Los Angeles Department of Water and Power (LADWP)

Governmental Accounting Standards Board Statement 68 (GAS 68) Actuarial Valuation

Actuarial Valuation Based on June 30, 2020
Measurement Date for Employer Reporting
as of June 30, 2021

This report has been prepared at the request of the LADWP to assist in preparing their financial report for their liabilities associated with the retirement plan. This valuation report may not otherwise be copied or reproduced in any form without the consent of the LADWP 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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Segal

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November 15, 2021

Ms. Ann Santilli
Chief Financial Officer
Department of Water and Power – City of Los Angeles
111 North Hope Street, Room 450
Los Angeles, CA 90012

Dear Ann:

We are pleased to submit this Governmental Accounting Standards (GAS) 68 Actuarial Valuation based on a June 30, 2020 measurement date for employer reporting as of June 30, 2021. It contains various information that will need to be disclosed in order for the two systems in the Los Angeles Department of Water and Power (LADWP) to comply with GAS 68.

This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the LADWP to assist the sponsors in preparing their financial report for the Water and Power Employees' Retirement Plan of the City of Lost Angeles (WPERP). The census and financial information on which our calculations were based was provided by the Retirement Office. That assistance is gratefully acknowledged.

The measurements shown in this actuarial valuation 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; and changes in plan provisions or applicable law.

The actuarial calculations were completed under the supervision of Eva Yum, FSA, 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 the 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 expectations for the WPERP. We look forward to reviewing this report with you and to answering any questions.

Sincerely,

Segal

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

Eva Yum, FSA, MAAA, EA
Vice President and Actuary

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Section 1: Actuarial Valuation Summary

Purpose and Basis

This report has been prepared by Segal to present certain disclosure information required by Governmental Accounting Standard (GAS) 68 for employer reporting as of June 30, 2021. The results used in preparing this GAS 68 report are comparable to those used in preparing the Governmental Accounting Standard (GAS) 67 report for the WPERP based on a reporting date and a measurement date as of June 30, 2020. This valuation is based on:

- The benefit provisions of the WPERP, as administered by the Board;
- The characteristics of covered active members, inactive vested members, and retired members and beneficiaries as of March 31, 2020, provided by the Retirement Office;
- The assets of the WPERP as of June 30, 2020, provided by the Retirement Office;
- Economic assumptions regarding future salary increases and investment earnings adopted by the Board for the July 1, 2020 valuation; and
- Other actuarial assumptions, regarding employee terminations, retirement, death, etc. adopted by the Board for the July 1, 2020 valuation.

General Observations on GAS 68 Actuarial Valuation

1. The Government Accounting Standard Board (GASB) rules only define pension liability and expense for financial reporting purposes, and do not apply to contribution amounts for pension funding purposes. Employers and plans should develop and adopt funding policies under current practices.
2. When measuring pension liability GASB uses the same actuarial cost method (Entry Age method) and the same type of discount rate (expected return on assets) as WPERP uses for funding. This means that the Total Pension Liability (TPL) measure for financial reporting shown in this report is determined on the same basis as WPERP’s Actuarial Accrued Liability (AAL) measure for funding. We note that the same is true for the Normal Cost component of the annual plan cost for funding and financial reporting.
3. The Net Pension Liability (NPL) is equal to the difference between the TPL and the Plan Fiduciary Net Position. The Plan Fiduciary Net Position is equal to the market value of assets and therefore, the NPL measure is very similar to an Unfunded Actuarial Accrued Liability (UAAL) calculated on a market value basis. The NPL reflects all investment gains and losses as of the measurement date.

Highlights of the Valuation

1. For this report, the reporting dates for the employer are June 30, 2021 and June 30, 2020. The NPL was measured as of June 30, 2020 and June 30, 2019, respectively, and determined based upon the results of the actuarial valuations as of July 1, 2020 and July 1, 2019, respectively. The Plan Fiduciary Net Position (plan assets) and the TPL were valued as of the measurement dates. Consistent with the provisions of GAS 68, the assets and liabilities measured as of June 30, 2020 and June 30, 2019 are not adjusted or rolled forward to the June 30, 2021 and June 30, 2020 reporting dates, respectively.
2. The NPL increased from $824.9 million as of June 30, 2019 to $1,111.6 million as of June 30, 2020 primarily due to unfavorable investment return during the year ending June 30, 2020 (3.55% return which was lower than the assumed return of 7.00%). The increase is partially offset by the employer's contributions amortizing a portion of the unfunded actuarial accrued liability (UAAL). Changes in these values during the last two fiscal years ending June 30, 2020 and June 30, 2019 can be found in *Section 2, Schedule of Changes in Net Pension Liability* on page 17.
3. The discount rate used to determine the TPL and NPL as of June 30, 2020 and 2019 was 7.00%, following the same assumptions used by the WPERP in the pension funding valuations as of July 1, 2020 and July 1, 2019. Details on the derivation of the discount rate can be found in *Section 3, Appendices A and B*. Various other information that is required to be disclosed can be found throughout *Section 2*.
4. There was an increase in the total employer pension expense from $322.7 million calculated last year to $361.2 million calculated this year. The primary cause of the increase was $89.4 million in new expense from lower than expected return on market value of assets during the year ending June 30, 2020, offset to some extent by the full recognition of $63.1 million in charges from asset losses that was identified in the June 30, 2015 valuation in developing last year's pension expense. A breakdown of the pension expenses for this year and last year can be found in *Section 2, Pension Expenses* on page 23.
5. The NPL has been allocated based on the projected compensation for each system for the year following the measurement date. LADWP provided us with information that indicates each member's percentage under Water versus Power and we used these percentages to determine each member's allocation between these two systems. The NPL allocation can be found in *Section 2, Determination of Proportionate Share* on page 20.
6. Results shown in this report exclude any employer contributions made after the measurement date of June 30, 2020. The LADWP should consult with their auditors to determine the deferred outflow that should be created for these contributions.
7. It is important to note that this actuarial valuation is based on plan assets as of June 30, 2020. Due to the COVID-19 pandemic, market conditions have changed significantly since the onset of the Public Health Emergency. The Plan's funded status does not reflect short-term fluctuations of the market, but rather is based on the market values on the last day of the Plan Year. Moreover, this actuarial valuation is based on Plan data as of March 31, 2020 (adjusted to June 30, 2020 by adding 3 months of age, service and interest on contribution balance, and increasing benefit by the assumed July 1 COLA for members in pay status) and it does not include any short-term or long-term impacts on mortality of the covered population that may emerge after

March 31, 2020. While it is impossible to determine how the pandemic will affect market conditions and other demographic experience of the Plan in future valuations, Segal is available to prepare projections of potential outcomes upon request.

Summary of Key Valuation Results

		June 30, 2021[1]	June 30, 2020[1]
Reporting Date for Employer under GAS 68		**June 30, 2021[1]**	**June 30, 2020[1]**
Measurement Date for Employer under GAS 68		**June 30, 2020**	**June 30, 2019**
Disclosure Elements for Plan Year Ending June 30:	• Service Cost[2]	$263,472,814	$243,262,953
	• Total Pension Liability	14,465,349,538	13,811,956,483
	• Plan Fiduciary Net Position	13,353,708,096	12,987,087,001
	• Net Pension Liability	1,111,641,442	824,869,482
	• Pension expense	361,165,338	322,749,874
Schedule of Contributions for Plan Year Ending June 30:	• Actuarially determined contributions[3]	$424,375,428	$408,750,192
	• Actual contributions	422,017,394	410,165,124
	• Contribution deficiency / (excess)	2,358,034	(1,414,932)
Demographic Data for Plan Year Ending June 30:	• Number of retired members and beneficiaries	9,443	9,315
	• Number of inactive vested members[4]	1,690	1,663
	• Number of active members	10,778	10,362
Key Assumptions as of June 30:	• Investment rate of return	7.00%	7.00%
	• Inflation rate	2.75%	2.75%
	• Projected salary increases[5]	4.50% to 10.25%, varying by service, including inflation	4.50% to 10.25%, varying by service, including inflation

[1] The reporting dates and measurement dates for the plan are June 30, 2020 and 2019, respectively.

[2] The service cost is always based on the previous year's assumptions, meaning the June 30, 2020 and June 30, 2019 measurement values are based on the assumptions shown as of July 1, 2019 and July 1, 2018, respectively. The key assumptions in the July 1, 2018 valuation were as follows:

Investment rate of return:	7.25%
Inflation rate:	3.00%
Projected salary increases:	4.50% to 10.00%, varying by service, including inflation.

[3] Based on actual covered payroll reported by the Retirement Office

[4] Includes terminated members due a refund of member contributions and members receiving PTD benefits.

[5] Includes inflation at 2.75%, plus real across-the-board salary increases of 0.50% plus merit and promotion increases as of June 30, 2020 and 2019, respectively.

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 a valuation, 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 (as well as the plan summary included in our funding valuation 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 measurement date, as provided by the Retirement Office.
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 and cost-of-living adjustments. 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.
Models	Segal valuation results are based on proprietary actuarial modeling software. The actuarial valuation models generate a comprehensive set of liability and cost calculations that are presented to meet regulatory, legislative and client requirements. Our Actuarial Technology and Systems unit, comprised of both actuaries and programmers, is responsible for the initial development and maintenance of these models. The models have a modular structure that allows for a high degree of accuracy, flexibility and user control. The client team programs the assumptions and the plan provisions, validates the models, and reviews test lives and results, under the supervision of the responsible actuary.

Section 1: Actuarial Valuation Summary

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 LADWP to assist in preparing items related to the retirement plan in their financial report. 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.
If LADWP 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 LADWP should look to their other advisors for expertise in these areas.

As Segal 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 or LADWP.

Section 2: GAS 68 Information

General Information About the Pension Plan

Plan Description

Plan administration. The Water and Power Employees’ Retirement Plan of the City of Los Angeles (WPERP) was established by the Los Angeles Department of Water and Power in 1938. WPERP is a single employer public employee retirement system whose main function is to provide retirement benefits to employees of the Los Angeles Department of Water and Power.

Under the provisions of the City Charter, the Board of Administration (the "Board") has the responsibility and authority to administer the Plan and to invest its assets. The Board members serve as trustees and must act in the exclusive interest of the Plan's members and beneficiaries. The Board has seven members: one member of the Board of Water and Power Commissioners, the General Manager, the Chief Accounting Employee, three employee members who are elected for three-year terms by active members of the Plan, and one retiree who is appointed by the Board of Water and Power Commissioners for a three-year term.

Plan membership. At June 30, 2020, pension plan membership consisted of the following:

Retired members or beneficiaries currently receiving benefits	9,443
Vested terminated members entitled to, but not yet receiving benefits[1]	1,690
Active members	10,778
Total	21,911

[1] Includes terminated members due a refund of member contributions and members receiving PTD benefits

Benefits provided. WPERP provides service retirement, disability, death and survivor benefits to eligible employees. Most employees of the LADWP become members of WPERP effective on the first day of biweekly payroll following employment. Members employed prior to January 1, 2014 are designated as Tier 1 and those hired on or after January 1, 2014 are designated as Tier 2 (unless a specific exemption applies to employee providing a right to Tier 1 status).

Tier 1 members are eligible to retire once they attain the age of 60 with 5 or more years of Department service or at age 55 with 10 or more years of Department service acquired in the last 12 years prior to retirement. A Tier 1 member with 30 years of Department service is eligible to retire regardless of age. Tier 2 members are eligible to retire once they attain the age of 60 with 5 years of continuous Department service with the Plan immediately prior to reaching eligibility or age 60 with 10 or more years of Qualifying service or at any age with 30 years of Qualifying service. For both tiers, combined years of service between WPERP and LACERS is used to determine retirement eligibility and at least 5 years must be actual employment at DWP or City. The one exception is the age 60 with 5 years of continuous Department Service for Tier 2 where only service with DWP can be counted. For both tiers, members receiving Permanent Total Disability benefits may retire regardless of age. For Tier 1, to be eligible for a Formula Pension, the employee must have worked or been paid disability four of the last five years immediately preceding eligibility to retire, or while eligible to retire.

The Formula Pension benefit the member will receive is based upon age at retirement, monthly average salary base and years of retirement service credit.

The Tier 1 Formula Pension is equal to 2.1% times years of service credit times monthly average salary base. In addition, members retiring after attaining age 55 with 30 years of service credit, receive an increase in the benefit factor from 2.1% to 2.3%. A reduced early retirement benefit is paid for those members attaining age 55 with 10 years of service or any age (under 55) with 30 years of service. The reduction is 1.5% for each year of retirement age between 60 and 55 and 3.0% for each year of retirement before age 55.

Under Tier 2, there are various benefit factors that apply as shown below:

- 1.5% at age 60 with 5 years of continuous Department Service (or 10 years of Qualifying Service)
- 2.0% at age 60 with 30 years of Qualifying Service
- 2.0% at age 55 with 30 years of Service Credit
- 2.0% at age 63 with 5 years of continuous Department Service (or 10 years of Qualifying Service)
- 2.1% at age 63 with 30 years of Qualifying Service

The reduced early retirement benefits for Tier 2 are the same as Tier 1. These are applied to the age 60 benefit for members (with 2.0% formula) who retire before age 60 with less than 30 years of service credit. Service Credit with the Department and with LACERS is combined for satisfying this requirement.

For Tier 1 members, the maximum monthly retirement allowance is 100% of monthly average salary base. For Tier 2 members, the maximum monthly retirement allowance is 80% of monthly average salary base.

Under Tier 1, pension benefits are calculated based on the highest average salary earned during a 12-month period. Under Tier 2, pension benefits are calculated based on the average salary earned during a 36-month period.

For both tiers, the member may elect the Full Allowance, or choose an optional retirement allowance. The Full Allowance provides the highest monthly benefit and up to a 50% continuance to an eligible surviving spouse or domestic partner. There are five optional retirement allowances the member may choose. Each of the optional retirement allowances requires a reduction in the Full

Allowance in order to allow the member the ability to provide various benefits to a surviving spouse, domestic partner, or named beneficiary.

WPERP provides annual cost-of-living adjustments (COLAs) to retirees that are not considered vested retirement. The cost-of-living adjustments are made each July 1 based on the percentage change in the average of the Consumer Price Index for the Los Angeles-Long Beach-Anaheim--All Items For All Urban Consumers. It is capped at 3.0% for Tier 1 and 2.0% for Tier 2. Tier 2 members may purchase additional 1% COLA protection at full actuarial cost.

The LADWP contributes to the retirement plan based upon actuarially determined contribution rates adopted by the Board of Administration. Employer contribution rates are adopted annually based upon recommendations received from WPERP's actuary after the completion of the annual actuarial valuation. The average employer contribution rate as of June 30, 2020 (based on the July 1, 2019 valuation) was 37.97% of compensation.

All members are required to make contributions to WPERP regardless of the retirement plan or tier in which they are included. The average member contribution rate as of June 30, 2020 (based on the July 1, 2019 valuation) was 7.43% of compensation. Most Tier 1 members contribute at 6% of compensation and all Tier 2 members contribute at 10% of compensation.

Net Pension Liability

The components of the Net Pension Liability were as follows:

Reporting Date for Employer under GAS 68	June 30, 2021	June 30, 2020
Measurement Date for Employer under GAS 68	**June 30, 2020**	**June 30, 2019**
Total Pension Liability	$14,465,349,538	$13,811,956,483
Plan Fiduciary Net Position	13,353,708,096	12,987,087,001
Net Pension Liability	**$1,111,641,442**	**$824,869,482**
Plan Fiduciary Net Position as a percentage of the Total Pension Liability	92.32%	94.03%

The Net Pension Liability (NPL) for the Plan was measured as of June 30, 2020 and 2019. The Plan Fiduciary Net Position (plan assets) and Total Pension Liability (TPL) were valued as of the measurement date and are from actuarial valuations as of July 1, 2020 and 2019, respectively.

Plan provisions. The plan provisions used in the measurement of the NPL are the same as those used in the WPERP actuarial valuations as of July 1, 2020 and 2019, respectively.

Actuarial assumptions. The TPL as of June 30, 2020 was determined by an actuarial valuation as of July 1, 2020. The actuarial assumptions used in the June 30, 2020 measurement were based on the results of an experience study for the period from July 1, 2015 through June 30, 2018. They are the same as the assumptions used in the July 1, 2020 funding actuarial valuation for the WPERP. The assumptions used in the funding valuation are outlined in *Section 3, Actuarial Assumptions and Methods*. In particular, the following assumptions were applied to all periods included in the June 30, 2020 measurement:

Inflation:	2.75%
Salary increases:	4.50% to 10.25%, varying by service, including inflation
Investment rate of return:	7.00%, net of pension plan investment expense, including inflation
Other assumptions:	Same as those used in the July 1, 2020 funding valuation

Section 2: GAS 68 Information

The TPL as of June 30, 2019 was determined by an actuarial valuation as of July 1, 2019. In particular, the following actuarial assumptions were applied to all periods included in the June 30, 2019 measurement:

Inflation:	2.75%
Salary increases:	4.50% to 10.25%, varying by service, including inflation
Investment rate of return:	7.00%, net of pension plan investment expense, including inflation
Other assumptions:	Same as those used in the July 1, 2019 funding valuation

Determination of Discount Rate and Investment Rates of Return

The long-term expected rate of return on pension plan investments was determined in 2019 using a building-block method in which expected future real rates of return (expected returns, net of inflation) are developed for each major asset class. These returns are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage, adding expected inflation and subtracting expected investment expenses and a risk margin. The target allocation and projected arithmetic real rates of return for each major asset class, after deducting inflation, but before deducting investment expenses, used in the derivation of the long-term expected investment rate of return assumption as of June 30, 2020 is summarized in the following table. This information will change every three years based on the actuarial experience study.

Asset Class	Target Allocation	Long-Term Expected Arithmetic Real Rate of Return
Large Cap US Equity	22.95%	5.44%
Small Cap US Equity	1.75%	6.18%
Developed International Large Cap Equity	13.06%	6.54%
Developed International Small Cap Equity	2.18%	6.64%
Global Equity	2.90%	6.45%
Emerging Market Equity	5.16%	8.73%
Real Estate	8.00%	4.60%
Cash and Equivalents	1.00%	0.25%
Private Equity	8.00%	9.27%
Hedge Funds	5.00%	3.53%
Custom Fixed Income	25.00%	1.65%
Custom Real Return	5.00%	2.07%
Total	100.00%	

Discount Rate. The discount rate used to measure the TPL was 7.00% as of June 30, 2020 and June 30, 2019, respectively. The projection of cash flows used to determine the discount rate assumed member contributions will be made at the current contribution rates and that employer contributions will be made at rates equal to the required contribution rates. For this purpose, only employee and employer contributions that are intended to fund benefits for current plan members and their beneficiaries are included. Projected employer contributions that are intended to fund the service costs for future plan members and their beneficiaries, as well as projected contributions from future plan members, are not included. Based on those assumptions, the Plan Fiduciary Net Position was projected to be available to make all projected future benefit payments for current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the TPL as of both June 30, 2020 and June 30, 2019.

Discount Rate Sensitivity

Sensitivity of the Net Pension Liability to changes in the discount rate. The following presents the NPL of the WPERP as of June 30, 2020, calculated using the discount rate of 7.00%, as well as what the WPERP NPL would be if it were calculated using a discount rate that is 1-percentage-point lower (6.00%) or 1-percentage-point higher (8.00%) than the current rate:

	1% Decrease (6.00%)	**Current Discount Rate (7.00%)**	**1% Increase (8.00%)**
Water	$986,440,023	$359,273,247	($158,671,932)
Power	2,065,742,734	752,368,195	(332,281,114)
Total for all systems	**$3,052,182,757**	**$1,111,641,442**	**$(490,953,046)**

Schedule of Changes in Net Pension Liability

Reporting Date for Employer under GAS 68 Measurement Date for Employer under GAS 68	June 30, 2021 June 30, 2020	June 30, 2020 June 30, 2019
Total Pension Liability		
• Service Cost	$263,472,814	$243,262,953
• Interest	963,032,210	952,071,733
• Change of benefit terms	0	0
• Differences between expected and actual experience	62,540,626	17,806,843
• Changes of assumptions	0	8,835,790
• Benefit payments, including refunds of member contributions	(635,652,595)	(597,563,566)
Net change in Total Pension Liability	**$653,393,055**	**$624,413,753**
Total Pension Liability – beginning	**13,811,956,483**	**13,187,542,730**
Total Pension Liability – ending	**$14,465,349,538**	**$13,811,956,483**
Plan Fiduciary Net Position		
• Contributions – employer (including those for administrative expenses)	$427,655,268	$416,180,197
• Contributions – employee	120,299,327	104,741,925
• Net investment income	459,024,099	791,832,113
• Benefit payments, including refunds of member contributions	(635,652,595)	(597,563,566)
• Administrative expense	(4,705,004)	(5,188,931)
• Other	0	0
Net change in Plan Fiduciary Net Position	**$366,621,095**	**$710,001,738**
Plan Fiduciary Net Position – beginning	**12,987,087,001**	**12,277,085,263**
Plan Fiduciary Net Position – ending	**$13,353,708,096**	**$12,987,087,001**
Net Pension Liability – ending	**$1,111,641,442**	**$824,869,482**
Plan Fiduciary Net Position as a percentage of the Total Pension Liability	**92.32%**	**94.03%**
Covered payroll[1]	**$1,130,066,141**	**$1,028,212,002**
Net Pension Liability as percentage of covered payroll	**98.37%**	**80.22%**

[1] Covered payroll represents payroll on which contributions to the pension plan are based.

Notes to Schedule:

Benefit changes: None

Schedule of Employer Contributions

Year Ended Error! Bookmark not defined.	Actuarially Determined Contributions[1, 2, 3, 4]	Contributions in Relation to the Actuarially Determined Contributions[2, 3]	Contribution Deficiency / (Excess)	Covered Payroll	Contributions as a Percentage of Covered Payroll
2011	$304,431,910	$286,699,384	$17,732,526	$791,760,493	36.21%
2012	336,874,865	321,688,919	15,185,946	805,607,436	39.93%
2013	376,667,610	368,426,348	8,241,262	817,421,028	45.07%
2014	387,823,989	384,265,892	3,558,097	819,923,866	46.87%
2015	387,464,759	376,902,022	10,562,737	839,213,254	44.91%
2016	368,599,924	362,359,894	6,240,030	861,818,854	42.05%
2017	403,780,319	391,717,359	12,062,960	892,332,196	43.90%
2018	425,512,236	433,412,569	(7,900,333)	953,635,670	45.45%
2019	408,750,192	410,165,124	(1,414,932)	1,028,212,002	39.89%
2020	424,375,428	422,017,394	2,358,034	1,130,066,141	37.34%

1 All “Actuarially Determined Contributions” through June 30, 2014 were determined as the “Annual Required Contribution” under GAS 25 and 27.

2 Based on actual covered payroll reported by the Retirement Office. For the year ended June 30, 2015, reflects the effect of the phase-in over two years of the contribution rate impact of new actuarial assumptions adopted by the Board effective with the July 1, 2014 valuation. For the year ended June 30, 2017, reflects the effect of the phase-in over two years of the contribution rate impact of new actuarial assumptions adopted by the Board effective with the July 1, 2016 valuation.

3 Excludes employer contributions towards administrative expenses.

4 Starting in 2019, the actuarially determined contribution is determined by applying the Tier 1 and Tier 2 contribution rates to their respective payroll.

See accompanying notes to this schedule on the next page.

Schedule of Employer Contributions (continued)

Notes to Schedule:

Methods and assumptions used to establish "actuarially determined contribution" rates:

Valuation date	Actuarially determined contribution rates are calculated as of June 30, one year prior to the end of the fiscal year in which contributions are reported
Actuarial cost method	Entry Age Actuarial Cost Method
Amortization method	Level dollar amortization
Remaining amortization period	The July 1, 2004 Unfunded Actuarial Accrued Liability is amortized over a 15-year period commencing July 1, 2004 (fully amortized as of July 1, 2019). Any subsequent changes in Unfunded Actuarial Accrued Liability are amortized over separate 15-year periods effective with that valuation.
Asset valuation method	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 market return and the expected return on a market value basis, and is recognized over a five-year period. Prior to the July 1, 2020 valuation, as directed by the Retirement Office, the actuarial valuation of assets may be reduced by an amount classified as non-valuation reserve.

Actuarial assumptions:

Valuation Date:	July 1, 2020 Valuation Date	July 1, 2019 Valuation Date
Investment rate of return:	7.00%, net of investment expenses	7.00%, net of investment expenses
Inflation rate:	2.75%	2.75%
Real across-the-board salary increase:	0.50%	0.50%
Projected salary increases:[1]	4.50% to 10.25%	4.50% to 10.25%
Cost of living adjustments:	2.75% (actual increases are contingent upon CPI increases with a 3.00% maximum for Tier 1, 2.00% maximum for Tier 2)	2.75% (actual increases are contingent upon CPI increases with a 3.00% maximum for Tier 1, 2.00% maximum for Tier 2)
Other assumptions:	Same as those used in the July 1, 2020 funding actuarial valuation	Same as those used in the July 1, 2019 funding actuarial valuation

[1] Includes inflation at 2.75% plus real across-the-board salary increases of 0.50% plus merit and promotion increases as of July 1, 2020 and 2019, respectively.

Determination of Proportionate Share

Projected Compensation by System

July 1, 2020 to June 30, 2021

System	Projected Compensation	Percentage
Water	$391,643,122	32.319%
Power	820,155,218	67.681%
Total	**$1,211,798,340**	**100.000%**

Allocation of June 30, 2020 Net Pension Liability (NPL)

System	NPL	Percentage
Water	$359,273,247	32.319%
Power	752,368,195	67.681%
Total	**$1,111,641,442**	**100.000%**

Notes:

- The unrounded percentages are used in the allocation of the NPL amongst systems.
- The Net Pension Liability (NPL) has been allocated based on the projected compensation for each system for the fiscal year following the measurement date. LADWP provided us with information that indicates each member's percentage under Water versus Power and we used those percentages to determine each member's allocation between these two systems. Projected July 1, 2020 through June 30, 2021 compensation information is from the July 1, 2020 actuarial valuation for the Retirement Plan.
- The NPL is the Total Pension Liability (TPL) minus the Plan Fiduciary Net Position (plan assets).
- The NPL is allocated based on the projected compensation from each system. The steps used for the allocation are as follows:
  1. First calculate the ratio of the projected compensation from the system to the total projected compensation.
  2. Then multiply this ratio by the NPL to determine the system's proportionate share of the NPL.

Determination of Proportionate Share (continued)

Projected Compensation by System

July 1, 2019 to June 30, 2020

System	Projected Compensation	Percentage
Water	$360,944,278	31.610%
Power	780,931,338	68.390%
Total	**$1,141,875,616**	**100.000%**

Allocation of June 30, 2019 Net Pension Liability (NPL)

System	NPL	Percentage
Water	$260,739,362	31.610%
Power	564,130,120	68.390%
Total	**$824,869,482**	**100.000%**

Notes:

- The unrounded percentages are used in the allocation of the NPL amongst systems.
- The Net Pension Liability (NPL) has been allocated based on the projected compensation for each system for the fiscal year following the measurement date. LADWP provided us with information that indicates each member's percentage under Water versus Power and we used those percentages to determine each member's allocation between these two systems. Projected July 1, 2019 through June 30, 2020 compensation information is from the July 1, 2019 actuarial valuation for the Retirement Plan.
- The NPL is the Total Pension Liability (TPL) minus the Plan Fiduciary Net Position (plan assets).
- The NPL is allocated based on the projected compensation from each system. The steps used for the allocation are as follows:
  1. First calculate the ratio of the projected compensation from the system to the total projected compensation.
  2. Then multiply this ratio by the NPL to determine the system's proportionate share of the NPL.

Determination of Proportionate Share (continued)

For purposes of the above results, the reporting dates for the employer under GAS 68 are June 30, 2021 and June 30, 2020. The reporting date and measurement date for the plan under GAS 67 are June 30, 2020 and June 30, 2019 respectively. Consistent with the provisions of GAS 68, the assets and liabilities measured as of June 30, 2020 and June 30, 2019 are not adjusted or "rolled forward" to June 30, 2021 and June 30, 2020 reporting dates. Other results, such as the total deferred inflows and outflows would also be allocated based on the same proportionate shares determined above

The following items are allocated based on the corresponding proportionate share shown above.

1. Net Pension Liability
2. Service Cost
3. Interest on the Total Pension Liability
4. Current-period benefit changes
5. Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability
6. Expensed portion of current-period changes of assumptions or other inputs
7. Member contributions
8. Projected earnings on plan investments
9. Expensed portion of current-period differences between actual and projected earnings on plan investments
10. Administrative expense
11. Recognition of beginning of year deferred outflows of resources as pension expense
12. Recognition of beginning of year deferred inflows of resources as pension expense

Pension Expense

Total

Reporting Date for Employer under GAS 68	June 30, 2021	June 30, 2020
Measurement Date for Employer under GAS 68	**June 30, 2020**	**June 30, 2019**
• Service cost	$263,472,814	$243,262,953
• Interest on the Total Pension Liability	963,032,210	952,071,733
• Expensed portion of current-period changes in proportion and differences between system's contributions and proportionate share of contributions	0	0
• Current-period benefit changes	0	0
• Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	9,376,406	2,765,038
• Expensed portion of current-period changes of assumptions or other inputs	0	1,372,017
• Member contributions	(120,299,327)	(104,741,925)
• Projected earnings on plan investments	(905,861,985)	(887,122,330)
• Expensed portion of current-period differences between actual and projected earnings on plan investments	89,367,577	19,058,043
• Administrative expense	4,705,004	5,188,931
• Other	0	0
• Recognition of beginning of year deferred outflows of resources as pension expense	284,216,997	337,432,913
• Recognition of beginning of year deferred inflows of resources as pension expense	(226,844,358)	(246,537,499)
• Net amortization of deferred amounts from changes in proportion and differences between system's contributions and proportionate share of contributions	0	0
Pension Expense	**$361,165,338**	**$322,749,874**

Pension Expense (continued)

Water

Reporting Date for Employer under GAS 68	June 30, 2021	June 30, 2020
Measurement Date for Employer under GAS 68	**June 30, 2020**	**June 30, 2019**
• Service cost	$85,152,218	$76,894,866
• Interest on the Total Pension Liability	311,243,982	300,947,704
• Expensed portion of current-period changes in proportion and differences between system's contributions and proportionate share of contributions	1,165,195	(354,252)
• Current-period benefit changes	0	0
• Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	3,030,376	874,022
• Expensed portion of current-period changes of assumptions or other inputs	0	433,691
• Member contributions	(38,879,740)	(33,108,684)
• Projected earnings on plan investments	(292,767,042)	(280,417,346)
• Expensed portion of current-period differences between actual and projected earnings on plan investments	28,882,856	6,024,204
• Administrative expense	1,520,618	1,640,209
• Other	0	0
• Recognition of beginning of year deferred outflows of resources as pension expense	91,856,564	106,661,774
• Recognition of beginning of year deferred inflows of resources as pension expense	(73,314,205)	(77,929,941)
• Net amortization of deferred amounts from changes in proportion and differences between system's contributions and proportionate share of contributions	(389,566)	514,467
Pension Expense	**$117,501,256**	**$102,180,714**

Pension Expense (continued)

Power

Reporting Date for Employer under GAS 68	June 30, 2021	June 30, 2020
Measurement Date for Employer under GAS 68	**June 30, 2020**	**June 30, 2019**
• Service cost	$178,320,596	$166,368,087
• Interest on the Total Pension Liability	651,788,228	651,124,029
• Expensed portion of current-period changes in proportion and differences between system's contributions and proportionate share of contributions	(1,165,195)	354,252
• Current-period benefit changes	0	0
• Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	6,346,030	1,891,016
• Expensed portion of current-period changes of assumptions or other inputs	0	938,326
• Member contributions	(81,419,587)	(71,633,241)
• Projected earnings on plan investments	(613,094,943)	(606,704,984)
• Expensed portion of current-period differences between actual and projected earnings on plan investments	60,484,721	13,033,839
• Administrative expense	3,184,386	3,548,722
• Other	0	0
• Recognition of beginning of year deferred outflows of resources as pension expense	192,360,433	230,771,139
• Recognition of beginning of year deferred inflows of resources as pension expense	(153,530,153)	(168,607,558)
• Net amortization of deferred amounts from changes in proportion and differences between system's contributions and proportionate share of contributions	389,566	(514,467)
Pension Expense	**$243,664,082**	**$220,569,160**

Deferred Outflows of Resources and Deferred Inflows of Resources

Total

Reporting Date for Employer under GAS 68		June 30, 2021	June 30, 2020
Measurement Date for Employer under GAS 68		**June 30, 2020**	**June 30, 2019**
Deferred Outflows of Resources			
• Changes in proportion and differences between system's contributions and proportionate share of contributions[1]		$11,762,029	$8,312,429
• Changes of assumptions or other inputs		89,260,427	218,584,242
• Net difference between projected and actual earnings on pension plan investments (if any)		232,508,582	0
• Difference between actual and expected experience in the Total Pension Liability		70,717,188	21,977,189
• **Total Deferred Outflows of Resources**		**$404,248,226**	**$248,873,860**
Deferred Inflows of Resources			
• Changes in proportion and differences between system's contributions and proportionate share of contributions[1]		$11,762,029	$8,312,429
• Changes of assumptions or other inputs		0	0
• Net difference between actual and projected earnings on pension plan investments (if any)		0	120,666,681
• Difference between expected and actual experience in the Total Pension Liability		85,422,303	166,092,746
• **Total Deferred Inflows of Resources**		**$97,184,332**	**$295,071,856**
Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:			
Reporting Date for Employer under GAS 68 Year Ended June 30:			
	2021	N/A	$57,372,639
	2022	$5,657,645	(93,086,338)
	2023	57,149,393	(41,594,590)
	2024	123,598,266	24,854,283
	2025	103,179,691	4,435,707
	2026	11,196,709	1,820,303
	2027	6,282,190	0
	Thereafter	0	0

[1] Calculated in accordance with Paragraphs 54 and 55 of GAS 68.

Deferred Outflows of Resources and Deferred Inflows of Resources (continued)

Water

Reporting Date for Employer under GAS 68	June 30, 2021	June 30, 2020
Measurement Date for Employer under GAS 68	**June 30, 2020**	**June 30, 2019**
Deferred Outflows of Resources		
• Changes in proportion and differences between system's contributions and proportionate share of contributions[1]	$9,266,761	$4,043,851
• Changes of assumptions or other inputs	28,848,226	69,093,980
• Net difference between projected and actual earnings on pension plan investments (if any)	75,144,834	0
• Difference between actual and expected experience in the Total Pension Liability	22,855,206	6,946,939
• **Total Deferred Outflows of Resources**	**$136,115,027**	**$80,084,770**
Deferred Inflows of Resources		
• Changes in proportion and differences between system's contributions and proportionate share of contributions[1]	$2,495,268	$4,268,578
• Changes of assumptions or other inputs	0	0
• Net difference between actual and projected earnings on pension plan investments (if any)	0	38,142,463
• Difference between expected and actual experience in the Total Pension Liability	27,607,776	52,501,538
• **Total Deferred Inflows of Resources**	**$30,103,044**	**$94,912,579**
Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:		
Reporting Date for Employer under GAS 68 Year Ended June 30:		
2021	N/A	$17,745,794
2022	$2,574,184	(29,843,894)
2023	20,134,113	(12,649,244)
2024	41,561,974	8,307,232
2025	34,302,678	1,192,784
2026	4,628,004	419,519
2027	2,811,030	0
Thereafter	0	0

[1] Calculated in accordance with Paragraphs 54 and 55 of GAS 68.

Deferred Outflows of Resources and Deferred Inflows of Resources (continued)

Power

Reporting Date for Employer under GAS 68		June 30, 2021	June 30, 2020
Measurement Date for Employer under GAS 68		**June 30, 2020**	**June 30, 2019**
Deferred Outflows of Resources			
• Changes in proportion and differences between system's contributions and proportionate share of contributions[1]		$2,495,268	$4,268,578
• Changes of assumptions or other inputs		60,412,201	149,490,262
• Net difference between projected and actual earnings on pension plan investments (if any)		157,363,748	0
• Difference between actual and expected experience in the Total Pension Liability		47,861,982	15,030,250
• **Total Deferred Outflows of Resources**		**$268,133,199**	**$168,789,090**
Deferred Inflows of Resources			
• Changes in proportion and differences between system's contributions and proportionate share of contributions[1]		$9,266,761	$4,043,851
• Changes of assumptions or other inputs		0	0
• Net difference between actual and projected earnings on pension plan investments (if any)		0	82,524,218
• Difference between expected and actual experience in the Total Pension Liability		57,814,527	113,591,208
• **Total Deferred Inflows of Resources**		**$67,081,288**	**$200,159,277**
Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:			
Reporting Date for Employer under GAS 68 Year Ended June 30:			
	2021	N/A	$39,626,845
	2022	$3,083,461	(63,242,444)
	2023	37,015,280	(28,945,346)
	2024	82,036,292	16,547,051
	2025	68,877,013	3,242,923
	2026	6,568,705	1,400,784
	2027	3,471,160	0
	Thereafter	0	0

[1] Calculated in accordance with Paragraphs 54 and 55 of GAS 68.

Deferred Outflows of Resources and Deferred Inflows of Resources (continued)

There are changes in each system's proportionate share of the total Net Pension Liability (NPL) during the measurement period ended June 30, 2020. The net effect of the change on the system's proportionate share of the collective NPL and collective deferred outflows of resources and deferred inflows of resources is recognized over the average of the expected remaining service lives of all employees that are provided with pensions through the WPERP which is 6.67 years determined as of July 1, 2019 (the beginning of the measurement period ended June 30, 2020). This is described in Paragraph 33a. of GAS 68.

In addition, the difference between the actual employer contributions and the proportionate share of the employer contributions during the measurement period ended June 30, 2020 is recognized over the same period.

The net effects of the change on the system's proportionate share of the collective NPL and collective deferred outflows of resources and deferred inflows of resources and the difference between the actual employer contributions and the proportionate share of the employer contributions for prior periods continue to be recognized based on the expected remaining service lives of all employees calculated as of those prior measurement dates.

The average of the expected service lives of all employees is determined by:

- Calculating each active employees' expected remaining service life as the present value of $1 per year of future service at zero percent interest.
- Setting the remaining service life to zero for each nonactive or retired member.
- Dividing the sum of the above amounts by the total number of active employee, nonactive and retired members.

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Schedule of Proportionate Share of the Net Pension Liability

Total

Reporting Date for Employer Under GAS 68 as of June 30	Measurement Date as of June 30	Proportion of the Net Pension Liability	Proportionate Share of Net Pension Liability	Covered Payroll[1]	Proportionate Share of the Net Pension Liability as a Percentage of Covered Payroll	Plan Fiduciary Net Position as a Percentage of the Total Pension Liability
2013	2012	100.0%	$2,308,458,976	$805,607,436	286.55%	76.18%
2014	2013	100.0%	1,790,856,442	817,421,028	219.09%	82.26%
2015	2014	100.0%	1,272,233,314	819,923,866	155.16%	88.41%
2016	2015	100.0%	1,144,145,298	839,213,254	136.34%	89.80%
2017	2016	100.0%	2,191,386,273	861,818,854	254.27%	82.17%
2018	2017	100.0%	1,343,201,931	892,332,196	150.53%	89.39%
2019	2018	100.0%	910,457,467	953,635,670	95.47%	93.10%
2020	2019	100.0%	824,869,482	1,028,212,002	80.22%	94.03%
2021	2020	100.0%	1,111,641,442	1,130,066,141	98.37%	92.32%

[1] These are the actual payroll amounts for the years ending on the measurement dates shown.

Schedule of Proportionate Share of the Net Pension Liability (continued)

Water

Reporting Date for Employer Under GAS 68 as of June 30	Measurement Date as of June 30	Proportion of the Net Pension Liability	Proportionate Share of Net Pension Liability	Covered Payroll[1]	Proportionate Share of the Net Pension Liability as a Percentage of Covered Payroll	Plan Fiduciary Net Position as a Percentage of the Total Pension Liability
2013	2012	32.292%	$745,446,783	$260,146,478	286.55%	76.18%
2014	2013	32.573%	583,343,786	266,262,257	219.09%	82.26%
2015	2014	32.344%	411,484,901	265,192,153	155.16%	88.41%
2016	2015	32.603%	373,023,565	273,607,137	136.34%	89.80%
2017	2016	31.892%	698,878,038	274,851,713	254.27%	82.17%
2018	2017	31.748%	426,443,932	283,300,404	150.53%	89.39%
2019	2018	32.121%	292,447,213	306,316,444	95.47%	93.10%
2020	2019	31.610%	260,739,362	325,015,469	80.22%	94.03%
2021	2020	32.319%	359,273,247	365,227,957	98.37%	92.32%

[1] These are the actual payroll amounts for the years ending on the measurement dates shown.

Schedule of Proportionate Share of the Net Pension Liability (continued)

Power

Reporting Date for Employer Under GAS 68 as of June 30	Measurement Date as of June 30	Proportion of the Net Pension Liability	Proportionate Share of Net Pension Liability	Covered Payroll[1]	Proportionate Share of the Net Pension Liability as a Percentage of Covered Payroll	Plan Fiduciary Net Position as a Percentage of the Total Pension Liability
2013	2012	67.708%	$1,563,012,193	$545,460,958	286.55%	76.18%
2014	2013	67.427%	1,207,512,656	551,158,771	219.09%	82.26%
2015	2014	67.656%	860,748,413	554,731,713	155.16%	88.41%
2016	2015	67.397%	771,121,733	565,606,117	136.34%	89.80%
2017	2016	68.108%	1,492,508,235	586,967,141	254.27%	82.17%
2018	2017	68.252%	916,757,999	609,031,792	150.53%	89.39%
2019	2018	67.879%	618,010,254	647,319,226	95.47%	93.10%
2020	2019	68.390%	564,130,120	703,196,533	80.22%	94.03%
2021	2020	67.681%	752,368,195	764,838,184	98.37%	92.32%

[1] These are the actual payroll amounts for the years ending on the measurement dates shown.

Schedule of Reconciliation of Net Pension Liability

Total

Reporting Date for Employer under GAS 68	June 30, 2021	June 30, 2020
Measurement Date for Employer under GAS 68	**June 30, 2020**	**June 30, 2019**
• Beginning Net Pension Liability	$824,869,482	$910,457,467
• Pension Expense	361,165,338	322,749,874
• Employer Contributions	(427,655,268)	(416,180,197)
• New Net Deferred Inflows/Outflows	410,634,529	98,737,752
• Change in Allocation of Prior Deferred Inflows/Outflows	0	0
• New Net Deferred Flows Due to Change in Proportion[1]	0	0
• Recognition of Prior Deferred Inflows/Outflows	(57,372,639)	(90,895,414)
• Recognition of Prior Deferred Flows Due to Change in Proportion[1]	0	0
Ending Net Pension Liability	**$1,111,641,442**	**$824,869,482**

[1] Includes differences between actual employer contributions and proportionate share of contributions.

Schedule of Reconciliation of Net Pension Liability (continued)

Water

Reporting Date for Employer under GAS 68	June 30, 2021	June 30, 2020
Measurement Date for Employer under GAS 68	**June 30, 2020**	**June 30, 2019**
• Beginning Net Pension Liability	$260,739,362	$292,447,213
• Pension Expense	117,501,256	102,180,714
• Employer Contributions	(139,807,163)	(134,202,129)
• New Net Deferred Inflows/Outflows	132,713,657	31,210,778
• Change in Allocation of Prior Deferred Inflows/Outflows	(327,726)	276,220
• New Net Deferred Flows Due to Change in Proportion[1]	6,606,654	(1,927,134)
• Recognition of Prior Deferred Inflows/Outflows	(18,542,359)	(28,731,833)
• Recognition of Prior Deferred Flows Due to Change in Proportion[1]	389,566	(514,467)
Ending Net Pension Liability	**$359,273,247**	**$260,739,362**

[1] Includes differences between actual employer contributions and proportionate share of contributions.

Schedule of Reconciliation of Net Pension Liability (continued)

Power

Reporting Date for Employer under GAS 68	June 30, 2021	June 30, 2020
Measurement Date for Employer under GAS 68	**June 30, 2020**	**June 30, 2019**
• Beginning Net Pension Liability	$564,130,120	$618,010,254
• Pension Expense	243,664,082	220,569,160
• Employer Contributions	(287,848,105)	(281,978,068)
• New Net Deferred Inflows/Outflows	277,920,872	67,526,974
• Change in Allocation of Prior Deferred Inflows/Outflows	327,726	(276,220)
• New Net Deferred Flows Due to Change in Proportion[1]	(6,606,654)	1,927,134
• Recognition of Prior Deferred Inflows/Outflows	(38,830,280)	(62,163,581)
• Recognition of Prior Deferred Flows Due to Change in Proportion[1]	(389,566)	514,467
Ending Net Pension Liability	**$752,368,195**	**$564,130,120**

[1] Includes differences between actual employer contributions and proportionate share of contributions.

Schedule of Recognition of Changes in Total Net Pension Liability

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of Differences between Actual and Expected Experience on Total Pension Liability

Reporting Date for Employer under GAS 68 Year Ended June 30	Differences Between Actual and Expected Experience	Recognition Period (Years)	Reporting Date for Employer under GAS 68 Year Ended June 30:							
			2020	2021	2022	2023	2024	2025	2026	2027
2015	$(154,221,968)	5.13	$(3,908,158)	$0	$0	$0	$0	$0	$0	$0
2016	(162,912,927)	5.47	(29,782,985)	(13,998,002)	0	0	0	0	0	0
2017	(189,469,795)	5.65	(33,534,477)	(33,534,477)	(21,797,410)	0	0	0	0	0
2018	(196,176,749)	5.92	(33,137,964)	(33,137,964)	(33,137,964)	(30,486,929)	0	0	0	0
2019	10,253,750	6.18	1,659,183	1,659,183	1,659,183	1,659,183	1,659,183	298,652	0	0
2020	17,806,843	6.44	2,765,038	2,765,038	2,765,038	2,765,038	2,765,038	2,765,038	1,216,615	0
2021	62,540,626	6.67	0	9,376,406	9,376,406	9,376,406	9,376,406	9,376,406	9,376,406	6,282,190
Net Increase/(Decrease) in Pension Expense			**($95,939,363)**	**($66,869,816)**	**($41,134,747)**	**($16,686,302)**	**$13,800,627**	**$12,440,096**	**$10,593,021**	**$6,282,190**

As described in *Section 2, Schedule of Deferred Outflows of Resources and Deferred Inflows of Resources*, the average of the expected remaining service lives of all employees that are provided with pensions through the WPERP (active and inactive employees) determined as of July 1, 2019 (the beginning of the measurement period ending June 30, 2020) is 6.67 years.

Schedule of Recognition of Changes in Total Net Pension Liability (continued)

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of Assumption Changes

Reporting Date for Employer under GAS 68 Year Ended June 30	Effect of Assumption Changes	Recognition Period (Years)	Reporting Date for Employer under GAS 68 Year Ended June 30:							
			2020	2021	2022	2023	2024	2025	2026	2027
2015	$525,443,921	5.13	$13,315,341	$0	$0	$0	$0	$0	$0	$0
2016	0	5.47	0	0	0	0	0	0	0	0
2017	722,927,661	5.65	127,951,798	127,951,798	83,168,671	0	0	0	0	0
2018	0	5.92	0	0	0	0	0	0	0	0
2019	0	6.18	0	0	0	0	0	0	0	0
2020	8,835,790	6.44	1,372,017	1,372,017	1,372,017	1,372,017	1,372,017	1,372,017	603,688	0
2021	0	6.67	0	0	0	0	0	0	0	0
Net Increase/(Decrease) in Pension Expense			**$142,639,156**	**$129,323,815**	**$84,540,688**	**$1,372,017**	**$1,372,017**	**$1,372,017**	**$603,688**	**$0**

As described in *Section 2, Schedule of Deferred Outflows of Resources and Deferred Inflows of Resources*, the average of the expected remaining service lives of all employees that are provided with pensions through the WPERP (active and inactive employees) determined as of July 1, 2019 (the beginning of the measurement period ending June 30, 2020) is 6.67 years.

Schedule of Recognition of Changes in Total Net Pension Liability (continued)

Increase (Decrease) in Pension Expense Arising from the Recognition of Differences between Projected and Actual Earnings on Pension Plan Investments

Reporting Date for Employer under GAS 68 Year Ended June 30	Differences Between Projected and Actual Earnings	Recognition Period (Years)	Reporting Date for Employer under GAS 68 Year Ended June 30:							
			2020	2021	2022	2023	2024	2025	2026	2027
2015	$(762,372,550)	5.00	$0	$0	$0	$0	$0	$0	$0	$0
2016	315,478,371	5.00	63,095,675	0	0	0	0	0	0	0
2017	657,054,582	5.00	131,410,916	131,410,918	0	0	0	0	0	0
2018	(551,059,866)	5.00	(110,211,973)	(110,211,973)	(110,211,974)	0	0	0	0	0
2019	(179,809,710)	5.00	(35,961,942)	(35,961,942)	(35,961,942)	(35,961,942)	0	0	0	0
2020	95,290,217	5.00	19,058,043	19,058,043	19,058,043	19,058,043	19,058,045	0	0	0
2021	446,837,886	5.00	0	89,367,577	89,367,577	89,367,577	89,367,577	89,367,578	0	0
Net Increase/(Decrease) in Pension Expense			**$67,390,719**	**$93,662,623**	**($37,748,296)**	**$72,463,678**	**$108,425,622**	**$89,367,578**	**$0**	**$0**

The differences between projected and actual earnings on pension plan investments are recognized over a five-year period per Paragraph 33b. of GAS 68.

Schedule of Recognition of Changes in Total Net Pension Liability (continued)

Total Increase (Decrease) in Pension Expense

Reporting Date for Employer under GAS 68 Year Ended June 30	Total Differences	Reporting Date for Employer under GAS 68 Year Ended June 30: 2020	2021	2022	2023	2024	2025	2026	2027
2015	$(391,150,597)	$9,407,183	$0	$0	$0	$0	$0	$0	$0
2016	152,565,444	33,312,690	(13,998,002)	0	0	0	0	0	0
2017	1,190,512,448	225,828,237	225,828,239	61,371,261	0	0	0	0	0
2018	(747,236,615)	(143,349,937)	(143,349,937)	(143,349,938)	(30,486,929)	0	0	0	0
2019	(169,555,960)	(34,302,759)	(34,302,759)	(34,302,759)	(34,302,759)	1,659,183	298,652	0	0
2020	121,932,850	23,195,098	23,195,098	23,195,098	23,195,098	23,195,100	4,137,055	1,820,303	0
2021	509,378,512	0	98,743,983	98,743,983	98,743,983	98,743,983	98,743,984	9,376,406	6,282,190
Net Increase/(Decrease) in Pension Expense		**$114,090,512**	**$156,116,622**	**$5,657,645**	**$57,149,393**	**$123,598,266**	**$103,179,691**	**$11,196,709**	**$6,282,190**

Allocation of Changes in Total Net Pension Liability

In addition to the amounts shown in *Section 2, Schedule of Recognition of Changes in Total Net Pension Liability*, there are changes in each system's proportionate share of the total Net Pension Liability (NPL) during the measurement period ending on June 30, 2020. The net effect of the change on the system's proportionate share of the collective NPL and collective deferred outflows of resources and deferred inflows of resources is also recognized over the average of the expected remaining service lives of all employees shown previously. The differences between the actual employer contributions and the proportionate share of the employer contributions during the measurement period ending on June 30, 2020 are recognized over the same period. These amounts are shown below, with the corresponding amounts for the measurement periods ending each June 30 beginning in 2014 as follows. While these amounts are different for each system, they sum to zero for the entire Plan.

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of the Change in Proportion and Change in Employer Contributions for the Year Ended June 30, 2020

	Total Change to be Recognized	Recognition Period (Years)	Reporting Date for Employer under GAS 68 Year Ended June 30						
			2021	2022	2023	2024	2025	2026	2027
Water	$7,771,849	6.67	$1,165,195	$1,165,195	$1,165,195	$1,165,195	$1,165,195	$1,165,195	$780,679
Power	(7,771,849)	6.67	(1,165,195)	(1,165,195)	(1,165,195)	(1,165,195)	(1,165,195)	(1,165,195)	(780,679)
Total	**$0**		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Allocation of Changes in Total Net Pension Liability (continued)

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of the Change in Proportion and Change in Employer Contributions for the Year Ended June 30, 2019

	Total Change to be Recognized	Recognition Period (Years)	Reporting Date for Employer under GAS 68 Year Ended June 30						
			2020	2021	2022	2023	2024	2025	2026
Water	$(2,281,386)	6.44	$(354,252)	$(354,252)	$(354,252)	$(354,252)	$(354,252)	$(354,252)	$(155,874)
Power	2,281,386	6.44	354,252	354,252	354,252	354,252	354,252	354,252	155,874
Total	**$0**		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of the Change in Proportion and Change in Employer Contributions for the Year Ended June 30, 2018

	Total Change to be Recognized	Recognition Period (Years)	Reporting Date for Employer under GAS 68 Year Ended June 30						
			2019	2020	2021	2022	2023	2024	2025
Water	$4,975,531	6.18	$805,102	$805,102	$805,102	$805,102	$805,102	$805,102	$144,919
Power	(4,975,531)	6.18	(805,102)	(805,102)	(805,102)	(805,102)	(805,102)	(805,102)	(144,919)
Total	**$0**		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Allocation of Changes in Total Net Pension Liability (continued)

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of the Change in Proportion and Change in Employer Contributions for the Year Ended June 30, 2017

	Total Change to be Recognized	Recognition Period (Years)	Reporting Date for Employer under GAS 68 Year Ended June 30					
			2018	2019	2020	2021	2022	2023
Water	$307,966	5.92	$52,021	$52,021	$52,021	$52,021	$52,021	$47,861
Power	(307,966)	5.92	(52,021)	(52,021)	(52,021)	(52,021)	(52,021)	(47,861)
Total	**$0**		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of the Change in Proportion and Change in Employer Contributions for the Year Ended June 30, 2016

	Total Change to be Recognized	Recognition Period (Years)	Reporting Date for Employer under GAS 68 Year Ended June 30					
			2017	2018	2019	2020	2021	2022
Water	$(8,017,676)	5.65	$(1,419,058)	$(1,419,058)	$(1,419,058)	$(1,419,058)	$(1,419,058)	$(922,386)
Power	8,017,676	5.65	1,419,058	1,419,058	1,419,058	1,419,058	1,419,058	922,386
Total	**$0**		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Allocation of Changes in Total Net Pension Liability (continued)

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of the Change in Proportion and Change in Employer Contributions for the Year Ended June 30, 2015

	Total Change to be Recognized	Recognition Period (Years)	Reporting Date for Employer under GAS 68 Year Ended June 30					
			2016	2017	2018	2019	2020	2021
Water	$6,128,971	5.47	$1,120,470	$1,120,470	$1,120,470	$1,120,470	$1,120,470	$526,621
Power	(6,128,971)	5.47	(1,120,470)	(1,120,470)	(1,120,470)	(1,120,470)	(1,120,470)	(526,621)
Total	**$0**		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of the Change in Proportion and Change in Employer Contributions for the Year Ended June 30, 2014

	Total Change to be Recognized	Recognition Period (Years)	Reporting Date for Employer under GAS 68 Year Ended June 30					
			2015	2016	2017	2018	2019	2020
Water	$(1,739,043)	5.13	$(338,995)	$(338,995)	$(338,995)	$(338,995)	$(338,995)	$(44,068)
Power	1,739,043	5.13	338,995	338,995	338,995	338,995	338,995	44,068
Total	**$0**		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Section 3: Actuarial Assumptions and Methods and Appendices

Actuarial Assumptions and Methods

For June 30, 2020 Measurement Date and Employer Reporting as of June 30, 2021

Rationale for Assumptions

The information and analysis used in selecting each assumption that has a significant effect on this actuarial valuation is shown in the July 1, 2015 through June 30, 2018 Actuarial Experience Study dated June 12, 2019. Unless otherwise noted, all actuarial assumptions and methods shown below apply to both Tier 1 and Tier 2 members.

Economic Assumptions

Net Investment Return:	7.00%; net of investment expenses. Based on the Actuarial Experience Study referenced above, expected investment expenses represent about 0.35% of the average Market Value of Assets.
Employee Contribution, Additional Annuity and Matching Account Crediting Rate:	7.00%, based on Plan provisions
Consumer Price Index:	Increase of 2.75% per year. Retiree COLA increases due to CPI are subject to a 3% maximum change per year for Tier 1 and 2% maximum change per year for Tier 2.
Administration Expenses:	Offset by additional employer contributions.
Increase in Internal Revenue Code Section 401(a)(17) Compensation Limit:	Increase of 2.75% per year from the valuation date.

Salary Increases:

The annual rate of compensation increase includes: inflation at 2.75% per year, plus “across the board” salary increases of 0.50% per year, plus the following merit and promotion increases

Merit and Promotion Increases

Years of Service	Rate (%)
Less than 1	7.00
1 – 2	7.00
2 – 3	6.50
3 – 4	5.25
4 – 5	3.75
5 – 6	2.75
6 – 7	2.25
7 – 8	2.00
8 – 9	1.70
9 – 10	1.60
10 – 11	1.50
11 – 12	1.45
12 – 13	1.40
13 – 14	1.35
14 – 15	1.30
15 & over	1.25

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Demographic Assumptions

Post-Retirement Mortality Rates:	*Service Retirement and Disability Retirement* • Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) times 105% for males and 100% for females, projected generationally with the two-dimensional mortality improvement scale MP-2018. *Beneficiaries* • Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2018. *Optional Form of Payment Amounts at Retirement and Conversion of Contribution Balance to Annuities at Retirement* • *Members*: Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Table times 105% for males and 100% for females, projected generationally with the two-dimensional improvement scale MP-2018 associated with a retirement year of 2022, weighted 75% male and 25% female. • *Beneficiaries*: Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Table, projected generationally with the two-dimensional improvement scale MP-2018 associated with a retirement year of 2022, weighted 25% male and 75% female. The Pub-2010 mortality tables and adjustments as shown above reasonably reflect the mortality experience as of the measurement date. These mortality tables were adjusted to future years using the generational projection to reflect future mortality improvement between the measurement date and those years.

Pre-Retirement Mortality Rates:

Pub-2010 General Employee Amount-Weighted Above-Median Mortality Table (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2018.

	Rate (%)	
Age	**Male**	**Female**
25	0.024	0.008
30	0.031	0.013
35	0.041	0.021
40	0.057	0.033
45	0.085	0.051
50	0.129	0.076
55	0.190	0.112
60	0.276	0.169
65	0.405	0.270
70	0.609	0.445

5% of pre-retirement deaths are assumed to be duty related with the remaining being non-duty related. Note that generational projections beyond the base year (2010) are not reflected in the above mortality rates.

Disability Incidence Rates:

	Rate (%)	
Age	**Male**	**Female**
25	0.006	0.000
30	0.012	0.006
35	0.012	0.036
40	0.018	0.072
45	0.030	0.102
50	0.054	0.138
55	0.126	0.168

Termination Rates:

Total Termination

Years of Service	Rate (%)
Less than 1	10.00
1 – 2	5.25
2 – 3	3.75
3 – 4	3.50
4 – 5	2.50
5 – 6	2.00
6 – 7	1.50
7 – 8	1.50
8 – 9	1.50
9 – 10	1.00
10 – 20	0.75
20 & Over	0.50

Tier 1 Allocation of Termination Rates (%) between Ordinary Withdrawals and Vested Terminations

Years of Service	Ordinary Withdrawals	Vested Terminations
Less than 1	100	0
1 – 9	30	70
10 & Over	15	85

Tier 2 Allocation of Termination Rates (%) between Ordinary Withdrawals and Vested Terminations

Years of Service	Ordinary Withdrawals	Vested Terminations
Less than 5	100	0
5 & Over	15	85

Ordinary withdrawals are assumed to receive their account balance at termination. Vested terminations are assumed to receive a deferred retirement benefit. No termination is assumed after a member is first eligible to retire.

Retirement Rates:

	Rate (%)			
	Tier 1		Tier 2	
Age	Under 30 Years of Service	30 or More Years of Service	Under 30 Years of Service	30 or More Years of Service
50	0.00	1.00	0.00	0.00
51	0.00	0.00	0.00	0.00
52	0.00	0.00	0.00	0.00
53	0.00	0.00	0.00	0.00
54	0.00	0.00	0.00	0.00
55	4.25	27.00	0.00	25.00
56	2.00	20.00	0.00	14.00
57	2.50	17.50	0.00	13.00
58	3.50	17.50	0.00	13.00
59	3.50	17.50	0.00	13.00
60	5.50	22.00	5.50	17.50
61	6.50	22.00	3.50	10.00
62	7.00	22.00	2.50	10.00
63	8.00	25.00	20.00	25.00
64	8.50	27.00	12.00	25.00
65	11.50	30.00	11.00	28.00
66	12.00	30.00	11.00	28.00
67	12.50	30.00	12.00	28.00
68	13.00	30.00	12.50	28.00
69	17.00	30.00	15.00	28.00
70	22.00	25.00	50.00	50.00
71	22.00	25.00	50.00	50.00
72	22.00	25.00	50.00	50.00
73	22.00	25.00	50.00	50.00
74	22.00	25.00	50.00	50.00
75 & Over	100.00	100.00	100.00	100.00

Retirement Age and Benefit for Inactive Vested Members:	For Tier 1, inactive vested members are assumed to retire at age 60 with a Money Purchase Annuity. For Tier 2, inactive vested members are assumed to retire at age 63. Tier 1 and Tier 2 members receiving Permanent Total Disability benefits are assumed to retire at the earlier of age 65 or age 55 with 30 years of service.
Definition of Active Members:	First day of biweekly payroll following employment.
Unknown Data for Members:	Same as those exhibited by members with similar known characteristics. If not specified, members are assumed to be male.
Data Adjustments:	Data as of March 31 has been adjusted to June 30 by adding three months of age and, for active employees, three months of service. Contribution account balances were also increased by three months of interest. For members in pay status, we have increased their benefits by the assumed July 1 COLA.
Percent Married/Domestic Partner:	85% of male members and 60% of female members are assumed to have an eligible spouse or domestic partner at pre-retirement death or retirement. The assumption is also applied for current retirees retired before April 1, 2012 with Options Full, A, B, or C since they are missing this data. Spousal gender is assumed to be opposite that of the member.
Age of Spouse:	Male retirees are 3 years older than their spouses, and female retirees are 2 years younger than their spouses.
Future Benefit Accruals:	1.0 year of service per year.
Additional Service Accrual:	Tier 1 members are assumed to purchase an additional 0.07 years of service per year. Tier 2 members are assumed to purchase an additional 0.02 years of service per year. These service purchases exclude those priced at full actuarial cost. The valuation reflects expected future member contributions that are associated with these assumed service purchases.

Actuarial Methods

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
Projected Compensation:	Projected compensation for the year following the valuation date is calculated by annualizing the bi-weekly pay rate increased by the assumed rate of salary increase. For members with less than one year of service as of the valuation date, no salary increase assumption is applied to their annualized compensation
Expected Remaining Service Lives:	The average of the expected service lives of all employees is determined by: • Calculating each active employee's expected remaining service life as the present value of $1 per year of future service at zero percent interest. • Setting the remaining service life to zero for each nonactive or retired member. • Dividing the sum of the above amounts by the total number of active employee, nonactive and retired members.

Changes in Actuarial Assumptions

None.

Appendix A: Projection of Plan Fiduciary Net Position for Use in the Calculation of the Discount Rate as of June 30, 2020 ($ in millions)

Year Beginning July 1,	Projected Beginning Plan Fiduciary Net Position (a)	Projected Total Contributions (b)	Projected Benefit Payments (c)	Projected Investment Earnings (d)	Projected Ending Plan Fiduciary Net Position (e) = (a) + (b) - (c) + (d)
2020	$13,354	$482	$709	$927	$14,054
2021	14,054	458	749	974	14,737
2022	14,737	463	795	1,020	15,425
2023	15,425	496	839	1,068	16,150
2024	16,150	455	882	1,116	16,838
2025	16,838	358	923	1,159	17,431
2026	17,431	328	964	1,198	17,992
2027	17,992	285	1,004	1,234	18,507
2028	18,507	269	1,044	1,268	19,000
2029	19,000	256	1,085	1,301	19,472
2045	23,737	135	1,737	1,606	23,740
2046	23,740	124	1,772	1,604	23,696
2047	23,696	112	1,807	1,599	23,601
2048	23,601	100	1,844	1,591	23,447
2049	23,447	85	1,883	1,578	23,227
2094	1,243	0	146	82	1,179
2095	1,179	0	120	78	1,137
2096	1,137	0	97	76	1,117
2097	1,117	0	77	75	1,115
2098	1,115	0	60	76	1,131
2132	9,224	0	0 *	646	9,870
2133	9,870				
2133	Discounted Value: 5 **				

* Less than $1 million, when rounded.

** $9,870 million when discounted with interest at the rate of 7.00% per annum has a value of $5 million as of June 30, 2020.

Notes:

1. Amounts may not total exactly due to rounding.
2. Years 2030-2044, 2050-2093, and 2099-2131 have been omitted from this table.
3. Column (a): Except for the "discounted value" shown for 2133, none of the projected beginning Plan Fiduciary Net Position amounts shown have been adjusted for the time value of money.
4. Column (b): Projected total contributions include employee and employer Normal Cost contributions based on closed group projections (based on covered active members as of June 30, 2020), plus employer contributions to the Unfunded Actuarial Accrued Liability. Contributions are assumed to occur halfway through the year, on average.
5. Column (c): Projected benefit payments have been determined in accordance with paragraph 39 of GASB Statement No. 67, and are based on the closed group of active, inactive vested, retired members, and beneficiaries as of June 30, 2020. The projected benefit payments reflect the cost of living increase assumptions used in the June 30, 2020 valuation report. The projected benefit payments are assumed to occur halfway through the year, on average.
6. Column (d): Projected investment earnings are based on the assumed investment rate of return of 7.00% per annum.
7. Throughout the projection, administrative expenses are not shown as they are expected to be offset by additional employer contributions above those shown in this projection.
8. As illustrated in this Appendix, the Plan Fiduciary Net Position was projected to be available to make all projected future benefit payments for current Plan members. In other words, there is no projected "cross-over date" when projected benefits are not covered by projected assets. Therefore, the long-term expected rate of return on Plan investments of 7.00% per annum was applied to all periods of projected benefit payments to determine the Total Pension Liability as of June 30, 2020 shown earlier in this report, pursuant to paragraph 44 of GASB Statement No. 67.
9. This projection is based on a model developed by our Actuarial Technology and Systems unit, comprised of both actuaries and programmers. The model allows the client team, under the supervision of the responsible actuary, control over the entry of future expected contribution income, benefit payments and administrative expenses. The projection of fiduciary net position and the discounting of benefits is part of the model.

Appendix B: Projection of Plan Fiduciary Net Position for Use in the Calculation of the Discount Rate as of June 30, 2019 ($ in millions)

Year Beginning July 1,	Projected Beginning Plan Fiduciary Net Position (a)	Projected Total Contributions (b)	Projected Benefit Payments (c)	Projected Investment Earnings (d)	Projected Ending Plan Fiduciary Net Position (e) = (a) + (b) - (c) + (d)
2019	$12,987	$502	$664	$903	$13,729
2020	13,729	470	701	953	14,451
2021	14,451	433	746	1,001	15,139
2022	15,139	426	791	1,047	15,821
2023	15,821	448	834	1,094	16,528
2024	16,528	395	877	1,140	17,186
2025	17,186	297	919	1,181	17,745
2026	17,745	266	960	1,218	18,270
2027	18,270	223	999	1,252	18,745
2028	18,745	206	1,038	1,283	19,195
2044	23,107	117	1,680	1,563	23,106
2045	23,106	107	1,711	1,561	23,064
2046	23,064	97	1,742	1,557	22,976
2047	22,976	86	1,772	1,549	22,839
2048	22,839	73	1,804	1,538	22,646
2093	19,089	0	126	1,332	20,295
2094	20,295	0	103	1,417	21,610
2095	21,610	0	83	1,510	23,037
2096	23,037	0	66	1,610	24,581
2097	24,581	0	52	1,719	26,249
2131	243,638	0	0 *	17,055	260,692
2132	260,692				
2132 Discounted Value:	125 **				

* Less than $1 million, when rounded.

** $260,692 million when discounted with interest at the rate of 7.00% per annum has a value of $125 million as of June 30, 2019.

Notes:

(1) Amounts may not total exactly due to rounding.

(2) Years 2029-2043, 2049-2092, and 2098-2130 have been omitted from this table.

(3) Column (a): Except for the "discounted value" shown for 2132, none of the projected beginning Plan Fiduciary Net Position amounts shown have been adjusted for the time value of money.

(4) Column (b): Projected total contributions include employee and employer normal cost contributions based on closed group projections (based on covered active members as of June 30, 2019), plus employer contributions to the unfunded actuarial accrued liability. Contributions are assumed to occur halfway through the year, on average.

(5) Column (c): Projected benefit payments have been determined in accordance with Paragraph 39 of GASB Statement No. 67, and are based on the closed group of active, inactive vested, retired members, and beneficiaries as of June 30, 2019. The projected benefit payments reflect the cost of living increase assumptions used in the July 1, 2019 valuation report. The projected benefit payments are assumed to occur halfway through the year, on average.

(6) Column (d): Projected investment earnings are based on the assumed investment rate of return of 7.00% per annum.

(7) Throughout the projection, administrative expenses are not shown as they are expected to be offset by additional employer contributions above those shown in this projection.

(8) As illustrated in this Appendix, the Plan Fiduciary Net Position was projected to be available to make all projected future benefit payments for current Plan members. In other words, there is no projected "cross-over date" when projected benefits are not covered by projected assets. Therefore, the long-term expected rate of return on Plan investments of 7.00% per annum was applied to all periods of projected benefit payments to determine the Total Pension Liability as of June 30, 2019 shown earlier in this report, pursuant to Paragraph 44 of GASB Statement No. 67.

Appendix C: Definition of Terms

Definitions of certain terms as they are used in Statement 68. The terms may have different meanings in other contexts.

Active Employees:	Individuals employed at the end of the reporting or measurement period, as applicable.
Actual Contributions:	Cash contributions recognized as additions to a pension Plan Fiduciary Net Position.
Actuarial Present Value of Projected Benefit Payments:	Projected benefit payments discounted to reflect the expected effects of the time value (present value) of money and the probabilities of payment.
Actuarial Valuation:	The determination, as of a point in time (the actuarial valuation date), of the service cost, Total Pension Liability, and related actuarial present value of projected benefit payments for pensions performed in conformity with Actuarial Standards of Practice unless otherwise specified by the GASB.
Actuarial Valuation Date:	The date as of which an actuarial valuation is performed.
Actuarially Determined Contribution:	A target or recommended contribution to a defined benefit pension plan for the reporting period, determined in conformity with Actuarial Standards of Practice based on the most recent measurement available when the contribution for the reporting period was adopted.
Ad Hoc Cost-of-Living Adjustments (Ad Hoc COLAs):	Cost-of-living adjustments that require a decision to grant by the authority responsible for making such decisions.
Ad Hoc Postemployment Benefit Changes:	Postemployment benefit changes that require a decision to grant by the authority responsible for making such decisions.
Agent Employer:	An employer whose employees are provided with pensions through an agent multiple-employer defined benefit pension plan.
Agent Multiple-Employer Defined Benefit Pension Plan (Agent Pension Plan):	A multiple-employer defined benefit pension plan in which pension plan assets are pooled for investment purposes but separate accounts are maintained for each individual employer so that each employer's share of the pooled assets is legally available to pay the benefits of only its employees.
Automatic Cost-of-Living Adjustments (Automatic COLAs):	Cost-of-living adjustments that occur without a requirement for a decision to grant by a responsible authority, including those for which the amounts are determined by reference to a specified experience factor (such as the earnings experience of the pension plan) or to another variable (such as an increase in the consumer price index).
Automatic Postemployment Benefit Changes:	Postemployment benefit changes that occur without a requirement for a decision to grant by a responsible authority, including those for which the amounts are determined by reference to a specified experience factor (such as the earnings experience of the pension plan) or to another variable (such as an increase in the consumer price index).

Closed Period:	A specific number of years that is counted from one date and declines to zero with the passage of time. For example, if the recognition period initially is five years on a closed basis, four years remain after the first year, three years after the second year, and so forth.
Collective Deferred Outflows of Resources and Deferred Inflows of Resources Related to Pensions:	Deferred outflows of resources and deferred inflows of resources related to pensions arising from certain changes in the collective Net Pension Liability.
Collective Net Pension Liability:	The Net Pension Liability for benefits provided through (1) a cost-sharing pension plan or (2) a single-employer or agent pension plan in circumstances in which there is a special funding situation.
Collective Pension Expense:	Pension expense arising from certain changes in the collective Net Pension Liability.
Contributions:	Additions to a pension Plan Fiduciary Net Position for amounts from employers, non-employer contributing entities (for example, state government contributions to a local government pension plan), or employees. Contributions can result from cash receipts by the pension plan or from recognition by the pension plan of a receivable from one of these sources.
Cost-of-Living Adjustments:	Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.
Cost-Sharing Employer:	An employer whose employees are provided with pensions through a cost-sharing multiple-employer defined benefit pension plan.
Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (Cost-Sharing Pension Plan):	A multiple-employer defined benefit pension plan in which the pension obligations to the employees of more than one employer are pooled and pension plan assets can be used to pay the benefits of the employees of any employer that provides pensions through the pension plan.
Covered Payroll:	Payroll on which contributions to the pension plan are based.
Defined Benefit Pension Plans:	Pension plans that are used to provide defined benefit pensions.
Defined Benefit Pensions:	Pensions for which the income or other benefits that the employee will receive at or after separation from employment are defined by the benefit terms. The pensions may be stated as a specified dollar amount or as an amount that is calculated based on one or more factors such as age, years of service, and compensation. (A pension that does not meet the criteria of a defined contribution pension is classified as a defined benefit pension for purposes of Statement 68.)
Defined Contribution Pension Plans:	Pension plans that are used to provide defined contribution pensions.

Defined Contribution Pensions:	Pensions having terms that (1) provide an individual account for each employee; (2) define the contributions that an employer is required to make (or the credits that it is required to provide) to an active employee's account for periods in which that employee renders service; and (3) provide that the pensions an employee will receive will depend only on the contributions (or credits) to the employee's account, actual earnings on investments of those contributions (or credits), and the effects of forfeitures of contributions (or credits) made for other employees, as well as pension plan administrative costs, that are allocated to the employee's account.
Discount Rate:	The single rate of return that, when applied to all projected benefit payments, results in an actuarial present value of projected benefit payments equal to the total of the following: 1. The actuarial present value of benefit payments projected to be made in future periods in which (a) the amount of the pension Plan Fiduciary Net Position is projected (under the requirements of Statement 68) to be greater than the benefit payments that are projected to be made in that period and (b) pension plan assets up to that point are expected to be invested using a strategy to achieve the long-term expected rate of return, calculated using the long-term expected rate of return on pension plan investments. 2. The actuarial present value of projected benefit payments not included in (1), calculated using the municipal bond rate.
Entry Age Actuarial Cost Method:	A method under which the actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis over the earnings or service of the individual between entry age and assumed exit age(s). The portion of this actuarial present value allocated to a valuation year is called the normal cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future normal costs is called the actuarial accrued liability.
Inactive Employees:	Terminated individuals that have accumulated benefits but are not yet receiving them, and retirees or their beneficiaries currently receiving benefits.
Measurement Period:	The period between the prior and the current measurement dates.
Multiple-Employer Defined Benefit Pension Plan:	A defined benefit pension plan that is used to provide pensions to the employees of more than one employer.
Net Pension Liability (NPL):	The liability of employers and non-employer contributing entities to employees for benefits provided through a defined benefit pension plan.
Non-Employer Contributing Entities:	Entities that make contributions to a pension plan that is used to provide pensions to the employees of other entities. For purposes of Statement 68, employees are not considered non-employer contributing entities.

Other Postemployment Benefits:	All postemployment benefits other than retirement income (such as death benefits, life insurance, disability, and long-term care) that are provided separately from a pension plan, as well as postemployment healthcare benefits, regardless of the manner in which they are provided. Other postemployment benefits do not include termination benefits.
Pension Plans:	Arrangements through which pensions are determined, assets dedicated for pensions are accumulated and managed and benefits are paid as they come due.
Pensions:	Retirement income and, if provided through a pension plan, postemployment benefits other than retirement income (such as death benefits, life insurance, and disability benefits). Pensions do not include postemployment healthcare benefits and termination benefits.
Plan Members:	Individuals that are covered under the terms of a pension plan. Plan members generally include (1) employees in active service (active plan members) and (2) terminated employees who have accumulated benefits but are not yet receiving them and retirees or their beneficiaries currently receiving benefits (inactive plan members).
Postemployment:	The period after employment.
Postemployment Benefit Changes:	Adjustments to the pension of an inactive employee.
Postemployment Healthcare Benefits:	Medical, dental, vision, and other health-related benefits paid subsequent to the termination of employment.
Projected Benefit Payments:	All benefits estimated to be payable through the pension plan to current active and inactive employees as a result of their past service and their expected future service.
Public Employee Retirement System:	A special-purpose government that administers one or more pension plans; also may administer other types of employee benefit plans, including postemployment healthcare plans and deferred compensation plans.
Real Rate of Return:	The rate of return on an investment after adjustment to eliminate inflation.
Service Costs:	The portions of the actuarial present value of projected benefit payments that are attributed to valuation years.
Single Employer:	An employer whose employees are provided with pensions through a single-employer defined benefit pension plan.
Single-Employer Defined Benefit Pension Plan (Single-Employer Pension Plan):	A defined benefit pension plan that is used to provide pensions to employees of only one employer.

Special Funding Situations:	Circumstances in which a non-employer entity is legally responsible for making contributions directly to a pension plan that is used to provide pensions to the employees of another entity or entities and either of the following conditions exists: 1. The amount of contributions for which the non-employer entity legally is responsible is not dependent upon one or more events or circumstances unrelated to the pensions. 2. The non-employer entity is the only entity with a legal obligation to make contributions directly to a pension plan.
Termination Benefits:	Inducements offered by employers to active employees to hasten the termination of services, or payments made in consequence of the early termination of services. Termination benefits include early-retirement incentives, severance benefits, and other termination-related benefits.
Total Pension Liability (TPL):	The portion of the actuarial present value of projected benefit payments that is attributed to past periods of employee service in conformity with the requirements of Statement 68.

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