



Philadelphia Gas Works Pension Plan—Funding

Actuarial Valuation Report for the Plan Year
July 1, 2020—June 30, 2021



December 4, 2020

Philadelphia Gas Works
1800 N. Ninth Street
Philadelphia, PA 19122

We have been retained by Philadelphia Gas Works to perform the actuarial valuation of the Philadelphia Gas Works Pension Plan as of July 1, 2020. This report sets forth the contribution range for the Plan Year, running from July 1, 2020 through June 30, 2021. The valuation is based on data sent to us by Philadelphia Gas Works, the Plan as described in the official Plan document, the assets of the Plan as reported by Philadelphia Gas Works, and the stated actuarial assumptions.

The purposes of the actuarial valuation are:

1. To determine the financial condition of the Plan and the contribution requirements for the Plan year;
2. To provide information to be used in the preparation of any required governmental forms;
3. To provide information for use in satisfying the requirements of your auditors;
4. To provide actuarial certification of the adequacy and appropriateness of the cost method and assumptions used for your Plan; and
5. To provide comments on the developing experience under your Plan, the need for changes in the Plan or funding, and other areas of concern to you. In this respect, the actuarial valuation report becomes an essential source of information for discussions throughout the year on the Pension Plan.

In our opinion, this report is complete and accurate, and the actuarial assumptions and methods, in the aggregate, are reasonably related to the experience of the Plan and represent our best estimate of future Plan experience as it should be considered for proper funding of your pension obligations. It is also our opinion that each of the actuarial assumptions and methods utilized in this valuation are reasonable (taking into account the experience of the plan and reasonable expectations) or, in the aggregate, result in total contribution equivalents that would be determined if each assumption and method were reasonable.

Aon is pleased to submit this report of the Pension Plan to you and will be pleased to discuss any aspects of the report with you after you have had a chance to review it.

Respectfully submitted,

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Introduction

This report documents the results of the actuarial valuation for the plan year ending June 30, 2021 of the Philadelphia Gas Works Pension Plan. The plan is a single-employer plan and issues a separate financial statement. The information provided in this report is intended strictly for documenting the annual contribution for the plan year ending June 30, 2021.

Determinations for purposes other than the funding valuation may be significantly different from the results in this report. Thus, the use of this report for purposes other than those expressed here may not be appropriate.

This valuation has been conducted in accordance with generally accepted actuarial principles and practices, including the applicable Actuarial Standards of Practice as issued by the Actuarial Standards Board and includes any guidance or interpretations provided by the Plan Sponsor prior to the issuance of this report.

A valuation model was used to develop the liabilities for the July 1, 2020 valuation. The valuation model relies on ProVal software, which was developed by Winklevoss Technologies, LLC. Experts within Aon selected this software and determined it is appropriate for performing valuations. We coded and reviewed the software for the provisions, assumptions, methods, and data of the Philadelphia Gas Works Pension Plan.

The undersigned relied on experts at PFM Asset Management LLC for the development of the capital market assumptions and the model underlying the expected rate of return.

The valuation model was used to project certain financial results for the funded status and contribution projections. The valuation model relies on ProVal software, which was developed by Winklevoss Technologies, LLC and selected, reviewed, and evaluated by experts within Aon as appropriate for use for developing liabilities for the funded status and contribution projections.

Future actuarial measurements may differ significantly from the current measurements presented in this report due (but not limited to) to such factors as the following:

- Plan experience differing from that anticipated by the economic or demographic assumptions;
- Changes in actuarial methods or in economic or demographic assumptions;
- Increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period); and
- Changes in plan provisions or applicable law.

Due to the limited scope of our assignment, we did not perform an analysis of the potential range of such future measurements. However, an assessment and disclosure of risks pertaining to the funding valuation as required by the actuarial standards of practice is being provided in a separate report.

Funded status measurements shown in this report are determined based on various measures of plan assets and liabilities. For funding purposes, plan assets are measured based on the asset valuation method described in the Actuarial Assumptions and Methods section of this report. Plan liabilities are measured based on the interest rates and other assumptions summarized in the Actuarial Assumptions and Methods section of this report.

These funded status measurements may not be appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations, and funded status measurements for Philadelphia Gas Works and plan disclosure and reporting purposes may not be appropriate for assessing the need for or the amount of future contributions.

In determining the annual contribution for the Philadelphia Gas Works Pension Plan, Aon may be assisting the appropriate plan fiduciary as it performs tasks that are required for the administration for an employee benefit plan. Aon may be consulting with Philadelphia Gas Works as it considers alternative strategies for funding the plan. Thus, Aon potentially will be providing assistance to Philadelphia Gas Works (and/or certain of its employees) acting in a fiduciary capacity (for the benefit of plan participants and beneficiaries) and to Philadelphia Gas Works (and/or its executives) acting in a settlor capacity (for the benefit of the employer sponsoring the Philadelphia Gas Works Pension Plan).

In conducting the valuation, we have relied on personnel, plan design, and asset information supplied by Philadelphia Gas Works as of the funding valuation date. While we cannot verify the accuracy of all the information, the supplied information was reviewed for consistency and reasonableness. As a result of this review, we have no reason to doubt the substantial accuracy or completeness of the information and believe that it has produced appropriate results.

The actuarial assumptions and methods used in this valuation are described in the Actuarial Assumptions and Methods section of this report. Philadelphia Gas Works selected the economic and demographic assumptions and prescribed them for use for purposes of compliance with the state's funding regulations. Aon provided guidance with respect to these assumptions, and it is our belief that the assumptions represent reasonable expectations of anticipated plan experience.

The undersigned are familiar with the near-term and long-term aspects of pension valuations and collectively meet the Qualification Standards of the American Academy of Actuaries necessary to render the actuarial opinions contained herein. The information provided in this report is dependent upon various factors as documented throughout this report, which may be subject to change. Each section of this report is considered to be an integral part of the actuarial opinions.

To our knowledge, no colleague of Aon providing services to Philadelphia Gas Works has any material direct or indirect financial interest in Philadelphia Gas Works. Thus, we believe there is no relationship existing that might affect our capacity to prepare and certify this actuarial report for Philadelphia Gas Works.



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Executive Summary

The plan's actuarial funded ratio increased from 72.64% to 75.27% as of June 30, 2020 on a smoothed Actuarial Value of Assets basis. This ratio is above the 73.34% forecast in 2019. The main driver for the ratio exceeding expectations was due to a decrease in liability due to an update of assumptions based on an experience study completed during 2020 and an update to mortality assumptions to the current industry standard mortality tables. These changes are detailed in section N of this report. The decrease in liability is partially offset by the actual investment return during the year-ending June 30, 2020 falling below the long-term expectations of 7.3% per year. The impact of this investment return shortfall is smoothed over a period of five years.

The calculated contribution rate for the upcoming year under the funding policy is 24.48% of pay. This is a decrease from the prior year rate of 27.27% and slightly lower than the forecast rate of 25.73%. In developing the contribution rate, PGW uses a "smoothed" asset value that gradually accounts for deviations in the investment performance. As a result, the impact of the prior year's investment returns will be phased in over several years.

The number of active plan participants continues to decline gradually as the impact of the pension choice provision continues to mature. In the year ending June 30, 2020, about 53% of incoming employees chose the pension program with 47% choosing the Defined Contribution program. The expected employee contributions now equal about 1.6% of total payroll, and will, over time, grow to 6.0% of pay, once all active participants are in the contributory tier.

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A. Comparative Summary of Principal Valuation Results

	Actuarial Valuation for Plan Year Beginning		<u>Percent Change</u>
	<u>July 1, 2019</u>	<u>July 1, 2020</u>	
1. <u>Participant Data</u>			
Active Participants	1,195	1,163	(2.7) %
Retired Participants	2,178	2,195	0.8 %
Vested Terminated Participants	<u>317</u>	<u>319</u>	0.6 %
Total	3,690	3,677	(0.4) %
Total Payroll	98,453,547	95,933,744	(2.6) %
Average Pay	82,388	82,488	0.1 %
Active Employee Average Age	44.44	44.26	(0.4) %
Active Employee Average Past Service	14.96	14.63	(2.2) %

A. Comparative Summary of Principal Valuation Results (cont.)

	Actuarial Valuation for Plan Year Ending		Percent Change
	<u>June 30, 2020</u>	<u>June 30, 2021</u>	
1. <u>Contribution Range</u>			
Net Normal Cost (<i>Exhibit D</i>)	\$ 7,281,627	\$ 6,161,485	(15.4) %
<u>Indicated Midyear -</u>			
20 Year Contribution (<i>Exhibit E</i>)	\$ 26,844,381	\$ 23,492,377	(12.5) %
30 Year Contribution (<i>Exhibit E</i>)	\$ 24,914,161	\$ 22,101,298	(11.3) %
Directed Contribution ¹	\$ 29,227,000	\$ 30,000,000	2.6 %
<u>Contribution as a Percentage of Compensation</u>			
20 Year Contribution	27.27%	24.49%	(10.2) %
30 Year Contribution	25.31%	23.04%	(9.0) %
Directed Contribution	29.69%	31.27%	5.3 %

The Normal Cost above represents the cost of benefits being earned by additional years of service with PGW net of employee contributions. This figure has decreased since the previous year as the result of a decrease in expected payroll and an increase in expected employee contributions.

The contribution levels are the sum of the Normal Cost and a level dollar amortization of the unfunded actuarial liability. The contribution amounts have decreased over the prior period (20-year basis) for several reasons:

- Experience Study Assumptions: A change in assumptions based on the experience study reduced the Accrued Actuarial Liability by approximately \$12.6 million and the normal cost by \$0.6 million. This decreased the annual contribution by approximately \$1.8 million (1.8% of pay).
- Open amortization policy: The 20-year contribution is based on an open amortization period. An open amortization period leads to a decrease in the contribution amount year-over-year assuming no experience gains or losses. The effect of this policy is a decrease of \$0.5 million (0.5% of pay).
- Investment returns and smoothed value of assets: The investment return for the period ending June 30, 2020 was approximately \$14.3 million. Based on the 7.30% assumption in place on July 1, 2019, a return of \$39.5 million would have been expected over this period. The plan recognizes a smoothed value of assets which reduces the impact of the asset returns. The impact of asset performance not meeting expectations and the impact of asset smoothing led to an increase in the annual contribution of \$0.6 million (0.6% of pay).
- Mortality Table Assumption: A change in the mortality table assumption to the Pri-2012 mortality table generationally projected with scale MP-2020 decreased the Accrued Actuarial Liability by approximately \$6.2 million. This decreased the annual contribution by approximately \$0.5 million (0.5% of pay).
- Demographic Changes: The accrued actuarial liability as of July 1, 2020 was approximately \$1.6 million lower than expected based on the prior year valuation. This decreased the annual contribution by \$0.3 million (0.3% of pay).
- Employee Contributions: Employee contribution are expected to increase by \$0.2 million compared to the prior year based on the plan population. This decreased the annual contribution by \$0.2 million (0.2% of pay).

¹ The City of Philadelphia Director of Finance directed a contribution of \$29,227,000 for plan year ending June 30, 2020 and \$30,000,000 for plan year ending June 30, 2021

A. Comparative Summary of Principal Valuation Results (cont.)

	Actuarial Valuation for Plan Year Beginning		Percent Change
	<u>July 1, 2019</u>	<u>July 1, 2020</u>	
1. <u>Liabilities</u>			
Unfunded Accrued Actuarial Liability (Exhibit E)	\$ 206,785,296	\$ 183,306,911	(11.4) %
Present Value of Accumulated Vested Benefits (Exhibit F)	\$ 687,829,656	\$ 684,485,590	(0.5) %
Present Value of Accumulated Plan Benefits (Exhibit F)	\$ 712,658,528	\$ 704,579,715	(1.1) %
2. <u>Development of Actuarial Liability</u>			
(1) Liability at July 1, 2019		\$ 755,782,248	
(2a) Normal Cost	\$ 8,591,346		
(2b) Interest Cost	\$ 53,773,921		
(2c) Expected Benefit Payments	\$ <u>(56,483,930)</u>		
(2d) Total Increase/(Decrease)	\$ 5,881,337		
(3) Expected Liability at June 30, 2020		\$ 761,663,585	
(3a) Demographic (Gain)/Loss	\$ (1,597,904)		
(3b) Discount Rate (Gain)/Loss	\$ 0		
(3c) Experience Study Assumptions (Gain)/Loss	\$ (12,601,547)		
(3c) Mortality (Gain)/Loss	\$ <u>(6,185,097)</u>		
(3d) Total (Gain)/Loss	\$ (20,384,548)		
(4) Actual Liability at July 1, 2020		\$ 741,279,037	

A. Comparative Summary of Principal Valuation Results (cont.)

	Actuarial Valuation for Plan Year Beginning		<i>Percent Change</i>
	<i><u>July 1, 2019</u></i>	<i><u>July 1, 2020</u></i>	
1. <u>Assets</u>			
Market Asset Value (<i>Exhibit C</i>)	\$ 553,239,562	\$ 543,230,351	(1.8) %
Actuarial Asset Value (<i>Exhibit C</i>)	\$ 548,996,952	\$ 557,972,126	1.6 %

Plan assets are invested in a mix of stocks and bonds held by the Sinking Fund Commission. The long-term asset allocation strategy is an equity allocation of 65% of the portfolio and a fixed income allocation of 35% of the portfolio. The total fund asset return was 2.83% for the plan year ending June 30, 2020 as provided by PFM in the monthly performance review for the period ended June 30, 2020. This represented an underperformance of plan investments versus the actuarial assumption of 7.30% for the period, but not necessarily an underperformance versus independent investment benchmarks. Review of performance against those benchmarks is outside the scope of this report.

B. Discussion

Since the last actuarial valuation performed as of July 1, 2019, the demographics of the plan participants have changed as follows:

- The number of plan participants decreased 0.4%
- The total number of actives in the plan decreased 2.7%
- Total payroll decreased 2.6%
- Average pay increased 0.1%
- Average age of active plan participants decreased 0.4%

PGW has indicated they plan to contribute the larger of a 20-year open amortization period and a 30-year closed amortization period of the unfunded liability. Both schedules were included in the range of potential contribution levels and both are expected to gradually improve the funded status of the plan.

C. Financial Summary¹

Assets as of July 1, 2019 \$ 553,239,562

Receipts

Employer Contribution	29,413,979	
Employee Contribution	1,519,517	
Investment return *	14,286,177	
Total Receipts		\$ 45,219,673

Disbursements

Benefit Payments	55,061,155	
Administrative Expenses	167,729	
Total Disbursements		\$ 55,228,884

Assets as of July 1, 2020 \$ 543,230,351

Asset Information as of July 1, 2020

<u>Asset Allocations</u>	<u>Current Allocation</u>	<u>Target Allocation</u>
Equity	64.56%	65.00%
Total Fixed Income	31.60%	35.00%
Other	3.84%	0.00%

<u>Annual Rate of Return</u>	<u>Market Value</u>	<u>Assumed Rate</u>
Rate ²	2.83%	7.30%

**Net of any additional fund expenses not included in Administrative Expenses under Disbursements*

¹ Asset information as reported by the City of Philadelphia.

² The total fund asset return of 2.83% for the plan year ending June 30, 2020 as provided by PFM in the monthly performance review for the period ended June 30, 2020.

C. Financial Summary (cont.)

Development of Actuarial Value of Assets

Market Value of Assets as of July 1, 2019	\$	553,239,562
Expected Assets as of July 1, 2020	\$	568,443,880
Market Value of Assets as of July 1, 2020	\$	543,230,351
<u>Total Gain/(Loss) From Prior Years</u>		
Gain/(Loss) (Current Year)	\$	(25,213,529)
Gain/(Loss) (Valuation Year -1)	\$	(4,511,621)
Gain/(Loss) (Valuation Year -2)	\$	7,063,075
Gain/(Loss) (Valuation Year -3)	\$	26,553,955
<u>Unrecognized Gain/(Loss) From Prior Years</u>		
Gain/(Loss) (Current Year)	\$	(20,170,823)
Gain/(Loss) (Valuation Year -1)	\$	(2,706,973)
Gain/(Loss) (Valuation Year -2)	\$	2,825,230
Gain/(Loss) (Valuation Year -3)	\$	5,310,791
<u>Preliminary Actuarial Value of Assets as of July 1, 2020</u>		
	\$	557,972,126
80% of Market Value of Assets	\$	434,584,281
120% of Market Value of Assets	\$	651,876,421
<u>Actuarial Value of Assets as of July 1, 2020</u>		
	\$	557,972,126

D. Summary of Valuation Results

	<u>Retired</u>	<u>Vested Terminated</u>	<u>Active</u>	<u>Total</u>
1 Number of Participants Included in the Valuation	2,195	319	1,163	3,677
2 Projected Annual Benefits	\$ 55,764,966	\$ 3,334,031	\$ 124,293,311	\$ 183,392,308
3 Present Value of Projected Benefits as of July 1, 2019	\$ 550,798,902	\$ 14,499,051	\$ 262,665,045	\$ 827,962,998
4 Present Value of Future Normal Costs	\$ <u> -</u>	\$ <u> -</u>	\$ <u>86,683,961</u>	\$ <u>86,683,961</u>
5 Accrued Actuarial Liability as of July 1, 2020: (3)-(4)	\$ 550,798,902	\$ 14,499,051	\$ 175,981,084	\$ 741,279,037
6 Actuarial Asset Value			\$ <u>557,972,126</u>	
7 Unfunded Accrued Actuarial Liability: (5)-(6)			\$ 183,306,911	
8 Normal Cost Payable on July 1, 2020			\$ 7,656,577	
9 Expected Employee Contributions			\$ <u>1,495,092</u>	
10 Net Employer Normal Cost (8)-(9)			\$ 6,161,485	

E. Contribution Levels¹

Twenty Year Amortization (Open Amortization Period)

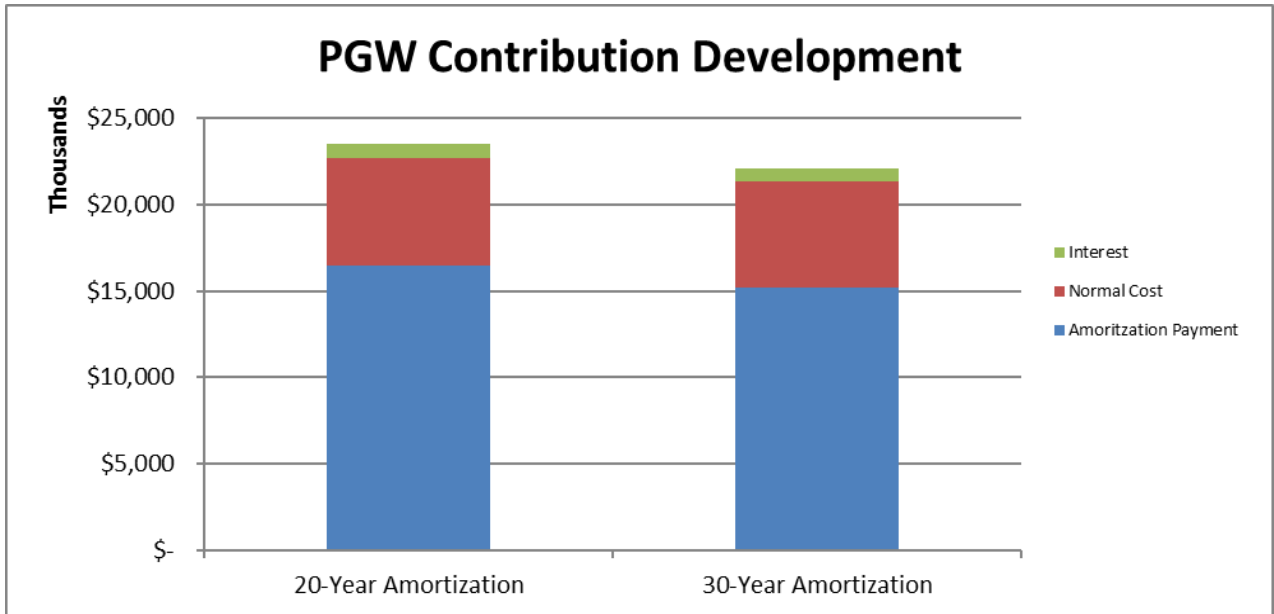
1.	Contribution for Normal Cost					\$ 6,161,485
2.	Amortization Schedule					
	<u>Effective Date</u>	<u>Amortization Period</u>	<u>Initial Amount</u>	<u>Unfunded Accrued Actuarial Liability</u>	<u>BOY Annual Payment</u>	
	7/1/2020	20	\$ 183,306,911	\$ 183,306,911	\$ 16,503,616	\$ 16,503,616
3.	Contributions July 1, 2020: (1) + (2)					\$ 22,665,101
4.	Contributions Mid-year (3) x 1.0365					\$ 23,492,377
5.	Contributions June 30, 2021: (3) x 1.073					\$ 24,319,653

Thirty Year Amortization (Closed Amortization Period)

1.	Contribution for Normal Cost					\$ 6,161,485
2.	Amortization Schedule					
	<u>Effective Date</u>	<u>Amortization Period</u>	<u>Initial Amount</u>	<u>Unamortized Amount</u>	<u>BOY Annual Payment</u>	
	7/1/2015	25	\$ 195,984,721	\$ 184,729,377	\$ 15,174,714	
	7/1/2016	26	\$ 30,648,588	\$ 29,277,863	\$ 2,371,581	
	7/1/2017	27	\$ (3,804,097)	\$ (3,681,102)	\$ (294,361)	
	7/1/2018	28	\$ 6,379,537	\$ 6,246,911	\$ 493,647	
	7/1/2019	29	\$ (12,799,101)	\$ (12,670,740)	\$ (990,391)	
	7/1/2020	30	\$ (20,595,398)	\$ (20,595,398)	\$ (1,593,667)	
	Total			\$ 183,306,911	\$ 15,161,523	
3.	Contributions July 1, 2020: (1) + (2)					\$ 21,323,008
4.	Contributions Mid-year: (3) x 1.0365					\$ 22,101,298
5.	Contributions June 30, 2021: (3) x 1.073					\$ 22,879,588

¹ The City of Philadelphia Director of Finance directed a contribution of \$30,000,000 for plan year ending June 30, 2021

E. Contribution Levels (cont.)



F. Actuarial Present Value of Accumulated Benefits Determined

Accounting Standards Codification Topic 960

	<u>July 1, 2019</u>	<u>July 1, 2020</u>
1. Actuarial Present Value of Accumulated Vested Benefits		
Participants currently receiving		
a. benefits	\$ 541,643,453	\$ 550,798,902
b. Vested terminated participants	\$ 14,437,435	\$ 14,499,051
c. Active Participants	<u>\$ 131,748,768</u>	<u>\$ 119,187,637</u>
d. Total	\$ 687,829,656	\$ 684,485,590
2. Actuarial Present Value of Accumulated Non-Vested Benefits	\$ 24,828,872	\$ 20,094,125
3. Total Actuarial Present Value of Accumulated Plan Benefits: (1d) + (2)	\$ 712,658,528	\$ 704,579,715
4. Net Assets Available for Benefits (Market Value, Exhibit C)	\$ 553,239,562	\$ 543,230,351
5. Excess (deficiency) of Net Assets Available for Benefits over (under) Actuarial Present Value of Accumulated Plan Benefits: (4) - (3)	\$ (159,418,966)	\$ (161,349,364)
6. Active Participant Count		
a. 100% Vested	909	896
b. Partially Vested	0	0
c. Non-Vested	286	267

G. Estimated 10-Year Benefit Pay-Out Projections

Figures Shown in Thousands

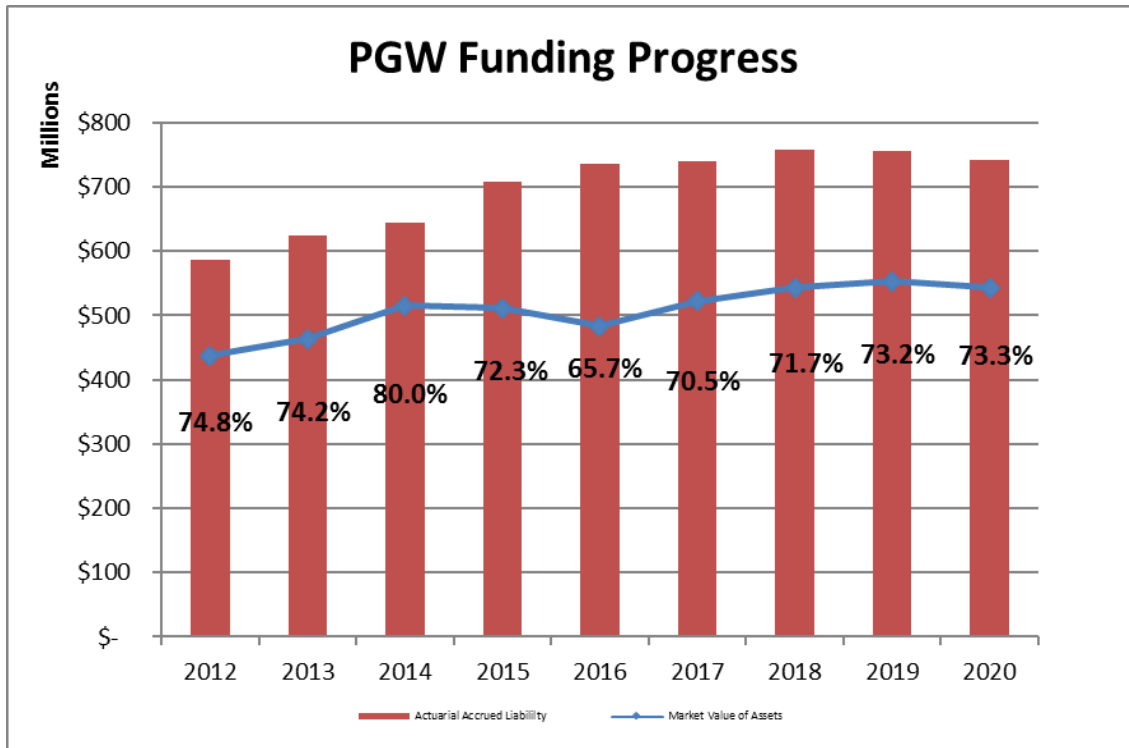
Plan Year Beginning July 1	Expected Annual Benefit Pay-Out During Plan Year	Expected PGW Contributions During Plan Year	Expected Employee Contributions During Plan Year	Expected Benefits Paid from Plan Assets
2020	\$57,316	\$30,000	\$1,495	\$25,821
2021	58,006	22,172	1,624	34,210
2022	58,694	22,032	1,761	34,901
2023	59,411	22,211	1,915	35,285
2024	59,963	22,412	2,070	35,481
2025	60,451	21,993	2,225	36,233
2026	60,861	21,742	2,383	36,736
2027	61,170	21,762	2,533	36,875
2028	61,434	21,827	2,680	36,927
2029	61,568	21,945	2,820	36,803

Note: The above projected pay-outs recognized expected mortality, termination, and incidence of disability and assume all benefits will commence at Assumed Retirement Date. No assumption has been made regarding possible retirements prior to Assumed Retirement Date or anticipation of new entrants. Investment returns assumed to be 7.30% per year. Covered payroll projected to increase based on valuation assumptions. Expected PGW contributions calculated assuming contributions made based on greater of 20 year open amortization policy and 30 year closed amortization policy. The City of Philadelphia Director of Finance directed a contribution of \$30 million for plan year ending June 30, 2021. Expected employee contributions assume 50% of new employees select the PGW defined benefit pension plan and employee contribution rate remains 6% of pay.

H. Schedule of Funding Progress

(\$ thousands)

Actuarial Valuation Date	Market Value of Assets	Actuarial Accrued Liability	Unfunded Actuarial Accrued Liability	Funded Ratio	Assumed Rate of Return	Covered Payroll	UAAL as a % of Covered Payroll
9/1/2012	\$ 437,780	\$ 585,632	\$ 147,852	74.75%	8.15%	\$ 107,494	137.54%
9/1/2013	462,691	623,612	160,921	74.20%	7.95%	103,530	155.43%
9/1/2014	514,944	643,988	129,044	79.96%	7.95%	105,636	122.16%
7/1/2015	510,719	706,704	195,985	72.27%	7.65%	95,187	205.89%
7/1/2016	483,259	736,078	252,819	65.65%	7.30%	90,860	278.25%
7/1/2017	521,526	739,872	218,346	70.49%	7.30%	94,768	230.40%
7/1/2018	543,246	758,069	214,823	71.66%	7.30%	101,271	212.13%
7/1/2019	553,240	755,782	202,542	73.20%	7.30%	98,454	205.72%
7/1/2020	543,230	741,279	198,049	73.28%	7.30%	95,934	206.44%



Notes:

Covered payroll was assumed to increase by 3% in years when a full valuation was not performed

Asset Values estimated for years when a full valuation was not performed

I. Calculation of Annual Pension Cost

I. Calculation of Annual Pension Cost (20 Year Open Amortization) (\$ thousands)

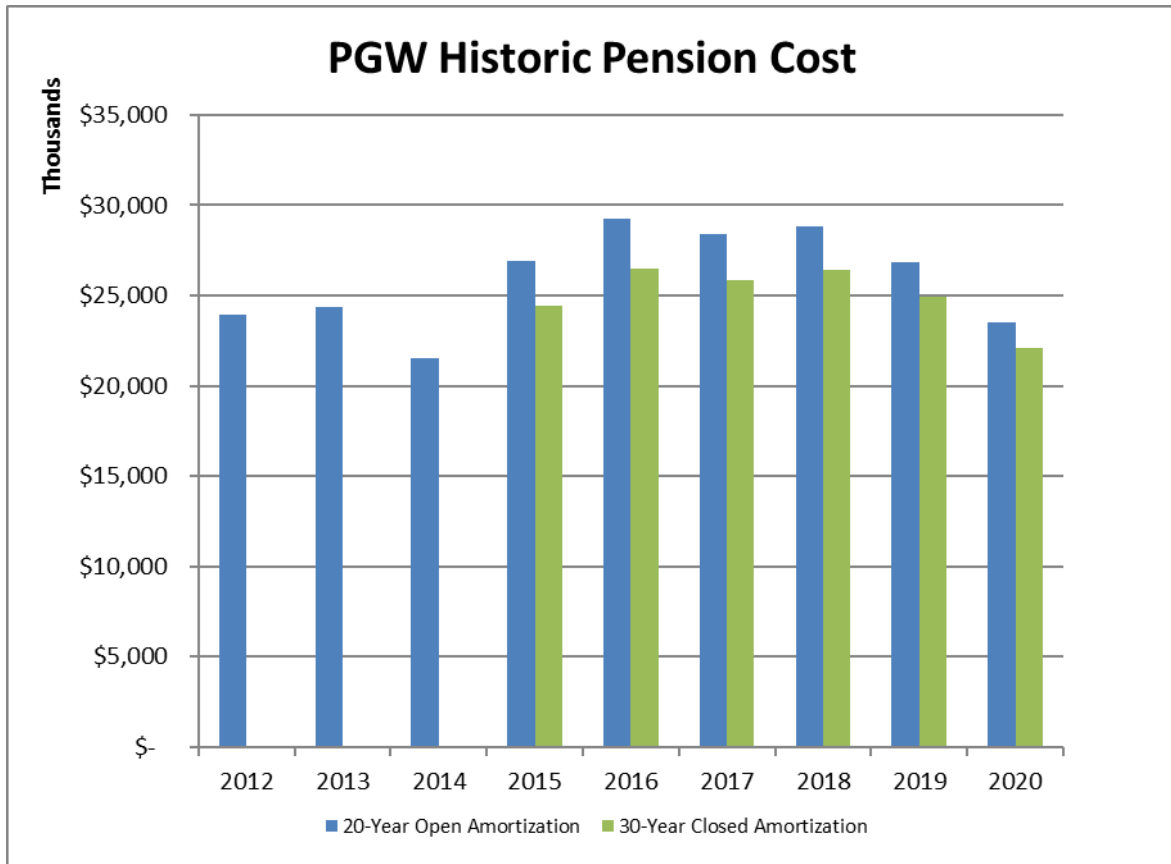
Actuarial Valuation Date	Unfunded Actuarial Accrued Liability	Amortization Payment	Normal Cost	Employee Contribution	Mid-year Contribution
9/1/2012	\$147,852	\$14,357	\$8,782	\$137	\$23,951
9/1/2013	160,921	15,127	8,533	207	24,385
9/1/2014	129,044	12,130	8,852	279	21,526
7/1/2015	195,985	18,063	7,859	497	26,913
7/1/2016	224,789	20,238	7,992	658	29,260
7/1/2017	218,567	19,678	7,717	919	28,395
7/1/2018	222,391	20,022	7,760	1,182	28,797
7/1/2019	206,785	18,617	7,282	1,310	26,844
7/1/2020	183,307	16,504	6,161	1,495	23,492

I-2. Calculation of Annual Pension Cost (30 Year Closed Amortization) (\$ thousands)

Actuarial Valuation Date	Unfunded Actuarial Accrued Liability	Amortization Payment	Normal Cost	Employee Contribution	Mid-year Contribution
9/1/2012	\$147,852	\$14,357	\$8,782	\$137	N/A
9/1/2013	160,921	15,127	8,533	207	N/A
9/1/2014	129,044	12,130	8,852	279	N/A
7/1/2015	195,985	15,641	7,859	497	24,398
7/1/2016	224,789	17,546	7,992	658	26,470
7/1/2017	218,567	17,252	7,717	919	25,880
7/1/2018	222,391	17,746	7,760	1,182	26,437
7/1/2019	206,785	16,755	7,282	1,310	24,914
7/1/2020	183,307	15,162	6,161	1,495	22,101

Employee contributions estimated based on census data

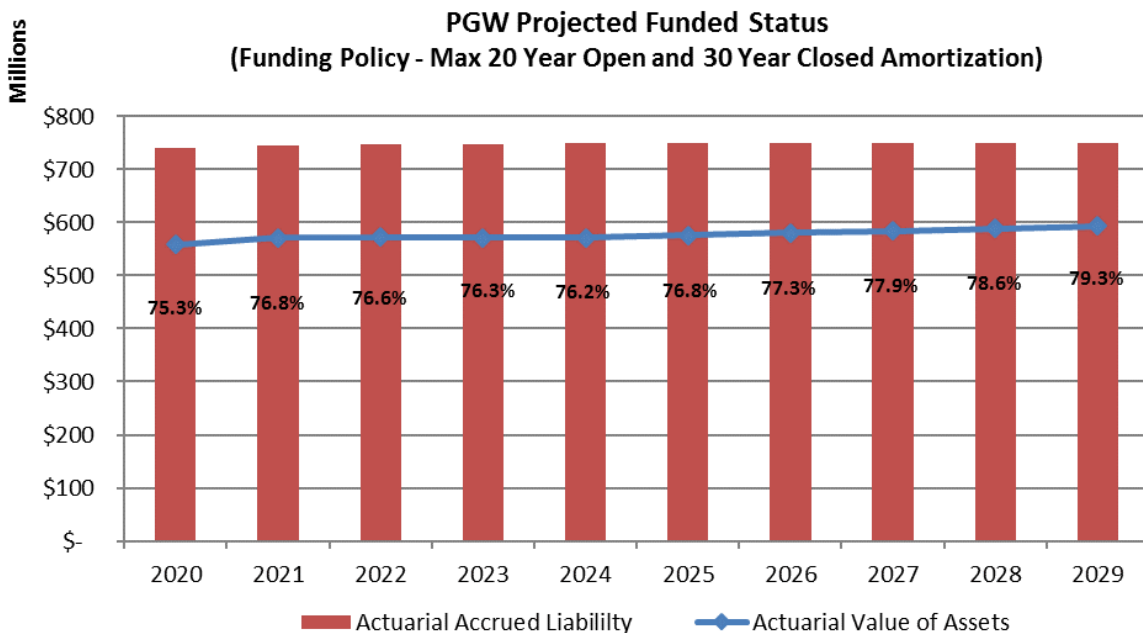
I. Calculation of Annual Pension Cost (cont.)



J. Schedule of Prospective Funded Status

J. Schedule of Prospective Funded Status – Additional Contribution for 7/1/2020 Plan Year¹ (Funding Policy - Max 20 Year Open and 30 Year Closed Amortization) (\$ thousands)

Actuarial Valuation Date	Actuarial Value of Assets	Actuarial Accrued Liability	Unfunded Actuarial Accrued Liability	Mid-Year Contribution	Funded Ratio	Covered Payroll	Contribution as % of Covered Payroll	UAAL as a % of Covered Payroll
7/1/2020	\$557,972	\$741,279	\$183,307	\$30,000 ¹	75.27%	\$95,934	31.27%	191.08%
7/1/2021	571,643	744,669	173,026	22,172	76.76%	95,357	23.25%	181.45%
7/1/2022	572,249	746,944	174,695	22,032	76.61%	95,046	23.18%	183.80%
7/1/2023	571,101	748,251	177,150	22,211	76.32%	94,668	23.46%	187.13%
7/1/2024	570,808	749,105	178,297	22,412	76.20%	94,813	23.64%	188.05%
7/1/2025	575,701	749,922	174,221	21,993	76.77%	95,386	23.06%	182.65%
7/1/2026	580,171	750,155	169,984	21,742	77.34%	95,521	22.76%	177.95%
7/1/2027	584,447	749,831	165,384	21,762	77.94%	95,765	22.72%	172.70%
7/1/2028	588,891	749,292	160,401	21,827	78.59%	95,556	22.84%	167.86%
7/1/2029	593,605	748,808	155,203	21,945	79.27%	95,699	22.93%	162.18%



¹ The City of Philadelphia Director of Finance directed a contribution of \$30 million for plan year ending June 30, 2021

Investment returns assumed to be 7.30% per year

Covered payroll projected to increase based on valuation assumptions

K. Distribution of Inactive Participants by Age and Years of Retirement

1. Receiving Benefits

<u>Years Receiving Benefits as of July 1, 2020</u>									
<u>Age</u>	<u>0-4</u>	<u>5-9</u>	<u>10-14</u>	<u>15-19</u>	<u>20-24</u>	<u>25+</u>	<u>Total</u>	<u>Annual Benefits</u>	
								<u>Total</u>	<u>Average</u>
15-44	0	0	0	0	0	0	0	\$0	\$0
45-49	1	2	0	0	0	0	3	31,009	10,336
50-54	38	7	0	0	0	0	45	1,693,085	37,624
55-59	139	64	15	4	0	1	223	6,786,739	30,434
60-64	114	250	67	14	4	3	452	14,441,314	31,950
65-69	59	172	116	85	15	5	452	12,439,144	27,520
70-74	25	77	102	99	28	35	366	8,841,021	24,156
75-79	16	30	30	39	30	66	211	4,349,614	20,614
80-84	18	23	6	16	23	80	166	3,216,947	19,379
85-89	14	17	10	14	14	81	150	2,458,392	16,389
90+	9	9	13	14	14	68	127	1,507,701	11,872
Total	433	651	359	285	128	339	2,195	55,764,966	25,405
Average Age: 70.94					Average Retirement Years: 12.52				

2. Vested Terminated

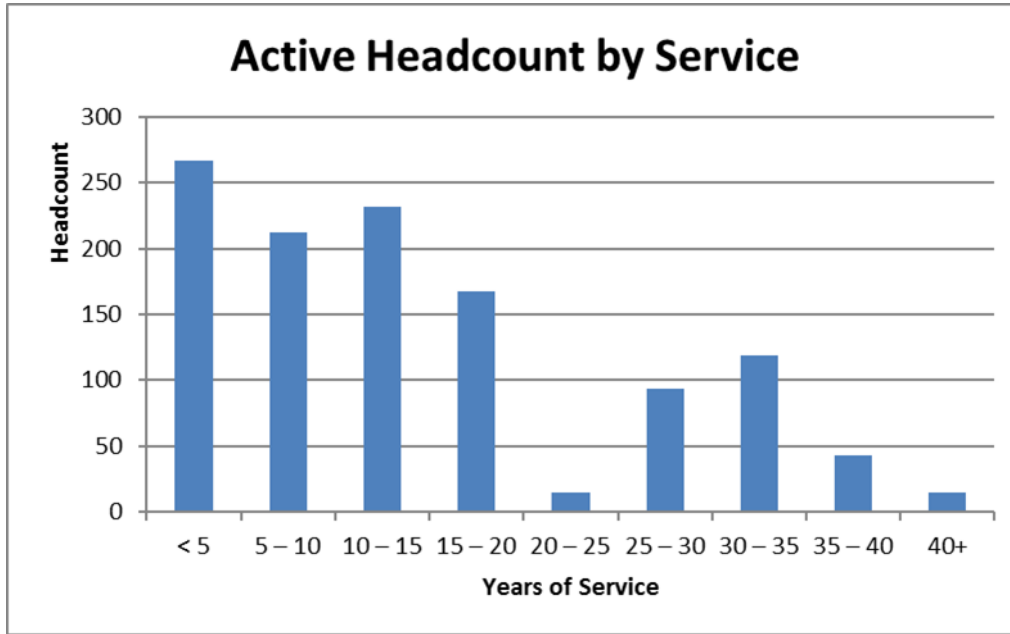
<u>Age</u>	<u>Number</u>	<u>Annual Benefits</u>	
		<u>Total</u>	<u>Average</u>
15-44	109	\$872,837	\$8,008
45-49	36	351,085	9,752
50-54	76	959,572	12,626
55-59	66	750,660	11,374
60-64	26	342,130	13,159
65+	6	57,747	9,624
Total	319	\$3,334,031	\$10,452

L. Distribution of Active Participants by Age and Service

(Showing Number of Employees and Average Earnings)

Completed Years of Service as of July 1, 2020														
Age	00-00	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	Total	Earnings		
												Total	Average	
15-19	-	-	-	-	-	-	-	-	-	-	-	-	0	0
	-	-	-	-	-	-	-	-	-	-	-	-		
20-24	12	28	2	-	-	-	-	-	-	-	42	2,114,698	50,350	
	40,536	53,151	70,015	-	-	-	-	-	-	-	50,350			
25-29	15	51	30	3	-	-	-	-	-	-	99	6,050,419	61,115	
	42,709	59,171	70,342	93,946	-	-	-	-	-	-	61,115			
30-34	16	45	80	62	-	-	-	-	-	-	203	15,000,946	73,896	
	42,661	59,363	80,647	83,795	-	-	-	-	-	-	73,896			
35-39	7	19	31	61	35	-	-	-	-	-	153	12,692,958	82,961	
	47,919	65,439	82,280	88,995	89,567	-	-	-	-	-	82,961			
40-44	4	21	17	28	36	1	-	-	-	-	107	9,119,866	85,232	
	47,467	68,916	84,175	93,981	93,359	59,419	-	-	-	-	85,232			
45-49	2	14	23	22	36	-	18	2	-	-	117	9,996,566	85,441	
	66,691	77,609	76,786	92,347	88,381	-	89,293	94,977	-	-	85,441			
50-54	2	15	11	23	28	5	31	44	4	-	163	14,869,372	91,223	
	65,964	61,838	86,826	99,791	93,922	108,466	91,521	93,448	109,648	-	91,223			
55-59	2	11	9	18	20	5	26	54	18	1	164	14,750,516	89,942	
	82,348	76,587	77,385	87,425	92,667	124,992	87,165	90,041	91,425	220,775	89,942			
60-64	1	1	6	9	8	3	15	16	21	8	88	8,729,379	99,197	
	120,000	78,308	64,489	81,668	79,695	119,395	90,926	108,550	97,428	158,336	99,197			
65-69	-	1	3	5	3	-	2	3	-	4	21	1,957,531	93,216	
	-	98,331	55,980	90,650	84,783	-	79,316	79,601	-	146,557	93,216			
70+	-	-	-	1	1	1	1	-	-	2	6	651,494	108,582	
	-	-	-	222,695	71,251	118,417	73,913	-	-	82,609	108,582			
Total	61	206	212	232	167	15	93	119	43	15	1,163	95,933,744	82,488	
	47,294	62,626	78,567	89,865	90,562	113,554	89,324	93,609	96,052	149,261	82,488			
Average Age: 44.26											Average Service: 14.63			

L. Distribution of Active Participants by Service (cont.)



<u>Service</u>	<u>Active Headcount</u>
< 5	267
5 - 10	212
10 - 15	232
15 - 20	167
20 - 25	15
25 - 30	93
30 - 35	119
35 - 40	43
40+	15
Total	1,163

M. Data Reconciliation

	<i>Actives</i>	<i>Term Vested</i>	<i>Retiree*</i>	<i>Total</i>
1. Participants as of 7/1/2019	1,195	317	2,178	3,690
a. New Participants	61	0	0	61
b. Return from Retirement	0	0	0	0
c. Retirements	(59)	(12)	71	0
d. Surviving Spouses	0	0	0	0
e. Rehires	1	(1)	0	0
f. Terminations	(15)	15	0	0
g. Nonvested Terminations	(18)	0	0	(18)
h. Deaths w/ Beneficiary	0	0	(29)	(29)
i. New Beneficiary	0	0	29	29
j. Deaths w/o Beneficiary	(2)	0	(59)	(61)
k. Data Corrections	0	0	1	1
l. New QDRO	<u>0</u>	<u>0</u>	<u>4</u>	<u>4</u>
m. Total Increase / (Decrease)	(32)	2	17	(13)
2. Actual Participants as of 6/30/2020	1,163	319	2,195	3,677

**Includes Surviving Spouses and Alternate Payees*

N. Actuarial Methods and Assumptions

1. Cost Methods

The cost method used is the Projected Unit Credit Cost method. Each year the projected benefits of each participant are estimated and their present value determined. The normal cost for each active participant is determined by dividing this present value by service from entry into the plan to assumed retirement age. The total normal cost is equal to the sum of individual normal costs.

The accrued actuarial liability for each active participant is equal to the normal cost multiplied by service since entry to valuation date. The accrued actuarial liability for inactive participants is equal to the present value of their benefits. The total accrued actuarial liability is equal to the sum of the individual accrued actuarial liabilities.

The Unfunded Accrued Actuarial Liability as of any date is equal to the accrued actuarial liability less the actuarial value of assets as of such date.

Each year actuarial gains and losses occur since actual experience under the Plan will vary from the actuarial assumptions. All gains and losses will be amortized in future years.

2. Asset Valuation Technique

The Actuarial Asset Value is equal to the value of fund assets as reported by the City of Philadelphia smoothed over a period of 5 years. The Actuarial Asset Value is further limited to fall within a corridor of 80% and 120% of the Market Value of Assets.

N. Actuarial Methods and Assumptions (cont.)

3. Actuarial Assumptions

(Unless otherwise specified, the same assumptions have been used for the determination of the Contribution Range and Accumulated Plan Benefits)

- a. Mortality Rates: Healthy: Pri-2012 employees and healthy annuitants mortality table projected generationally from the central year using Scale MP-2020:
- Disabled: Pri-2012 disabled retiree mortality table projected generationally from the central year using Scale MP-2020:
- Surviving Spouses: Pri-2012 contingent survivor mortality table projected generationally from the central year using Scale MP-2020:
- b. Interest: 7.30%, compounded annually.
- c. Turnover: A scale varying by age and service with illustrative annual rates of turnover. See table 1 for details.
- d. Disability: A scale varying by age with illustrative annual rates of disability. See table 2 for details
- e. Salary Increase
- | | |
|--|---|
| <i>Determination of Contribution Range</i> | Salaries are assumed to increase by an amount based on years of service. See table 3 for details. |
| <i>Accumulated Plan Benefits</i> | Past salaries are discounted at the same rate as described above. Future salaries are assumed to remain at the same level as on the valuation date. |

N. Actuarial Methods and Assumptions (cont.)

- f. Retirement Age Retirements are assumed to occur at the following ages:

<u>Age</u>	<u>Service</u> <u>< 30</u>	<u>Service</u> <u>> 30</u>	<u>Age</u>	<u>Service</u> <u>< 30</u>	<u>Service</u> <u>> 30</u>
50	0%	15%	61	10%	15%
51	0%	15%	62	10%	40%
52	0%	15%	63	10%	25%
53	0%	15%	64	10%	25%
54	0%	15%	65	20%	25%
55	5%	15%	66	20%	40%
56	5%	15%	67	20%	40%
57	10%	15%	68	20%	40%
58	10%	15%	69	20%	40%
59	10%	15%	70+	100%	100%
60	10%	15%			

- g. Salary Current year salary is assumed to be the greater of the annualized 2020 Taxable Gross Wages based on actual wages through June 30, 2020 and the annual pay rate as provided by Philadelphia Gas Works.
- h. Conversion of Time Off Balances Participant compensation is assumed to increase in the final year of employment prior to retirement due to conversion of time off balances based on the following schedule:
 Less than 30 years of service: 7.5% increase in final year compensation
 30 of more years of service: 19.5% increase in final year compensation
- i. Optional payment form election percentage 40% single life annuity
 25% joint and 50% survivor annuity
 10% joint and 75% survivor annuity
 25% joint and 100% survivor annuity
- j. Surviving spouse benefit It is assumed that 70% of males and 70% of females have an eligible spouse, and that males are two years older than their spouses.

N. Actuarial Methods and Assumptions (cont.)

4. Change in Actuarial Assumptions

- The mortality table for healthy participants was updated from the RP-2014 mortality table for employees and healthy annuitants projected generationally from the central year using Scale MP-2018 to the Pri-2012 mortality table for employees and healthy annuitants projected generationally from the central year using Scale MP-2020.
- The mortality table for disabled participants was updated from the RP-2014 mortality table for disabled participants projected generationally from the central year using Scale MP-2018 to the Pri-2012 mortality table for disabled participants projected generationally from the central year using Scale MP-2020.
- The mortality table for surviving spouses was updated from the RP-2014 mortality table for employees and healthy annuitants projected generationally from the central year using Scale MP-2018 to the Pri-2012 mortality table for contingent survivors projected generationally from the central year using Scale MP-2020.
- The turnover rates were updated based on the experience review using actual terminations from 2014 to 2019.
- The disability rates were updated to use Aon's standard disability incidence table based on analysis as part of a recent experience review.
- The salary scale was updated based on the experience review using pay increases from 2014 to 2019.
- Participant compensation is assumed to increase in the final year of employment prior to retirement due to conversion of time off balances. The assumed increase is 7.5% for participants with less than 30 years of service and 19.5% for participants with 30 or more years of service.
- The retirement rates were updated based on the experience review using actual retirements from 2014 to 2019.
- Optional payment form election percentage was updated based on the experience study from 100% single life annuity to 40% single life annuity, 25% joint and 50% survivor annuity, 10% joint and 75% survivor annuity, and 25% joint and 100% survivor annuity.
- Surviving spouse benefit assumption was updated from 80% of males and 80% of females have an eligible spouse and males are three years older than their spouse to 70% of males and 70% of females have an eligible spouse and males are two years older than their spouse.

Additional details can be found in the experience study report issued in October 2020.

N. Actuarial Methods and Assumptions (cont.)

Table 1

Turnover Rates

Age	0 Years of Service	1 Year of Service	2 Years of Service	3 Years of Service	4 Years of Service	5 or More Years of Service
20 or Younger	25.0%	15.0%	12.0%	10.0%	7.0%	3.0%
21	25.0%	15.0%	12.0%	10.0%	7.0%	3.0%
22	25.0%	15.0%	12.0%	10.0%	7.0%	3.0%
23	25.0%	15.0%	12.0%	10.0%	7.0%	3.0%
24	25.0%	15.0%	12.0%	10.0%	7.0%	3.0%
25	25.0%	15.0%	12.0%	10.0%	7.0%	3.0%
26	25.0%	15.0%	12.0%	10.0%	7.0%	3.0%
27	25.0%	15.0%	12.0%	10.0%	7.0%	3.0%
28	25.0%	15.0%	12.0%	10.0%	7.0%	3.0%
29	25.0%	15.0%	12.0%	10.0%	7.0%	3.0%
30	25.0%	15.0%	12.0%	10.0%	7.0%	3.0%
31	25.0%	15.0%	12.0%	10.0%	7.0%	3.0%
32	25.0%	15.0%	12.0%	10.0%	7.0%	3.0%
33	25.0%	15.0%	12.0%	10.0%	7.0%	3.0%
34	25.0%	15.0%	12.0%	10.0%	7.0%	3.0%
35	25.0%	15.0%	12.0%	10.0%	7.0%	3.0%
36	25.0%	15.0%	12.0%	10.0%	7.0%	3.0%
37	25.0%	15.0%	12.0%	10.0%	7.0%	3.0%
38	23.0%	15.0%	12.0%	9.0%	6.6%	2.8%
39	21.0%	15.0%	12.0%	8.0%	6.2%	2.6%
40	19.0%	15.0%	12.0%	7.0%	5.8%	2.4%
41	17.0%	15.0%	12.0%	6.0%	5.4%	2.2%
42	15.0%	15.0%	12.0%	5.0%	5.0%	2.0%
43	14.0%	14.0%	10.6%	4.6%	4.6%	2.0%
44	13.0%	13.0%	9.2%	4.2%	4.2%	2.0%
45	12.0%	12.0%	7.8%	3.8%	3.8%	2.0%
46	11.0%	11.0%	6.4%	3.4%	3.4%	2.0%
47	10.0%	10.0%	5.0%	3.0%	3.0%	2.0%
48	10.0%	10.0%	5.0%	2.8%	2.8%	2.0%
49	10.0%	10.0%	5.0%	2.6%	2.6%	2.0%
50	10.0%	10.0%	5.0%	2.4%	2.4%	2.0%
51	10.0%	10.0%	5.0%	2.2%	2.2%	2.0%
52	10.0%	10.0%	5.0%	2.0%	2.0%	2.0%
53	10.0%	10.0%	5.0%	2.0%	2.0%	2.0%
54	10.0%	10.0%	5.0%	2.0%	2.0%	2.0%
55 or Older	10.0%	10.0%	5.0%	2.0%	2.0%	2.0%

N. Actuarial Methods and Assumptions (cont.)

Table 2

Disability Rates

Age	Males	Females
27 and Younger	0.03345%	0.03345%
28	0.03345%	0.04460%
29	0.03345%	0.04460%
30	0.03345%	0.04460%
31	0.03345%	0.05575%
32	0.03345%	0.05575%
33	0.03345%	0.06690%
34	0.03345%	0.06690%
35	0.04460%	0.07805%
36	0.04460%	0.08920%
37	0.05575%	0.10035%
38	0.06690%	0.11150%
39	0.07805%	0.13380%
40	0.08920%	0.14495%
41	0.10035%	0.16725%
42	0.11150%	0.18955%
43	0.13380%	0.21185%
44	0.15610%	0.24530%
45	0.17840%	0.26760%
46	0.20070%	0.30105%
47	0.23415%	0.33450%
48	0.27875%	0.36795%
49	0.31220%	0.40140%
50	0.36795%	0.44600%
51	0.43485%	0.49060%
52	0.51290%	0.54635%
53	0.59095%	0.60210%
54	0.68015%	0.65785%
55	0.76935%	0.71360%
56	0.85855%	0.76935%
57	0.95890%	0.82510%
58	1.05925%	0.89200%
59	1.17075%	0.94775%
60	1.28225%	1.00350%
61	1.40490%	1.07040%
62	1.53870%	1.12615%
63	1.68365%	1.17075%
64	1.82860%	1.21535%
65 and Older	0.0%	0.0%

N. Actuarial Methods and Assumptions (cont.)

Table 3

Assumed Salary Increases

Years of Service	Annual Increase
0	8.86%
1	8.59%
2	8.31%
3	8.04%
4	7.77%
5	7.49%
6	7.22%
7	6.94%
8	6.67%
9	6.39%
10	6.12%
11	5.84%
12	5.57%
13	5.29%
14	5.02%
15	4.74%
16	4.54%
17	4.33%
18	4.12%
19	3.91%
20 or more	3.71%

O. Summary of the Principal Plan Provisions

Any ambiguities or questionable provisions of this summary should be resolved by reference to the official Plan Document. This summary is not intended to be a source document, but merely an instrument of convenience for the administration of the Plan.

1. Effective Date: March 24, 1967, most recently amended as of June 26, 2002.
2. Eligibility: Full-time employees hired prior to March 24, 1967 who will have completed 15 years of Credited Service at normal retirement occurring prior to January 1, 1979 or 5 years Credited Service at normal retirement occurring on or after January 1, 1979 became participants on March 24, 1967. Employees hired on or after March 24, 1967 will become participants on their date of employment. A full-time employee is one who works regularly for 20 or more hours each week.
3. Contribution: Philadelphia Gas Works pays the entire cost of the Plan for all employees hired prior to May 21, 2011. Union employees hired on or after May 21, 2011 and Non-Union employees hired on or after December 21, 2011 have the option to participate in the Philadelphia Gas Works Pension Plan and contribute 6% of applicable wages to the Plan, or they may elect to participate in the 401(a) Plan with Philadelphia Gas Works contributing 5.5% of applicable wages.
4. Credited Service: Years and months of service credited prior to March 24, 1967 and years and months of continuous service thereafter; continuous service is reduced for periods of approved unpaid leaves (except for military leave) in excess of one month. Layoff periods are also excluded and, if in excess of one year, when approved, the employee is considered terminated.
5. Final Average Compensation: Average of the five highest calendar years' earnings during the last 10 years of Credited Service. Compensation includes overtime, bonus, shift differential, and any other special compensation. Per the amendment approved on November 14, 1986, compensation includes amounts deferred under the PGW Employees' Deferred Compensation Plan.
6. Retirement Dates
 - a. Normal Retirement: First of the month next following attainment of age 65 and completion of 5 years of Credited Service.
 - b. Early Retirement: First of any month after attaining age 55 and completing 15 years of Credited Service, or after completing 30 years of credited service.
 - c. Late Retirement: First of any month after Normal Retirement up to age 70.
 - d. Disability Retirement: If permanently disabled and has attained age 45 and completed at least 15 years of Credited Service, provided age plus years of Credited Service equals at least 65. Or after completion of at least 20 years of Credited Service regardless of age, upon recommendation of the Medical Director of the Company.

O. Summary of the Principal Plan Provisions (cont.)

7. Benefit Formula

- a. Normal Retirement: The monthly equivalent of the greater of (i) or (ii) below, payable for life.
 - i. 1.25% of the first \$6,600 of Final Average Earnings plus 1.75% of the excess of Final Average Earnings over \$6,600, times Credited Service; maximum of 60% of the highest annual earnings during any one of the last 10 years of Credited Service; applicable to all participants.
 - ii. 2% of total earnings received during period of Credited Service plus 22.5% of the first \$1,200 of such amount; applicable only to participants who were employees on or prior to March 24, 1967.
- b. Early Retirement: Same as 7(a) above, based upon Final Average Earnings and Credited Service as of the early retirement date and reduced by the percentage described in 8 below depending upon Credited Service as of the early retirement date.
- c. Late Retirement: Same as Normal Retirement Benefit based on Final Average Compensation and Credited Service as of Late Retirement Date.
- d. Disability Retirement: Same as Normal Retirement Benefit, based on Final Average Compensation and Credited Service as of date of disability.

8. Benefits Upon Termination of Employment - Vesting: All participants who terminate after having completed at least 5 years of Credited Service are entitled to a benefit as described in 7(a) above, based upon Final Average Compensation and Credited Service as of the date of termination.

Early Commencement of Payments: A former participant who is entitled to a deferred benefit may elect to have his benefit commence on the first day of any month between his 55th and 65th birthdays. Such benefit will be reduced by 3% for each of the first 5 years and 5% for each of the next 5 years by which commencement of payments precedes age 65. If the participant has completed 25 years of Credited Service, his benefit will be unreduced for the first 3 years and reduced by 3% for each of the next 2 years and by 5% for the following 5 years by which commencement of payments precedes age 65.

If a participant has completed 30 or more years of credited service, payments are not reduced.

O. Summary of the Principal Plan Provisions (cont.)

9. Death Benefits

- a. Before Retirement: Spouses of deceased active participants or of former participants are entitled to vested benefits, provided such participants died after having attained age 45 and completed at least 15 years of Credited Service and whose age plus years of Credited Service equals at least 65 years or who have completed at least 15 years of Credited Service regardless of age.

The benefit payable is an amount for the spouse's remaining lifetime equal to the amount the beneficiary of the participant would have received had the participant retired due to disability on the day preceding his death and elected the 100% Contingent Annuitant Option.

- b. After Retirement: None except as provided by election of an optional form.

10. Normal Form of Benefits: Life annuity

11. Optional Benefit Forms: 100%, 75%, or 50% Contingent Annuitant option, 75% or 50% Joint and Last Survivor option.

About Aon

Aon plc (NYSE:AON) is a leading global professional services firm providing a broad range of risk, retirement, and health solutions. Our 50,000 colleagues in 120 countries empower results for clients by using proprietary data and analytics to deliver insights that reduce volatility and improve performance.

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