (2,110,977.83)	\$ 1,032,571.53	(32.85)%	\$ (592,817.86)	\$ (592,817.86)
		7305		Advertising	\$ (6,000.00)	\$ (1,475.55)	\$ 4,524.45	(75.41)%	\$ (82,000.00)	\$ (6,000.00)	\$ (1,475.55)	\$ 4,524.45	(75.41)%	\$ (3,342.92)	\$ (3,342.92)
		7306		Annual Report	\$ -	\$ -	\$ -		\$ (15,000.00)	\$ -	\$ -	\$ -		\$ -	\$ -
		7307		Advertising - Marketing	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
		7310		Annual Audit	\$ (5,000.00)	\$ (7,500.00)	\$ (2,500.00)	50.00%	\$ (49,500.00)	\$ (5,000.00)	\$ (7,500.00)	\$ (2,500.00)	50.00%	\$ (1,999.39)	\$ (1,999.39)
		7315		Billing Contract	\$ (50,000.00)	\$ (40,375.39)	\$ 9,624.61	(19.25)%	\$ (600,000.00)	\$ (50,000.00)	\$ (40,375.39)	\$ 9,624.61	(19.25)%	\$ (34,567.09)	\$ (34,567.09)
		7321		Coll Agency Sewage	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
		7323		Consultants	\$ (179,968.05)	\$ (13,476.50)	\$ 166,491.55	(92.51)%	\$ (2,142,817.32)	\$ (179,968.05)	\$ (13,476.50)	\$ 166,491.55	(92.51)%	\$ (61,773.75)	\$ (61,773.75)
		7325		Consumer Confidence Rpt	\$ -	\$ -	\$ -		\$ (3,500.00)	\$ -	\$ -	\$ -		\$ -	\$ -
		7328		Contingencies	\$ (2,000.00)	\$ 2,000.00	\$ 2,000.00	(100.00)%	\$ (39,500.00)	\$ (2,000.00)	\$ 2,000.00	\$ 2,000.00	(100.00)%	\$ -	\$ -
		7332		Consulting Engineers	\$ (25,000.00)	\$ 25,000.00	\$ 25,000.00	(100.00)%	\$ (100,000.00)	\$ (25,000.00)	\$ 25,000.00	\$ 25,000.00	(100.00)%	\$ -	\$ -
		7335		Misc Serv NonCapital	\$ (426,823.67)	\$ (560,719.23)	\$ (133,895.56)	31.37%	\$ (4,840,174.21)	\$ (426,823.67)	\$ (560,719.23)	\$ (133,895.56)	31.37%	\$ (87,209.90)	\$ (87,209.90)
		7345		Ins Auto	\$ (109,410.56)	\$ (128,254.00)	\$ (18,843.44)	17.22%	\$ (109,410.56)	\$ (109,410.56)	\$ (128,254.00)	\$ (18,843.44)	17.22%	\$ (73,057.00)	\$ (73,057.00)
		7348		Ins Commercial Prop	\$ (233,827.57)	\$ 233,827.57	\$ 233,827.57	(100.00)%	\$ (233,827.57)	\$ (233,827.57)	\$ 233,827.57	\$ 233,827.57	(100.00)%	\$ -	\$ -
		7353		Ins Gen Liability	\$ (22,502.48)	\$ (22,500.00)	\$ 2.48	(0.01)%	\$ (22,502.48)	\$ (22,502.48)	\$ (22,500.00)	\$ 2.48	(0.01)%	\$ (21,637.00)	\$ (21,637.00)
		7359		Ins Officers Director	\$ (76,018.56)	\$ (77,306.00)	\$ (1,287.44)	1.69%	\$ (76,018.56)	\$ (76,018.56)	\$ (77,306.00)	\$ (1,287.44)	1.69%	\$ (74,528.00)	\$ (74,528.00)
		7365		Ins WorkersComp	\$ (409,283.55)	\$ (444,043.00)	\$ (34,759.45)	8.49%	\$ (409,283.55)	\$ (444,043.00)	\$ (444,043.00)	\$ (34,759.45)	8.49%	\$ -	\$ -
		7366		Ins WorkersComp City	\$ -	\$ (7,696.68)	\$ (7,696.68)		\$ (32,000.00)	\$ -	\$ (7,696.68)	\$ (7,696.68)		\$ (7,696.68)	\$ (7,696.68)
		7368		Internet Connection Serv	\$ -	\$ (617.83)	\$ (617.83)		\$ -	\$ -	\$ (617.83)	\$ (617.83)		\$ (4,385.98)	\$ (4,385.98)
		7370		Legal	\$ (210,000.00)	\$ (202,682.77)	\$ 7,317.23	(3.48)%	\$ (2,520,000.00)	\$ (210,000.00)	\$ (202,682.77)	\$ 7,317.23	(3.48)%	\$ (4,690.50)	\$ (4,690.50)
		7371		Legal Self Ins	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
		7373		Minority Women Bus Enter	\$ -	\$ -	\$ -		\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
		7375		Meter Services	\$ (800,000.00)	\$ (193,738.32)	\$ 606,261.68	(75.78)%	\$ (800,000.00)	\$ (800,000.00)	\$ (193,738.32)	\$ 606,261.68	(75.78)%	\$ (53,915.82)	\$ (53,915.82)
		7382		Payroll Services	\$ (5,941.00)	\$ (10,008.33)	\$ (4,067.33)	68.45%	\$ (59,537.00)	\$ (5,941.00)	\$ (10,008.33)	\$ (4,067.33)	68.45%	\$ (5,941.00)	\$ (5,941.00)
		7383		Prof Service Other	\$ (550,299.92)	\$ (356,290.23)	\$ 194,009.69	(35.26)%	\$ (7,616,257.64)	\$ (550,299.92)	\$ (356,290.23)	\$ 194,009.69	(35.26)%	\$ (140,282.83)	\$ (140,282.83)







# The Pittsburgh Water and Sewer Authority

2020 – 2024 Capital Improvement Plan





# The Pittsburgh Water and Sewer Authority Board of Directors

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Paul Leger, Chairperson  
Margaret L. Lanier, Vice Chairperson  
James Turner, Secretary  
Deborah Gross, Assistant Secretary  
Chatón Turner, Member  
Michael L. Domach, Member

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Pittsburgh  
Water & Sewer  
Authority

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## Introduction

The Pittsburgh Water and Sewer Authority (“**the Authority**”) is a body corporate and politic organized and existing under the Act pursuant to Resolution No. 36 of the Council of the City of Pittsburgh (the “**City**”), duly enacted on February 6, 1984, approved by the Mayor on February 8, 1984, and effective February 16, 1984. The Secretary of the Commonwealth of Pennsylvania approved the Authority’s Articles of Incorporation and issued a Certificate of Incorporation on February 17, 1984. Articles of Amendment were approved and a Certificate of Amendment was issued by the Pennsylvania Department of State on December 11, 1989, to include, among authorized projects, low head dams and facilities for generating surplus electric power. Articles of Amendment were approved and a Certificate of Amendment was issued by the Pennsylvania Department of State on May 9, 2008, to extend the term of existence of the Authority to May 21, 2045.

Under its Articles of Incorporation, the Authority is specifically authorized to acquire, hold, construct, finance, improve, maintain, operate, own and lease, either as lessor or lessee, projects of the following kinds and character: sewers, sewer systems or parts thereof, waterworks, water supply works, and water distribution systems, low head dams and facilities for generating surplus power.

The System provides water to approximately 81,000 customers or 84% of the total population in the geographic boundaries of the City. The Authority provides wastewater collection and transmission service to almost the entire City, estimated at 306,000 residents. The System does not include wastewater treatment facilities; such facilities are the responsibility of Allegheny County Sanitary Authority (“**ALCOSAN**”), a separate and distinct legal entity.

The Authority operates and maintains a 117 million gallon per day (MGD) rapid sand type water treatment plant, a 26 MGD microfiltration plant, approximately 964 miles of water mains, over 32,000 valves and fire hydrants, 1 raw water pump station, 10 finished water pump stations, 4 in-ground reservoirs, 10 storage tanks, approximately 1,220 miles of sanitary, storm and combined sewers, 29,000 manholes, 30,000 catch basins and inlets, 38 combined sewer overflow outfalls, 185 storm outfalls, and four wastewater pump stations.

## Pennsylvania Public Utility Commission Oversight of the Authority

On December 21, 2017, the Pennsylvania legislature enacted Act 65 of 2017 (“**Act 65**”), placing the Authority under the jurisdiction of the Pennsylvania Public Utility Commission (“**PUC**”) pursuant to the Pennsylvania Public Utility Code (the “**Public Utility Code**”). Act 65 applies most of the provisions of the Public Utility Code to the Authority in the same manner as a “public utility,” resulting in regulation of the Authority’s rate making, its operating effectiveness, debt issuances and other aspects of conducting its business similar to the way the PUC regulates investor-owned utilities. Act 65 includes provisions that allow the Authority to impose, charge or collect rates or charges as necessary to permit the Authority to comply with its covenants with the holders of any bonds or other financial obligations of the Authority, and prohibits the PUC from requiring the Authority to take any action that would cause the interest on the Authority’s financial obligations to be includible in gross income of the holders of such obligations for federal income tax purposes.

## Capital Improvement Program

### Overview

PWSA’s Capital Improvement Program focuses on sustaining cost-effective operations, while optimizing the system’s asset performance and life expectancy. The 2020-2024 Capital Improvement Program invests in programs which consider risk and consequence of asset failure and levels of service benefits.

### Development and Approval Process

PWSA’s CIP process begins each year in January when project nominations are solicited from the entire organization. At the completion of the nomination period, the Planning Department screens and evaluates the nominated projects using

a predefined scoring system and recommends which projects should be considered for further planning. Further planning efforts consist of the preparation of a Project Sheet, which provides more detailed information on a project's potential scope options, risks, schedule, and the development of a preliminary cost estimate. This process lasts several months and culminates with the presentation of the updated CIP to PWSA's Board of Directors. Projects that are not selected for execution at any stage will be re-assessed during the next year's CIP development process

### **Capital Project Prioritization**

Due to funding limitations and the need to renew/replacing a significant amount of aging infrastructure, the following criteria are used to evaluate and prioritize capital projects:

- Safety - Potential health and safety risks to personnel and the public if action is not taken
- Regulatory Compliance – Regulatory compliance schedule and potential fines for non-compliance
- Reliability/Operational Flexibility – Location, age, and condition of infrastructure and risk if action is not taken
- Capacity – Meets community health needs and growth, as needed
- Operations and Maintenance Efficiency – Potential for operating cost savings
- Regional Cooperation/Stewardship – Coordination with external stakeholders or meeting the communities needs
- Level of Service – Improvement to customer service
- Sustainability – Energy efficiency and "green" approach to improving water quality

### **Funding Sources**

The PWSA Capital Improvement Program is funded through several primary sources to which specific programs and projects are allocated. These funding sources include, but are not limited to, PWSA Future Capital Bond Authorizations, cost shares with other utilities, and grants. PWSA is dedicated to identifying and pursuing funding from all potential sources to offset planned capital investments.

### **Capital Improvement Plan Organization**

The CIP is organized into six project classes (types):

- Water Treatment Plant
- Water Pumping and Storage
- Water Distribution System, which includes lead service line replacements
- Wastewater System
- Stormwater System
- Other

Each project class is then made up of individual projects. Projects are defined based upon current information, which range from annual allowances for asset renewal and/or replacement activities, to major, multiple phase facility renewal projects.

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The following information is provided for each project:

**Project Class** – Type of project.

**Project Name** – Descriptive name assigned to the project.

**Project Number** – Unique number(s) assigned to track the project from inception to completion. This number is established once a project is approved.

**Neighborhood/Ward** – Project location(s) based within the City of Pittsburgh.

**Status** – Phase in the project life-cycle (i.e. assessment/design/construction).

**Priority** – Criteria utilized to prioritize the project.

**Project Description** - A basic understanding of the project's intent and scope of work.

**Project Justification** - A detailed explanation to why the project is needed.

**Risk(s)** - Outlines the risk(s) to PWSA if the project is delayed or is not selected.

**Impact on Operations** – Describes the anticipated impact to PWSA's operations when the project is completed.

**Alternatives to the Recommended Action** – Lists the alternatives that were considered or evaluated.

**Cash Flow Summary\*** – Estimated five-year cash flow for the project.

**Funding Source(s)** – Proposed funding source(s) for the project.

\*The Cash Flow Summary includes contingencies.

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## 2020-2024 Capital Improvement Program

The figures below illustrate the proposed breakdown of the project classes, funding sources, and yearly cash flows for the 2020 to 2024 CIP.

Figure 1. Proposed Yearly Capital Cash Flow by Project Class

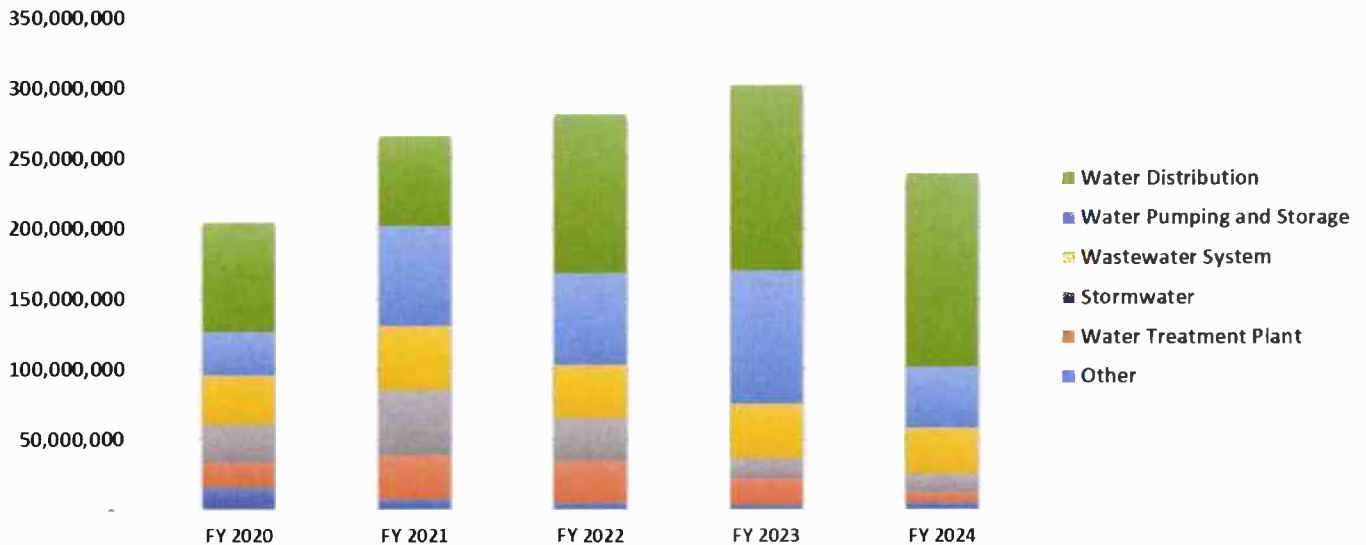


Figure 2. Capital Requirements

	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Total
Water Treatment Plant	\$ 16,884,025	31,260,131	29,455,887	18,164,003	7,054,471	\$ 102,818,518
Water Pumping and Storage	31,065,447	71,377,720	65,541,850	94,750,016	44,069,562	306,804,594
Water Distribution	77,597,135	63,277,796	112,385,623	131,689,581	136,347,581	521,297,717
Wastewater System	35,140,573	46,010,731	37,623,291	38,191,236	32,042,104	189,007,936
Stormwater	26,927,774	46,008,174	30,591,717	14,881,563	13,453,392	131,862,619
Other	16,650,000	7,634,500	5,200,000	4,000,000	5,200,000	38,684,500
<b>Total Capital Requirements</b>	<b>\$ 204,264,954</b>	<b>265,569,052</b>	<b>280,798,368</b>	<b>301,676,400</b>	<b>238,167,110</b>	<b>\$ 1,290,475,883</b>

Figure 3. Funding Sources

	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Total
Debt (Revenue Bonds)	\$ 149,026,299	238,835,405	254,699,574	273,541,635	211,491,887	\$ 1,127,594,800
Cash (PAYGO)	26,977,306	26,733,647	26,098,794	28,134,765	26,675,223	134,619,734
PENNVEST	28,261,349	-	-	-	-	28,261,349
Federal Funds	-	-	-	-	-	-
Other Grants	-	-	-	-	-	-
<b>Total Funding Sources</b>	<b>\$ 204,264,954</b>	<b>265,569,052</b>	<b>280,798,368</b>	<b>301,676,400</b>	<b>238,167,110</b>	<b>\$ 1,290,475,883</b>

# 2020 Project Summary



Page	Project Name	2020 Budget
<b>Project Class: Water Treatment Plant</b>		
9	Aspinwall and Membrane Filtration Plant Fiberglass Reinforced Plastic Chemical Tank Inspections	4,691
10	Aspinwall Water Treatment Plant Raw Water Intakes	2,304,856
11	Aspinwall Treatment Plant Pretreatment Chemical System and Clarification Improvements	4,596,583
12	Aspinwall Water Treatment Plant Electrical and Backup Power Improvements	1,082,568
13	Clearwell Emergency Response Project	4,800,000
14	Corrosion Control Chemical Storage & Feed Systems	390,748
15	Aspinwall Water Treatment Plant Security Fence, Lighting, and Surveillance	300,000
16	Highland Park Membrane Filtration Plant UV System	2,100,000
17	Highland Park Membrane Filtration Module Replacement Program	1,132,731
18	Membrane Filtration Plant Assessment and Critical Process Improvements	171,848
<b>Total: Water Treatment Plant</b>		<b>16,884,025</b>
<b>Project Class: Pumping and Storage</b>		
20	Ross Pump Station	2,184,432
21	Clearwell Improvements	3,159,375
22	Aspinwall Pump Station to Lanpher Reservoir Rising Main	4,468,239
23	Bruecken Pump Station Valve Vault	31,485
24	Aspinwall Water Treatment Plant High Service Pumping	2,794,262
25	Chlorine Booster Station Improvements	1,090,090
26	Highland Reservoir Pump Station and Rising Main	1,563,260
27	Inline Pump Station (Coral and Pacific) Improvements	53,000
28	Lanpher Reservoir Improvements	3,716,026
29	Highland No. 2 Reservoir Improvements	4,965,756
30	Herron Hill Reservoir Improvements	3,864,000
31	Garfield Tank Improvements	-
32	Lincoln Tank Improvements	-
33	Spring Hill Tank Improvements	-
34	Mission Pump Station Improvements	-
35	Herron Hill Tank Pump Station Improvements	-
36	Herron Hill Pump Station Improvements	-
37	Howard Pump Station Improvements	-
38	Lincoln Pump Station Improvements	331,061
39	Saline Pump Station Improvements	359,848
40	2019 Large Diameter Water Main Improvements - Rising Mains 3 & 4	2,484,612
<b>Total: Pumping and Storage</b>		<b>31,065,447</b>
<b>Project Class: Water Distribution</b>		
42	Lead Service Line Replacement	36,780,128
43	Lead Service Identification Program	3,000,000
44	Private Lead Service Line Reimbursement Program	1,000,000
45	Small Diameter Water Main Replacement	13,459,161
46	Large Diameter Water Main Replacement	1,292,197
47	Curb Box Inspections	278,081
48	Water Relay	2,317,816
49	Valve Replacement	3,888,977
50	Hydrant Replacement	1,899,892
51	Small Meter Replacement	785,775
52	Large Meter Replacement	847,000
53	Unmetered and Flat Rate Properties	3,078,419
54	Surface Restoration (Capital Only)	3,564,474
55	Low Pressure Area Remediation	1,029,259

Page	Project Name	2020 Budget
<b>Project Class: Water Distribution (Con't)</b>		
56	Bus Rapid Transit (BRT) Water Distribution	700,000
57	Bates Street Waterline Relay	160,000
58	District Water and Pressure Meters	1,731,143
59	West Ohio Street Bridge Replacement	289,250
60	Fort Duquesne Bridge Water Air Release Valve Repair	1,495,563
<b>Total: Water Distribution</b>		<b>77,597,135</b>
<b>Project Class: Wastewater System</b>		
62	Small Diameter Sewer Rehabilitation	13,469,310
63	Sewers Under Structures	7,251,959
64	Sewer Reconstruction	1,700,668
65	Large Diameter Sewer Rehabilitation	3,847,000
66	31st Ward Sewer System	4,000,000
67	Maytide Storm and Sanitary Sewer System Improvements	3,013,907
68	Browns Hill Road Sewer Pump Station Replacement	-
69	Larimer Avenue Sewer and 28th Street Slope Stabilization	583,400
70	Mellon Terrace Sewer System Improvements	340,000
71	M-29 Outfall Improvements	934,329
<b>Total: Wastewater System</b>		<b>35,140,573</b>
<b>Project Class: Stormwater</b>		
73	Catch Basin and Inlet Replacement	5,689,061
74	Saw Mill Run MS4 Compliance Projects	-
75	Tide Gate Installations	-
76	Overbrook Middle School Pollution and Flood Reduction	2,625,058
77	Queenston Stormwater Infrastructure Improvements	750,000
78	Volunteer's Field Stormwater Infrastructure Improvements	854,185
79	Saw Mill Run Stream Bank Restoration Stormwater Infrastructure Improvements	876,204
80	Lawn and Ophelia	275,375
81	Wightman Park Stormwater Infrastructure Improvements	2,515,715
82	Woods Run Stream Removal Stormwater Infrastructure Improvements	2,570,000
83	Maryland Avenue Stormwater Infrastructure Improvements - Phase 1	2,401,200
84	Four Mile Run Stormwater Infrastructure Improvements	3,000,000
85	Woodland Drive Stormwater Infrastructure Improvements	-
86	Thomas and McPherson Stormwater Infrastructure Improvements - Phase 1	250,000
87	Southside Stormwater Infrastructure Improvements	590,180
88	St. Johns Stormwater Infrastructure Improvements	2,973,230
89	Spring Garden Stream Stormwater Infrastructure Improvements	-
90	Martin Luther King Field Stormwater Infrastructure Improvements	1,200,000
91	AMG Capital Funds - As-Needed Sewer Flow Monitoring	102,500
92	Bus Rapid Transit (BRT) Stormwater Infrastructure Improvements	255,065
<b>Total: Stormwater</b>		<b>26,927,774</b>
<b>Project Class: Other</b>		
94	Computerized Maintenance Management System	1,250,000
95	Enterprise Resource Planning	1,250,000
96	Property Acquisition / Facility Upgrades	9,000,000
97	Park Maintenance / Upgrades	1,000,000
98	GIS System Upgrades: Water	800,000
99	Facility Standby Power	750,000
100	Utility Cost Shares	500,000
101	Vehicle and Major Equipment	2,100,000
<b>Total: Other</b>		<b>16,650,000</b>

# Water Treatment Plant



# Water Treatment Plant

## Aspinwall and Membrane Filtration Plant Fiberglass Reinforced Plastic Chemical Tank Inspections and Repairs/Replacement

**PROJECT NUMBER:** 2017-322-102-0  
**NEIGHBORHOOD/WARD:** Systemwide

<b>PHASE:</b> Assessment/Construction
<b>PRIORITY:</b> Safety, Reliability/Operational Flexibility
<b>PROJECT DESCRIPTION:</b> Inspection and rehabilitation and/or replacement of the fiberglass reinforced plastic chemical tanks
<b>PROJECT JUSTIFICATION:</b> Based on the age, service, and visual observations of the tanks, rehabilitation is needed to maintain the integrity of the tanks. Known repairs include the replacement of the 300 gallon sodium hypochlorite day tank and repair/modification of the vent piping on the caustic tank.
<b>RISK(S):</b> Failure of a chemical storage tank poses a significant health and safety risk to personnel. Failure exposes the Authority and the Highland No. 1 Service Area to a potentially deficient or non-complaint water supply, where emergency/unplanned repairs will typically add 30% to 50% to the capital expenses required.
<b>IMPACT ON OPERATIONS:</b> Increased flexibility and reliability and improved safety conditions for staff.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no practical alternatives to the recommended action.

		CASH FLOW SUMMARY						FUNDING SOURCE(S)
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	Cash (PAYGO)
<b>Total</b>	<b>\$294,000</b>	<b>4,691</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$4,691</b>	

\*Includes contingencies

# Water Treatment Plant

## Aspinwall Water Treatment Plant Raw Water Intakes

**PROJECT NUMBER:** 2018-322-100-0

**NEIGHBORHOOD/WARD:** Systemwide

**PHASE:**  
Preliminary Design

**PRIORITY:**  
Water Quality/Regulatory

**PROJECT DESCRIPTION:**  
Project will include condition assessment, renewing or replacing the existing West and East Raw Water Intake Gate House buildings and associated systems, including gates, screens, and associated mechanical equipment as well as the addition of SCADA. Influent piping through the Ross Pump Station will also be addressed.

**PROJECT JUSTIFICATION:**  
The West Gate is 90% closed and inoperable. Both gate houses are in need of rehabilitation or replacement. The West Gatehouse is 100 years old, and the East Gate is almost 90 years old.

**RISK(S):**  
Only one gate is operational. Failure of the East Gate would result in a major disruption to the supply of water for the City of Pittsburgh.

**IMPACT ON OPERATIONS:**  
Modernization of systems will require less time spent in operations and maintenance of these facilities.

**ALTERNATIVES TO THE RECOMMENDED ACTION:**  
There are no practical alternatives to the recommended action.

		CASH FLOW SUMMARY						FUNDING SOURCE(S)
	Total Budget (Prior Years Included)	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Total	Debt (Revenue Bonds)
Total	\$45,000,000	2,304,856	7,435,574	12,421,380	11,921,380	7,054,471	\$41,137,661	

\*Includes contingencies



# Water Treatment Plant

## Aspinwall Treatment Plant Pretreatment Chemical System and Clarification Improvements

**PROJECT NUMBER:** 2017-322-101-0/-1/-2/-3/-4/-5/-6

**NEIGHBORHOOD/WARD:** Systemwide

<b>PHASE:</b> Construction
<b>PRIORITY:</b> Safety, Regulatory Compliance, Reliability/Operational Flexibility, Operations and Maintenance Efficiency
<b>PROJECT DESCRIPTION:</b> Improvements to pretreatment chemical and clarification systems to provide improved water treatment capabilities. This project is the parent project for all of the clarification and pre-treatment related projects.
<b>PROJECT JUSTIFICATION:</b> Chemical treatment systems are a critical component to producing safe drinking water. Components of the chemical treatment systems can no longer be operated in a safe, effective, or reliable manner to meet water quality requirements. Many bulk water treatment chemicals present safety hazards to staff. The storage and pumping systems associated with these chemicals have reached the end of their useful life. Failures resulting in dust creation and chemical spills can place operators in unsafe working conditions and can cause physical damage to equipment and structures, as well as environmental contamination.
<b>RISK(S):</b> Inefficient operation of chemical systems results in increased operating costs, including chemical consumption, labor, solids generation and disposal, and wear on equipment. Failure of a chemical system poses a significant health and safety risk to personnel as well as an increased risk to water quality compliance.
<b>IMPACT ON OPERATIONS:</b> Increased operating efficiency, flexibility, reliability, and life expectancy and improved safety conditions for staff.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no practical alternatives to the recommended action.

		CASH FLOW SUMMARY						FUNDING SOURCE(S)
	Total Budget (Prior Years Included)	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Total	Debt (Revenue Bonds)
Total	\$28,505,990	4,596,583	5,623,596	8,763,546	0	0	\$18,983,725	

\*Includes contingencies

# Water Treatment Plant

## Aspinwall Water Treatment Plant Electrical and Backup Power Improvements

**PROJECT NUMBER:** 2017-322-100-0

**NEIGHBORHOOD/WARD:** Systemwide

<b>PHASE:</b> Design
<b>PRIORITY:</b> Safety, Regulatory Compliance, Reliability/Operational Flexibility, Operations and Maintenance Efficiency
<b>PROJECT DESCRIPTION:</b> Improvements to electrical systems at Water Treatment Plant, including provisions for stand-by or backup power systems, upgrades to existing electrical distribution system, replacement of motor control centers, and associated panels, conduit, wiring, and systems.
<b>PROJECT JUSTIFICATION:</b> Electrical systems at the Water Treatment Plant have generally met the end of their useful lives and spare/replacement parts are unavailable. Electrical panels do not meet current safety standards, including lack of arc flash protection. Additionally, the Water Treatment Plant does not have redundant power systems or a means for stand-by power for critical pumping and treatment systems.
<b>RISK(S):</b> Electrical power is critical to maintain pumping and treatment of water. Failure of these systems will result in the inability to produce water to meet demand and/or quality requirements.
<b>IMPACT ON OPERATIONS:</b> Increased operating efficiency, flexibility, and reliability and improved safety conditions for staff.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
<b>Total</b>	<b>\$26,520,000</b>	<b>1,082,568</b>	<b>8,270,961</b>	<b>8,270,961</b>	<b>6,242,623</b>	<b>0</b>	<b>\$23,867,114</b>	

\*Includes contingencies

# Water Treatment Plant

## Clearwell Emergency Response Project

**PROJECT NUMBER:** 2017-323-100-0

**NEIGHBORHOOD/WARD:** Systemwide

<b>PHASE:</b> Preliminary Design
<b>PRIORITY:</b> Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
<b>PROJECT DESCRIPTION:</b> Long-term bypass of the existing 108 year old clearwell (finished water structure) including the construction of pump wetwells at the Aspinwall and Bruecken Pump Stations, modifications to the clearwell inlet and outlet gate house, and the construction of a bypass line around the clearwell to the outlet gate house.
<b>PROJECT JUSTIFICATION:</b> The clearwell was constructed in 1908 and has not undergone any major modifications or upgrades since. The clearwell has two main functions: providing equalization storage that allows the filters to operate independently of potential fluctuations in system demands and providing sufficient contact time for disinfection agents to meet the requirements of the Surface Water Treatment Rule and Long-Term 2 Enhanced Surface Water Treatment Rule. In order to replace the clearwell, a long-term bypass is required in order to provide adequate suction pressure for the pump stations.
<b>RISK(S):</b> Clearwell failure will cease all potable water delivery to all the Authority's customers (residential, commercial, industrial, institutional, bulk rate customers, public health and safety providers, fire protection, governmental facilities, other water distributors, etc.), creating a public health emergency. Existing temporary bypass measures could cause failure of the existing pumps due to insufficient suction pressure.
<b>IMPACT ON OPERATIONS:</b> Ability to meet system reliability and water quality regulations.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no practical alternatives to the recommended action.

		CASH FLOW SUMMARY						FUNDING SOURCE(S)
	Total Budget (Prior Years Included)	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Total	Debt (Revenue Bonds)
Total	\$27,670,000	4,800,000	9,700,000	0	0	0	\$14,500,000	

\*Includes contingencies

# Water Treatment Plant

## Corrosion Control Chemical Storage & Feed Systems

**PROJECT NUMBER:** 2017-322-107-0

**NEIGHBORHOOD/WARD:** Systemwide

<b>PHASE:</b> Construction
<b>PRIORITY:</b> Water Quality/Regulatory
<b>PROJECT DESCRIPTION:</b> Installation of three phosphoric acid storage and feed systems located at Aspinwall Pump Station, Bruecken Pump Station, and the Membrane Filtration Plant to provide corrosion control in the distribution system.
<b>PROJECT JUSTIFICATION:</b> Required in order to lower lead levels in water.
<b>RISK(S):</b> The existing corrosion control system was not adequate to maintain lead levels below the PA DEP action limit.
<b>IMPACT ON OPERATIONS:</b> In order to prevent algae growth in the open Highland No. 1 Reservoir, treatment must occur at three major locations with 6 injection points. This requires additional maintenance of treatment facilities at satellite locations.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> Abandon Membrane Filtration Plant and the Highland No. 1 Reservoir and add orthophosphate at the Water Treatment Plant or use another less effective corrosion control method.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
<b>Total</b>	<b>\$9,142,035</b>	<b>390,748</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$390,748</b>	

\*Includes contingencies

# Water Treatment Plant

## Aspinwall Water Treatment Plant Security Fence, Lighting, and Surveillance

PROJECT NUMBER: Unidentified

NEIGHBORHOOD/WARD: Systemwide

<b>PHASE:</b> Not Started
<b>PRIORITY:</b> Safety
<b>PROJECT DESCRIPTION:</b> Install new fencing, lighting, and surveillance around the Water Treatment Plant.
<b>PROJECT JUSTIFICATION:</b> The fencing and security infrastructure around the Water Treatment Plant is in need of upgrades.
<b>RISK(S):</b> Increases the likelihood of security issues.
<b>IMPACT ON OPERATIONS:</b> Increased security around the Water Treatment Plant.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> Delay the implementation of the security upgrades.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Cash (PAYGO)</u>
<b>Total</b>	<b>\$530,000</b>	<b>300,000</b>	<b>230,000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$530,000</b>	

\*Includes contingencies

# Water Treatment Plant

## Highland Park Membrane Filtration Plant UV System

**PROJECT NUMBER:** 2017-322-106-0/-1

**NEIGHBORHOOD/WARD:** Systemwide

<b>PHASE:</b> Construction
<b>PRIORITY:</b> Safety, Regulatory Compliance, Reliability/Operational Flexibility, Capacity, Operations and Maintenance Efficiency, Level of Service
<b>PROJECT DESCRIPTION:</b> Installation of a UV treatment system and appurtenances at the Membrane Filtration Plant to comply with the 1 log inactivation of Giardia cysts and the PA DEP Administrative Order dated October 25, 2017.
<b>PROJECT JUSTIFICATION:</b> PA DEP determined that additional disinfection was required.
<b>RISK(S):</b> Membrane Filtration Plant cannot operate without additional disinfection measures.
<b>IMPACT ON OPERATIONS:</b> Membrane Filtration Plant cannot operate without this project.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> Construction of a clearwell in lieu of a UV system, eliminate Membrane Filtration Plant and provide additional potable water storage. Neither of these options are viable in the timeframe that is needed to provide adequate supply to the system.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
<b>Total</b>	<b>\$6,697,381</b>	<b>2,100,000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$2,100,000</b>	

\*Includes contingencies

# Water Treatment Plant

## Highland Park Membrane Filtration Module Replacement Program

**PROJECT NUMBER:** 2017-322-105-0

**NEIGHBORHOOD/WARD:** Systemwide

<b>PHASE:</b> Construction
<b>PRIORITY:</b> Safety, Regulatory Compliance, Reliability/Operational Flexibility, Capacity, Operations and Maintenance Efficiency, Level of Service
<b>PROJECT DESCRIPTION:</b> Replace membrane modules. The Membrane Filtration Plant includes a total of 10 racks, each with 80 modules.
<b>PROJECT JUSTIFICATION:</b> Membrane modules have reached the end of their useful life and are beginning to fail at an increasing rate.
<b>RISK(S):</b> Exposes the Authority to higher costs to address emergency facility failures, and the Highland No. 1 Service Area to a potentially deficient or non-complaint water supply.
<b>IMPACT ON OPERATIONS:</b> Increase operating flexibility and reliability.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no short term practical alternatives to the recommended action. Long term alternative is providing covered finished water storage for the Highland No. 1 Service Area and eliminating the Membrane Filtration Plant.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	Cash (PAYGO)
<b>Total</b>	<b>\$2,289,711</b>	<b>1,132,731</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$1,132,731</b>	

\*Includes contingencies



# Water Treatment Plant

## Membrane Filtration Plant Assessment and Critical Process Improvements

**PROJECT NUMBER:** 2017-322-104-0

**NEIGHBORHOOD/WARD:** Systemwide

**PHASE:**  
Construction

**PRIORITY:**  
Safety, Regulatory Compliance, Reliability/Operational Flexibility, Capacity, Operations and Maintenance Efficiency, Level of Service

**PROJECT DESCRIPTION:**  
Complete a condition assessment of systems supporting the treatment process and perform critical improvements to maintain water treatment and allow full warranty of replacement modules. Improvements may include electrical, chemical feed, strainers, and other support systems.

**PROJECT JUSTIFICATION:**  
Membrane module failure rate has continually increased over the last several years and are more than 5 years beyond the manufacturer's recommended replacement cycle. To allow module membrane manufacturers to extend a full warranty, a system condition assessment is needed. A detailed condition assessment is needed to address other critical worker safety and degradation of equipment that are essential to maintain the water treatment process. Improvements to the plan are required in order to restart the Membrane Filtration Plant.

**RISK(S):**  
Exposes the Authority to higher costs to address emergency failures and exposes the Highland No. 1 Service Area to a potentially deficient or non-complaint water supply.

**IMPACT ON OPERATIONS:**  
Increase operating flexibility and reliability.

**ALTERNATIVES TO THE RECOMMENDED ACTION:**  
Provide covered system storage for the Highland No. 1 Service Area and eliminate the microfiltration plant.

		CASH FLOW SUMMARY						FUNDING SOURCE(S)
	Total Budget (Prior Years Included)	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Total	Cash (PAYGO)
Total	\$2,417,622	171,848	0	0	0	0	\$171,848	

\*Includes contingencies



# Water Pumping and Storage



# Water Pumping and Storage

## Ross Pump Station

**PROJECT NUMBER:** 2018-323-101-0

**NEIGHBORHOOD/WARD:** Systemwide

<b>PHASE:</b> Design
<b>PRIORITY:</b> Water Quality/Regulatory
<b>PROJECT DESCRIPTION:</b> Replacement of aged pump and valve equipment, meters, SCADA, electrical equipment, HVAC, auxiliary systems, as well as the rehabilitation of the building architectural and energy management systems.
<b>PROJECT JUSTIFICATION:</b> Pump station is in need of rehabilitation. Pumps and ancillary systems are beyond their design life.
<b>RISK(S):</b> Exposes the Authority to higher capital costs to address emergency failures, and exposes customers to a potentially deficient water supply. Staff members may be exposed to electrical arc flashes due to the age of the electrical systems.
<b>IMPACT ON OPERATIONS:</b> Increased operating efficiency, flexibility, reliability, life expectancy, and improved safety conditions for staff.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
<b>Total</b>	<b>\$43,000,000</b>	<b>2,184,432</b>	<b>5,653,015</b>	<b>8,632,569</b>	<b>12,438,916</b>	<b>10,438,916</b>	<b>\$39,347,848</b>	

\*Includes contingencies

# Water Pumping and Storage

## Clearwell Improvements

**PROJECT NUMBER:** Unidentified  
**NEIGHBORHOOD/WARD:** Systemwide

<b>PHASE:</b> Not Started
<b>PRIORITY:</b> Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
<b>PROJECT DESCRIPTION:</b> Replacement of the existing 108 year old clearwell (finished water structure) with multi-celled clearwell to allow for maintenance.
<b>PROJECT JUSTIFICATION:</b> The clearwell was constructed in 1908 and has not undergone any major modifications or upgrades since. It has two main functions: providing equalization storage that allows the filters to operate independently of potential fluctuations in system demands, and providing sufficient retention contact time for disinfection agents to meet the requirements of the Surface Water Treatment Rule and Long-Term 2 Enhanced Surface Water Treatment Rule. Considering the age and condition of the clearwell, it is the water system’s weakest link as there are no practical means to deliver water by bypassing the clearwell, while maintaining the required volume, quality, and contact time.
<b>RISK(S):</b> Clearwell failure will cease all water delivery to all the Authority’s customers (residential, commercial, industrial, institutional, wholesale customers, public health and safety providers, fire protection, governmental facilities, other water distributors, etc.), creating a public health emergency.
<b>IMPACT ON OPERATIONS:</b> Ability to meet system reliability and water quality regulations.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
<b>Total</b>	<b>\$67,062,343</b>	<b>3,159,375</b>	<b>4,134,375</b>	<b>3,359,102</b>	<b>31,229,284</b>	<b>25,180,207</b>	<b>\$67,062,343</b>	

\*Includes contingencies

# Water Pumping and Storage

## Aspinwall Pump Station to Lanpher Reservoir Rising Main

**PROJECT NUMBER:** 2018-323-100-0

**NEIGHBORHOOD/WARD:** Systemwide

<b>PHASE:</b> Design
<b>PRIORITY:</b> Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
<b>PROJECT DESCRIPTION:</b> Construction of a new, redundant rising main from Aspinwall Pump Station to Lanpher Reservoir.
<b>PROJECT JUSTIFICATION:</b> The existing 60-inch rising main that supplies the Lanpher Reservoir is a 150 year old riveted steel pipe, has several tap connections to critical and bulk customers, and has experienced recent pipe failures. The new proposed rising main would serve as a primary supply source for the Lanpher Reservoir during the Clearwell Replacement Project and a redundant supply line in case of a failure or planned cleaning and rehabilitation of the existing 60-inch supply main.
<b>RISK(S):</b> Failure of the rising main could impact up to half of the Authority's customers, including St. Margaret's Hospital, and other wholesale customers, including Aspinwall, Blawnox, Etna, Sharpsburg, Fox Chapel, and Shaler.
<b>IMPACT ON OPERATIONS:</b> Increased operating flexibility and reliability.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> Rehabilitation of the existing 60-inch supply main and construction of a parallel main in sections that cannot currently be isolated to clean, inspect, or rehabilitate.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
<b>Total</b>	<b>\$49,454,000</b>	<b>4,468,239</b>	<b>11,463,520</b>	<b>8,730,659</b>	<b>8,036,963</b>	<b>0</b>	<b>\$32,699,381</b>	

\*Includes contingencies

# Water Pumping and Storage

## Bruecken Pump Station Valve Vault

**PROJECT NUMBER:** 2013-323-175-0/1/2  
**NEIGHBORHOOD/WARD:** Systemwide

<b>PHASE:</b> Construction
<b>PRIORITY:</b> Safety, Reliability/Operational Flexibility, Capacity, Operations and Maintenance Efficiency, Level of Service
<b>PROJECT DESCRIPTION:</b> Replacement of aged pump and valve equipment, electrical equipment, HVAC, auxiliary systems, and rehabilitation of the building architectural and energy management systems.
<b>PROJECT JUSTIFICATION:</b> The pump station was constructed in 1931. The pump station is in need of renovations and upgrades to maintain service, restore a 20 to 25 year useful life expectancy, and to provide safer conditions for staff. Additionally, installation of variable frequency drives will reduce water pressure surges during start-up, allow the pumps to operate more efficiently over a wide range of flow demands, and will reduce the required size of the new clearwell.
<b>RISK(S):</b> Exposes the Authority to higher capital costs to address emergency facility failures and its customers to a potentially deficient water supply. Staff members may be exposed to electrical arc flashes due to the age of the electrical systems.
<b>IMPACT ON OPERATIONS:</b> Increased operating efficiency, flexibility, reliability, and improved safety conditions for staff.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> Construction of a new facility to replace the existing pump station.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
<b>Total</b>	<b>\$9,697,952</b>	<b>31,485</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$31,485</b>	

\*Includes contingencies

# Water Pumping and Storage

## Aspinwall Water Treatment Plant High Service Pumping

**PROJECT NUMBER:** Unidentified  
**NEIGHBORHOOD/WARD:** Systemwide

<b>PHASE:</b> Not Started
<b>PRIORITY:</b> Safety, Reliability/Operational Flexibility, Capacity, Operations and Maintenance Efficiency, Level of Service
<b>PROJECT DESCRIPTION:</b> Replacement of aged pump and valve equipment, electrical equipment, HVAC, auxiliary systems, and rehabilitation of the building architectural and energy management systems at the Bruecken and Aspinwall Pump Stations or replacement with a single high service pump station at the Water Treatment Plant.
<b>PROJECT JUSTIFICATION:</b> Both pump stations are in need of renovations and upgrades to maintain service, restore a 20 to 25 year useful life expectancy, and to provide safer conditions for staff. Additionally, installation of variable frequency drives will reduce water pressure surges during start-up, and allow the pumps to operate over a wide range of flow, allow the pumps to operate while the clearwell is being replaced. Alternately, a new high service pump station to replace the existing pump stations is also being investigated.
<b>RISK(S):</b> Exposes the Authority to higher capital costs to address emergency failures and customers to a potentially deficient water supply. Staff may be exposed to electrical arc flashes due to the age of the electrical systems.
<b>IMPACT ON OPERATIONS:</b> Increased operating efficiency, flexibility, and reliability and improved safety conditions for staff.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$53,620,000	2,794,262	10,653,269	18,303,263	21,869,206	0	\$53,620,000	

\*Includes contingencies

# Water Pumping and Storage

## Chlorine Booster Station Improvements

**PROJECT NUMBER:** 2019-323-101-0

**NEIGHBORHOOD/WARD:** Systemwide

<b>PHASE:</b> Planning
<b>PRIORITY:</b> Safety, Regulatory Compliance, Reliability
<b>PROJECT DESCRIPTION:</b> Replacement of existing chlorine injection facilities at reservoirs and tanks for chlorine residual.
<b>PROJECT JUSTIFICATION:</b> The Authority boosts chlorine residual at a majority of its storage facilities. Recent changes to PA DEP regulations require an increase in minimum chlorine residual levels in the distribution system. All chlorine booster facilities need to be upgraded in order to meet these requirements.
<b>RISK(S):</b> Exposes the Authority's customers to poor water quality.
<b>IMPACT ON OPERATIONS:</b> Increased flexibility and reliability, system compliance, and improved safety conditions for staff.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no practical alternatives to the recommended action.

<u>CASH FLOW SUMMARY</u>								<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
<b>Total</b>	<b>\$10,090,000</b>	<b>1,090,090</b>	<b>6,117,915</b>	<b>2,556,409</b>	<b>0</b>	<b>0</b>	<b>\$9,764,414</b>	

\*Includes contingencies

# Water Pumping and Storage

## Highland Reservoir Pump Station and Rising Main

**PROJECT NUMBER:** 2017-323-101-0

**NEIGHBORHOOD/WARD:** Systemwide

<b>PHASE:</b> Design
<b>PRIORITY:</b> Regulatory Compliance, Reliability/Operational Flexibility, Capacity, Level of Service
<b>PROJECT DESCRIPTION:</b> Construction of a new finished water pump station and transmission main to supply water to the Highland No.1 Service Area from Highland No. 2 Reservoir.
<b>PROJECT JUSTIFICATION:</b> All compliant water supply for the Highland No. 1 Service Area currently flows through the Highland No. 1 Reservoir and the Membrane Filtration Plant. There is no other source water supply for the Highland No. 1 Service Area. In addition to providing alternate supply, this project is to temporarily provide finished water that meets the chlorine disinfection rules to the Highland No. 1 Service Area during the Clearwell Replacement Project. Additionally, this new facility could also be designed to service the Garfield pressure district, thus eliminating the rehabilitation of the Highland Pump Station.
<b>RISK(S):</b> Failure of the two rising mains (No. 1 or No. 2), Membrane Filtration Plant, or Bruecken Pump Station would result in the loss of compliant water supply to approximately 40% of the Authority's customer base.
<b>IMPACT ON OPERATIONS:</b> Increased operation and maintenance labor and expenses. Increased operating flexibility in the future.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> Construction of a new clearwell at the site of the existing west sedimentation basin. However, a previous study still recommended the addition of these assets as part of the Clearwell Replacement project.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
<b>Total</b>	<b>\$37,130,000</b>	<b>1,563,260</b>	<b>3,614,929</b>	<b>11,731,087</b>	<b>10,320,724</b>	<b>0</b>	<b>\$27,230,000</b>	

\*Includes contingencies



# Water Pumping and Storage

## Inline Pump Station (Coral and Pacific) Improvements

**PROJECT NUMBER:** Unidentified  
**NEIGHBORHOOD/WARD:** Bloomfield/8

<b>PHASE:</b> Not Started
<b>PRIORITY:</b> Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
<b>PROJECT DESCRIPTION:</b> Replacement of aged pump and valve equipment, electrical equipment, HVAC, auxiliary systems, and rehabilitation of the building architectural and energy management systems as prioritized by the recommended Finished Water Pump Stations Condition Assessment Project.
<b>PROJECT JUSTIFICATION:</b> The pump station is in need of renovations and upgrades to maintain service, restore a 20 to 25 year useful life expectancy, and to provide safer conditions for staff.
<b>RISK(S):</b> Lack of facility planning exposes the Authority to higher capital costs to address emergency failures and its customers to a potentially deficient water supply. Staff members may be exposed to electrical arc flashes due to the age of the electrical systems.
<b>IMPACT ON OPERATIONS:</b> Increased operating efficiency, flexibility, reliability, and improved safety conditions for staff.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> Construction of a new facility to replace the existing pump station.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$600,000	53,000	487,833	59,167	0	0	\$600,000	

\*Includes contingencies

# Water Pumping and Storage

## Lanpher Reservoir Improvements

**PROJECT NUMBER:** 2017-323-105-0/1/2/3

**NEIGHBORHOOD/WARD:** North Side/25

<b>PHASE:</b> Construction
<b>PRIORITY:</b> Safety, Regulatory Compliance, Reliability, Capacity, Level of Service
<b>PROJECT DESCRIPTION:</b> Replacement of existing reservoir liner and cover and associated reservoir rehabilitation. Replacement of existing chlorine injection system.
<b>PROJECT JUSTIFICATION:</b> The existing cover failed and had to be replaced on an emergency basis as part of the PA DEP October 2017 Administrative Order. Existing chlorine feed systems are beyond their useful life and must be replaced.
<b>RISK(S):</b> Exposes the Authority's customers to poor water quality from reservoir failure and inadequate booster disinfection.
<b>IMPACT ON OPERATIONS:</b> Increased flexibility and reliability, system compliance, and improved safety conditions for staff.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
<b>Total</b>	<b>\$30,890,182</b>	<b>3,716,026</b>	<b>6,465,302</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$10,181,328</b>	

\*Includes contingencies

# Water Pumping and Storage

## Highland No. 2 Reservoir Improvements

**PROJECT NUMBER:** 2019-323-102-0

**NEIGHBORHOOD/WARD:** Systemwide

<b>PHASE:</b> Planning
<b>PRIORITY:</b> Safety, Regulatory Compliance, Reliability, Capacity, Level of Service
<b>PROJECT DESCRIPTION:</b> Replacement of existing reservoir liner and cover and associated reservoir rehabilitation. Replacement of existing chlorine injection system. Upgrade of reservoir outlet structure.
<b>PROJECT JUSTIFICATION:</b> The Highland No. 2 Reservoir will be used as a temporary clearwell while the new clearwell is being constructed. Existing chlorine feed facilities must be upgraded to meet PA DEP regulatory requirements for distribution chlorine residual. Existing reservoir outlet structure must be upgraded to accommodate new Highland Reservoir Pump Station.
<b>RISK(S):</b> Exposes the Authority's customers to poor water quality from reservoir failure and inadequate booster disinfection.
<b>IMPACT ON OPERATIONS:</b> Increased flexibility and reliability, system compliance, and improved safety conditions for staff.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
<b>Total</b>	<b>\$27,510,000</b>	<b>4,965,756</b>	<b>11,743,206</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$16,708,962</b>	

\*Includes contingencies

# Water Pumping and Storage

## Herron Hill Reservoir Improvements

**PROJECT NUMBER:** 2019-323-100-0

**NEIGHBORHOOD/WARD:** Upper Hill/5

<b>PHASE:</b> Design
<b>PRIORITY:</b> Safety, Regulatory Compliance, Reliability, Capacity, Level of Service
<b>PROJECT DESCRIPTION:</b> Replacement of existing reservoir liner and cover and associated reservoir rehabilitation. Replacement of existing chlorine injection system.
<b>PROJECT JUSTIFICATION:</b> The existing cover has reached the end of its useful life and must be replaced. Existing chlorine feed systems are beyond their useful life and must be replaced.
<b>RISK(S):</b> Exposes the Authority's customers to poor water quality from reservoir failure and inadequate booster disinfection.
<b>IMPACT ON OPERATIONS:</b> Increased flexibility and reliability, system compliance, and improved safety conditions for staff.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
<b>Total</b>	<b>\$5,520,000</b>	<b>3,864,000</b>	<b>1,656,000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$5,520,000</b>	

\*Includes contingencies

# Water Pumping and Storage

## Garfield Tank Improvements

**PROJECT NUMBER:** Unidentified  
**NEIGHBORHOOD/WARD:** Garfield/9

<b>PHASE:</b> Not Started
<b>PRIORITY:</b> Safety, Regulatory Compliance, Reliability, Capacity, Level of Service
<b>PROJECT DESCRIPTION:</b> Rehabilitation or replacement of the existing tank. Increase of tank capacity may be necessary.
<b>PROJECT JUSTIFICATION:</b> The Garfield Elevated Storage Tank was constructed in 1959 and last rehabilitated in 1992. The existing tank does not have sufficient capacity to meet PA DEP's requirements for sizing, which states that a tank must have sufficient capacity to meet average day demand plus fire flow demand. This project will provide adequate storage through system redundancy to meet the pressure district's demand and fire flow conditions.
<b>RISK(S):</b> Exposes the Authority's customers to poor water quality from coating problems or a potentially deficient water supply.
<b>IMPACT ON OPERATIONS:</b> Increased flexibility and reliability, system compliance, and improved safety conditions for staff.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> Do nothing and risk catastrophic failure of the tank. Postpone replacement or full rehabilitation until a later date through short-term rehabilitation.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	Cash (PAYGO)
Total	\$4,050,000	0	0	528,235	2,026,807	1,462,605	\$4,017,647	

\*Includes contingencies

# Water Pumping and Storage

## Lincoln Tank Improvements

**PROJECT NUMBER:** Unidentified  
**NEIGHBORHOOD/WARD:** Lincoln-Lemington/12

<b>PHASE:</b> Not Started
<b>PRIORITY:</b> Safety, Regulatory Compliance, Reliability, Capacity, Level of Service
<b>PROJECT DESCRIPTION:</b> Rehabilitation or replacement of the existing tank.
<b>PROJECT JUSTIFICATION:</b> Constructed in 1939, this tank is nearing the end of its useful life. The last inspection, which was performed in 2018, noted deficiencies that need to be addressed to ensure water quality standards are met.
<b>RISK(S):</b> Exposes the Authority's customers to poor water quality from coating problems or a potentially deficient water supply in the event of tank failure.
<b>IMPACT ON OPERATIONS:</b> Increased flexibility and reliability and system compliance.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> Rehabilitation of the existing tank, which may be a larger investment than replacement.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	Cash (PAYGO)
Total	\$4,195,000	0	0	1,215,910	2,327,815	332,255	\$3,875,980	

\*Includes contingencies

# Water Pumping and Storage

## Spring Hill Tank Improvements

**PROJECT NUMBER:** Unidentified  
**NEIGHBORHOOD/WARD:** City View, Spring Hill, Spring Garden, Troy Hill/24,26

<b>PHASE:</b> Not Started
<b>PRIORITY:</b> Safety, Regulatory Compliance, Reliability, Capacity, Level of Service
<b>PROJECT DESCRIPTION:</b> Perform a comprehensive inspection of the existing storage tanks and rehabilitation or replacement of the existing tanks.
<b>PROJECT JUSTIFICATION:</b> Constructed in 1929 of riveted steel, the coatings and structure of these tanks may require rehabilitation due to corrosion. The existing shell ladder, ladder cage, and rolling roof ladder do not meet current OSHA dimensional requirements.
<b>RISK(S):</b> Exposes the Authority's customers to poor water quality from coating problems or a potentially deficient water supply in the event of tank failure. Additionally, it exposes the Authority's staff and contractors to safety issues.
<b>IMPACT ON OPERATIONS:</b> Increased flexibility and reliability and system compliance.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> Rehabilitation of the existing tank, which may be a larger investment than replacement.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Cash (PAYGO)</u>
<b>Total</b>	<b>\$2,125,000</b>	<b>0</b>	<b>0</b>	<b>164,545</b>	<b>642,154</b>	<b>1,233,541</b>	<b>\$2,040,241</b>	

\*Includes contingencies



# Water Pumping and Storage

## Mission Pump Station Improvements

**PROJECT NUMBER:** Unidentified  
**NEIGHBORHOOD/WARD:** Sheradan, Elliott, West End, Westwood, Ridgemont, Duquesne Heights, South Shore, Mount Washington, Allentown, Southside Slopes/16, 17, 18, 20

<b>PHASE:</b> Not Started
<b>PRIORITY:</b> Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
<b>PROJECT DESCRIPTION:</b> Replacement of aged pump and valve equipment, electrical equipment, HVAC, auxiliary systems, and rehabilitation of the building architectural and energy management systems as prioritized by the recommended Finished Water Pump Stations Condition Assessment Project.
<b>PROJECT JUSTIFICATION:</b> The Mission Pump Station is the only pumping station located south of the Monongahela River and was originally constructed between 1910 and 1912. The pump station is in need of renovations and upgrades to maintain service, restore a 20 to 25 year useful life expectancy, and to provide safer conditions for staff.
<b>RISK(S):</b> Lack of facility planning exposes the Authority to higher capital costs to address emergency failures and its customers to a potentially deficient water supply. Staff may be exposed to electrical arc flashes due to the age of the electrical systems.
<b>IMPACT ON OPERATIONS:</b> Increased operating efficiency, flexibility, and reliability and improved safety conditions for staff.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> Construction of a new facility to replace the existing pump station.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	
Total	\$16,865,000	0	0	995,714	1,054,286	2,202,270	\$4,252,270	Cash (PAYGO)

\*Includes contingencies



# Water Pumping and Storage

## Herron Hill Tank Pump Station Improvements

PROJECT NUMBER: Unidentified  
NEIGHBORHOOD/WARD: Upper Hill/5

<b>PHASE:</b> Not Started
<b>PRIORITY:</b> Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
<b>PROJECT DESCRIPTION:</b> Replacement of aged pump and valve equipment, electrical equipment, HVAC, auxiliary systems, and rehabilitation of the building architectural and energy management systems as prioritized by the recommended Finished Water Pump Stations Condition Assessment Project.
<b>PROJECT JUSTIFICATION:</b> The pump station is in need of renovations and upgrades to maintain service, restore a 20 to 25 year useful life expectancy, and to provide safer conditions for staff.
<b>RISK(S):</b> Lack of facility planning exposes the Authority to higher capital costs to address emergency failures and customers to a potentially deficient water supply. Staff may be exposed to electrical arc flashes due to the age of the electrical systems.
<b>IMPACT ON OPERATIONS:</b> Increased operating efficiency, flexibility, and reliability and improved safety conditions for staff.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> Construction of a new facility to replace the existing pump station.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	Cash (PAYGO)
Total	\$1,110,000	0	0	0	115,152	366,189	\$481,340	

\*Includes contingencies

# Water Pumping and Storage

## Herron Hill Pump Station Improvements

**PROJECT NUMBER:** Unidentified  
**NEIGHBORHOOD/WARD:** Squirrel Hill, Regent Square, Point Breeze, Greenfield/14

<b>PHASE:</b> Not Started
<b>PRIORITY:</b> Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
<b>PROJECT DESCRIPTION:</b> Replacement of aged pump and valve equipment, electrical equipment, HVAC, auxiliary systems, and rehabilitation of the building architectural and energy management systems as prioritized by the recommended Finished Water Pump Stations Condition Assessment Project.
<b>PROJECT JUSTIFICATION:</b> The pump station was originally constructed in the late 1890's. The pump station is in need of renovations and upgrades to maintain service, restore a 20 to 25 year useful life expectancy, and to provide safer conditions for staff.
<b>RISK(S):</b> Lack of facility planning exposes the Authority to higher capital costs to address emergency failures and customers to a potentially deficient water supply. Staff may be exposed to electrical arc flashes due to the age of the electrical systems.
<b>IMPACT ON OPERATIONS:</b> Increased operating efficiency, flexibility, and reliability and improved safety conditions for staff.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> Construction of a new facility to replace the existing pump station.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Cash (PAYGO)</u>
<b>Total</b>	<b>\$10,960,000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>891,429</b>	<b>1,574,532</b>	<b>\$2,465,961</b>	

\*Includes contingencies

# Water Pumping and Storage

## Howard Pump Station Improvements

**PROJECT NUMBER:** Unidentified  
**NEIGHBORHOOD/WARD:** Brighton Heights, California Kirkbride, Marshall- Shadeland, Northview Heights, Perry, Pineview, Spring Garden, Summer Hill/21, 24, 25, 26, 27

<b>PHASE:</b> Not Started
<b>PRIORITY:</b> Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
<b>PROJECT DESCRIPTION:</b> Replacement of aged pump and valve equipment, electrical equipment, HVAC, auxiliary systems, and rehabilitation of the building architectural and energy management systems as prioritized by the recommended Finished Water Pump Stations Condition Assessment Project.
<b>PROJECT JUSTIFICATION:</b> The pump station was originally constructed between 1900 and 1904. The pump station is in need of renovations and upgrades to maintain service, restore a 20 to 25 year useful life expectancy, and to provide safer conditions for the staff.
<b>RISK(S):</b> Lack of facility planning exposes the Authority to higher capital costs to address emergency failures and its customers to a potentially deficient water supply. Staff may be exposed to electrical arc flashes due to the age of the electrical systems.
<b>IMPACT ON OPERATIONS:</b> Increased operating efficiency, flexibility, and reliability and improved safety conditions for staff.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> Construction of a new facility to replace the existing pump station.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	Cash (PAYGO)
Total	\$18,650,000	0	0	0	404,762	1,279,048	\$1,683,810	

\*Includes contingencies

# Water Pumping and Storage

## Lincoln Pump Station Improvements

**PROJECT NUMBER:** Unidentified  
**NEIGHBORHOOD/WARD:** Lincoln-Lemington/12

<b>PHASE:</b> Not Started
<b>PRIORITY:</b> Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
<b>PROJECT DESCRIPTION:</b> Replacement of aged pump and valve equipment, electrical equipment, HVAC, and auxiliary systems, and rehabilitation of the building architectural and energy management systems as prioritized by the recommended Finished Water Pump Stations Condition Assessment Project.
<b>PROJECT JUSTIFICATION:</b> The pump station was originally constructed in 1952. The pump station is in need of renovations and upgrades to maintain service, restore a 20 to 25 year useful life expectancy, and to provide safer conditions for staff.
<b>RISK(S):</b> Lack of facility planning exposes the Authority to higher capital costs to address emergency failures and customers to a potentially deficient water supply. Staff may be exposed to electrical arc flashes due to the age of the electrical systems.
<b>IMPACT ON OPERATIONS:</b> Increased operating efficiency, flexibility, and reliability and improved safety conditions for staff.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> Construction of a new facility to replace the existing pump station.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
<b>Total</b>	<b>\$1,374,898</b>	<b>331,061</b>	<b>1,043,838</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$1,374,898</b>	

\*Includes contingencies

# Water Pumping and Storage

## Saline Pump Station Improvements

**PROJECT NUMBER:** Unidentified  
**NEIGHBORHOOD/WARD:** Glen Hazel, Hazelwood, Squirrel Hill South, Swisshelm Park/14, 15

<b>PHASE:</b> Not Started
<b>PRIORITY:</b> Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
<b>PROJECT DESCRIPTION:</b> Replacement of aged pump and valve equipment, electrical equipment, HVAC, auxiliary systems, and rehabilitation of the building architectural and energy management systems as prioritized by the recommended Finished Water Pump Stations Condition Assessment Project.
<b>PROJECT JUSTIFICATION:</b> The pump station was originally constructed in 1935. The pump station is in need of renovations and upgrades to maintain service, restore a 20 to 25 year useful life expectancy, and to provide safer conditions for staff.
<b>RISK(S):</b> Lack of facility planning exposes the Authority to higher capital costs to address emergency failures and its customers to a potentially deficient water supply. Staff may be exposed to electrical arc flashes due to the age of the electrical systems.
<b>IMPACT ON OPERATIONS:</b> Increased operating efficiency, flexibility, and reliability and improved safety conditions for staff.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> Construction of a new facility to replace the existing pump station.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	Debt (Revenue Bonds)
<b>Total</b>	<b>\$1,491,995</b>	<b>359,848</b>	<b>1,132,147</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$1,491,995</b>	

\*Includes contingencies

# Water Pumping and Storage

## 2019 Large Diameter Water Main Improvements - Rising Mains 3 & 4

PROJECT NUMBER: 2019-325-103-0  
NEIGHBORHOOD/WARD: Systemwide

<b>PHASE:</b> Planning
<b>PRIORITY:</b> Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
<b>PROJECT DESCRIPTION:</b> Condition assessment and rehabilitation or replacement of Rising Mains 3 and 4. Replacement or rehabilitation depending upon existing condition of rising mains.
<b>PROJECT JUSTIFICATION:</b> Rising Mains 3 and 4 feed the Highland 2 Pump Station. The capacity of these rising mains may need to be increased to accommodate additional flow during the bypass of the clearwell. These mains will need to accommodate demand from both Highland No.1 and Highland No. 2 reservoirs during the bypass of the clearwell as well as to supply a redundant feed to the Highland No. 1 reservoir.
<b>RISK(S):</b> The consequences of failure for larger mains are much greater than for smaller distribution mains. Consequences typically include significant service outages (larger area and longer time frame impacts), as well as property and roadway damage.
<b>IMPACT ON OPERATIONS:</b> Increased system reliability and improved system management.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> Continue to extend utility component life until a high failure rate justifies replacement.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	Debt (Revenue Bonds)
Total	\$23,550,000	2,484,612	7,212,370	9,265,188	3,392,519	0	\$22,354,689	

\*Includes contingencies

# Water Distribution



# Water Distribution System

## 2018-2019 Lead Service Line Replacement Program

**PROJECT NUMBER:** 2018-325-100-0/1/2/3/4/5, WSI9-325-100-0/1/2/3  
**NEIGHBORHOOD/WARD:** Systemwide

**PHASE:**  
Construction

**PRIORITY:**  
Safety, Regulatory Compliance

**PROJECT DESCRIPTION:**  
Replacement of 7% of lead service lines per year.

**PROJECT JUSTIFICATION:**  
Due to the exceedance of the action levels from compliance tests for lead and copper, the PA DEP required the Authority to perform additional distribution system water quality monitoring, and the optimization of corrosion control treatment, public education, and lead service line replacement.

**RISK(S):**  
Failure to comply will result in regulatory fines and poses a public health risk.

**IMPACT ON OPERATIONS:**  
Reduction in service line failure due to replacing with new infrastructure, reducing demands on operations repair crews.

**ALTERNATIVES TO THE RECOMMENDED ACTION:**  
There are no practical alternatives to the recommended action.

		CASH FLOW SUMMARY						FUNDING SOURCE(S)
	Total Budget (Prior Years Included)	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Total	Debt (Revenue Bonds) & PENNVEST
Total	\$90,460,234	36,780,128	0	0	0	0	\$36,780,128	

\*Includes contingencies



# Water Distribution System

## 2019-2021 Lead Service Line Identification Program

**PROJECT NUMBER:** Unidentified  
**NEIGHBORHOOD/WARD:** Systemwide

<b>PHASE:</b> Not Started
<b>PRIORITY:</b> Safety, Regulatory Compliance
<b>PROJECT DESCRIPTION:</b> Locating lead service lines allows the Authority to identify both individual service lines to replace and waterlines that have a particularly high amount of lead service lines that can be replaced to facilitate the lead service line replacements.
<b>PROJECT JUSTIFICATION:</b> Understanding where the lead service lines are within the water system will allow the Authority to more efficiently replace all lead service lines.
<b>RISK(S):</b> Failure to identify all lead service lines could slow the rate in which they are replaced.
<b>IMPACT ON OPERATIONS:</b> Increased system reliability and improved system management.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
<b>Total</b>	\$13,434,666	3,000,000	3,138,667	4,737,334	2,558,667	0	\$13,434,667	

\*Includes contingencies

# Water Distribution System

## 2020-2024 Private Lead Service Line Reimbursement Program

**PROJECT NUMBER:** Unidentified  
**NEIGHBORHOOD/WARD:** Systemwide

<b>PHASE:</b> Not Started
<b>PRIORITY:</b> Safety, Regulatory Compliance
<b>PROJECT DESCRIPTION:</b> Reimbursement of private line lead service line costs.
<b>PROJECT JUSTIFICATION:</b> Replacing both private and public lead service lines is required to eliminate lead in the water system.
<b>RISK(S):</b> Failure to replace private lead service lines poses a public health risk.
<b>IMPACT ON OPERATIONS:</b> Increased system reliability and improved system management.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
<b>Total</b>	<b>\$5,000,000</b>	<b>1,000,000</b>	<b>1,000,000</b>	<b>1,000,000</b>	<b>1,000,000</b>	<b>1,000,000</b>	<b>\$5,000,000</b>	

\*Includes contingencies

# Water Distribution System

## 2018-2024 Small Diameter Water Main Replacement Program

**PROJECT NUMBER:** 2017-325-103-0, 2019-325-101-0, 2019-325-102-0

**NEIGHBORHOOD/WARD:** Systemwide

**PHASE:**  
Construction

**PRIORITY:**  
Safety, Reliability/Operational Flexibility, Regional Cooperation/Stewardship, Level of Service

**PROJECT DESCRIPTION:**  
Strategic replacement of water mains to improve system reliability as well as improve water pressure, maintain water quality, and minimize disturbance to the community. Program will initially focus on replacing existing 4-inch and 6-inch unlined cast iron mains and mains with a history of frequent breaks.

**PROJECT JUSTIFICATION:**  
By maintaining a proactive approach to asset management, efforts can be directed towards remedying assets before their failure, thus saving overall replacement cost. Additionally, projects will be coordinated with other utilities to minimize disturbance to the community and street surface restoration costs. Water quality will also improve by removing tuberculated mains.

**RISK(S):**  
Customers may be subject to service outages or the potential for inadequate pressure for firefighting activities.

**IMPACT ON OPERATIONS:**  
Increased operating flexibility and reliability.

**ALTERNATIVES TO THE RECOMMENDED ACTION:**  
Continue to extend utility component life until a high failure rate justifies replacement.

		CASH FLOW SUMMARY						FUNDING SOURCE(S)
	Total Budget (Prior Years Included)	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Total	Debt (Revenue Bonds)
Total	\$430,410,000	13,459,161	32,788,975	79,928,673	99,429,521	100,527,383	\$326,133,714	

\*Includes contingencies

# Water Distribution System

## 2020-2024 Large Diameter Water Main Replacement Program

**PROJECT NUMBER:** Unidentified  
**NEIGHBORHOOD/WARD:** Systemwide

<b>PHASE:</b> Not Started
<b>PRIORITY:</b> Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
<b>PROJECT DESCRIPTION:</b> Strategic replacement or rehabilitation of large diameter water mains (16-inch and larger) and appurtenances to improve system reliability and hydraulics, including internal and external inspections.
<b>PROJECT JUSTIFICATION:</b> The Authority's water system has approximately 122 miles of large diameter water mains. By maintaining a proactive approach to asset management, efforts can be directed towards remedying assets before their failure, thus resulting in cost savings. Typically, large diameter pipe is not readily available and has a 6 to 8 week lead time for delivery. A large percentage of the Authority's large diameter mains are riveted steel, which cannot be easily repaired without the use of field fabricated specialty fittings
<b>RISK(S):</b> The consequences of failure for larger mains are much greater than for smaller distribution mains, which typically include significant service outages (larger area and longer time frame impacts), as well as property and roadway damage. This is especially true for the Highland No. 1 Pressure District and all districts fed by the Highland No. 1 reservoir.
<b>IMPACT ON OPERATIONS:</b> Increased system reliability and improved system management.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> Continue to extend utility component life until a high failure rate justifies replacement.

		CASH FLOW SUMMARY						FUNDING SOURCE(S)
	Total Budget (Prior Years Included)	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Total	Debt (Revenue Bonds)
<b>Total</b>	<b>\$70,763,030</b>	<b>1,292,197</b>	<b>3,790,379</b>	<b>6,990,879</b>	<b>14,120,545</b>	<b>20,299,809</b>	<b>\$46,493,809</b>	

\*Includes contingencies

# Water Distribution System

## 2018 Curb Box Inspections

**PROJECT NUMBER:** 2017-325-106-0  
**NEIGHBORHOOD/WARD:** Systemwide

**PHASE:**  
 Non-Construction

**PRIORITY:**  
 Safety, Regulatory Compliance

**PROJECT DESCRIPTION:**  
 Locating lead service lines allows the Authority to identify both individual service lines to replace and waterlines that have a particularly high amount of lead service lines that can be replaced to facilitate the lead service line replacements.

**PROJECT JUSTIFICATION:**  
 Understanding where the lead service lines are within the water system will allow the Authority to more efficiently replace all lead service lines.

**RISK(S):**  
 Failure to identify all lead service lines could slow the rate in which they are replaced.

**IMPACT ON OPERATIONS:**  
 Increased system reliability and improved system management.

**ALTERNATIVES TO THE RECOMMENDED ACTION:**  
 There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$2,980,174	278,081	0	0	0	0	\$278,081	

\*Includes contingencies

# Water Distribution System

## 2018-2024 Water Relay

**PROJECT NUMBER:** 2018-325-101-0

**NEIGHBORHOOD/WARD:** Systemwide

**PHASE:**  
Construction

**PRIORITY:**  
Safety, Reliability/Operational Flexibility, Level of Service

**PROJECT DESCRIPTION:**  
Replacement of existing water mains, valves, fittings, service connections, and hydrants due to emergency situations.

**PROJECT JUSTIFICATION:**  
The existing water distribution system is aging and updates are required to address failures that could be significant public safety hazards.

**RISK(S):**  
Customers will be subject to service outages or inadequate pressure for firefighting activities until break is addressed.

**IMPACT ON OPERATIONS:**  
Increased operating flexibility and reliability.

**ALTERNATIVES TO THE RECOMMENDED ACTION:**  
Utilize Authority staff and equipment to perform all upgrades. This would require an increase in operations expenses for both personnel and equipment.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
<b>Total</b>	<b>\$14,595,767</b>	<b>2,317,816</b>	<b>1,727,500</b>	<b>1,757,000</b>	<b>1,869,000</b>	<b>1,880,000</b>	<b>\$9,551,316</b>	

\*Includes contingencies

# Water Distribution System

## 2017-2024 Valve Replacement Program

**PROJECT NUMBER:** 2017-325-104-0, 2018-325-105-0

**NEIGHBORHOOD/WARD:** Systemwide

**PHASE:**  
Construction

**PRIORITY:**  
Safety, Reliability/Operational Flexibility, Level of Service

**PROJECT DESCRIPTION:**  
Replacement of defective or non-operational valves on transmission and distribution mains throughout the water distribution system, excluding valves replaced during waterline relays.

**PROJECT JUSTIFICATION:**  
Increasing the number of operable valves in the system will reduce the number of number of valves that would need to be closed during emergency conditions, and therefore the number of customers that may be impacted.

**RISK(S):**  
A larger number of customers may be subject to service outages.

**IMPACT ON OPERATIONS:**  
Increased operating flexibility and reliability.

**ALTERNATIVES TO THE RECOMMENDED ACTION:**  
Utilize Authority staff and equipment to perform all repairs. This would require an increase in operation expenses for both personnel and equipment.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	Debt (Revenue Bonds)
<b>Total</b>	\$25,209,208	3,888,977	3,230,652	2,995,000	3,208,198	4,993,997	\$18,316,824	

\*Includes contingencies

# Water Distribution System

## 2017-2024 Hydrant Replacement Program

**PROJECT NUMBER:** 2017-325-102-0, 2018-325-104-0  
**NEIGHBORHOOD/WARD:** Systemwide

<b>PHASE:</b> Construction
<b>PRIORITY:</b> Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
<b>PROJECT DESCRIPTION:</b> Replacement of broken hydrants throughout the water distribution system. The goal of the program is to replace a minimum of 100 hydrants per year, excluding hydrants replaced during waterline relays.
<b>PROJECT JUSTIFICATION:</b> Increasing the number of operational hydrants provides better fire protection for the City of Pittsburgh.
<b>RISK(S):</b> Customers will be subject to inadequate pressure for firefighting activities.
<b>IMPACT ON OPERATIONS:</b> Increased operating flexibility and reliability.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> Utilize Authority staff and equipment to perform all repairs. This would result in an increase in operating expenses for both personnel and equipment.

		CASH FLOW SUMMARY						FUNDING SOURCE(S)
	Total Budget (Prior Years Included)	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Total	Debt (Revenue Bonds)
<b>Total</b>	\$10,007,574	1,899,892	1,539,725	1,450,000	1,524,314	1,575,000	\$7,988,931	

\*Includes contingencies



# Water Distribution System

## 2019-2024 Small Meter Replacement Program

**PROJECT NUMBER:** Unidentified  
**NEIGHBORHOOD/WARD:** Systemwide

<b>PHASE:</b> Not Started
<b>PRIORITY:</b> Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
<b>PROJECT DESCRIPTION:</b> Annual replacement of water meters one inch or less.
<b>PROJECT JUSTIFICATION:</b> Ensure capture of all revenue. As meters age, they typically underestimate the amount of water consumed.
<b>RISK(S):</b> Failure to replace meters annually could result in lost revenue or violate regulatory requirements.
<b>IMPACT ON OPERATIONS:</b> Increased system reliability, reliability, and improved system management.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	Cash (PAYGO)
<b>Total</b>	<b>\$4,985,915</b>	<b>785,775</b>	<b>857,000</b>	<b>867,000</b>	<b>877,000</b>	<b>887,000</b>	<b>\$4,273,775</b>	

\*Includes contingencies

# Water Distribution System

## 2019-2024 Large Meter Replacement Program

**PROJECT NUMBER:** Unidentified  
**NEIGHBORHOOD/WARD:** Systemwide

<b>PHASE:</b> Not Started
<b>PRIORITY:</b> Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
<b>PROJECT DESCRIPTION:</b> Annual replacement of water meters larger than one inch.
<b>PROJECT JUSTIFICATION:</b> Ensure capture of all revenue. As meters age, they typically underestimate the amount of water consumed.
<b>RISK(S):</b> Failure to replace meters annually could result in lost revenue.
<b>IMPACT ON OPERATIONS:</b> Increased system reliability, reliability, and improved system management.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no practical alternatives to the recommended action.

		CASH FLOW SUMMARY						FUNDING SOURCE(S)
	Total Budget (Prior Years Included)	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Total	Cash (PAYGO)
Total	\$5,190,000	847,000	857,000	867,000	877,000	887,000	\$4,335,000	

\*Includes contingencies

# Water Distribution System

## 2019-2021 Unmetered and Flat Rate Properties

**PROJECT NUMBER:** 2019-325-104-0, Unidentified

**NEIGHBORHOOD/WARD:** Systemwide

<b>PHASE:</b> Design
<b>PRIORITY:</b> Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
<b>PROJECT DESCRIPTION:</b> Metering unmetered and flat rate properties as required by regulations.
<b>PROJECT JUSTIFICATION:</b> Required per the PUC regulations. The impact of not installing meters is the loss of revenue and lack of ability to accurately estimate water loss in the system.
<b>RISK(S):</b> Failure to comply with PUC regulations and the potential of lost revenue.
<b>IMPACT ON OPERATIONS:</b> Increased system reliability, reliability, and improved system management.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no practical alternatives to the recommended action.

		CASH FLOW SUMMARY						FUNDING SOURCE(S)
	Total Budget (Prior Years Included)	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Total	Cash (PAYGO)
<b>Total</b>	\$8,840,000	3,078,419	3,266,087	1,744,698	527,947	0	\$8,617,151	

\*Includes contingencies

# Water Distribution System

## 2019-2024 Surface Restoration

**PROJECT NUMBER:** 2019-325-106-0, Unidentified  
**NEIGHBORHOOD/WARD:** Systemwide

**PHASE:**  
Construction

**PRIORITY:**  
Safety, Operations and Maintenance Efficiency

**PROJECT DESCRIPTION:**  
Resurfacing of streets as a result of other capital projects.

**PROJECT JUSTIFICATION:**  
Adequately restoring street surface conditions is a requirement for all applicable capital projects.

**RISK(S):**  
Customers could experience temporary street closures as a result of street resurfacing work.

**IMPACT ON OPERATIONS:**  
Increased system reliability and improved system management.

**ALTERNATIVES TO THE RECOMMENDED ACTION:**  
There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
<b>Total</b>	<b>\$25,911,333</b>	<b>3,564,474</b>	<b>4,158,926</b>	<b>4,097,387</b>	<b>4,197,390</b>	<b>4,297,393</b>	<b>\$20,315,569</b>	

\*Includes contingencies

# Water Distribution System

## Low Pressure Area Remediation

**PROJECT NUMBER:** Unidentified  
**NEIGHBORHOOD/WARD:** Systemwide

**PHASE:**  
Not Started

**PRIORITY:**  
Regulatory Compliance, Reliability/Operational Flexibility, Level of Service

**PROJECT DESCRIPTION:**  
Fix chronically low pressure areas by either extending neighboring higher pressure districts into the area, booster pump stations, or household booster pumps.

**PROJECT JUSTIFICATION:**  
This project is in response to the low pressure monitors required by the October 2017 Administrative Order.

**RISK(S):**  
Customers may experience temporary service outages as a result of the work on this project.

**IMPACT ON OPERATIONS:**  
Increased system reliability and improved system management.

**ALTERNATIVES TO THE RECOMMENDED ACTION:**  
There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
<b>Total</b>	<b>\$2,393,358</b>	<b>1,029,259</b>	<b>1,193,445</b>	<b>170,654</b>	<b>0</b>	<b>0</b>	<b>\$2,393,358</b>	

\*Includes contingencies

# Water Distribution System

## Bus Rapid Transit (BRT) Water Distribution

**PROJECT NUMBER:** Unidentified  
**NEIGHBORHOOD/WARD:** Uptown & Oakland/ 1 & 4

**PHASE:**  
Not Started

**PRIORITY:**  
Regional Cooperation/ Stewardship and Level of Service

**PROJECT DESCRIPTION:**  
The City is making roadway improvements on Fifth Ave and Forbes Ave from downtown through Oakland, with full depth reconstruction planned on Forbes from Crosstown Blvd to Craft Ave and on Fifth between Crosstown Blvd and the Birmingham Bridge. The City's work, in partnership with the Port Authority, will include signal pole upgrades, traffic redesign, sidewalk bumpouts, and new bus shelters. The full depth reconstruction portion of the project has the potential to affect existing 15-inch, 16-inch, 20-inch, and 6-inch mains that are 80-100+ years old. The full depth replacement of the roadway along with lowering of the roadway could result in damage to these mains. These mains should be replaced as part of this project. However, first a study should be completed to ensure proper size of these mains as they could be oversized.

**PROJECT JUSTIFICATION:**  
The full depth replacement of the roadway along with lowering of the roadway could result in damage to these mains.

**RISK(S):**  
Replacement of water mains along the Fifth and Forbes corridor reduces the risk of service outages due to breaks, reduces the potential for inadequate capacity for firefighting activities, and improves water quality.

**IMPACT ON OPERATIONS:**  
Increased system reliability, reliability, and improved system management.

**ALTERNATIVES TO THE RECOMMENDED ACTION:**  
Delay the replacement of the required water mains and risk damage to the water system resulting from the project.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
<b>Total</b>	<b>\$11,730,000</b>	<b>700,000</b>	<b>3,750,000</b>	<b>5,780,000</b>	<b>1,500,000</b>	<b>0</b>	<b>\$11,730,000</b>	

\*Includes contingencies

# Water Distribution System

## Bates Street Waterline Relay

**PROJECT NUMBER:** 2019-325-111-0

**NEIGHBORHOOD/WARD:** Oakland/4

**PHASE:**  
Not Started

**PRIORITY:**  
Regional Cooperation/ Stewardship and Level of Service

**PROJECT DESCRIPTION:**  
PennDOT is repaving this critical road in 2020. The existing 8-inch and 12-inch mains have had multiple breaks which cause significant delays to traffic. This line must be replaced prior to repaving.

**PROJECT JUSTIFICATION:**  
This main will continue to break and must be replaced before final paving by PennDOT.

**RISK(S):**  
Replacement of a high-risk main would result in less frequent loss of water service due to breaks.

**IMPACT ON OPERATIONS:**  
Increased system reliability, reliability, and improved system management.

**ALTERNATIVES TO THE RECOMMENDED ACTION:**  
Delay the replacement of the watermain and risk the increased change of breaks.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
<b>Total</b>	<b>\$1,151,000</b>	<b>160,000</b>	<b>991,000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$1,151,000</b>	

\*Includes contingencies

# Water Distribution System

## District Water and Pressure Meters

**PROJECT NUMBER:** 2017-325-114-0

**NEIGHBORHOOD/WARD:** Systemwide

**PHASE:**  
Procurement

**PRIORITY:**  
Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service

**PROJECT DESCRIPTION:**  
Installation of water meters and pressure monitors in the distribution system to determine water usage and loss, and pressure loss.

**PROJECT JUSTIFICATION:**  
This project will help determine areas of water loss in the water system. This information can then be used to develop an action plan to mitigate water loss.

**RISK(S):**  
Customers may experience temporary service outages as a result of the work on this project.

**IMPACT ON OPERATIONS:**  
Increased system reliability and improved system management.

**ALTERNATIVES TO THE RECOMMENDED ACTION:**  
There are no practical alternatives to the recommended action.

		CASH FLOW SUMMARY						FUNDING SOURCE(S)
	Total Budget (Prior Years Included)	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Total	Cash (PAYGO)
Total	\$2,835,000	1,731,143	985,524	0	0	0	\$2,716,667	

\*Includes contingencies



# Water Distribution System

## West Ohio Street Bridge Replacement

**PROJECT NUMBER:** 2019-325-112-0

**NEIGHBORHOOD/WARD:** Systemwide

**PHASE:**  
Not Started

**PRIORITY:**  
Reegional Cooperation/Stewardship, Operations and Maintenance Efficiency

**PROJECT DESCRIPTION:**  
Relocate and upgrade water infrastructure attached to the West Ohio Street Bridge as part of the City of Pittsburgh's plan to relocate the bridge.

**PROJECT JUSTIFICATION:**  
This project provides for a cost share opportunity to relocate water infrastructure attached to the West Ohio Street Bridge.

**RISK(S):**  
Unforeseen costs could be required in relocating the water infrastructure.

**IMPACT ON OPERATIONS:**  
Increased system reliability and improved sytem management.

**ALTERNATIVES TO THE RECOMMENDED ACTION:**  
There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
<b>Total</b>	<b>\$289,250</b>	<b>289,250</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$289,250</b>	

\*Includes contingencies

# Water Distribution System

## Fort Duquesne Bridge Water Air Release Valve Repair

**PROJECT NUMBER:** 2017-325-100-0  
**NEIGHBORHOOD/WARD:** North Shore & Central Business District/1,22

**PHASE:**  
Construction

**PRIORITY:**  
Safety, Reliability/Operational Flexibility, Regional Cooperation/Stewardship, Level of Service

**PROJECT DESCRIPTION:**  
Perform transient analysis along existing 30-inch water main that is suspended from the Fort Duquesne Bridge. Design and construct new pipe supports and thrust restraint based on the results of the analysis. Includes the replacement of the existing air-release valve on the 30-inch water main, including insulation or heat tracing to reduce the potential for freezing and cracking of the valve.

**PROJECT JUSTIFICATION:**  
A recent PENNDOT inspection of the Fort Duquesne Bridge identified priority code 1 defects in the support of the existing 30-inch diameter water main. Additionally, the existing 2-inch diameter air-release valve located on the main has a history of failure. The water main is located below the lower deck of the Fort Duquesne Bridge and serves as an emergency interconnection between pressure gradients and is a vital component to the system operation.

**RISK(S):**  
Customers may be subject to service outages or the potential for inadequate pressure for firefighting activities.

**IMPACT ON OPERATIONS:**  
Increased operating flexibility and reliability.

**ALTERNATIVES TO THE RECOMMENDED ACTION:**  
There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
<b>Total</b>	<b>\$2,850,000</b>	<b>1,495,563</b>	<b>2,916</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$1,498,479</b>	

\*Includes contingencies

# Wastewater System



# Wastewater System

## 2018-2024 Small Diameter Sewer Rehabilitation

**PROJECT NUMBER:** 2018-424-100-0, 2019-424-100-0/1, Unidentified

**NEIGHBORHOOD/WARD:** Systemwide

**PHASE:**  
Construction

**PRIORITY:**  
Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service

**PROJECT DESCRIPTION:**  
Proactive, trenchless rehabilitation of sewer mains with less than 36-inch diameter to restore structural integrity, reduce root intrusion, and reduce infiltration and inflow; including cleaning and pre and post construction CCTV inspections.

**PROJECT JUSTIFICATION:**  
Provides the Authority with a means to address several moderate/major structural defects in pipe segments prior to complete failure. This trenchless pipe renewal method renews the asset, eliminates disruptive excavation, and is more cost effective than replacement.

**RISK(S):**  
If moderate/major structural defects are not proactively addressed, complete failure will eventually occur and excavation will be required. Any complete failure that occurs will result in dramatically increased expenditures for repair.

**IMPACT ON OPERATIONS:**  
Increased operating flexibility and reliability.

**ALTERNATIVES TO THE RECOMMENDED ACTION:**  
Perform excavated point repairs to address defective sections of pipe, replace segment in its entirety, or continue to extend asset life until failure.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
<b>Total</b>	<b>\$111,170,000</b>	<b>13,469,310</b>	<b>21,359,629</b>	<b>19,300,000</b>	<b>20,300,000</b>	<b>21,300,000</b>	<b>\$95,728,939</b>	

\*Includes contingencies

# Wastewater System

## 2018-2023 Sewers Under Structures

**PROJECT NUMBER:** 2017-424-110-0, Unidentified  
**NEIGHBORHOOD/WARD:** Systemwide

**PHASE:**  
Construction

**PRIORITY:**  
Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service

**PROJECT DESCRIPTION:**  
Rehabilitation, relocation, and abandonment, if applicable, of existing sewer infrastructure located under or adjacent to buildings, bridges, or railroads or located on steep slopes.

**PROJECT JUSTIFICATION:**  
In recent years, there has been an increasing rate of failure of this asset type due to limited accessibility and pipe age. By maintaining a proactive approach to asset management, efforts can be directed towards remedying assets before their failure, thus saving in overall replacement cost.

**RISK(S):**  
Failure of this asset type could result in significant property/structure damage, increased replacement cost, and increased service outages or bypass pumping.

**IMPACT ON OPERATIONS:**  
Increased operating flexibility and reliability.

**ALTERNATIVES TO THE RECOMMENDED ACTION:**  
Continue to extend utility component life until a high failure rate justifies replacement.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$52,790,000	7,251,959	10,394,090	8,036,803	7,651,474	7,925,668	\$41,259,993	

\*Includes contingencies

# Wastewater System

## 2018-2024 Sewer Reconstruction

**PROJECT NUMBER:** 2017-424-111-0, 2019-424-102-0, Unidentified  
**NEIGHBORHOOD/WARD:** Systemwide

<b>PHASE:</b> Construction
<b>PRIORITY:</b> Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
<b>PROJECT DESCRIPTION:</b> Reconstruction of existing sewers, manholes, catch basins, and inlets due to emergency situations or pipe failures.
<b>PROJECT JUSTIFICATION:</b> The existing sewer system is aging and immediate repairs are required to address failures that could be significant public safety hazards.
<b>RISK(S):</b> Customers may be subject to basement backups or overflows may occur due to collapsed pipes. The Authority may be subject to related fines due to sewer overflows or for non-compliance as outlined in the Consent Order and Agreement.
<b>IMPACT ON OPERATIONS:</b> Increased operating flexibility and reliability.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> Utilize Authority staff and equipment to perform all repairs. This would result in an increase to labor, equipment, and related operating expenses.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$12,100,000	1,700,668	2,274,105	1,751,488	1,834,762	1,859,167	\$9,420,190	

\*Includes contingencies

# Wastewater System

## 2020-2024 Large Diameter Sewer Rehabilitation

PROJECT NUMBER: Unidentified  
NEIGHBORHOOD/WARD: Systemwide

**PHASE:**  
Not Started

**PRIORITY:**  
Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service

**PROJECT DESCRIPTION:**  
Proactive, trenchless rehabilitation of 36-inch diameter or greater sewer mains to restore structural integrity, reduce root intrusion, and reduce infiltration and inflow; including cleaning and pre and post construction CCTV inspections.

**PROJECT JUSTIFICATION:**  
Provides the Authority with a means to address several moderate/major structural defects in pipe segments prior to complete failure. This trenchless pipe renewal method renews the asset, eliminates disruptive excavation, and is more cost effective than replacement.

**RISK(S):**  
If moderate/major structural defects are not proactively addressed, complete failure will eventually occur and excavation will be required. Any complete failure that occurs will result in dramatically increased expenditures for repair.

**IMPACT ON OPERATIONS:**  
Increased operating flexibility and reliability.

**ALTERNATIVES TO THE RECOMMENDED ACTION:**  
Perform excavated point repairs to address defective sections of pipe, replace segment in its entirety, or continue to extend asset life until failure.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
<b>Total</b>	<b>\$21,320,000</b>	<b>3,847,000</b>	<b>4,529,000</b>	<b>4,320,000</b>	<b>4,054,000</b>	<b>397,270</b>	<b>\$17,147,270</b>	

\*Includes contingencies

# Wastewater System

## 31st Ward Sewer System

**PROJECT NUMBER:** 2017-424-100-0

**NEIGHBORHOOD/WARD:** Lincoln Place/31

**PHASE:**

Design

**PRIORITY:**

Regulatory Compliance, Reliability/Operational Flexibility, Regional Cooperation/ Stewardship, Level of Service

**PROJECT DESCRIPTION:**

Evaluation to identify and locate the source(s) of the infiltration and inflow (I/I), removal of public I/I sources, and rehabilitation/replacement of the Rogers Street and Mifflin Road Pump Station and force main.

**PROJECT JUSTIFICATION:**

Both sewage pump stations and the force main that convey flow to the Streets Run Sanitary Trunk Sewer were constructed in the late 1940's and are reaching the end of their useful life. Additionally, past studies suggest this sewershed may be significantly impacted by high levels of infiltration/inflow.

**RISK(S):**

The Authority may be subject to fines due to sanitary sewer overflows caused by pump station system failures or excessive infiltration and inflow in the system.

**IMPACT ON OPERATIONS:**

Increased operating flexibility and reliability.

**ALTERNATIVES TO THE RECOMMENDED ACTION:**

Abandonment of the existing pump stations and installation of a new gravity main to convey flows to the West Mifflin Sanitary Authority.

		CASH FLOW SUMMARY						FUNDING SOURCE(S)
	Total Budget (Prior Years Included)	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Total	Debt (Revenue Bonds)
Total	\$13,730,000	4,000,000	1,300,000	4,215,000	4,115,000	0	\$13,630,000	

\*Includes contingencies



# Wastewater System

## Maytide Storm and Sanitary Sewer System Improvements

**PROJECT NUMBER:** 2017-424-109-0

**NEIGHBORHOOD/WARD:** Carrick/29

<b>PHASE:</b> Design
<b>PRIORITY:</b> Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
<b>PROJECT DESCRIPTION:</b> Reconstruction of storm infrastructure from Merritt Avenue to the storm interceptor on Ravilla Avenue and the realignment of the 10-inch sanitary sewer on Maytide (Sanderson to Valline).
<b>PROJECT JUSTIFICATION:</b> Localized property and street flooding has been well-documented for several years at this location and the undeveloped right-of-way of Sanderson has significantly deteriorated. Additionally, an inspection of the 10-inch sanitary sewer on Maytide Street revealed structural and construction defects.
<b>RISK(S):</b> Continual degradation to a steep slope could result in property damage and an increased cost to stabilize. Customers may be subject to basement backups, or overflows may occur due to collapsed pipes.
<b>IMPACT ON OPERATIONS:</b> Increased operating reliability.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
<b>Total</b>	<b>\$6,520,000</b>	<b>3,013,907</b>	<b>3,013,907</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$6,027,814</b>	

\*Includes contingencies

# Wastewater System

## Browns Hill Road Sewer Pump Station Replacement

**PROJECT NUMBER:** Unidentified  
**NEIGHBORHOOD/WARD:** Glen Hazel, Hazelwood/ 15

<b>PHASE:</b> Not Started
<b>PRIORITY:</b> Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
<b>PROJECT DESCRIPTION:</b> Construction of a replacement 160 GPM sanitary sewer pump station, including standby power, safer ingress and egress for routine maintenance, a water supply for equipment wash down and odor control facilities, if required. Additionally, perform a condition assessment of the 4-inch force main ( approx. 790 l.f.) constructed in 2007, but was not utilized and confirm sanitary sewer separation occurred. Additional sewer separation may need to occur prior to modifying the existing diversion chamber.
<b>PROJECT JUSTIFICATION:</b> The existing sanitary sewer pump station has reached the end of its useful life. The replacement station will provide increased operating efficiency and resiliency and improved safety conditions for staff.
<b>RISK(S):</b> If the station is not replaced, pump or wet well failures could occur, which would result in sanitary sewer overflows. Sanitary sewer overflows could result in fines and notice of violations from regulating agencies.
<b>IMPACT ON OPERATIONS:</b> Increased operating flexibility and reliability.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> Delay the construction and risk pump or wet well failures.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$1,500,000	0	0	0	236,000	560,000	\$796,000	

\*Includes contingencies

# Wastewater System

## Larimer Avenue Sewer and 28th Street Slope Stabilization

**PROJECT NUMBER:** 2016-424-102-0

**NEIGHBORHOOD/WARD:** Strip District/2

**PHASE:**

Planning

**PRIORITY:**

Safety, Reliability/Operational Flexibility, Level of Service

**PROJECT DESCRIPTION:**

Evaluation of rerouting storm laterals, sewer televising, geotechnical investigations, and slope stabilization to address a structurally deficient 18-inch combined sewer that has severely eroded the ground surface on the slope below Brereton Street and above the Port Authority of Allegheny County's East Busway.

**PROJECT JUSTIFICATION:**

Provides a solution to sufficiently reroute infrastructure while stabilizing the slope in the applicable area.

**RISK(S):**

The slope may continue to erode prior to the completion of this project.

**IMPACT ON OPERATIONS:**

Increased operating flexibility and reliability.

**ALTERNATIVES TO THE RECOMMENDED ACTION:**

There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
<b>Total</b>	<b>\$695,901</b>	<b>583,400</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$583,400</b>	

\*Includes contingencies

# Wastewater System

## Mellon Terrace Sewer System Improvements

**PROJECT NUMBER:** Unidentified  
**NEIGHBORHOOD/WARD:** Highland Park/11

**PHASE:**  
Not Started

**PRIORITY:**  
Regulatory Compliance, Reliability/Operational Flexibility, Regional Cooperation/ Stewardship, Level of Service

**PROJECT DESCRIPTION:**  
Realignment of approximately 665 linear feet of 24-inch combined sewer main on Mellon Terrace.

**PROJECT JUSTIFICATION:**  
Repairs were issued on previous annual contracts; however, were not performed due to depth and soil conditions. Additionally, the City of Pittsburgh's Department of Public Works is planning to repair/rebuild the roadway.

**RISK(S):**  
Customers may be subject to basement backups, or overflows may occur due to collapsed pipes. The Authority may be subject to related fines due to sewer overflows or for non-compliance as outlined in the Consent Order and Agreement.

**IMPACT ON OPERATIONS:**  
Increased operating reliability.

**ALTERNATIVES TO THE RECOMMENDED ACTION:**  
Utilize Authority staff and equipment to perform the repairs. This would result in an increase to labor, equipment, and related operating expenses.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
<b>Total</b>	<b>\$2,030,000</b>	<b>340,000</b>	<b>1,690,000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$2,030,000</b>	

\*Includes contingencies

# Wastewater System

## M-29 Outfall Improvements

**PROJECT NUMBER:** 2018-424-103-0

**NEIGHBORHOOD/WARD:** Hazelwood/15

**PHASE:**  
Design

**PRIORITY:**  
Regulatory Compliance, Reliability/Operational Flexibility, Level of Service

**PROJECT DESCRIPTION:**  
Modifying diversion chamber, rehabilitating culvert, constructing an endwall, and installing flapgate associated with the M-29 outfall structure

**PROJECT JUSTIFICATION:**  
The M-29 outfall structure is critical infrastructure that has been in jeopardy of failing for several years due to significant structural defects in the existing culvert.

**RISK(S):**  
The M-29 outfall structure could fail prior to completion of the project.

**IMPACT ON OPERATIONS:**  
Increased operating flexibility and reliability.

**ALTERNATIVES TO THE RECOMMENDED ACTION:**  
There are no practical alternatives to the recommended action.

		CASH FLOW SUMMARY						FUNDING SOURCE(S)
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$1,868,659	934,329	1,450,000	0	0	0	\$2,384,329	

\*Includes contingencies

# Stormwater



# Stormwater System

## 2018-2024 Catch Basin and Inlet Replacement

**PROJECT NUMBER:** 2018-424-101-0/1, 2019-424-107-0, Unidentified  
**NEIGHBORHOOD/WARD:** Systemwide

<b>PHASE:</b> Construction
<b>PRIORITY:</b> Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
<b>PROJECT DESCRIPTION:</b> Strategic replacement of catch basins and storm inlets throughout the system to replace failed units, stormwater control reliability, and minimize disturbance to the community.
<b>PROJECT JUSTIFICATION:</b> By maintaining a proactive approach to asset management, efforts can be directed towards remedying assets before their failure, thus saving in overall replacement cost.
<b>RISK(S):</b> Overland and street flooding could occur due to a defective or undersized catch basin or storm inlet, creating a public health and safety hazard during wet weather events. Exposes Authority to potential fines and penalties for not meeting the annual requirements listed in the Minimum Control Measures under the NPDES permit.
<b>IMPACT ON OPERATIONS:</b> Increased operating reliability.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> Continue to extend utility component life until a high failure rate justifies replacement.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds) &amp; Cash (PAYGO)</u>
<b>Total</b>	<b>\$67,687,500</b>	<b>5,689,061</b>	<b>11,651,535</b>	<b>8,953,599</b>	<b>9,453,594</b>	<b>9,953,392</b>	<b>\$45,701,180</b>	

\*Includes contingencies

# Stormwater System

## Saw Mill Run MS4 Compliance Projects

PROJECT NUMBER: Unidentified  
NEIGHBORHOOD/WARD: Overbrook, Carrick/32&29

<b>PHASE:</b> Not Started
<b>PRIORITY:</b> Safety, Regulatory Compliance
<b>PROJECT DESCRIPTION:</b> Identifying and completing projects related to MS4 compliance.
<b>PROJECT JUSTIFICATION:</b> This project is necessary to become compliant with MS4 regulatory requirements.
<b>RISK(S):</b> The timeline to complete the MS4 compliance projects could take longer than expected.
<b>IMPACT ON OPERATIONS:</b> Increased system reliability and improved system management.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$8,500,000	0	0	0	1,000,000	2,500,000	\$3,500,000	

\*Includes contingencies



# Stormwater System

## Tide Gate Installations

**PROJECT NUMBER:** Unidentified  
**NEIGHBORHOOD/WARD:** Systemwide

<b>PHASE:</b> Not Started
<b>PRIORITY:</b> Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency, Level of Service
<b>PROJECT DESCRIPTION:</b> Installation of tide gates at 44 combined sewer overflow diversion chamber locations to assist in preventing river water intrusion.
<b>PROJECT JUSTIFICATION:</b> Will prevent the intrusion of sewage into river water during heavy wet weather events.
<b>RISK(S):</b> The length of time to install the tide gates could result in sewage overflowing into river water prior to the completion of the project.
<b>IMPACT ON OPERATIONS:</b> Increased operating flexibility and reliability.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
<b>Total</b>	<b>\$4,500,000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,000,000</b>	<b>\$1,000,000</b>	

\*Includes contingencies

# Stormwater System

## Overbrook Middle School Pollution and Flood Reduction

**PROJECT NUMBER:** Unidentified  
**NEIGHBORHOOD/WARD:** Overbrook/32

<b>PHASE:</b> Not Started
<b>PRIORITY:</b> Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
<b>PROJECT DESCRIPTION:</b> Implementation of stormwater treatment and reconnection of streams to vegetated floodplains to help mitigate stormwater peak flows and reduce sediment and other pollutant loads. This project will demonstrate the effectiveness of green infrastructure in reducing pollutants, controlling CSO/SSOs, and restoring the health of the aquatic ecosystems in the Saw Mill Run watershed to comply with regulatory obligations.
<b>PROJECT JUSTIFICATION:</b> This project will help to comply with regulatory obligations by reducing pollutants and controlling CSO/SSO's.
<b>RISK(S):</b> It may be difficult to comply with certain regulatory obligations prior to the completion of the project.
<b>IMPACT ON OPERATIONS:</b> Increased system reliability and improved system management.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
<b>Total</b>	<b>\$6,500,000</b>	<b>2,625,058</b>	<b>3,874,942</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$6,500,000</b>	

\*Includes contingencies

# Stormwater System

## Queenston Stormwater Infrastructure Improvements

**PROJECT NUMBER:** Unidentified  
**NEIGHBORHOOD/WARD:** Overbrook/32

<b>PHASE:</b> Not Started
<b>PRIORITY:</b> Safety, Regulatory Compliance, Reliability/Operational Flexibility, Level of Service
<b>PROJECT DESCRIPTION:</b> Development of alternatives, selection, design and construction of preferred alternative to address flooding issues impacting residents on Yale Drive, Lucina Street, Queenston Street, and Walton Avenue due to collapsed storm sewers.
<b>PROJECT JUSTIFICATION:</b> This project will help to mitigate flooding issues resulting from collapsed storm sewers.
<b>RISK(S):</b> Flooding issues will continue until the project is completed.
<b>IMPACT ON OPERATIONS:</b> Increased system reliability and improved system management.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
<b>Total</b>	<b>\$1,500,000</b>	<b>750,000</b>	<b>750,000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$1,500,000</b>	

\*Includes contingencies

# Stormwater System

## Volunteer's Field Stormwater Infrastructure Improvements

**PROJECT NUMBER:** 2018-GI-104-0

**NEIGHBORHOOD/WARD:** Carrick/29

<b>PHASE:</b> Procurement
<b>PRIORITY:</b> Safety, Regulatory Compliance, Regional Cooperation/Stewardship
<b>PROJECT DESCRIPTION:</b> Project is located in the Carrick neighborhood of the City of Pittsburgh and is tributary to Saw Mill Run. Installation of GI BMPs within the Park to reduce sediment and other pollutant loads along with stormwater volume and peak flow reduction.
<b>PROJECT JUSTIFICATION:</b> Required for compliance with the MS4 permit and EPA TMDL requirements. Project will also detain stormwater to reduce downstream flooding in Saw Mill Run.
<b>RISK(S):</b> It may be difficult to comply with certain regulatory obligations prior to the completion of the project.
<b>IMPACT ON OPERATIONS:</b> Increased operating flexibility and reliability.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no practical alternatives to the recommended action.

	CASH FLOW SUMMARY							FUNDING SOURCE(S)
	Total Budget (Prior Years Included)	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Total	Debt (Revenue Bonds)
Total	\$1,714,942	854,185	0	0	0	0	\$854,185	

\*Includes contingencies

# Stormwater System

## Saw Mill Run Stream Bank Restoration Stormwater Infrastructure Improvements

**PROJECT NUMBER:** 2018-GI-107-0  
**NEIGHBORHOOD/WARD:** Overbrook, Carrick/32&29

<b>PHASE:</b> Procurement
<b>PRIORITY:</b> Safety, Regulatory Compliance, Regional Cooperation/Stewardship
<b>PROJECT DESCRIPTION:</b> Stream restoration of approximately 1,500 linear feet of the Saw Mill Run Creeks to reduce pollutants in the impaired waterway. This project is required to comply with the MS4 NPDES permit application submitted to the PA DEP.
<b>PROJECT JUSTIFICATION:</b> This is required in order to comply with certain regulatory obligations.
<b>RISK(S):</b> It may be difficult to comply with certain regulatory obligations prior to the completion of the project.
<b>IMPACT ON OPERATIONS:</b> Increased system reliability and improved system management.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	Debt (Revenue Bonds)
<b>Total</b>	<b>\$1,385,000</b>	<b>876,204</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$876,204</b>	

\*Includes contingencies

# Stormwater System

## Lawn and Ophelia

**PROJECT NUMBER:** 2017-424-104-0  
**NEIGHBORHOOD/WARD:** Oakland/4

<b>PHASE:</b> Design
<b>PRIORITY:</b> Safety, Regulatory Compliance, Regional Cooperation/Stewardship
<b>PROJECT DESCRIPTION:</b> Project is located in the South Oakland neighborhood in the City of Pittsburgh and is tributary to the M-19B outfall. This project is intended to be a community gathering space combined with stormwater management features.
<b>PROJECT JUSTIFICATION:</b> It is anticipated that 1.9 impervious acres from neighboring roads and roofs can be managed.
<b>RISK(S):</b> Customers within the service area of this project may experience stormwater related issues prior to the completion of this project.
<b>IMPACT ON OPERATIONS:</b> Increased system reliability and improved system management.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	Cash (PAYGO)& ALCOSAN Grow Grant
<b>Total</b>	<b>\$785,000</b>	<b>275,375</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$275,375</b>	

\*Includes contingencies

\*\*\$313,900 ALCOSAN GROW grant funding secured

# Stormwater System

## Wightman Park Stormwater Infrastructure Improvements

**PROJECT NUMBER:** 2017-424-105-0

**NEIGHBORHOOD/WARD:** Squirrel Hill/14

<b>PHASE:</b> Design
<b>PRIORITY:</b> Safety, Regulatory Compliance, Regional Cooperation/Stewardship
<b>PROJECT DESCRIPTION:</b> Project is located in the Squirrel Hill neighborhood of the City of Pittsburgh and is tributary to the M-29 outfall. Stormwater management within the park itself as well as the necessary piping or inlet work to direct up to 3.25 impervious acres from the adjacent streets into the park. The Wightman Park project along with future street bioswale projects are expected to increase the impervious acres captured as well as alleviate reported sewer basement backups in the neighborhood around Wightman Park.
<b>PROJECT JUSTIFICATION:</b> 2.24 million gallons of stormwater runoff will be managed through this project in a typical year, producing downstream CSO reduction. The project will also improve the performance of adjacent, downstream sewers through peak flow reduction
<b>RISK(S):</b> Customers may be subject to basement backups or overflows may occur due to collapsed pipes. The Authority may be subject to related fines due to sewer overflows or for non-compliance as outlined in the Consent Order and Agreement.
<b>IMPACT ON OPERATIONS:</b> Increased operating flexibility and reliability.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> Delay construction which will increase the risk of sewer basement backups.

	<u>CASH FLOW SUMMARY</u>							<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	Cash (PAYGO)& ALCOSAN Grow Grant
<b>Total</b>	<b>\$4,332,000</b>	<b>2,515,715</b>	<b>1,047,025</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$3,562,740</b>	

\*Includes contingencies

\*\*\$368,300 ALCOSAN GROW grant funding secured

# Stormwater System

## Woods Run Stream Removal Stormwater Infrastructure Improvements

**PROJECT NUMBER:** 2017-424-108-0

**NEIGHBORHOOD/WARD:** Woodsrun/26

**PHASE:**

Design

**PRIORITY:**

Safety, Regulatory Compliance, Regional Cooperation/Stewardship

**PROJECT DESCRIPTION:**

This project will redirect an existing stream inflow location into a detain and slow release subsurface storage facility. The stream base and wet weather flow currently discharge directly into the 36-inch diameter PWSA combined sewer on Mairdale Avenue

**PROJECT JUSTIFICATION:**

This project will separate wet weather flow being directly discharged into the Authority's combined sewer system.

**RISK(S):**

Wet weather flow may continue to flow into the combined sewer system prior to the completion of the project, which could in issues during wet weather events.

**IMPACT ON OPERATIONS:**

Increased operating flexibility and reliability.

**ALTERNATIVES TO THE RECOMMENDED ACTION:**

There are no practical alternatives to the recommended action.

		CASH FLOW SUMMARY						FUNDING SOURCE(S)
	Total Budget (Prior Years Included)	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Total	Cash (PAYGO)& ALCOSAN Grow Grant
Total	\$10,476,000	2,570,000	525,641	2,816,929	3,739,430	0	\$9,652,000	

\*Includes contingencies

\*\*\$412,300 ALCOSAN GROW grant funding secured



# Stormwater System

## Maryland Avenue Stormwater Infrastructure Improvements - Phase 1

**PROJECT NUMBER:** 2017-424-101-0

**NEIGHBORHOOD/WARD:** Point Breeze/7

<b>PHASE:</b> Design
<b>PRIORITY:</b> Safety, Regulatory Compliance, Operations and Maintenance Efficiency
<b>PROJECT DESCRIPTION:</b> Permeable paver based GSI project to manage approximately 7 acres of impervious acres for 1.5" runoff event.
<b>PROJECT JUSTIFICATION:</b> The project purpose is to reduce combined sewer overflows at the downstream A-22 outfall while also improving performance of the local combined sewer system that has experienced surcharge and flooding during intense rain events in downstream areas of Shadyside.
<b>RISK(S):</b> Progress to CSO compliance goals (with targets of reducing volume and frequency of overflows and water quality impacts) and continued flooding in A-22 sewershed.
<b>IMPACT ON OPERATIONS:</b> Increased system reliability and improved system management.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> Implementing stormwater management projects at less cost-effective locations.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Cash (PAYGO)</u>
<b>Total</b>	<b>\$2,658,000</b>	<b>2,401,200</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$2,401,200</b>	

\*Includes contingencies

# Stormwater System

## Four Mile Run Stormwater Infrastructure Improvements

PROJECT NUMBER: 2018-GI-102-0

NEIGHBORHOOD/WARD: Hazelwood/15

**PHASE:**

Design

**PRIORITY:**

Safety, Regulatory Compliance, Regional Cooperation/Stewardship

**PROJECT DESCRIPTION:**

Sewer separation, stream restoration, stream daylighting, bioretention, and underground storage to remove the existing stream base and wet weather flow currently discharging into the combined sewer located in M-29.

**PROJECT JUSTIFICATION:**

This project will separate wet weather flow being directly discharged into the Authority's combined sewer system.

**RISK(S):**

Wet weather flow may continue to flow into the combined sewer system prior to the completion of the project, which could in issues during wet weather events.

**IMPACT ON OPERATIONS:**

Increased operating flexibility and reliability.

**ALTERNATIVES TO THE RECOMMENDED ACTION:**

There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	Debt (Revenue Bonds)
<b>Total</b>	<b>\$30,000,000</b>	<b>3,000,000</b>	<b>13,500,000</b>	<b>13,500,000</b>	<b>0</b>	<b>0</b>	<b>\$30,000,000</b>	

\*Includes contingencies

# Stormwater System

## Woodland Drive Stormwater Infrastructure Improvements

**PROJECT NUMBER:** 2018-GI-108-0  
**NEIGHBORHOOD/WARD:** Squirrel Hill/14

<b>PHASE:</b> Design
<b>PRIORITY:</b> Safety, Regulatory Compliance, Operations and Maintenance Efficiency
<b>PROJECT DESCRIPTION:</b> Bioretention based GSI project to manage appx. 3 acres of impervious acres for 1.5" runoff event. Project location is in A-22 sewershed on the campus of Chatham University adjacent to Woodland Rd. Design activities include field investigations (site survey, geotech), development of design documents for construction and pre-construction flow monitoring.
<b>PROJECT JUSTIFICATION:</b> The project purpose is to reduce combined sewer overflows at the downstream A-22 outfall while also improving performance of the local combined sewer system that has experienced surcharge and flooding during intense rain events in downstream areas of Shadyside.
<b>RISK(S):</b> Progress to CSO compliance goals (with targets of reducing volume and frequency of overflows and water quality impacts) and continued flooding in A-22 sewershed.
<b>IMPACT ON OPERATIONS:</b> Increased system reliability and improved system management.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> Implementing stormwater management projects at less cost-effective locations.

		CASH FLOW SUMMARY						FUNDING SOURCE(S)
	Total Budget {Prior Years Included}	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Total	Cash (PAYGO)
Total	\$1,965,000	0	1,695,395	0	0	0	\$1,695,395	

\*Includes contingencies

# Stormwater System

## Thomas and McPherson Stormwater Infrastructure Improvements - Phase 1

**PROJECT NUMBER:** 2018-GI-106-0

**NEIGHBORHOOD/WARD:** Point Breeze/7

<b>PHASE:</b> Design
<b>PRIORITY:</b> Safety, Regulatory Compliance, Reliability/Operational Flexibility
<b>PROJECT DESCRIPTION:</b> Installation of roadside bioretention features to capture and detain impervious road runoff in the North Point Breeze neighborhood of the City of Pittsburgh, which is tributary to the A-42 combined sewer outfall.
<b>PROJECT JUSTIFICATION:</b> This project will help slow or reduce runoff into the the combined sewer system during wet weather events.
<b>RISK(S):</b> Wet weather flow may continue to flow into the combined sewer system prior to the completion of the project, which could in issues during wet weather events.
<b>IMPACT ON OPERATIONS:</b> Increased system reliability and improved sytem management.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	Cash (PAYGO)& ALCOSAN Grow Grant
<b>Total</b>	<b>\$4,901,000</b>	<b>250,000</b>	<b>4,651,000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$4,901,000</b>	

\*Includes contingencies

\*\*\$1,517,800 ALCOSAN GROW grant funding secured

# Stormwater System

## Southside Stormwater Infrastructure Improvements

**PROJECT NUMBER:** 2019-GI-100-0  
**NEIGHBORHOOD/WARD:** Southside, St. Clair/16&17

**PHASE:**  
Design

**PRIORITY:**  
Safety, Regulatory Compliance, Regional Cooperation/Stewardship

**PROJECT DESCRIPTION:**  
The Southside Green / Stormwater project is located in the M-16 sewershed, which discharges approximately 103MG of combined sewer overflows (CSOs) in typical year as it is defined in the current system model. Additionally, there are 15 known surface streams within the park that appear to connect into the combined sewer system. The project will focus on stormwater management source control opportunities within Southside Park and downstream through the S. 21st Street corridor and to the outfall at the Monongahela River. The project will look at separating the stormwater runoff from the park and road right-of-way areas through a new storm sewer discharge to the Monongahela, and detaining and slowly returning the stormwater runoff to the combined sewer system.

**PROJECT JUSTIFICATION:**  
This project will help with complying with the Consent Order Agreement (COA) by reducing CSOs.

**RISK(S):**  
It may be difficult to comply with certain regulatory obligations prior to the completion of the project.

**IMPACT ON OPERATIONS:**  
Increased system reliability and improved system management.

**ALTERNATIVES TO THE RECOMMENDED ACTION:**  
There are no practical alternatives to the recommended action.

		CASH FLOW SUMMARY						FUNDING SOURCE(S)
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	Cash (PAYGO)& ALCOSAN Grow Grant
<b>Total</b>	<b>\$6,155,000</b>	<b>590,180</b>	<b>1,994,000</b>	<b>2,877,500</b>	<b>0</b>	<b>0</b>	<b>\$5,461,680</b>	

\*Includes contingencies

\*\*\$1,489,900 ALCOSAN GROW grant funding secured

# Stormwater System

## St. Johns Stormwater Infrastructure Improvements

**PROJECT NUMBER:** 2019-424-101-0  
**NEIGHBORHOOD/WARD:** Brighton Heights/27

<b>PHASE:</b> Design
<b>PRIORITY:</b> Safety, Regulatory Compliance, Reliability/Operational Flexibility
<b>PROJECT DESCRIPTION:</b> Evaluating cost-effective opportunities for managing stormwater runoff from the surrounding drainage area around the St. John's site and implementing appropriate stormwater mitigation practices.
<b>PROJECT JUSTIFICATION:</b> This project will help to improve stormwater mitigation around the St. John's site.
<b>RISK(S):</b> Flooding issues could continue until the project is completed.
<b>IMPACT ON OPERATIONS:</b> Increased system reliability and improved system management.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Cash (PAYGO)</u>
<b>Total</b>	<b>\$5,309,000</b>	<b>2,973,230</b>	<b>1,803,665</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$4,776,895</b>	

\*Includes contingencies

# Stormwater System

## Spring Garden Stream Stormwater Infrastructure Improvements

**PROJECT NUMBER:** 2019-GI-101-0

**NEIGHBORHOOD/WARD:** Woodsrun/26

**PHASE:**

Design

**PRIORITY:**

Safety, Regulatory Compliance, Reliability/Operational Flexibility

**PROJECT DESCRIPTION:**

Construct a stormwater storage BMP to be located near the Spring Garden direction stream inflow along with approximately 11,000-ft of separate storm sewer system to convey flow from the BMP to the Allegheny River.

**PROJECT JUSTIFICATION:**

This project will help to improve stormwater mitigation near the Spring Garden.

**RISK(S):**

Flooding issues could continue until the project is completed.

**IMPACT ON OPERATIONS:**

Increased system reliability and improved system management.

**ALTERNATIVES TO THE RECOMMENDED ACTION:**

There are no practical alternatives to the recommended action.

		CASH FLOW SUMMARY						FUNDING SOURCE(S)
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	Cash (PAYGO)
<b>Total</b>	<b>\$13,752,000</b>	<b>0</b>	<b>1,000,000</b>	<b>479,000</b>	<b>0</b>	<b>0</b>	<b>\$1,479,000</b>	

\*Includes contingencies

# Stormwater System

## Martin Luther King Field Stormwater Infrastructure Improvements

**PROJECT NUMBER:** 2019-GI-104-0  
**NEIGHBORHOOD/WARD:** Schenley Heights, Oakland/4&5

<b>PHASE:</b> Design
<b>PRIORITY:</b> Safety, Regulatory Compliance, Reliability/Operational Flexibility
<b>PROJECT DESCRIPTION:</b> Installation of regenerative step pools, rain gardens, and underground detention facilities to capture and detain impervious acres from the adjacent streets and upstream separate storm sewers, which currently discharging into the combined sewer located in M-19. This project will also explore retrofitting 100' of an abandoned 60-inch sewer to be utilized as a detention and slow release system.
<b>PROJECT JUSTIFICATION:</b> This project will help slow or reduce runoff into the the combined sewer system during wet weather events.
<b>RISK(S):</b> Wet weather flow may continue to flow into the combined sewer system prior to the completion of the project, which could in issues during wet weather events.
<b>IMPACT ON OPERATIONS:</b> Increased system reliability and improved system management.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no practical alternatives to the recommended action.

		CASH FLOW SUMMARY						FUNDING SOURCE(S)
	Total Budget [Prior Years Included]	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Total	Cash (PAYGO)& ALCOSAN Grow Grant
Total	\$3,348,276	1,200,000	2,148,276	0	0	0	\$3,348,276	

\*Includes contingencies

\*\*\$855,270 ALCOSAN GROW grant funding secured



# Stormwater System

## AMG Capital Funds - As-Needed Sewer Flow Monitoring

**PROJECT NUMBER:** 2019-424-105-0

**NEIGHBORHOOD/WARD:** Systemwide

**PHASE:**

Non-Construction

**PRIORITY:**

Operations and Maintenance Efficiency

**PROJECT DESCRIPTION:**

Pre-construction flow monitoring services through the existing As-Needed Sewer Flow Monitoring contract with AMG Environmental. Pre-construction flow monitoring services are capitalized and budgeted under each individual stormwater / sewer project.

**PROJECT JUSTIFICATION:**

This project will be used as needed for pre-construction flow monitoring services.

**RISK(S):**

The demand for as-needed flow monitoring services could be greater than the amount that was budgeted.

**IMPACT ON OPERATIONS:**

Increased operating flexibility and reliability.

**ALTERNATIVES TO THE RECOMMENDED ACTION:**

There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
<b>Total</b>	<b>\$102,500</b>	<b>102,500</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$102,500</b>	

\*Includes contingencies

# Stormwater System

## Bus Rapid Transit (BRT) Stormwater Infrastructure Improvements

PROJECT NUMBER: Unidentified  
NEIGHBORHOOD/WARD: Uptown,Oakland/1&4

<b>PHASE:</b> Not Started
<b>PRIORITY:</b> Safety, Regional Cooperation/Stewardship, Reliability/Operational Flexibility
<b>PROJECT DESCRIPTION:</b> A cost share with the City's Department of Mobility and Infrastructure on the redesign of Forbes Avenue and Fifth Avenue to accommodate bus rapid transit from downtown to Birmingham Bridge. This project will include the installation of permeable paving, underground storage, and bioretention plantings and is tributary to the M-05 and M-19 outfall.
<b>PROJECT JUSTIFICATION:</b> This project will help slow or reduce runoff into the the combined sewer system during wet weather events.
<b>RISK(S):</b> Wet weather flow may continue to flow into the combined sewer system prior to the completion of the project, which could in issues during wet weather events.
<b>IMPACT ON OPERATIONS:</b> Increased system reliability and improved sytem management.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
<b>Total</b>	<b>\$4,274,988</b>	<b>255,065</b>	<b>1,366,695</b>	<b>1,964,689</b>	<b>688,539</b>	<b>0</b>	<b>\$4,274,988</b>	

\*Includes contingencies

**Other**

**PGH<sub>2</sub>O**

# Other

## Computerized Maintenance Management System

PROJECT NUMBER: Unidentified  
NEIGHBORHOOD/WARD: Systemwide

<b>PHASE:</b> Not Started
<b>PRIORITY:</b> Reliability/Operational Flexibility, Operations and Maintenance Efficiency
<b>PROJECT DESCRIPTION:</b> Implement a new computerized maintenance system that will maintain a database of information about the Authority's maintenance operations.
<b>PROJECT JUSTIFICATION:</b> The implementation of a computerized maintenance management system is required to improve Authority operations.
<b>RISK(S):</b> The Authority staff will have additional responsibilities during implementation to ensure all workflows are properly designed.
<b>IMPACT ON OPERATIONS:</b> Increased operating flexibility and reliability.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	Cash (PAYGO)
<b>Total</b>	<b>\$2,500,000</b>	<b>1,250,000</b>	<b>1,250,000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$2,500,000</b>	

\*Includes contingencies

# Other

## Enterprise Resource Planning

PROJECT NUMBER: Unidentified  
NEIGHBORHOOD/WARD: Systemwide

<b>PHASE:</b> Not Started
<b>PRIORITY:</b> Reliability/Operational Flexibility, Operations and Maintenance Efficiency
<b>PROJECT DESCRIPTION:</b> Implement a new enterprise resource planning system that will enable more efficient Authority operations.
<b>PROJECT JUSTIFICATION:</b> The implementation of a enterprise resource planning system is required to improve Authority operations.
<b>RISK(S):</b> The Authority staff will have additional responsibilities during implementation to ensure all workflows are properly designed.
<b>IMPACT ON OPERATIONS:</b> Increased operating flexibility and reliability.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	Cash (PAYGO)
<b>Total</b>	<b>\$2,500,000</b>	<b>1,250,000</b>	<b>1,250,000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$2,500,000</b>	

\*Includes contingencies

# Other

## 2020-2024 Property Acquisition / Facility Upgrades

PROJECT NUMBER: Unidentified  
NEIGHBORHOOD/WARD: Systemwide

<b>PHASE:</b> Not Started
<b>PRIORITY:</b> Reliability/Operational Flexibility, Operations and Maintenance Efficiency
<b>PROJECT DESCRIPTION:</b> This project will fund all future property/building acquisitions and facility upgrades.
<b>PROJECT JUSTIFICATION:</b> The current facilities of the Authority are in need of upgrades. In addition, new properties may be acquired to fill the need of increased staffing and equipment levels.
<b>RISK(S):</b> Deferred maintenance on current facilities and limited space will impact operations.
<b>IMPACT ON OPERATIONS:</b> Increased operating flexibility and reliability.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
<b>Total</b>	<b>\$13,000,000</b>	<b>9,000,000</b>	<b>1,000,000</b>	<b>1,000,000</b>	<b>1,000,000</b>	<b>1,000,000</b>	<b>\$13,000,000</b>	

\*Includes contingencies

# Other

## 2020-2024 Park Maintenance / Upgrades

PROJECT NUMBER: Unidentified  
NEIGHBORHOOD/WARD: Systemwide

<b>PHASE:</b> Not Started
<b>PRIORITY:</b> Reliability/Operational Flexibility, Operations and Maintenance Efficiency
<b>PROJECT DESCRIPTION:</b> This project will fund water and sewer infrastrucutre upgrades within City of Pittsburgh parks.
<b>PROJECT JUSTIFICATION:</b> The water and sewer infrastrucutre within City of Pittsburgh parks is in need of upgrades.
<b>RISK(S):</b> Deferred maintenance of water and sewer infrastructure could have negative impacts on the functionality of City of Pittsburgh parks.
<b>IMPACT ON OPERATIONS:</b> Increased system reliability and improved sytem management.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$5,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	\$5,000,000	

\*Includes contingencies

# Other

## GIS System Upgrades: Water

**PROJECT NUMBER:** 2019-325-107-0  
**NEIGHBORHOOD/WARD:** Systemwide

<b>PHASE:</b> Planning
<b>PRIORITY:</b> Reliability/Operational Flexibility, Operations and Maintenance Efficiency
<b>PROJECT DESCRIPTION:</b> Rescan water record books, input material, update valve layer, and pipe age into geographic information system.
<b>PROJECT JUSTIFICATION:</b> Having this information updated and readily available improves the efficiency of operations.
<b>RISK(S):</b> Some of the records that need updated could be unreadable or missing.
<b>IMPACT ON OPERATIONS:</b> Increased system reliability and improved system management.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> Delay upgrading the information within the geographic information system, which could have a negative impact on operations.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	Cash (PAYGO)
<b>Total</b>	<b>\$1,400,000</b>	<b>800,000</b>	<b>600,000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$1,400,000</b>	

\*Includes contingencies



# Other

## Facility Standby Power

**PROJECT NUMBER:** Unidentified  
**NEIGHBORHOOD/WARD:** Systemwide

<b>PHASE:</b> Not Started
<b>PRIORITY:</b> Safety, Reliability/Operational Flexibility, Operations and Maintenance Efficiency
<b>PROJECT DESCRIPTION:</b> This project will fund future standby power needs at the Water Treatment Plant and potentially other facilities.
<b>PROJECT JUSTIFICATION:</b> Standby power must be installed at all facilities to ensure continued functions in all operations.
<b>RISK(S):</b> Facilities without standby power could be at risk if a power outage occurs.
<b>IMPACT ON OPERATIONS:</b> Increased system reliability and improved system management.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> There are no practical alternatives to the recommended action.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	Cash (PAYGO)
<b>Total</b>	<b>\$750,000</b>	<b>750,000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>\$750,000</b>	

\*Includes contingencies

# Other

## Utility Cost Shares

**PROJECT NUMBER:** 2017-424-112-0, 2018-WS-103-0, 2018-WS-102-0, 2013-424-220-0, 2013-424-162-0  
**NEIGHBORHOOD/WARD:** Systemwide

<b>PHASE:</b> Not Started
<b>PRIORITY:</b> Regional Cooperation/ Stewardship
<b>PROJECT DESCRIPTION:</b> This project will fund future cost sharing projects.
<b>PROJECT JUSTIFICATION:</b> Cost sharing projects can provide a savings to the Authority.
<b>RISK(S):</b> Cost sharing projects have the potential to be delayed due to coordination issues.
<b>IMPACT ON OPERATIONS:</b> Increased operating flexibility and reliability.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> Complete projects without cost sharing agreements.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	<u>Debt (Revenue Bonds)</u>
Total	\$4,300,000	500,000	800,000	1,000,000	1,000,000	1,000,000	\$4,300,000	

\*Includes contingencies

# Other

## 2020-2024 Vehicle and Major Equipment

PROJECT NUMBER: Unidentified  
NEIGHBORHOOD/WARD: Systemwide

<b>PHASE:</b> Not Started
<b>PRIORITY:</b> Reliability/Operational Flexibility, Operations and Maintenance Efficiency
<b>PROJECT DESCRIPTION:</b> Replacement of vehicles and other major equipment.
<b>PROJECT JUSTIFICATION:</b> Vehicles and major equipment must be replaced after the useful life to ensure reliable operations without large maintenance costs.
<b>RISK(S):</b> Failure to properly replace vehicles and major equipment could result in interruptions to operations and increase costs.
<b>IMPACT ON OPERATIONS:</b> Increased system reliability and improved system management.
<b>ALTERNATIVES TO THE RECOMMENDED ACTION:</b> Delay the purchase of vehicle and major equipment, which could have a negative impact on operations.

		<u>CASH FLOW SUMMARY</u>						<u>FUNDING SOURCE(S)</u>
	<u>Total Budget (Prior Years Included)</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Total</u>	Cash (PAYGO)
Total	\$9,234,500	2,100,000	1,734,500	2,200,000	1,000,000	2,200,000	\$9,234,500	

\*Includes contingencies

	2020	2019			2020	2019	2018	2020/2019	
	Budget	Budget	Difference	%	Budget	Actual	Actual	Difference	%
<b>Receipts</b>									
Water	106,717,590	118,053,758	(11,336,168)	-10%	106,717,590	102,709,438	106,426,492	4,008,152	4%
Sewage Conveyance	68,079,675	65,703,000	2,376,675	4%	68,079,675	68,472,959	57,306,572	(393,284)	-1%
DSIC	-	-	-	0%	-	1,485	(11,459)	(1,485)	-100%
ALCOSAN	76,286,841	74,971,806	1,315,035	2%	76,286,841	73,522,941	69,376,086	2,763,900	4%
Fees	4,106,303	3,735,374	370,929	10%	4,106,303	5,156,829	3,700,379	(1,050,526)	-20%
Miscellaneous Revenue	1,136,617	1,677,562	(540,945)	-32%	1,136,617	710,629	823,049	425,988	60%
<b>Total Receipts</b>	<b>256,327,026</b>	<b>264,141,500</b>	<b>(7,814,474)</b>	<b>-3%</b>	<b>256,327,026</b>	<b>250,574,281</b>	<b>237,621,119</b>	<b>5,752,745</b>	<b>2%</b>
<b>Operating Expenses</b>									
Salaries	27,377,003	26,643,741	733,262	3%	27,377,003	22,261,855	18,427,947	5,115,148	23%
Benefits	7,043,650	9,001,163	(1,957,513)	-22%	7,043,650	6,730,702	5,899,887	312,948	5%
Direct Operating	41,120,170	38,803,561	2,316,609	6%	41,120,170	38,378,874	29,880,985	2,741,296	7%
Inventory	1,799,520	1,921,185	(121,665)	-6%	1,799,520	2,048,723	1,482,595	(249,203)	-12%
General & Administrative	32,715,533	35,458,077	(2,742,544)	-8%	32,715,533	20,122,435	23,626,785	12,593,098	63%
ALCOSAN	77,049,709	75,484,220	1,565,489	2%	77,049,709	71,397,509	51,467,593	5,652,200	8%
City Co-Op Payment	-	7,000,000	(7,000,000)	-100%	-	4,600,474	1,787,500	(4,600,474)	-100%
Non-City Subsidy and Other	-	1,700,000	(1,700,000)	-100%	-	1,404,861	3,390,600	(1,404,861)	-100%
<b>Total Operating Expenses</b>	<b>187,105,585</b>	<b>196,011,947</b>	<b>(8,906,362)</b>	<b>-5%</b>	<b>187,105,585</b>	<b>166,945,433</b>	<b>135,963,892</b>	<b>20,160,152</b>	<b>12%</b>
<b>Net Operating Income</b>	<b>69,221,441</b>	<b>68,129,553</b>	<b>1,091,888</b>	<b>2%</b>	<b>69,221,441</b>	<b>83,628,848</b>	<b>101,657,227</b>	<b>(14,407,407)</b>	<b>-17%</b>
<b>Debt Service</b>									
Debt Service - Principal	29,345,494	23,375,003	5,970,491	26%	29,345,494	23,163,490	24,602,797	6,182,004	27%
Debt Service - Interest	37,201,873	34,740,309	2,461,564	7%	37,201,873	36,116,276	19,174,810	1,085,597	3%
<b>Total Debt Service</b>	<b>66,547,366</b>	<b>58,115,312</b>	<b>8,432,054</b>	<b>15%</b>	<b>66,547,366</b>	<b>59,279,766</b>	<b>43,777,607</b>	<b>7,267,600</b>	<b>12%</b>
<b>Total Costs</b>	<b>253,652,951</b>	<b>254,127,259</b>	<b>(474,308)</b>	<b>0%</b>	<b>253,652,951</b>	<b>226,225,199</b>	<b>179,741,499</b>	<b>27,427,752</b>	<b>12%</b>
<b>Net Cash Flow</b>	<b>2,674,075</b>	<b>10,014,241</b>	<b>(7,340,166)</b>	<b>-73%</b>	<b>2,674,075</b>	<b>24,349,082</b>	<b>57,879,620</b>	<b>(21,675,007)</b>	<b>-89%</b>
Unrestricted Cash Balance- Beginning	64,346,968	47,986,060	16,360,908	34%	64,346,968	46,920,000		17,426,968	37%
<b>Net Cash Flow</b>	<b>2,674,075</b>	<b>10,014,241</b>	<b>(7,340,166)</b>	<b>-73%</b>	<b>2,674,075</b>	<b>24,349,082</b>		<b>(21,675,007)</b>	<b>-89%</b>
<b>Operating Reserve</b>	<b>-</b>	<b>(2,510,983)</b>	<b>2,510,983</b>	<b>-100%</b>	<b>-</b>	<b>(2,510,983)</b>		<b>2,510,983</b>	<b>-100%</b>
<b>Rate Stabilization Fund</b>	<b>(2,000,000)</b>	<b>-</b>	<b>(2,000,000)</b>	<b>0%</b>	<b>(2,000,000)</b>	<b>-</b>		<b>(2,000,000)</b>	<b>0%</b>
<b>Capital Spending</b>	<b>(27,000,000)</b>	<b>(7,503,258)</b>	<b>(19,496,742)</b>	<b>260%</b>	<b>(27,000,000)</b>	<b>(4,411,131)</b>		<b>(22,588,869)</b>	<b>512%</b>
<b>Unrestricted Cash Balance- End</b>	<b>38,021,044</b>	<b>47,986,060</b>	<b>(9,965,016)</b>	<b>-21%</b>	<b>38,021,044</b>	<b>64,346,968</b>		<b>(26,325,925)</b>	<b>-41%</b>