The Water and Power Employees' Retirement Disability and Death Benefit Insurance Plan

Review of the Death Benefit Fund as of July 1, 2019

This report has been prepared at the request of the Board of Administration to assist in administering the Plan. This valuation report may not otherwise be copied or reproduced in any form without the consent of the Board of Administration and may only be provided to other parties in its entirety, unless expressly authorized by Segal. The measurements shown in this actuarial valuation may not be applicable for other purposes.

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December 13, 2019

Board of Administration
The Water and Power Employees' Retirement Plan of the City of Los Angeles
111 North Hope Street, Room 357
Los Angeles, California 90012

Dear Board Members:

We are pleased to submit this Actuarial Valuation and Review as of July 1, 2019 for the Death Benefit Fund. It summarizes the actuarial data used in the valuation and establishes the funding requirements for July 1, 2019 to June 30, 2020.

This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the Board to assist in administering the Plan. The census information and financial information on which our calculations were based was prepared by the Retirement Office. That assistance is gratefully acknowledged.

The actuarial calculations were directed under the supervision of John Monroe, ASA, MAAA and Enrolled Actuary. We are members of the American Academy of Actuaries and we meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of our knowledge, the information supplied in this actuarial valuation is complete and accurate. Further, in our opinion, the assumptions as approved by the Board are reasonably related to the experience of and the expectations for the Fund.

We look forward to reviewing this report at your next meeting and to answering any questions.

Sincerely,

Segal Consulting, a Member of The Segal Group, Inc.

By:

Paul Angelo, FSA, MAAA, FCA, EA	John Monroe, ASA, MAAA, EA
Senior Vice President and Actuary	Vice President and Actuary

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Section 1: Actuarial Valuation Summary

Purpose and Basis

This report was prepared by Segal Consulting ("Segal") to present a valuation of the Death Benefit Fund as of July 1, 2019. The valuation was performed to determine whether the assets and contribution rates are sufficient to provide the prescribed benefits. The measurements shown in this actuarial valuation may not be applicable for other purposes. In particular, the measures herein are not necessarily appropriate for assessing the sufficiency of current plan assets to cover the estimated cost of settling the plan's accrued benefit obligations.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements; and changes in plan provisions or applicable law.

The contribution requirements presented in this report are based on:

- The benefit provisions of the Fund, as administered by the Retirement Board;
- The characteristics of covered active members, inactive vested members, and retired members and beneficiaries as of March 31, 2019, provided by the Retirement Office;
- The assets of the Fund as of June 30, 2019, provided by the Retirement Office;
- Economic assumptions regarding future salary increases and investment earnings adopted by the Retirement Board for the July 1, 2019 valuation;
- Other actuarial assumptions regarding employee terminations, retirement, death, etc. adopted by the Retirement Board for the July 1, 2019 valuation; and
- The funding policy adopted by the Retirement Board.

One of the general goals of an actuarial valuation is to establish contributions which fully fund the Fund's liabilities, and which, as a percentage of payroll, remain as level as possible for each generation of active members. Annual actuarial valuations measure the progress toward this goal, as well as test the adequacy of the contribution rates.

In preparing this valuation, we have employed generally accepted actuarial methods and assumptions to evaluate the Fund's liabilities and future contribution requirements. Our calculations are based upon member data and financial information provided to us by the Retirement Office. This information has not been audited by us, but it has been reviewed and found to be consistent, both internally and with prior year's information.

The contribution requirements are determined as a percentage of payroll. The Board's employer contribution rates provide for both Normal Cost and a contribution to amortize any unfunded or overfunded actuarial accrued liabilities. In this valuation, we have applied the funding policy adopted by the Retirement Board in 2019. Details of the funding policy are provided in *Section 4, Exhibit I* on pages 31-32.

A schedule of current amortization balances and payments may be found in *Section 3, Exhibit F* on page 26.

The employer contribution rates calculated in this report may be adopted by the Board for the fiscal year that extends from July 1, 2019 through June 30, 2020.

Significant Issues

Ref: Pg. 31-32

1. In prior years, the funding policy for the Death Benefit Fund used a "modified pay as you go" approach. The Board has adopted a new funding policy effective with this valuation that is based on a level cost funding approach using the same funding policy components as the funding policy for the Retirement Fund. Under the new level cost funding approach, the recommended Department contribution will consist of the Normal Cost plus an amortization of the Unfunded Actuarial Accrued Liability (UAAL). Under the funding policy, the UAAL is amortized over 15-year periods, each beginning with the year that portion of the UAAL was first identified and amortized.

Ref: Pg. 18
Ref: Pg. 16

2. As of July 1, 2019, the Fund's actuarial accrued liability is $134.3 million. The Actuarial Value of Assets is $28.5 million and, therefore, the UAAL is $105.7 million. The ratio of the Actuarial Value of Assets to Actuarial Accrued Liability is 21.2%. The ratio of the Market Value of Assets to the Actuarial Accrued Liability is 21.5%.

Ref: Pg. 17

3. The Department's required contribution of $13.4 million is 1.18% as a percentage of payroll for the 2019-2020 plan year. The required contribution is made up of the following components:
   a. Employer normal cost of $4.3 million;
   b. Total of the 15-year UAAL amortization layer payments of $8.9 million; and
   c. Interest on each of the above for one-half year (1.75%) of $0.2 million.
4. The 3.50% discount rate is based on the Death Benefit Fund's current target asset allocation that is virtually all fixed income investments. It reflects expected real returns for that asset class as well as the 2.75% inflation assumption for the July 1, 2019 valuation report.
5. The results of this valuation reflect changes in the economic and demographic assumptions as recommended by Segal and adopted by the Board on June 26, 2019 for the July 1, 2019 valuation. These changes were documented in our *Analysis of Actuarial Experience During the Period July 1, 2015 through June 30, 2018* for The Water and Power Employees' Retirement Plan of the City of Los Angeles dated June 12, 2019 and our supplemental letter dated June 12, 2019 entitled *Review of Investment Return Assumption for Death and Disability Funds*.

6. The Actuarial Standards Board approved a new Actuarial Standard of Practice No. 51 (ASOP 51) regarding risk assessment. ASOP 51 is effective with WPERP's July 1, 2019 actuarial valuation for the Death Benefit Fund. ASOP 51 requires actuaries to identify and assess risks that "may reasonably be anticipated to significantly affect the plan's future financial condition". The key risk that is particularly relevant to the Death Benefit Fund is longevity risk.

   The actuary's initial assessment can be strictly a qualitative discussion about potential adverse experience and the possible effect on future results, but it may also include quantitative numerical demonstrations where informative.

   Since the actuarial valuation results are dependent on a fixed set of assumptions and data as of a specific date, there is risk that emerging results may differ, perhaps significantly, as actual experience is fluid and will not exactly track current assumptions. This potential divergence may have a significant impact on the future financial condition of the plan. We have not been engaged to perform a detailed analysis of the potential range of the impact of risk relative to the future financial condition of the plan, but have included a brief discussion of key risks that may affect the Plan in *Section 2, Subsection G*.

7. The actuarial valuation as of July 1, 2019 is based on financial information as of that date. Changes in the value of assets subsequent to that date are not reflected. Declines in asset values will increase the actuarial cost of the plan, while increases will decrease the actuarial cost of the plan.

Summary of Key Valuation Results

		July 1, 2019 Total Rate (% of Compensation)	July 1, 2019 Estimated Annual Dollar Amount
Required Contribution for plan year beginning July 1:[1]		1.18%	$13,440,562

		July 1, 2019
Actuarial Accrued Liability as of July 1:	• Retired members and beneficiaries	$92,126,194
	• Inactive vested members	4,475,153
	• Active members	37,656,249
	• Total Actuarial Accrued Liability	134,257,596
	• Total Normal Cost (beginning of year) for plan year beginning July 1	4,716,844
Assets as of June 30:	• Market Value of Assets (MVA)	$28,806,740
	• Actuarial Value of Assets (AVA)	28,518,673
Funded status as of July 1:	• Unfunded Actuarial Accrued Liability on Market Value of Assets basis	$105,450,856
	• Funded percentage on MVA basis	21.46%
	• Unfunded Actuarial Accrued Liability on Actuarial Value of Assets basis	$105,738,923
	• Funded percentage on AVA basis	21.24%
Key assumptions:	• Net investment return	3.50%
	• Price inflation	2.75%
	• Projected salary increases[2]	4.50% to 10.25%, varying by service, including inflation

(1) Required contributions are assumed to be paid at the middle of every year.

(2) Includes inflation at 2.75% per year plus real across-the-board salary increases of 0.50% plus merit and promotion increases for 2019.

Summary of Key Valuation Results (continued)

		July 1, 2019
Demographic data as of July 1:	**Active Members:**	
	• Number of members[1]	10,362
	• Average age	47.2
	• Average service	14.6
	• Total projected compensation	$1,141,875,615
	• Average projected compensation	$110,198
	Retired Members and Beneficiaries:	
	• Number of members:	
	– Retired[2]	7,355
	– Beneficiaries[3]	90
	– Total	7,445
	• Average age	72.5
	• Average monthly benefit[4]	$415
	Inactive Vested Members:	
	• Number of members[5]	630
	• Average Age	55.0
	Total Members:	18,437

(1) Includes 1,789 active members who have Supplemental Family Death Benefit (SFDB) coverage for 2019.

(2) Includes 151 retired members who have SFDB coverage for 2019.

(3) Receiving Family Death or Supplemental Family Death benefits.

(4) This is the average monthly benefit for beneficiaries currently receiving Family Death or Supplemental Family Death Benefits.

(5) Includes members receiving Permanent Total Disability (PTD) benefits. Excludes terminated members with less than five years of service who are not eligible for death benefits.

Important Information About Actuarial Valuations

An actuarial valuation is a budgeting tool with respect to the financing of future projected obligations of a pension or postemployment benefit plan. It is an estimated forecast – the actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.

In order to prepare a valuation, Segal Consulting ("Segal") relies on a number of input items. These include:

Plan of benefits	Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. Even where they appear precise, outside factors may change how they operate. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan summary included in our report to confirm that Segal has correctly interpreted the plan of benefits.
Participant data	An actuarial valuation for a plan is based on data provided to the actuary by the Retirement Office. Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. It is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.
Assets	The valuation is based on the Market Value of Assets as of the valuation date, as provided by the Fund. The Fund uses a "Actuarial Value of Assets" that differs from market value to gradually reflect year-to-year changes in the Market Value of Assets in determining the contribution requirements.
Actuarial assumptions	In preparing an actuarial valuation, Segal projects the benefits to be paid to existing plan participants for the rest of their lives and the lives of their beneficiaries. This projection requires actuarial assumptions as to the probability of death, disability, termination, and retirement of each participant for each year. In addition, the benefits projected to be paid for each of those events in each future year reflect actuarial assumptions as to salary increases. The projected benefits are then discounted to a present value, based on the assumed rate of return that is expected to be achieved on the plan's assets. There is a reasonable range for each assumption used in the projection and the results may vary materially based on which assumptions are selected. It is important for any user of an actuarial valuation to understand this concept. Actuarial assumptions are periodically reviewed to ensure that future valuations reflect emerging plan experience. While future changes in actuarial assumptions may have a significant impact on the reported results, that does not mean that the previous assumptions were unreasonable.

The user of Segal's actuarial valuation (or other actuarial calculations) should keep the following in mind:

- The actuarial valuation is prepared at the request of the WPERP. Segal is not responsible for the use or misuse of its report, particularly by any other party.
- An actuarial valuation is a measurement of the plan's assets and liabilities at a specific date. Accordingly, except where otherwise noted, Segal did not perform an analysis of the potential range of future financial measures. The actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan. Future contribution requirements may differ from those determined in the valuation because of:
  - Differences between actual experience and anticipated experience;
  - Changes in actuarial assumptions or methods; and
  - Changes in statutory provisions.
- If the WPERP is aware of any event or trend that was not considered in this valuation that may materially change the results of the valuation, Segal should be advised, so that we can evaluate it.
- Segal does not provide investment, legal, accounting, or tax advice. Segal's valuation is based on our understanding of applicable guidance in these areas and of the plan's provisions, but they may be subject to alternative interpretations. The Fund should look to their other advisors for expertise in these areas.

As Segal Consulting has no discretionary authority with respect to the management or assets of the plan, it is not a fiduciary in its capacity as actuaries and consultants with respect to the plan.

Section 2: Actuarial Valuation Results

A. Member Data

The Actuarial Valuation and Review considers the number and demographic characteristics of covered members, including active members, inactive vested members, retired members and beneficiaries.

This section presents a summary of significant statistical data on these member groups.

More detailed information for this valuation year and the preceding valuation can be found in *Section 3, Exhibits A and B.*

MEMBER POPULATION: 2019

Year Ended June 30	Active Members	Inactive Vested Members	Retired Members and Beneficiaries	Total Non-Actives	Ratio of Non-Actives to Actives	Ratio of Retired Members and Beneficiaries to Actives
2019	10,362	630	7,445	8,075	0.78	0.72

Historical Plan Population

MEMBER STATISTICS: 2019

	Active Participants			Retired Members and Beneficiaries		
Year Ended June 30	Count	Average Age	Average Service	Count	Average Age	Average Monthly Amount[1]
2019	10,362	47.2	14.6	7,445	72.5	$415

[1] This is the average monthly benefit for beneficiaries currently receiving Family Death or Supplemental Family Death Benefits.

B. Financial Information

Retirement plan funding anticipates that, over the long term, both contributions and investment earnings (less investment fees) will be needed to cover benefit payments. Retirement plan assets change as a result of the net impact of these income and expense components.

Additional financial information, including a summary of transactions for the valuation year, is presented in *Section 3, Exhibits C, D and E*.

Please note that, as instructed by Retirement Office staff, we have included all but $0.3 million (1% of the year end market value of assets) as valuation assets.

ALLOCATION OF MARKET VALUE OF ASSETS AS OF JUNE 30, 2019

Estimated Liability for Family Allowances	$4,289,423
Contribution Account for Family Allowances	7,044,579
General Reserve	13,879,500
Total Reserves and Designated Balances	$25,213,502
Unrealized Appreciation/(Depreciation) in the Fair Value of Investments	3,593,238
Total Reserves and Designated balances at Fair Value	$28,806,740

DETERMINATION OF ACTUARIAL VALUE OF ASSETS

1	Market Value of Assets as of June 30, 2019					$28,806,740
2	Calculation of unrecognized return	**Total Actual Market Return (net)**	**Expected Market Return (net)**	**Investment[1] Gain (Loss)**	**Deferred Factor**	**Deferred Return**
a)	Year ended June 30, 2019	N/A	N/A	N/A	N/A	$0
b)	Total unrecognized return[2]					$0
3	Gross Actuarial Value of Assets 1 – 2b					28,806,740
4	1% portion of assets not included as valuation asset					288,067
5	Net Actuarial Value of Assets as of June 30, 2019 3 - 4					$28,518,673
6	Net Actuarial Value of Assets as a percentage of Market Value of Assets 5 ÷ 1					99.0%

(1) Total return minus expected return on a market value basis. As of June 30, 2019, there are no deferred investment gains/losses as the method is effective with this valuation on a prospective basis.

(2) There is no deferred return as of June 30, 2019 to be recognized in future years.

C. Development of Unfunded Actuarial Accrued Liability

DEVELOPMENT FOR YEAR ENDED JUNE 30, 2019

The actuarial factors as of the valuation date are as follows:		
1 Normal cost		$4,716,844
2 Present value of future benefits		192,011,364
3 Present value of future normal costs		57,753,768
4 Actuarial accrued liability		134,257,596
a) Retired members	$87,624,568	
b) Beneficiaries	4,501,626	
c) Inactive members with vested rights	4,475,153	
d) Active members	37,656,249	
5 Actuarial value of assets		28,518,673
6 **Unfunded Actuarial Accrued Liability at end of year**		**$105,738,923**

D. Required Contribution

The required contribution is equal to the employer Normal Cost payment and a payment on the Unfunded Actuarial Accrued Liability. As of July 1, 2019, the recommended employer contribution rate is 1.18% of compensation or $13.4 million in dollars.

The contribution requirement as of July 1, 2019 is based on the data previously described, the actuarial assumptions and plan provisions described in *Section 4*, including all changes affecting future costs adopted at the time of the actuarial valuation, actuarial gains and losses, and changes in the actuarial assumptions.

REQUIRED EMPLOYER CONTRIBUTION FOR YEAR BEGINNING JULY 1

		2019	
		Amount ($ in '000s)	% of Projected Compensation
1	Total Normal Cost	$4,716,844	0.41%
2	Expected member contributions	-377,775	-0.03%
3	Employer Normal Cost: 1 – 2	$4,339,069	0.38%
4	Actuarial Accrued Liability	$134,257,596	
5	Actuarial Value of Assets	28,518,673	
6	Unfunded Actuarial Accrued Liability: 4 – 5	$105,738,923	
7	Amortization payment on Unfunded Actuarial Accrued Liability	8,870,328	0.78%
8	Interest adjustment to middle of year	231,165	0.02%
9	Total required employer contribution:[1] 3 + 7 + 8	$13,440,562	1.18%
10	Projected compensation	$1,141,875,615	

[1] Contributions are assumed to be paid at the middle of the year.

E. Funded Status

A commonly reported piece of information regarding the plan's financial status is the funded ratio. These ratios compare the Market and Actuarial Value of Assets to the Actuarial Accrued Liability of the plan. Higher ratios indicate a relatively well-funded plan while lower ratios may indicate recent changes to actuarial assumptions, funding of the plan below actuarial requirements, poor asset performance, or a variety of other causes.

The funded status measures shown in this valuation are appropriate for assessing the need for or amount of future contributions. However, they are not necessarily appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations.

SCHEDULE OF FUNDING PROGRESS
FOR PLAN YEAR ENDING JUNE 30, 2019

Actuarial Valuation Date as of July 1	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded/ (Overfunded) AAL (UAAL) (b) - (a)	Funded Ratio (%) (a) / (b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll (%) [(b) - (a)] / (c)
2019	$28,518,673	$134,257,596	$105,738,923	21.2%	$1,141,875,615	9.3%

F. Actuarial Balance Sheet

An overview of the plan's funding is given by an Actuarial Balance Sheet. In this approach, first the amount and timing of all future payments that will be made by the plan for current participants is determined. Then these payments are discounted at the valuation interest rate to the date of the valuation, thereby determining the present value, referred to as the Actuarial Present Value of Future Benefits of the plan.

Second, this Actuarial Present Value of Future Benefits is compared to the assets. The "assets" for this purpose include the net amount of assets already accumulated by the plan, the present value of future member and employer Normal Cost contributions, and the present value of future employer amortization payments for the Unfunded Actuarial Accrued Liability.

ACTUARIAL BALANCE SHEET

	July 1, 2019
Actuarial Present Value of Future Benefits	
• Present value of benefits for retired members and beneficiaries	$92,126,194
• Present value of benefits for inactive vested members	4,475,153
• Present value of benefits for active members	$95,410,017
Total Actuarial Present Value of Future Benefits	**$192,011,364**
Current and future assets	
• Total Actuarial Value of Assets	$28,518,673
• Present value of future normal cost contributions	57,753,768
• Present value of future Unfunded Actuarial Accrued Liability contributions	105,738,923
Total of current and future assets	**$192,011,364**

G. Risk Assessment

Since the actuarial valuation results are dependent on a fixed set of assumptions and data as of a specific date, there is risk that emerging results may differ, perhaps significantly, as actual experience is fluid and will not exactly track current assumptions. This potential divergence may have a significant impact on the future financial condition of the plan.

This section does not contain a detailed analysis of the potential range of future measurements, but does include a concise discussion of some of the primary risks that may affect the future financial condition of the Death Benefit Fund. We do not recommend that a more detailed assessment of the risks be performed due to the relatively small liabilities of the death benefits as compared to the main retirement benefits paid by WPERP.

This section provides descriptions and basic assessments of the primary risks that are likely to have an ongoing influence on the financial health of the Death Benefit Fund.

Risk Assessments

- Longevity Risk (the risk that mortality experience will be different than expected)

  The actuarial valuation includes current life expectancy assumptions and an expectation of future improvement in life expectancy, which are significant assumptions given the relatively long duration of liabilities for pension plans. Emerging plan experience that does not match these expectations will result in increases or decreases in the actuarially determined contribution over time. Because the Death Benefit Fund provides for death benefits payable to surviving spouses and children rather than a retirement annuity such as that paid by the Retirement Plan, members living longer than expected generally results in a decrease in liabilities and contribution rates.

- Other Risks

  In addition to longevity, the valuation includes a variety of other assumptions that are unlikely to match future experience exactly. Examples including demographic assumptions such as pre-retirement mortality, retirement, termination and disability assumptions.

Section 3: Supplemental Information

EXHIBIT A – TABLE OF PLAN COVERAGE
TOTAL PLAN

Category	Year Ended June 30, 2019
Active members in valuation:	
• Number[1]	10,362
• Average age	47.2
• Average years of service	14.6
• Total projected compensation	$1,141,875,615
• Average projected compensation	$110,198
Inactive vested members:	
• Number[2]	630
• Average age	55.0
Retired members:	
• Number in pay status[3]	7,355
• Average age	72.9
Beneficiaries:	
• Number in pay status[4]	90
• Average age	36.4
• Average monthly benefit	$415

(1) Includes 1,789 active members who have Supplemental Family Death Benefit (SFDB) coverage for 2019.

(2) Includes members receiving Permanent Total Disability (PTD) benefits. Excludes terminated members with less than five years of service who are not eligible for death benefits.

(3) Includes 151 retired members who have SFDB coverage for 2019.

(4) Receiving Family Death or Supplemental Family Death benefits.

EXHIBIT B – MEMBERS IN ACTIVE SERVICE AS OF JULY 1, 2019
BY AGE, YEARS OF SERVICE, AND AVERAGE PROJECTED COMPENSATION
TOTAL PLAN

	Years of Service									
Age	**Total**	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30 - 34**	**35 - 39**	**40 & over**
Under 25	141	140	1	- -	- -	- -	- -	- -	- -	- -
	$91,126	$91,130	$90,461	- -	- -	- -	- -	- -	- -	- -
25 - 29	641	590	50	- -	- -	- -	- -	- -	- -	- -
	$98,269	$95,878	$125,764	$134,594	- -	- -	- -	- -	- -	- -
30 - 34	981	723	151	106	1	- -	- -	- -	- -	- -
	$100,727	$92,879	$121,665	$124,750	$66,332	- -	- -	- -	- -	- -
35 - 39	1,249	642	135	349	120	3	- -	- -	- -	- -
	$107,668	$92,659	$118,932	$124,598	$125,907	$113,431	- -	- -	- -	- -
40 - 44	1,324	486	103	318	334	82	1	- -	- -	- -
	$108,227	$92,310	$109,580	$114,520	$123,015	$116,045	$122,692	- -	- -	- -
45 - 49	1,413	397	76	257	365	221	88	9	- -	- -
	$108,762	$92,397	$108,361	$109,800	$113,257	$115,085	$143,822	$124,057	- -	- -
50 - 54	1,712	269	64	195	322	180	366	305	11	- -
	$117,254	$95,395	$106,343	$106,639	$109,424	$118,231	$136,259	$130,005	$130,803	- -
55 - 59	1,582	153	56	156	237	136	290	417	135	2
	$118,389	$99,456	$101,833	$105,427	$108,234	$110,007	$121,075	$132,992	$136,937	$128,323
60 - 64	879	60	22	91	121	80	181	184	122	18
	$114,864	$100,146	$114,518	$100,961	$106,923	$106,700	$117,819	$121,424	$128,061	$138,105
65 - 69	333	12	13	33	73	36	50	56	35	25
	$106,303	$89,299	$96,558	$95,031	$100,781	$102,369	$115,587	$113,693	$109,280	$116,909
70 & over	107	3	2	5	16	10	20	18	13	20
	$106,336	$51,912	$69,130	$91,351	$100,431	$104,541	$105,327	$112,601	$123,173	$112,015
Total	**10,362**	**3,475**	**673**	**1,511**	**1,589**	**748**	**996**	**989**	**316**	**65**
	$110,198	**$93,705**	**$114,041**	**$113,501**	**$113,523**	**$113,368**	**$127,483**	**$128,373**	**$129,667**	**$121,624**

EXHIBIT C – SUMMARY STATEMENT OF INCOME AND EXPENSES ON A MARKET VALUE BASIS

		Year Ended June 30, 2019
Net assets at market value at the beginning of the year		**$27,210,220**
Department of Water & Power Contributions:		
• Active members	$2,110,835	
• Retired members (non-contributing)	4,963,513	
• Family death benefit	185,607	
• Administrative expenses	1,517,626	
Net department contribution income		$8,777,581
Contributions from Members:		
• Insured lives' death benefit	$252,939	
• Supplemental family death benefits	105,134	
Net members' contribution		$358,073
Investment income:		
• Net appreciation in fair value of investments	$1,346,590	
• Investment income	981,308	
• Less investment expense	(35,099)	
Net investment income		$2,292,799
Total income available for benefits		**$11,428,453**
Less benefit payments and administrative expense		
• Death benefit (active/retired members)	$(7,685,403)	
• Family allowances	(546,650)	
• Administrative expense	(1,599,880)	
Total payments		**$(9,831,933)**
Change in net assets at market value		**$1,596,520**
Net assets at market value at the end of the year		**$28,806,740**

Note: Results may not add due to rounding.

EXHIBIT D – SUMMARY STATEMENT OF PLAN ASSETS

		June 30, 2019
Cash equivalents		$994,997
Accounts receivable:		
• Department of Water and Power	$1,505,548	
• Accrued investment income	86,518	
• Others	20,044	
Total accounts receivable		$1,612,110
Investments:		
• Fixed income	$30,896,023	
• Short-term investments	$254,304	
Total investments at market value		$31,150,327
Other assets		$0
Total assets		$33,757,434
Accounts payable:		
• Pending investment purchases	$85,993	
• Other	776,220	
• Death claims in process – insured lives	4,088,481	
Total liability		$4,950,694
Net assets at market value		**$28,806,740**
Net assets at actuarial value		**$28,518,673**

Note: Results may not add due to rounding.

EXHIBIT E – DEVELOPMENT OF THE FUND THROUGH JUNE 30, 2019

Year Ended June 30	Market Value of Assets at Beginning of Year	Employer Contributions	Member Contributions	Administrative and Other Expenses	Net Investment Return	Benefit Payments	Market Value of Assets at Year-End
2019	$27,210,220	$8,777,581	$358,073	$1,599,880	$2,292,799	$8,232,053	$28,806,740

EXHIBIT F – TABLE OF AMORTIZATION BASES

Date Established	Source	Initial Amount ($ in '000s)	Initial Period	Outstanding Balance ($ in '000s)	Years Remaining	Amortization Amount[1] ($ in '000s)
July 1, 2019	Initial Amortization	$117,442,917	15	$117,442,917	15	$9,852,164
July 1, 2019	Assumption Changes	(11,703,994)	15	(11,703,994)	15	(981,836)
Total				**$105,738,923**		**$8,870,328**

[1] Level dollar amount as of beginning of year.

EXHIBIT G – DEFINITION OF PENSION TERMS

The following list defines certain technical terms for the convenience of the reader:

Actuarial Accrued Liability for Actives:	The equivalent of the accumulated Normal Costs allocated to the years before the valuation date.
Actuarial Accrued Liability for Pensioners and Beneficiaries:	Actuarial Present Value of lifetime benefits to existing pensioners and beneficiaries. This sum takes account of life expectancies appropriate to the ages of the annuitants and the interest that the sum is expected to earn before it is entirely paid out in benefits.
Actuarial Cost Method:	A procedure allocating the Actuarial Present Value of Future Benefits to various time periods; a method used to determine the Normal Cost and the Actuarial Accrued Liability that are used to determine the recommended contribution.
Actuarial Gain or Loss:	A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two Actuarial Valuation dates. To the extent that actual experience differs from that assumed, Actuarial Accrued Liabilities emerge which may be the same as forecasted, or may be larger or smaller than projected. Actuarial gains are due to favorable experience, e.g., assets earn more than projected. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, actuarial losses are the result of unfavorable experience, i.e., actual results yield actuarial liabilities that are larger than projected.
Actuarially Equivalent:	Of equal Actuarial Present Value, determined as of a given date and based on a given set of Actuarial Assumptions.
Actuarial Present Value (APV):	The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions. Each such amount or series of amounts is: Adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.) Multiplied by the probability of the occurrence of an event (such as survival, death, disability, termination, etc.) on which the payment is conditioned, and Discounted according to an assumed rate (or rates) of return to reflect the time value of money.

Actuarial Present Value of Future Benefits:	The Actuarial Present Value of benefit amounts expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age, anticipated future compensation, and future service credits. The Actuarial Present Value of Future Benefits includes the liabilities for active members, retired members, beneficiaries receiving benefits, and inactive members entitled to a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits and expenses when due.
Actuarial Valuation:	The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan, as well as Actuarially Determined Contributions.
Actuarial Value of Assets (AVA):	The value of the Plan's assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets, but commonly plans use a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the Actuarially Determined Contribution.
Actuarially Determined:	Values that have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the plan.
Actuarially Determined Contribution (ADC):	The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation, determined under the plan's funding policy. The ADC consists of the employer Normal Cost and the Amortization Payment.
Amortization Method:	A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the Unfunded Actuarial Accrued Liability. Under the Level Percentage of Pay method, the Amortization Payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the Unfunded Actuarial Accrued Liability. Under the Level Percentage of Pay method, the stream of payments increases at the assumed rate at which total covered payroll of all active members will increase.
Amortization Payment:	The portion of the pension plan contribution, or ADC, that is intended to payoff the Unfunded Actuarial Accrued Liability.

Assumptions or Actuarial Assumptions:	The estimates upon which the cost of the plan is calculated, including: Investment return - the rate of investment yield that the plan will earn over the long-term future; Mortality rates - the rate or probability of death at a given age for employees and pensioners; Retirement rates - the rate or probability of retirement at a given age or service; Disability rates – the rate or probability of disability retirement at a given age; Termination rates - the rate or probability at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement; Salary increase rates - the rates of salary increase due to inflation, real wage growth and merit and promotion increases.
Closed Amortization Period:	A specific number of years that is counted down by one each year, and therefore declines to zero with the passage of time. For example, if the amortization period is initially set at 20 years, it is 19 years at the end of one year, 18 years at the end of two years, etc. See Open Amortization Period.
Decrements:	Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or termination.
Defined Benefit Plan:	A retirement plan in which benefits are defined by a formula based on the member's compensation, age and/or years of service.
Defined Contribution Plan:	A retirement plan, such as a 401(k) plan, a 403(b) plan, or a 457 plan, in which the contributions to the plan are assigned to an account for each member, the plan's earnings are allocated to each account, and each member's benefits are a direct function of the account balance.
Experience Study:	A periodic review and analysis of the actual experience of the plan that may lead to a revision of one or more actuarial assumptions. Actual rates of decrement and salary increases are compared to the actuarially assumed values and modified based on recommendations from the Actuary.
Funded Ratio:	The ratio of the Actuarial Value of Assets (AVA) to the Actuarial Accrued Liability (AAL). Plans sometimes also calculate a market funded ratio, using the Market Value of Assets (MVA), rather than the AVA.
Investment Return:	The rate of earnings of the plan from its investments, including interest, dividends and capital gain and loss adjustments, computed as a percentage of the average value of the fund. For actuarial purposes, the investment return often reflects a smoothing of the capital gains and losses to avoid significant swings in the value of assets from one year to the next.
Normal Cost:	The portion of the Actuarial Present Value of Future Benefits allocated to a valuation year by the Actuarial Cost Method. Any payment with respect to an Unfunded Actuarial Accrued Liability is not part of the Normal Cost (see Amortization Payment). For pension plan benefits that are provided in part by employee contributions, Normal Cost refers to the total of member contributions and employer Normal Cost unless otherwise specifically stated.

Open Amortization Period:	An open amortization period is one which is used to determine the Amortization Payment but which does not change over time. If the initial period is set as 30 years, the same 30-year period is used in each future year in determining the Amortization Period.
Unfunded Actuarial Accrued Liability:	The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. This value may be negative, in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, also called the Funding Surplus or an Overfunded Actuarial Accrued Liability.
Valuation Date or Actuarial Valuation Date:	The date as of which the value of assets is determined and as of which the Actuarial Present Value of Future Benefits is determined. The expected benefits to be paid in the future are discounted to this date.

Section 4: Actuarial Valuation Basis

EXHIBIT I – ACTUARIAL ASSUMPTIONS AND METHODS

Rationale for Assumptions: The information and analysis used in selecting each assumption that has a significant effect on this actuarial valuation is generally shown in the July 1, 2015 through June 30, 2018 Actuarial Experience Study and our supplemental letter entitled Review of Investment Return Assumption for Death and Disability Funds both dated June 12, 2019. All actuarial assumptions and methods shown below apply to both Tier 1 and Tier 2 members.

<u>Actuarial Assumptions</u>

Net Investment Return: 3.50%, net of investment expenses.

Family Composition at Death for Active Members:

Plan	Not Married No Children	Not Married One Child	Not Married 2+ Children	Married No Children	Married One Child	Married 2+ Children	Married; One Disabled Child	1st Child's Age	2nd Child's Age
Family Death Benefits	20%	5%	7%	16%	15%	30%	7%	10	8
Supplemental Family Death Benefits	0%	15%	17%	0%	22%	39%	7%	10	8

The member's age at death is assumed to occur before age 55. No benefits are assumed to be payable upon deaths of active members age 55 or over or deaths of inactive vested members (receiving a Permanent Total Disability benefit) or retirees at any age.

Healthy child payments are assumed to end when the child reaches age 18. Disabled child payments are assumed to continue for life.

Other Actuarial Assumptions: Same as those used in July 1, 2019 actuarial valuation report for the Retirement Plan.

<u>Actuarial Funding Policy</u>

Actuarial Value of Assets: The market value of assets less unrecognized returns in each of the last five years. Unrecognized return is equal to the difference between the actual and expected returns on a market value basis and is recognized over a five-year period. As directed by the Retirement Office, the actuarial value of assets is reduced by 1% as an amount classified as a non-valuation reserve to develop the net actuarial value of assets.

Actuarial Cost Method:	Entry Age Actuarial Cost Method. Entry Age equals attained age less years of service. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are based on costs allocated as a level percent of salary, with Normal Cost determined as if the current benefit accrual rate had always been in effect (“replacement life within each tier”).
Amortization Policy:	The July 1, 2019 Unfunded Actuarial Accrued Liability is amortized over a fifteen-year period commencing July 1, 2019 (fully amortized as of July 1, 2034). Any subsequent changes in Surplus or Unfunded Actuarial Accrued Liability are amortized over separate fifteen-year periods. All amortization amounts are determined in equal dollar amounts over the amortization period. The Board may, by resolution, adopt a separate period of not more than thirty years to amortize the change in Surplus or Unfunded Actuarial Accrued Liability resulting from an unusual event, plan amendment or change in assumptions or methods.
Changed Actuarial Assumptions:	Same as those shown in the July 1, 2019 actuarial valuation report for the Retirement Plan except for net investment return.

EXHIBIT II – SUMMARY OF PLAN PROVISIONS

Plan Year:	July 1 through June 30
Covered Members:	
Age and Service Requirement for Family Death Benefit	Pre-retirement death of an active member at any age who is a full member of WPERP and was contributing to WPERP. If death occurs after retirement, must be receiving a retirement monthly retirement allowance from WPERP and had at least five years of Department Service at retirement.
Age and Service Requirement for Supplemental Family Death Benefit	Pre-retirement death of an active member at any age who is a full member of WPERP and was contributing to WPERP or post-retirement death of retired member receiving monthly retirement allowance from WPERP. Must be enrolled and make contributions by payroll deductions for 39 successive biweekly payroll periods (approximately 18 months) before coverage becomes effective.
Other Requirements for Family Death Benefit and Supplemental Family Death Benefit	The plan provides a monthly benefit for each surviving child that is: • the naturally or legally adopted child of the member • is under 18 and unmarried, or • disabled and over age 18 (only if the disability occurred before age 18) and unmarried.
Insured Lives Death Benefit (Contributing Active Members)	Any age with six months of continuous service. Pre-retirement death of an active member who is a full member of WPERP and was contributing to WPERP.
Insured Lives Death Benefit (Non-Contributing Retired Members)	Death occurs after retirement and member was receiving a retirement monthly allowance from WPERP and had at least five years of Department Service at retirement.
Member Contribution Rate:	
Family Death Benefit	None.
Supplemental Family Death Benefit	$2.25 per biweekly period (or $4.90 per month if retired).
Insured Lives Death Benefit (Contributing Active Members)	$1.00 per biweekly payroll period.
Insured Lives Death Benefit (Non-Contributing Retired Members)	None.
Department Contribution Rate:	The Department of Water and Power makes actuarially determined contributions that consist of the Normal Cost plus an amortization of the Unfunded Actuarial Accrued Liability as described in further detail in Exhibit I.

Benefit	
Family Death Benefit	The monthly benefit is the sum of: • $416 per month to each surviving child, plus • $416 per month to spouse (if the member's spouse has care of one or more of the member's eligible children) limited so that the total amount payable cannot exceed $1,170 per month. In addition, the spouse's portion will not be paid if the spouse is receiving a Survivor's Optional Death Benefit Allowance or an Eligible Spouse Allowance from the Retirement Plan. The benefit is no longer payable when the member's children no longer satisfy the eligibility requirements noted above
Supplemental Family Death Benefit	The monthly benefit is the sum of: • $520 per month to each surviving child, plus • $520 per month to spouse (if the member's spouse has care of one or more of the member's eligible children) limited so that the total amount payable cannot exceed $1,066 per month. In addition, the spouse's portion will not be paid if the spouse is receiving a Survivor's Optional Death Benefit Allowance or an Eligible Spouse Allowance from the Retirement Plan. The benefit is no longer payable when the member's children no longer satisfy the eligibility requirements noted above.
Insured Lives Death Benefit (Contributing Active Members)	A single sum distribution equal to 14 times monthly salary. In addition to this Insured Lives Death Benefit, death benefits payable from the Retirement Plan are payable to the beneficiary (not valued in this valuation).
Insured Lives Death Benefit (Non-Contributing Retired Members)	A single sum distribution equal to 14 times the member's Full Retirement Allowance (to a maximum of $20,000). In addition to this Insured Lives Death Benefit, death benefits payable from the Retirement Plan include any unpaid Retirement Plan allowances due and the balance of contributions remaining in the Retirement Plan if Option A was the member's selected method of pension payment all of which is payable to beneficiary (not valued in this valuation).
Changes in Plan Provisions:	There were no changes in plan provisions.

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