

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

Review of the Disability Fund as of July 1, 2018

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January 3, 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 review of the Disability Fund as of July 1, 2018. It establishes the funding requirements for fiscal year 2018-2019 and analyzes the preceding year's experience.

This review has been completed in accordance with generally accepted actuarial principles and practices. The census and financial information on which our calculations were based was prepared by the Retirement Office. That assistance is gratefully acknowledged.

The measurements shown in this review may not be applicable for other purposes. 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 (such as the end of an amortization period); and changes in plan provisions or applicable law.

The actuarial calculations were completed under the supervision of John Monroe, ASA, MAAA, 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 review 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 Funds.

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
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SECTION 1: Review Summary

Significant Issues in Review Year:

- Ref: Pg. 14* ➤ The Temporary Disability benefits and Permanent Total Disability benefits are included in this review. The funding for the Temporary Disability Benefit includes both the Temporary Disability Benefit and the Extended Temporary Disability Benefit. Only the Supplemental Industrial Disability benefit is funded by the Department on a “pay-as-you-go” basis. All the disability benefits are summarized in Section 3 of this report.
- Ref: Pg. 3*
Ref: Pg. 2 ➤ The total reserve for the disability benefits has decreased from \$47.2 million on June 30, 2017 to \$46.4 million on June 30, 2018. Member contributions amounted to about \$473,000 for the 2016-2017 fiscal year and \$493,000 for the 2017-2018 fiscal year. Department contributions amounted to about \$16.4 million for 2016-2017 fiscal year and about \$16.5 million for the 2017-2018 fiscal year.
- Ref: Pg. 8* ➤ The General Reserve for the Temporary Disability Benefit Fund increased from \$1.0 million as of June 30, 2017 to about \$2.1 million as of June 30, 2018. See Section 2.C for details.
- Ref: Pg. 5* ➤ The recommended Department contribution rate for the Temporary Disability Benefit Fund has decreased from \$1.44 per \$100 of compensation to \$1.31 per \$100 of compensation. See Section 2.B for details.
- For purposes of determining the contribution rate for the Temporary Disability Benefit Fund, there is one year remaining on the funding period to reach the target reserve level. This is consistent with the Board action in 2009 to adopt a Department contribution rate based on a funding period that would initially start at ten years. The General Reserve is greater than the target reserve level as of June 30, 2018.
- Ref: Pg. 10* ➤ The recommended Department contribution rate for the Permanent Total Disability Fund remains at \$0 per \$100 of compensation.

The Board should consider authorizing a review of the funding methods and reserving policies for this Fund. In particular, the Board may wish to consider a level cost funding approach consistent with that used by the Retirement Plan. The current funding period to reach the target reserve level has only one year remaining, so some review of funding policy will be needed in any case.

SECTION 1: Review Summary

Important Information about Actuarial Valuations

An actuarial valuation is a budgeting tool with respect to the financing of future projected obligations of a pension 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 an actuarial 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. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan description in this 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** This valuation is based on the market value of assets as of the valuation date, as provided by the Retirement Office.
- **Actuarial assumptions** There is a reasonable range for each assumption used 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 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.
- 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.

SECTION 1: Review Summary

- If 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 WPERP 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 WPERP, it is not a fiduciary in its capacity as actuaries and consultants with respect to WPERP.

SECTION 2: Disability Fund

A. INTRODUCTION AND CONSOLIDATED FINANCIAL INFORMATION

In this section, we give a general description of the method used to fund the various disability benefits of the Department of Water and Power. Under the funding method used, the total annual contribution to the Disability Fund equals the present value of all future payments for those expected to become disabled during the year, with a further adjustment for any interest credited to the reserves. The present value referred to is for disabilities that “accrue” in a given year and is called the “incurred claims” for the year.

Under this funding method no reserves are expected to accumulate to help cover future claims beyond those incurred during the forthcoming year.

The incurred claims for a year are estimated as the paid claims for the year plus the increase in claim reserves from one fiscal year-end to another. The claim reserve as of any year-end is the present value of all future disability payments on all claims that remain “open” (i.e., still disabled).

Amounts of paid claims, open claims (number and amount), and the general reserves are provided by the Retirement Office, and accepted by Segal Consulting without audit.

The total annual contribution to the Disability Fund is levied as a dollar rate per \$100 of covered compensation. There are separate rates for Temporary Disability and Permanent Total Disability; these rates in turn are split between employees and the Department of Water and Power. Employees pay \$1.00 each biweekly payroll period for both Temporary and Permanent Disability benefits.

In subsequent pages we recommend contribution rates for the various benefits based on a review of the past experience of the funds. We present tables that show the actual annual rate per \$100 of covered payroll. However, there has been substantial fluctuation in these rates over the years. Accordingly, we recommend a rate that, in our judgment, reflects a reasonable balance of recent experience and probable future trends.

Our recommended contribution rates also are designed to maintain a general reserve for each fund. The general reserve is maintained primarily to provide funds in the event of adverse experience. In subsequent pages, we state a recommended level for each general reserve that is based on historical practices. However, in practice the general reserve is set equal to any balance of funds at book value available over claim reserves. Thus, it is unlikely that the general reserve will be exactly at recommended levels at any given time. Rather, the recommended level should be regarded as a long-term goal for the general reserve.

In 2016 the Board adopted a resolution to lower the annual interest rate assumption from 4.00% to 3.50% effective with the July 1, 2016 valuation.

In the following sections, we present our detailed analysis of the Temporary Disability Benefits and the Permanent Total Disability Benefits.

SECTION 2: Disability Fund

CHART 1

Consolidated Summary Statement of Income and Expenses

	Year Ended June 30, 2018	Year Ended June 30, 2017
Contribution income:		
Employer contributions – temporary disability benefit	\$14,103,745	\$14,265,345
Employer contributions – permanent total disability benefit	0	0
Employer contributions – supplemental disability benefit	1,497,638	1,233,786
Employer contributions - administrative expenses	<u>897,795</u>	<u>866,534</u>
Total employer contribution income	\$16,499,178	\$16,365,665
Employee contributions – temporary disability benefit	\$249,642	\$238,341
Employee contributions – permanent total disability benefit	<u>243,575</u>	<u>234,419</u>
Total employee contribution income	\$493,217	\$472,760
Investment income:		
Investment income	\$1,001,807	\$787,201
Net appreciation (depreciation) in market value	(1,117,049)	(823,457)
Less investment fees	<u>(43,793)</u>	<u>(43,481)</u>
Net investment income	<u>(\$159,035)</u>	<u>(\$79,737)</u>
Total income available for benefits	\$16,833,360	\$16,758,688
Less benefit payments:		
Distributions – temporary disability benefit	\$12,989,490	\$12,766,755
Distributions – extended temporary disability benefit	379,185	484,249
Distributions – permanent total disability benefit	1,853,258	1,700,103
Distributions – supplemental disability benefit	<u>1,497,638</u>	<u>1,233,786</u>
Total distributions	\$16,719,571	\$16,184,893
Administrative expenses	<u>895,315</u>	<u>865,322</u>
Total deductions	\$17,614,886	\$17,050,215
Net increase (decrease) in reserve	(\$781,526)	(\$291,527)

SECTION 2: Disability Fund

CHART 2
Consolidated Summary Statement of Plan Assets

	Year Ended June 30, 2018	Year Ended June 30, 2017
Cash equivalents	\$1,292,540	\$3,139,543
Accounts receivable:		
Employer contributions	\$2,867,535	\$2,558,855
Accrued investment income	92,379	79,650
Other	1,751,910	855,379
Contingent disability benefit advance	<u>3,310,339</u>	<u>3,310,339</u>
Total accounts receivable	\$8,022,163	\$6,804,223
Investments:		
Fixed income	\$37,327,310	\$37,446,312
Short-term investments	<u>245,110</u>	<u>241,535</u>
Total investments at market value	<u>\$37,572,420</u>	<u>\$37,687,847</u>
Total assets	\$46,887,123	\$47,631,613
Less accounts payable:	(\$473,246)	(\$436,210)
Net assets at market value	<u>\$46,413,877</u>	<u>\$47,195,403</u>

SECTION 2: Disability Fund

B. TEMPORARY AND EXTENDED TEMPORARY DISABILITY BENEFITS

The Temporary Disability Benefits referred to in this section normally commence on the fifteenth calendar day of disability and terminate at the end of the twelfth month of disability. The monthly benefit is 40% to 85% of

compensation, depending on length of service and disability. In the table that follows on page 6, we set forth a summary of the cost of the Temporary Disability Benefits from inception of the Plan to June 30, 2018.

CHART 3

Rates of Contribution per \$100 of Compensation for Temporary and Extended Temporary Disability Benefits

As of June 30	Rates Per \$100 of Compensation		
	By Member	By Department	Total
1939 - 1940	\$.36	\$.24	\$.60
1941 - 1943	.47	.31	.78
1943 - 1948	.39	.26	.65
1948 - 1954	.59	.39	.98
1954 - 1957	.47	.31	.78
1958 - 1959	.36	.24	.60
1960 - 1974	.27	.18	.45
1975 - 1976	.39	.26	.65
1976 - 1981	.45	.30	.75
1981 - 1988	*	*	.75
1988 - 1993	*	*	.61
1994	*	*	.45
1995 - 1996	*	*	.35
1997	*	*	.30
1998 - 1999	*	*	.25
2000 - 2001	*	*	.35
2002 - 2004	*	*	.68
2005 - 2006	*	*	.74
2007	*	*	1.55
2008	*	*	2.18
2009	*	*	1.73
2010	*	*	1.37
2011	*	*	1.32
2012	*	*	1.46
2013	*	*	1.55
2014	*	*	1.54
2015	*	*	1.68
2016	*	*	1.74
2017	*	*	1.55
2018	*	*	1.47

* From January 1980 to January 1984, employees paid \$1 per month and the Department paid the balance of the total rate. As of January 1984, the employee amount was increased to \$1 per biweekly payroll period.

SECTION 2: Disability Fund

For Temporary and Extended Temporary Disability, the claim reserve is calculated as the sum of:

1. The open claim reserve, which is the number of open claims times the reserve factor specified in Section III D (2) of the Plan, and
2. The pending claim reserve, which is 1/26 of the benefits paid during the preceding fiscal year.

Incurred claims at an annual rate per \$100 of covered payroll are calculated as described in Section 2.A. and Section 3, Exhibit I. Since 1980, the goal for the general reserve has been to maintain it at approximately 20% of the claim reserve (\$4,911,780 as of June 30, 2018). Thus, the “target” is equal to \$982,356 (20% x \$4,911,780), as compared to the actual general reserve of \$2,118,648 as of June 30, 2018. Therefore, as of June 30, 2018, the current reserve surpasses the funding target by \$1,136,292. The current policy is to fund so as to reach the funding target by June 30, 2019 (i.e., 10 years from June 30, 2009).

In 2000, \$11 million was transferred over from the Permanent Total Disability Fund and the entire Temporary and Extended Temporary Disability Benefit became payable from this Fund. The Temporary Disability Experience Table indicates that, since 2000, the average cost per \$100 of covered payroll is \$1.43 before taking into account interest on the general reserve.

Based on reserves as of June 30, 2018, the expected interest credit for the next year is \$0.01 per \$100 of covered payroll (assuming a 3.50% investment return). Thus, the net average rate per \$100 of covered payroll is also \$1.42. From 2000 through 2007, the general reserve followed a decreasing trend due to the contribution rates

being lower than the increased claim rates. However, this trend reversed itself during 2008 through 2010 and then decreased during 2010 to 2012. During 2013, the General Reserve increased due to a decrease in the claim reserve and a decrease in benefit payments. During 2014, the General reserve decreased due to an increase in the claims reserve and the increase in benefit payments. During 2015 to 2018, the general reserve increased due to the contribution rates being higher than the claim rates. The claim reserve is slightly increased from the last year due to an increase in the reserve factor determined by the Retirement office as noted below.

As noted above, the total contribution rate needed to pay for expected claims is \$1.43 per \$100 of covered payroll. In order to reduce the general reserve to the target level over the current policy period of one year, we recommend a total contribution of \$1.34 per \$100 of covered payroll. After taking into account the employee contribution of \$1 per biweekly payroll period (which amounts to approximately \$0.03 per \$100 of covered payroll), the net recommended Department rate is \$1.31. This is a decrease from the current rate, which is \$1.44.

Pursuant to Section III D (2) of the Plan, the Temporary Disability claim reserve at the end of each year is determined by multiplying the number of open claims at the end of the year by a reserve factor of \$18,400 for 2018. This is comparable to \$18,700 for 2016 and \$18,100 for 2017. The current reserve factor of \$18,400 was provided by the Retirement Office, and accepted by Segal without audit.

SECTION 2: Disability Fund

C. TEMPORARY DISABILITY EXPERIENCE TABLE

Year Ending June 30	Covered Payroll	Claims and Expenses Paid	Claims and Expenses Incurred	Annual Rate of Incurred Claims and Expenses Per \$100 of Covered Payroll	Cumulative Rate of Incurred Claims and Expenses Per \$100 of Covered Payroll	General Reserve
1939	\$ 9,705,000	\$ 33,138	\$ 44,138	.45	.45	\$ 14,090
1940	14,015,000	60,138	65,797	.47	.46	45,061
1941	13,350,000	73,867	78,867	.59	.51	70,323
1942	13,415,000	79,870	79,870	.60	.53	95,090
1943	12,645,000	87,933	87,933	.70	.56	89,351
1944	12,400,000	108,197	113,197	.91	.62	56,753
1945	12,396,000	98,138	104,138	.84	.65	33,189
1946	15,293,000	123,539	123,539	.81	.68	9,056
1947	20,027,000	156,483	165,483	.83	.70	(8,741)
1948	23,316,000	161,558	158,558	.68	.70	61,194
1949	27,386,000	157,975	155,975	.57	.68	173,506
1950	30,105,000	163,475	175,476	.58	.66	293,063
1951	30,130,000	180,286	177,286	.59	.65	411,057
1952	37,792,000	204,381	208,381	.55	.64	573,038
1953	40,678,000	228,354	262,354	.64	.64	757,895
1954	44,915,000	255,289	244,289	.54	.63	892,666
1955	50,632,000	241,898	215,898	.43	.60	1,102,717
1956	53,988,000	244,824	242,824	.45	.59	1,317,674
1957	56,225,000	268,883	280,883	.50	.58	1,419,437
1958	63,087,000	286,924	291,924	.46	.56	1,557,783
1959	65,930,000	368,644	414,644	.63	.57	1,578,671
1960	65,993,000	388,060	305,260	.46	.56	1,628,091
1961	68,055,000	381,033	380,833	.56	.56	1,611,264
1962	73,192,000	393,013	404,413	.55	.56	1,593,485
1963	78,546,000	500,671	512,371	.65	.57	1,491,219
1964	83,672,000	562,565	518,765	.62	.57	1,401,956
1965	87,976,000	536,280	543,480	.62	.58	1,304,304
1966	92,885,000	554,020	548,920	.59	.58	1,220,641
1967	98,253,000	566,985	580,185	.59	.58	1,127,344
1968	103,283,000	634,571	633,871	.61	.58	999,592

SECTION 2: Disability Fund

C. TEMPORARY DISABILITY EXPERIENCE TABLE (continued)

Year Ending June 30	Covered Payroll	Claims and Expenses Paid	Claims and Expenses Incurred	Annual Rate of Incurred Claims and Expenses Per \$100 of Covered Payroll	Cumulative Rate of Incurred Claims and Expenses Per \$100 of Covered Payroll	General Reserve
1969	\$111,396,000	\$ 704,242	\$ 703,542	\$.63	\$.58	\$ 833,701
1970	121,866,000	767,820	775,170	.64	.59	637,461
1971	131,730,000	889,228	897,478	.68	.59	354,292
1972	140,154,000	859,374	864,575	.62	.60	132,771
1973	143,834,000	1,011,796	1,034,196	.72	.61	(253,712)
1974	146,962,000	1,140,512	1,175,512	.80	.62	(483,644)
1975	156,628,000	1,190,786	1,206,236	.77	.63	(702,745)
1976	163,951,000	1,304,122	1,325,572	.81	.64	(852,027)
1977	165,258,000	1,300,411	1,312,161	.79	.65	(959,819)
1978	172,256,000	1,404,379	1,393,979	.81	.66	(1,103,713)
1979	177,648,000	1,378,601	1,410,042	.79	.67	(107,066)
1980	175,962,000	1,400,805	1,350,503	.77	.67	(132,312)
1981	202,902,000	1,496,480	1,514,388	.75	.68	64,895
1982	245,734,000	1,394,848	1,438,322	.59	.67	505,214
1983	274,644,000	1,687,704	1,678,899	.61	.67	957,656
1984	288,311,000	1,789,909	1,864,263	.65	.67	1,370,865
1985	310,359,000	1,975,135	1,977,432	.64	.66	1,875,475
1986	327,365,000	2,210,661	2,251,124	.69	.67	2,157,948
1987	360,065,000	1,969,935	2,005,236	.56	.66	2,728,701
1988	400,537,000	2,290,491	2,260,068	.56	.65	3,348,749
1989	394,086,000	2,261,337	2,248,205	.57	.64*	3,849,928
1990	411,248,000	2,171,299	2,160,636	.53	.62*	4,580,470
1991	402,648,000	2,233,586	2,194,051	.54	.59*	5,286,005
1992	475,252,000	2,354,177	2,375,545	.50	.59*	6,298,902
1993	464,000,000	2,348,727	2,373,719	.51	.58*	6,888,804
1994	470,000,000	2,516,640	2,567,498	.55	.57*	6,709,671
1995	450,713,000	2,964,258	2,933,789	.65	.57*	5,845,370
1996	441,956,000	2,225,030	2,076,306	.47	.54*	5,593,988
1997	472,678,000	2,019,565	2,016,440	.43	.53*	5,286,560
1998	417,262,000	2,416,341	2,473,601	.59	.53*	4,210,250

SECTION 2: Disability Fund

C. TEMPORARY DISABILITY EXPERIENCE TABLE (continued)

Year Ending June 30	Covered Payroll	Claims and Expenses Paid	Claims and Expenses Incurred	Annual Rate of Incurred Claims and Expenses Per \$100 of Covered Payroll	Cumulative Rate of Incurred Claims and Expenses Per \$100 of Covered Payroll	General Reserve
1999	\$355,148,948	\$1,858,677	\$2,016,329	\$.57	\$.53*	\$ 3,371,035
2000	369,509,233	4,682,621	4,809,494	1.30	1.30**	13,339,138***
2001	403,265,472	4,211,036	4,426,638	1.10	1.20**	11,141,509
2002	430,397,884	4,584,284	4,528,640	1.05	1.15**	9,999,795
2003	472,432,303	5,306,242	5,388,510	1.14	1.15**	8,353,541
2004	522,227,280	6,210,253	6,246,423	1.20	1.16**	5,966,023
2005	554,839,816	7,298,197	7,480,641	1.35	1.19**	2,715,895
2006	574,315,572	8,897,820	9,028,144	1.57	1.24**	(2,009,091)
2007	604,514,525	9,502,988	9,556,168	1.58	1.29**	(4,328,285)
2008	623,634,208	9,578,292	9,540,484	1.53	1.31**	(1,103,230)
2009	696,704,083	8,889,938	9,337,463	1.34	1.32**	2,719,985
2010	767,912,436	10,947,771	11,262,418	1.47	1.33**	3,006,739
2011	791,760,493	11,720,424	13,268,642	1.68	1.36**	421,664
2012	805,607,436	12,469,833	13,051,706	1.62	1.38**	(1,243,338)
2013	817,421,028	12,130,514	11,770,414	1.44	1.38**	(538,036)
2014	819,923,866	14,171,121	14,648,006	1.79	1.41**	(2,476,726)
2015	839,213,254	13,158,645	13,500,304	1.61	1.42**	(2,270,074)
2016	861,818,854	12,614,416	12,573,684	1.46	1.43**	19,712
2017	892,332,196	13,251,004	13,616,488	1.53	1.43**	1,003,421
2018	953,635,670	13,368,674	13,390,600	1.40	1.43**	2,118,648

* Average of ten most recent rates prior to the addition of the entire Temporary and Extended Temporary Disability Benefit.

** Average of rates after addition of the entire Temporary and Extended Temporary Disability Benefits.

*** In 2000, \$11 million was transferred from the Permanent Total Disability Fund. Starting in 2000, the entire Temporary and Extended Temporary Disability Benefit became payable from this Fund.

Note: Starting in 1987, expenses are not included.

SECTION 2: Disability Fund

D. PERMANENT TOTAL DISABILITY BENEFITS

Permanent Total Disability Benefits may commence as early as the thirteenth month of disability or as late as the twenty-fifth month, depending on the member’s condition and Extended Temporary Disability Coverage. The monthly benefit is an amount equal to 40% of the member’s compensation. Cost-of-living benefits, with a

3% maximum increase per year (similar to those provided to service retirees), were adopted as of April 1, 1970.

The table on page 11 summarizes the cost of Permanent Total Disability Benefits from inception of the Plan to June 30, 2018.

CHART 4

Rates of Contribution per \$100 of Compensation for Permanent Total Disability Benefits

As of June 30	Rates Per \$100 of Compensation		
	By Member	By Department	Total
1938 – 1942	\$.62	\$.41	\$ 1.03
1942 – 1947	.52	.34	.86
1947 – 1953	.62	.41	1.03
1953 – 1956	.52	.34	.86
1956 – 1959	.36	.24	.60
1959 – 1969	.21	.14	.35
1969 – 1973	.12	.08	.20
1973 – 1975	.24	.16	.40
1975 – 1980	.36	.24	.60
1980 – 1981	*	*	.60
1981 – 1987	*	*	.55
1987 – 1992	*	*	.25
1992– 1998	*	*	.05
1998– 2018	*	.00	*

* From January 1980 to January 1984, employees paid \$1 per month and the Department paid the balance of the total rate. As of January 1984, the employee amount was increased to \$1 per biweekly payroll period.

SECTION 2: Disability Fund

For Permanent Total Disability Benefit, the claim reserve is calculated as the sum of:

1. The open (or reported) claim reserve, which is the present value of future disability benefits for open claims, and
2. The pending claim reserve, which is the contributions made during the fiscal year.

The rate of interest used by the Board in the present value calculation is 3.50%. Beginning in 1983, the present value calculation also reflects 3% cost-of-living increases. The incurred claims and the annual experience rate per \$100 of covered payroll were calculated as described in Section 2.A. and Section 3, Exhibit III. The current goal for the general reserve is that it be maintained at approximately 20% of the claim reserve (\$12,547,069 as of June 30, 2018).

For several years, the Permanent Total Disability Experience Table has shown a downward trend in the annual cost per \$100 of covered payroll. In 1983, the claim cost returned to earlier levels, but this was artificially high due to the change in reflecting cost-of-living increases. It appears that the Fund has reached a somewhat stable cumulative rate of claim costs, although year-by-year costs are still fluctuating.

As of June 30, 2018, the general reserve for Permanent Total Disability is \$21,304,975. This is much larger than the amount needed to meet the 2018 goal for the reserve, which is \$2,509,414 (20% x \$12,547,069). Also, it should be noted that expected interest on the general reserve (which amounts to \$745,674, or \$0.08 per \$100 of covered payroll, based on the reserve as of June 30, 2018 and 3.50% interest) is not reflected in the annual rate shown in the experience table.

If no expected interest on the general reserve had been taken into account, the average annual rate of contribution would have been \$0.28 per \$100 of covered payroll over the last 20 years, and the annual rate of contribution as of June 30, 2018 would have been \$0.27 per \$100 of covered payroll. The expected interest on the reserves (\$0.08 per \$100 of covered payroll) would reduce the \$0.28 per \$100 of payroll and \$0.27 per \$100 of payroll contribution rates to \$0.20 and \$0.19, respectively.

The general reserve is so large that interest alone is expected to be enough to pay a significant portion of the claims for many years to come. Thus, we recommend that the Board maintain the Department contribution of zero cents per \$100 of covered compensation so that the general reserve can be reduced closer to its target level.

SECTION 2: Disability Fund

E. PERMANENT TOTAL DISABILITY EXPERIENCE TABLE

Year Ending June 30	Covered Payroll	Claims and Expenses Paid	Claims and Expenses Incurred*	Annual Rate of Incurred Claims and Expenses Per \$100 of Covered Payroll*	Cumulative Rate of Incurred Claims and Expenses Per \$100 of Covered Payroll	General Reserve
1939	\$ 9,742,000	\$ 3,711	\$ 87,711	.90	.90	\$ 13,604
1940	13,989,000	21,342	103,588	.74	.81	56,344
1941	13,266,000	24,788	74,936	.56	.72	122,383
1942	13,306,000	32,566	91,896	.69	.71	175,539
1943	12,574,000	43,318	74,067	.59	.69	219,667
1944	12,319,000	58,699	83,340	.68	.69	252,063
1945	12,309,000	85,014	146,059	1.19	.76	218,072
1946	15,152,000	89,721	241,219	1.59	.88	111,847
1947	19,836,000	109,058	270,398	1.36	.96	18,764
1948	23,235,000	120,837	175,320	.75	.93	80,980
1949	27,275,000	136,224	133,200	.49	.86	233,675
1950	29,974,000	138,210	96,082	.32	.78	458,989
1951	29,990,000	135,367	144,943	.48	.74	632,438
1952	37,565,000	134,551	11,043	.03	.64	1,044,175
1953	40,464,000	156,803	403,365	1.00	.76	1,055,235
1954	44,971,000	184,131	166,033	.37	.64	1,316,150
1955	49,389,000	192,397	234,939	.48	.62	1,547,758
1956	50,836,000	179,587	14,956	.03	.56	2,021,772
1957	52,720,000	180,814	249,641	.47	.55	2,157,769
1958	58,829,000	152,089	33,695	.06	.50	2,560,220
1959	61,495,000	146,785	381,672	.62	.51	2,615,720
1960	64,964,000	187,826	367,442	.57	.52	2,572,558
1961	67,012,000	216,655	509,906	.76	.54	2,394,036
1962	71,708,000	230,601	205,588	.29	.52	2,526,768
1963	77,236,000	227,517	327,404	.42	.51	2,560,680
1964	82,455,000	240,242	319,583	.39	.50	2,624,717
1965	86,833,000	248,687	291,596	.34	.48	2,736,710
1966	91,488,000	277,855	395,424	.43	.48	2,763,324
1967	96,225,000	286,761	202,661	.21	.46	3,009,729
1968	101,556,000	298,893	401,943	.40	.46	3,079,294

SECTION 2: Disability Fund

E. PERMANENT TOTAL DISABILITY EXPERIENCE TABLE (continued)

Year Ending June 30	Covered Payroll	Claims and Expenses Paid	Claims and Expenses Incurred*	Annual Rate of Incurred Claims and Expenses Per \$100 of Covered Payroll*	Cumulative Rate of Incurred Claims and Expenses Per \$100 of Covered Payroll	General Reserve
1969	\$109,554,000	\$ 334,656	\$ 731,158	\$.67	\$.47	\$2,840,069
1970	120,246,000	374,358	729,926	.61	.48	2,446,761
1971	130,096,000	376,744	245,854	.19	.46	2,561,379
1972	138,857,000	446,816	1,012,405	.73	.48	1,902,860
1973	143,308,000	502,274	930,350	.65	.49	1,283,193
1974	146,886,000	582,628	1,244,725	.85	.52	651,223
1975	156,760,000	682,830	1,483,906	.95	.54	(214,183)
1976	164,183,000	761,200	1,332,986	.81	.56	(644,432)
1977	165,224,000	867,586	1,629,326	.99	.59	(1,348,628)
1978	171,767,000	920,799	1,042,386	.61	.59	(1,432,449)
1979	176,576,000	907,163	972,121	.55	.59	1,348,852
1980	177,340,000	912,703	837,008	.47	.58	1,887,689
1981	202,994,000	1,006,200	369,334	.18	.55	2,750,719
1982	245,580,000	946,778	29,798	.01	.51	4,404,597
1983	274,629,000	978,647	1,755,073	.64**	.52	4,534,031
1984	288,289,000	1,000,319	725,141	.21	.50	5,879,532
1985	310,360,000	1,006,631	591,410	.19	.48	7,623,235
1986	321,523,000	974,376	569,547	.18	.46	9,284,884
1987	360,072,000	901,033	121,268	.03	.45	11,090,748
1988	401,029,000	946,468	840,245	.21	.44	13,253,261
1989	394,084,000	1,024,870	1,563,694	.40	.47***	13,929,718
1990	411,248,000	1,038,907	594,815	.14	.45***	15,723,997
1991	405,132,000	1,046,404	739,845	.18	.45***	18,108,405
1992	472,984,000	1,054,203	989,998	.21	.42***	20,483,790
1993	464,000,000	1,102,722	1,652,617	.36	.41***	21,843,275
1994	470,000,000	1,058,778	320,344	.07	.37***	24,150,799
1995	515,122,000	1,059,537	1,506,726	.29	.34***	25,312,906
1996	456,604,000	1,027,066	1,230,694	.27	.27***	26,514,847
1997	460,540,000	930,321	1,166,197	.25	.27***	28,156,245
1998	432,750,000	1,022,029	839,204	.19	.25***	30,206,085

SECTION 2: Disability Fund

E. PERMANENT TOTAL DISABILITY EXPERIENCE TABLE (continued)

Year Ending June 30	Covered Payroll	Claims and Expenses Paid	Claims and Expenses Incurred*	Annual Rate of Incurred Claims and Expenses Per \$100 of Covered Payroll*	Cumulative Rate of Incurred Claims and Expenses Per \$100 of Covered Payroll	General Reserve
1999	\$355,148,948	\$ 944,740	\$1,257,860	\$.35	\$.24***	\$32,320,298
2000	369,509,233	1,023,333	1,336,453	.36	.24***	22,231,871
2001	403,265,472	1,037,601	681,004	.17	.24***	24,428,829
2002	430,397,884	1,107,061	2,760,650	.64	.27***	23,552,296
2003	472,432,303	1,154,061	1,451,604	.31	.25***	24,159,068
2004	522,227,280	1,235,285	2,557,099	.49	.26***	23,211,839
2005	554,839,816	1,344,393	1,237,126	.22	.26***	25,396,120
2006	574,315,572	1,416,598	684,738	.12	.26***	26,438,032
2007	604,514,525	1,493,732	2,624,785	.43	.28***	25,697,531
2008	623,634,208	1,542,574	2,366,329	.38	.29***	25,256,078
2009	696,704,083	1,579,230	2,615,312	.38	.29***	24,645,343
2010	767,912,436	1,671,993	703,497	.09	.29***	25,810,871
2011	791,760,493	2,012,392	422,748	.05	.28***	27,094,608
2012	805,607,436	1,837,781	406,382	.05	.27***	28,145,999
2013	817,421,028	1,853,493	1,452,570	.18	.26***	27,886,706
2014	819,923,866	1,883,397	1,437,362	.18	.27***	27,842,135
2015	839,213,254	1,840,316	3,325,516	.40	.27***	25,466,109
2016	861,818,854	1,734,775	796,486	.09	.26***	25,643,332
2017	892,332,196	1,700,103	3,680,032	.41	.27***	22,846,141
2018	953,635,670	1,853,258	2,592,793	.27	.28***	21,304,975

* Reflects credit of interest earnings on Claim Reserves but not on the General Reserve.

** This rate is artificially high due to the introduction of cost-of-living increases in the Claim Reserve Calculation.

*** Average of rates for last 20 years

Note: Starting in 1987, expenses are not included.

SECTION 3: Summary of Assumptions, Funding Methods and Plan Provisions for the Water and Power Employees' Disability Funds

EXHIBIT I

Actuarial Assumptions and Methods Used for Temporary and Extended Temporary Disability Benefit

Plan Year:	July 1 through June 30
Definition of Active Member:	First day of biweekly payroll period following employment for new Department employees or immediately following transfer from other City departments.
Projected Covered Payroll:	\$1,073,554,607 for 2018-2019 plan year.
Projected Distributions:	\$15,481,135 for first year (Projected Covered Payroll times two-year average of actual distributions as a percent of actual payroll) increasing 3.50% per year thereafter.
Net Investment Return:	3.50%, net of investment expenses. The information and analysis used in selecting this assumption is shown in the Proposed Change in Investment Return Assumption for Death and Disability Funds letter dated May 31, 2016.
Consumer Price Index (CPI):	Increase of 3.00% per year.
Member Contribution Rate:	Employees start contributing on the first day of the payroll period following the completion of 26 continuous weeks of Department and/or City service at the rate of \$1.00 for each biweekly payroll period.
Department Contribution Rate:	Rate recommended by Board's Actuary multiplied by the total monthly equivalent of compensation.
Funding Method:	Annual contributions equal the present value of all future disability payments for those expected to become disabled during the year with an adjustment for interest credited to the reserves. Subject to modification by the Board's funding policy.
Funding Policy:	Recommend a contribution rate to reach a target general reserve equal to 20% of the claim reserve at the end of ten years from June 30, 2009.
Claim Reserve:	The sum of the Open Claim Reserve and the Pending Claim Reserve.
Open Claim Reserve:	The number of open claims times the reserve factor specified in Section IIID(2) of the Plan. The reserve factor was increased to \$15,050 in 2012, \$16,000 in 2013, \$17,600 in 2014, \$18,450 in 2015, \$18,700 in 2016, decreased to \$18,100 in 2017, and increased to \$18,400 in 2018. These reserve factors are provided by the Retirement Office and accepted by Segal Consulting without audit.

SECTION 3: Summary of Assumptions, Funding Methods and Plan Provisions for the Water and Power Employees' Disability Funds

Pending Claim Reserve: 1/26 of the total benefits paid during the preceding fiscal year.
Incurred Claims: Paid claims for the year plus the increase in claim reserves.
Changes in Actuarial Assumptions: There were no changes in actuarial assumptions since the prior valuation.

SECTION 3: Summary of Assumptions, Funding Methods and Plan Provisions for the Water and Power Employees' Disability Funds

EXHIBIT II

Summary of Temporary and Extended Temporary Disability Benefit

Age Requirement: Any age

Service Requirement: Six months of continuous service.

Temporary Benefit: The biweekly benefit is a percentage of the biweekly compensation payable from the fifteenth day of disability through the end of the twelfth month of disability. The percentage is based on the following table.

Period of Continuous Service		Maximum Period Payable at Percentage of Compensation			
Not less than	Less than	85%	60%	50%	40%
6 months	3 Years	2 Weeks	1 Week	26 Weeks	21 Weeks
3 Years	5 Years	4 Weeks	2 Weeks	26 Weeks	18 Weeks
5 Years	10 Years	6 Weeks	3 Weeks	26 Weeks	15 Weeks
10 Years	15 Years	18 Weeks	10 Weeks	22 Weeks	--
15 Years	20 Years	20 Weeks	12 Weeks	18 Weeks	--
20 Years	25 Years	22 Weeks	14 Weeks	14 Weeks	--
25 Years	30 Years	24 Weeks	16 Weeks	10 Weeks	--
30 Years	35 Years	26 Weeks	18 Weeks	6 Weeks	--
35 Years		28 Weeks	20 Weeks	2 Weeks	--

SECTION 3: Summary of Assumptions, Funding Methods and Plan Provisions for the Water and Power Employees' Disability Funds

EXHIBIT II

Summary of Temporary and Extended Temporary Disability Benefit (continued)

Extended Disability Requirements: Received 50 weeks of Temporary Disability benefits and is not eligible for Permanent Total Disability.

Extended Disability Benefit: The biweekly benefit is 33 1/3 percent of their biweekly compensation payable from the end of the twelfth month of disability through the twenty-fourth month of disability. However, if a member qualifies for Permanent Total Disability while such member is receiving Extended Temporary Disability benefits, such benefits shall be terminated and the member shall receive the Permanent Total Disability benefits to which they are entitled.

SECTION 3: Summary of Assumptions, Funding Methods and Plan Provisions for the Water and Power Employees' Disability Funds

EXHIBIT III

Actuarial Assumptions and Methods Used for Permanent Total Disability Benefit

Plan Year:	July 1 through June 30
Definition of Active Member:	First day of biweekly payroll period following employment for new Department employees or immediately following transfer from other City departments.
Projected Covered Payroll:	\$1,073,554,607 for 2018-2019 plan year.
Net Investment Return:	3.50%, net of investment expenses. The information and analysis used in selecting this assumption is shown in the Proposed Change in Investment Return Assumption for Death and Disability Funds letter dated May 31, 2016.
Consumer Price Index (CPI):	Increase of 3.00% per year; benefit increases due to CPI subject to 3.00% maximum.
Member Contribution Rate:	Employees start contributing on the first day of the payroll period following the completion of 26 continuous weeks of Department and/or City service at the rate of \$1.00 for each biweekly payroll period.
Department Contribution Rate:	Rate recommended by Board's Actuary multiplied by the total monthly equivalent of compensation.
Funding Method:	Annual contributions equal the present value of all future disability payments for those expected to become disabled during the year with a further adjustment for interest credited to the reserves. Subject to modification by the Board's funding policy.
Funding Policy:	Recommend a contribution rate to maintain a target general reserve equal to 20% of the claim reserve.
Claim Reserve:	The sum of the Open Claim Reserve and the Pending Claim Reserve.
Open Claim Reserve:	The present value of future disability benefits for open claims.
Pending Claim Reserve:	Contributions made during the fiscal year.
Incurred Claims:	Paid claims for the year plus the increase in claim reserves.

SECTION 3: Summary of Assumptions, Funding Methods and Plan Provisions for the Water and Power Employees' Disability Funds

EXHIBIT III

Actuarial Assumptions and Methods Used for Permanent Total Disability Benefit (continued)

Changes in Actuarial Assumptions: There were no changes in actuarial assumptions since the prior valuation.

SECTION 3: Summary of Assumptions, Funding Methods and Plan Provisions for the Water and Power Employees' Disability Funds

EXHIBIT IV

Summary of Permanent Total Disability Benefit

Age Requirement:	Any age
Service Requirement:	Six months continuous service.
Other Requirements:	Received 50 weeks of Temporary Disability benefits and satisfies the rules for Permanent Total Disability.
Monthly Benefit:	The monthly benefit is 40 percent of the monthly compensation payable from the end of the twelfth month of disability (or later if benefits are payable under the extended temporary disability benefit) until the first day of the calendar month following the sixty-fifth birthday. If Permanent Total Disability benefits commence after the member's sixtieth birthday, the benefit is payable for 60 months. Permanent and Total Disability benefits are subject to annual cost-of-living adjustments, based on the CPI up to a maximum of 3% per year.

SECTION 3: Summary of Assumptions, Funding Methods and Plan Provisions for the Water and Power Employees' Disability Funds

EXHIBIT V

Actuarial Assumptions and Methods Used for Supplemental Industrial Disability Benefit

Plan Year:	July 1 through June 30
Definition of Active Member:	First day of biweekly payroll period following employment for new Department employees or immediately following transfer from other City departments.
Projected Covered Payroll:	\$1,073,554,607 for 2018-2019 plan year.
Net Investment Return	3.50%, net of investment expenses. The information and analysis used in selecting this assumption is shown in the Proposed Change in Investment Return Assumption for Death and Disability Funds letter dated May 31, 2016.
Member Contribution Rate:	None
Department Contribution Rate:	Funded on a cash basis
Funding Method:	Pay as you go
Funding Policy:	Funded on a cash basis
Claim Reserve:	None
Open Claim Reserve:	None
Pending Claim Reserve:	None
Incurred Claims:	Paid claims for the year
Changes in Actuarial Assumptions:	There were no changes in actuarial assumptions since the prior valuation.

SECTION 3: Summary of Assumptions, Funding Methods and Plan Provisions for the Water and Power Employees' Disability Funds

EXHIBIT VI

Summary of Supplemental Industrial Disability Benefit

Age Requirement:	Any age
Service Requirement:	Six months of continuous service.
Additional Requirements:	Injury or disease which arises out of and in the course of employment in the Department. Receiving workers' compensation benefits.
Supplemental Benefit:	For the first ten days the biweekly benefit is their biweekly compensation offset by the amount received from workers' compensation. Afterwards, the biweekly benefit is the Temporary, Extended Temporary, or Permanent Total Disability benefits offset by the amount received from workers' compensation.

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