CONTRA COSTA WATER DISTRICT

Retirement Plan

June 30, 2018 Actuarial Funding Valuation
for Calendar Year 2019 Contributions

December 19, 2018

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## Introduction and Actuarial Certification

### Purposes of the valuation

This report presents the results of the June 30, 2018 actuarial funding valuation for the Contra Costa Water District

- to determine the Actuarially Determined Contributions for the 2019 calendar year, and
- to evaluate the funded status of the plan.

This report has been prepared solely for the Contra Costa Water District to summarize the Plan's actuarial funding considerations. Computations for other purposes, such as plan accounting or termination, may differ significantly from the results shown in this report.

This report may not be used for any other purpose, and Van Iwaarden Associates is not responsible for the consequences of any unauthorized use. Its content may not be modified, incorporated into or used in other material, or otherwise provided, in whole or in part, to any other person or entity, without our permission.

### Changes from the prior year

Changes to the plan provisions and actuarial assumptions reflected in this valuation are described at the end of each of those sections in this report. These changes include:

- The general inflation assumption was updated from 2.75% to 2.50% to reflect historical data and forward-looking market expectations.
- The mortality assumption was updated to reflect the Society of Actuaries' MP-2017 mortality improvement scale.

### Summary of valuation results

Since the prior valuation, the plan's funded status increased from 87.1% to 88.2% on a market asset value basis and from 86.6% to 87.5% on an actuarial asset basis. This change was primarily due to assumption changes and investment returns greater than expected, but offset for actuarial experience losses and the 2019 cost of living adjustment (COLA).

The total Actuarially Determined Employer Contribution (ADEC, including the latest COLA) increased from $6,795,535 to $7,029,711. PEPRA employee contribution rates remained at 5.75%. Additional contribution details can be found on pages 11 to 13.

Please note that, unless otherwise noted, all liability and normal cost results in this report were calculated with the following assumptions:

- 2019 results reflect a 2.8% 2019 COLA; 2018 results reflect a 2.0% 2018 COLA; and
- Normal costs are based on the "blended" bargained and 5.75% PEPRA employee contribution rates.

## Introduction and Actuarial Certification (continued)

### Actuarial certification

To the best of our knowledge, this report is complete and accurate and all Plan liabilities were determined in accordance with generally accepted actuarial principles and practices. Upon receipt of the report, the District should notify us if you disagree with any information contained in the report or if you are aware of any information that would affect the results that has not been communicated to us. The report will be deemed final and acceptable to the District unless the District promptly notifies us otherwise.

The District is responsible for selecting the funding policy, actuarial assumptions, and methods used to calculate the Actuarially Determined Contribution and other results in this report. With the exception of the COLA assumption, we believe that these assumptions are reasonable estimates of future plan experience, both individually and in the aggregate. The District assumes no long-term COLAs because these are not automatically granted. However, we believe the District's policy of consistently granting retiree COLAs suggests they are substantively automatic and should be reflected in the actuarial calculations.

All results in this report have been prepared based on our understanding of the District's pension funding policy and the Plan's benefit provisions. Additional contributions to the Plan may be required if actual plan economic and demographic experience do not match actuarial assumptions, or if contributions to the Plan are less than expected.

The undersigned credentialed actuaries are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. We are available to answer questions on the material contained in the report or to provide explanations or further detail, as may be appropriate. We are not aware of any direct or material indirect financial interest or relationship that could create a conflict of interest or impair the objectivity of the work.

Respectfully submitted,

Mark W. Schulte, FSA, EA, MAAA
Consulting Actuary

James A. van Iwaarden, FSA, EA, MAAA
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Consulting Actuary

L/D/C/R: 4/dw/gg/ms/jvi
December 19, 2018

## Summary of Results

| | June 30, 2018 | June 30, 2017 |
|---|---|---|
| A. Plan participant data (see page 15) | | |
| 1. Number of participants | | |
| a. Active employees | 289 | 288 |
| b. Vested terminated and reciprocals | 95 | 91 |
| c. Retirees and beneficiaries | 367 | 363 |
| d. Total | 751 | 742 |
| 2. Projected payroll for contribution year[1] | $ 31,801,048 | $ 30,331,660 |
| B. Benefit liabilities (see pages 9 and 11) | | |
| 1. Present value of projected benefits | $ 259,431,759 | $ 248,267,503 |
| 2. Actuarial accrued liability (AAL) | 214,362,261 | 203,469,801 |
| 3. Total normal cost (calendar year) | 5,229,909 | 5,085,433 |
| C. Value of plan assets (see pages 5 and 7) | | |
| 1. Market value of assets (MVA) | 189,143,172 | 177,228,515 |
| 2. Actuarial value of assets (AVA) | 187,541,811 | 176,126,394 |
| 3. Investment return, market value basis | 7.9% | 12.1% |
| D. Funded status | | |
| 1. Unfunded AAL, on AVA basis (B.2. - C.2.) | $ 26,820,450 | $ 27,343,407 |
| 2. Funded status (C.2. / B.2.) | 87.5% | 86.6% |
| 3. Funded status, MVA basis (C.1. / B.2.) | 88.2% | 87.1% |
| | Calendar Year | |
| E. Contribution rates as a percent of payroll (see page 11) | 2019 | 2018 |
| 1. Normal cost | | |
| a. Employer | 8.22% | 8.49% |
| b. Employee | 8.23% | 8.28% |
| 2. Amortization of unfunded AAL (employer paid) | | |
| a. Without latest COLA[2] | 12.70% | 13.12% |
| b. Including latest COLA | 13.89% | 13.92% |
| 3. Employer contribution rates | | |
| a. Without latest COLA (1.a. + 2.a.) | 20.92% | 21.61% |
| b. Including latest COLA (1.a. + 2.b.) | 22.11% | 22.41% |
| F. Actuarially Determined Contribution (ADC, see page 11) | | |
| 1. Actuarially Determined Employer Contribution (ADEC) | | |
| a. ADEC without latest COLA | $ 6,651,556 | $ 6,553,474 |
| b. ADEC including latest COLA | 7,029,711 | 6,795,535 |
| 2. Estimated employee contributions | 2,618,144 | 2,511,864 |
| 3. Total ADC (1. + 2.) | | |
| a. ADC without latest COLA | 9,269,700 | 9,065,338 |
| b. ADC including latest COLA | 9,647,855 | 9,307,399 |

[1] Projected pay for the calendar year following the valuation date. Payroll differs from OPEB due to application of the PEPRA pay limits ($121,388 in 2018 and $118,775 in 2017 for Social Security members) in this pension valuation.

[2] The COLA for 2018 was 2.0%. The COLA for 2019 is 2.8%.

## Funded Status and Contribution Rate History

(amounts in $000s)[1]

| Actuarial Valuation Date (6/30) | Actuarial Value of Assets | Actuarial Accrued Liability (AAL) | Unfunded AAL (UAAL) | Funded Ratio | Covered Payroll[2] | UAAL as a Percentage of Covered Payroll | Pre-COLA District Contribution Rate | District Contribution Rate w/ COLA |
|---|---|---|---|---|---|---|---|---|
| 1997 | $34,217 | $38,281 | $4,064 | 89.4% | $15,822 | 25.7% | N/A | N/A |
| 1998 | 40,184 | 42,511 | 2,327 | 94.5% | 17,190 | 13.5% | N/A | N/A |
| 1999 | 46,725 | 46,197 | (528) | 101.1% | 17,462 | -3.0% | N/A | N/A |
| 2000 | 53,495 | 50,773 | (2,722) | 105.4% | 18,348 | -14.8% | N/A | N/A |
| 2001 | 59,537 | 56,002 | (3,535) | 106.3% | 19,438 | -18.2% | N/A | N/A |
| 2002 | 62,724 | 62,183 | (541) | 100.9% | 20,777 | -2.6% | N/A | N/A |
| 2003 | 72,447 | 71,628 | (819) | 101.1% | 21,308 | -3.8% | N/A | N/A |
| 2004 | 75,560 | 77,667 | 2,107 | 97.3% | 21,651 | 9.7% | N/A | N/A |
| 2005 | 78,950 | 83,194 | 4,244 | 94.9% | 22,160 | 19.2% | 7.02% | N/A |
| 2006 | 83,533 | 88,926 | 5,393 | 93.9% | 23,034 | 23.4% | 7.56% | N/A |
| 2007 | 93,937 | 95,166 | 1,229 | 98.7% | 22,991 | 5.3% | 6.24% | N/A |
| 2008 | 101,765 | 103,699 | 1,934 | 98.1% | 24,578 | 7.9% | 7.27% | N/A |
| 2009 | 102,581 | 105,933 | 3,352 | 96.8% | 26,049 | 12.9% | 8.52% | N/A |
| 2010 | 102,277 | 113,841 | 11,564 | 89.8% | 26,769 | 43.2% | 19.68% | N/A |
| 2011 | 105,068 | 122,542 | 17,474 | 85.7% | 27,893 | 62.6% | 21.84% | N/A |
| 2012 | 104,867 | 138,161 | 33,294 | 75.9% | 27,604 | 120.6% | 19.11% | N/A |
| 2013 | 126,095 | 152,849 | 26,754 | 82.5% | 27,375 | 97.7% | 21.23% | 21.54% |
| 2014 | 140,843 | 164,326 | 23,483 | 85.7% | 27,179 | 86.4% | 19.67% | 20.41% |
| 2015 | 154,251 | 176,013 | 21,762 | 87.6% | 27,700 | 78.6% | 19.48% | 20.15% |
| 2016[3] | 164,392 | 191,580 | 27,188 | 85.8% | 28,847 | 94.2% | 22.49% | 22.18% |
| 2017 | 176,126 | 203,470 | 27,343 | 86.6% | 29,850 | 91.6% | 21.61% | 22.41% |
| 2018 | 187,542 | 214,362 | 26,820 | 87.5% | 31,297 | 85.7% | 20.92% | 22.11% |

1 Amounts may not add due to rounding

2 Projected compensation for year beginning on valuation date, with PEPRA compensation limited to statutory amount

3 Includes minor adjustment for 2017 to account for difference between 2017 funding report and COLA letter dated 12/1/2016.

## Reconciliation of Market Value of Assets

| | Trust Year Ending June 30, 2018 | Trust Year Ending June 30, 2017 |
|---|---|---|
| A. Market value of assets at beginning of year[1] | $ 177,228,515 | $ 159,021,973 |
| B. Contributions | | |
| 1. Employer[2] | 7,166,111 | 7,475,193 |
| 2. Employee[3] | 2,557,812 | 2,455,448 |
| 3. Total | 9,723,923 | 9,930,641 |
| C. Investment earnings | | |
| 1. Gross investment earnings | 14,341,729 | 19,653,916 |
| 2. Investment expenses | (426,901) | (399,889) |
| 3. Net investment earnings | 13,914,828 | 19,254,027 |
| D. Benefit payments | (11,724,094) | (10,978,126) |
| E. Administrative expenses | - | - |
| F. Market value of assets at end of year (A. + B. + C.3. + D. + E.) | 189,143,172 | 177,228,515 |
| **G. Investment return since prior valuation[4]** | 7.9% | 12.1% |

[1] Market value of assets at beginning and end of year are adjusted for contributions made during first month of fiscal year but attributable to final pay period of prior fiscal year ($340,445 at beginning of year and $349,211 at end of year).

[2] Includes employer reimbursement to trust for quarterly investment management fees ($399,889 in FY2017 and $426,901 in FY2018).

[3] Includes amounts paid by District and credited to member accounts ($426,625 in FY2017 and $424,649 in FY2018) and employee service purchases of $179,044 in FY2017 and $193,675 in FY2018.

[4] These returns differ from the Fiduciary Net Position (FNP) returns shown in the GASB 67/68 reports due to the adjustments noted in footnote #1 above.

## Asset Allocation - Market Value of Assets

The June 30, 2018 trust asset allocation is provided by Wells Fargo. Details are shown below.

| | Market Value | Percentage |
|---|---|---|
| Cash & Cash Equivalents | $ 2,129,733 | 1.1% |
| | | |
| Investments | | |
| Domestic equity | 88,515,393 | 46.9% |
| International equity | 27,650,617 | 14.6% |
| Domestic fixed income | 51,757,382 | 27.4% |
| International fixed income | 9,331,553 | 4.9% |
| Real Estate | 9,409,213 | 5.0% |
| Total investments | 186,664,158 | 98.8% |
| | | |
| Total Cash & Investments | 188,793,891 | 99.9% |
| | | |
| Receivables | | |
| Accrued Income[1] | 70 | 0.0% |
| Contribution due from District[2] | 274,127 | 0.1% |
| Contribution due from participants | 75,084 | 0.0% |
| Total receivables | 349,281 | 0.1% |
| | | |
| Total Assets | 189,143,172 | 100.0% |

## Target Asset Allocation

The Board Directors of Contra Costa Water District last revised the asset allocation in September 2015, as shown below.

| | Low | Normal | High |
|---|---|---|---|
| Domestic equity | 29% | 45% | 61% |
| International equity | 11% | 15% | 19% |
| Domestic fixed income | 25% | 30% | 35% |
| International fixed income | 3% | 5% | 7% |
| Real Estate | 3% | 5% | 8% |

1 One-time adjustment needed due to rounding methodology used by prior actuary.

2 Includes employer-paid employee contributions (i.e. "pick-up" contributions)

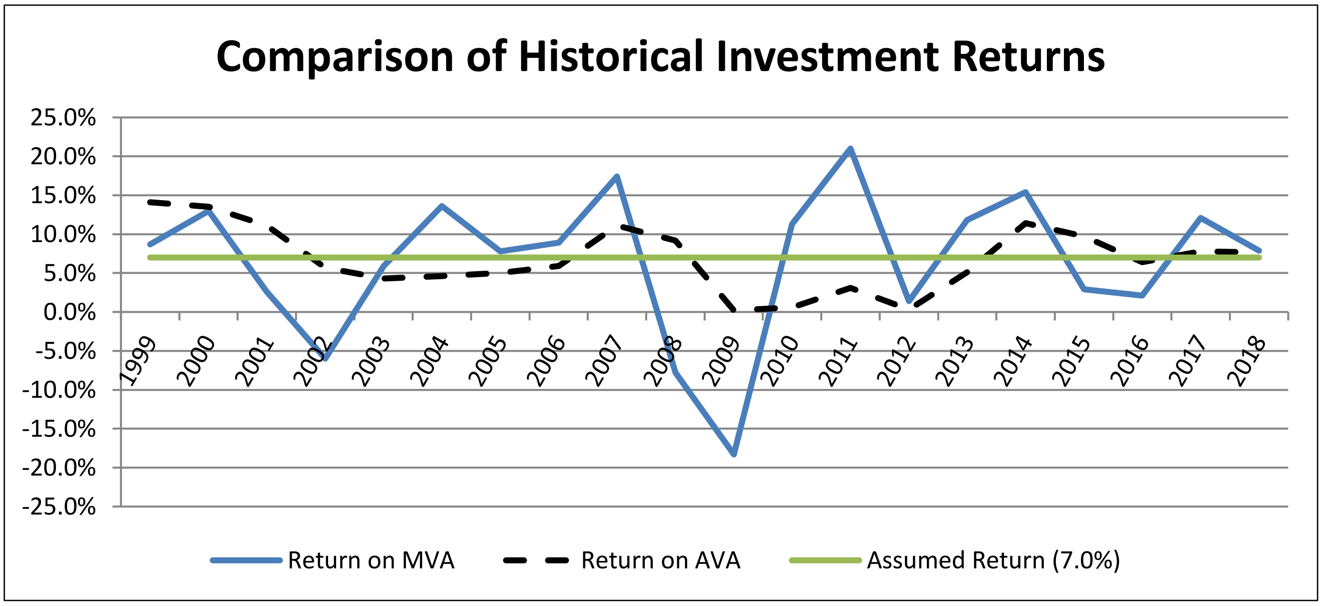
## Actuarial Value of Assets

| | Trust Year Ending | |
|---|---|---|
| | June 30, 2018 | June 30, 2017 |
| A. Market value of assets (MVA) | | |
| 1. Market value of assets at beginning of year | $ 177,228,515 | $ 159,021,973 |
| i. Contributions (employee + employer) | 9,723,923 | 9,930,641 |
| ii. Expected earnings | 12,335,990 | 11,094,876 |
| iii. Benefit payments | (11,724,094) | (10,978,126) |
| 2. Expected market value at end of year | 187,564,334 | 169,069,364 |
| 3. Actual market value at end of year | 189,143,172 | 177,228,515 |
| 4. Difference between actual MVA & expected MVA | (1,578,838) | (8,159,151) |
| B. Investment (gains) and losses[1] | | |
| 1. Year ending June 30, 2018, June 30, 2017 | | |
| i. Variance from expected return: loss or (gain) | (1,578,838) | (8,159,151) |
| ii. Portion not yet recognized | 80% | 80% |
| iii. Investment return not yet recognized (i. x ii.) | (1,263,070) | (6,527,321) |
| 2. Year ending June 30, 2017, June 30, 2016 | | |
| i. Variance from expected return: loss or (gain) | (8,159,151) | 8,087,000 |
| ii. Portion not yet recognized | 60% | 60% |
| iii. Investment return not yet recognized (i. x ii.) | (4,895,491) | 4,852,200 |
| 3. Year ending June 30, 2016, June 30, 2015 | | |
| i. Variance from expected return: loss or (gain) | 8,087,000 | 6,612,000 |
| ii. Portion not yet recognized | 40% | 40% |
| iii. Investment return not yet recognized (i. x ii.) | 3,234,800 | 2,644,800 |
| 4. Year ending June 30, 2015, June 30, 2014 | | |
| i. Variance from expected return: loss or (gain) | 6,612,000 | (10,359,000) |
| ii. Portion not yet recognized | 20% | 20% |
| iii. Investment return not yet recognized (i. x ii.) | 1,322,400 | (2,071,800) |
| 5. Total return not yet recognized (1.iii. + 2.iii. + 3.iii. + 4.iii.) | (1,601,361) | (1,102,121) |
| C. Actuarial Value of Assets (A.3. + B.5.) | 187,541,811 | 176,126,394 |

[1] The Actuarial Value of Assets is equal to the Market Value of Assets with a five year smoothing of gains and losses. This method is intended to reduce contribution rate volatility resulting from investment return fluctuations.

## Historical Investment Return Information

| Year Ended | CPI-W Increase[1] | Rate of Return on Market Value | Rate of Return on Actuarial Value |
|---|---|---|---|
| June 30, 1999 | 4.1% | 8.7% | 14.1% |
| June 30, 2000 | 4.1% | 13.0% | 13.5% |
| June 30, 2001 | 6.7% | 2.6% | 11.1% |
| June 30, 2002 | 1.2% | -6.0% | 5.7% |
| June 30, 2003 | 1.6% | 5.9% | 4.3% |
| June 30, 2004 | 1.7% | 13.6% | 4.6% |
| June 30, 2005 | 1.1% | 7.8% | 5.0% |
| June 30, 2006 | 3.9% | 8.9% | 5.9% |
| June 30, 2007 | 3.0% | 17.4% | 11.1% |
| June 30, 2008 | 4.7% | -7.8% | 9.2% |
| June 30, 2009 | -0.2% | -18.3% | 0.2% |
| June 30, 2010 | 1.4% | 11.3% | 0.6% |
| June 30, 2011 | 2.9% | 21.0% | 3.1% |
| June 30, 2012 | 2.7% | 1.4% | 0.3% |
| June 30, 2013 | 2.6% | 11.8% | 5.1% |
| June 30, 2014 | 2.9% | 15.4% | 11.4% |
| June 30, 2015 | 1.9% | 2.9% | 9.7% |
| June 30, 2016 | 2.5% | 2.1% | 6.4% |
| June 30, 2017 | 3.3% | 12.1% | 7.8% |
| June 30, 2018 | 4.0% | 7.9% | 7.7% |
| 20-year compound average | 2.8% | 6.2% | 6.8% |




[1] Increase of Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W), San Francisco-Oakland-San Jose, for 12 month period ending June 30.

## Summary of Liabilities Used to Determine Contributions

| | June 30, 2018 | June 30, 2017 |
|---|---|---|
| A. Actuarial present value of projected benefits[1] | | |
| 1. Active employees | $ 118,065,023 | $ 113,459,352 |
| 2. Vested terminated employees and reciprocals | 9,681,998 | 9,045,388 |
| 3. Service retirees | 123,101,116 | 117,936,681 |
| 4. Disabled participants | 519,459 | 515,668 |
| 5. Beneficiaries | 8,064,163 | 7,310,414 |
| 6. Total | 259,431,759 | 248,267,503 |
| B. Actuarial accrued liability[2] | | |
| 1. Active employees | 72,995,525 | 68,661,650 |
| 2. Vested terminated employees and reciprocals | 9,681,998 | 9,045,388 |
| 3. Service retirees | 123,101,116 | 117,936,681 |
| 4. Disabled participants | 519,459 | 515,668 |
| 5. Beneficiaries | 8,064,163 | 7,310,414 |
| 6. Total | 214,362,261 | 203,469,801 |
| C. Normal cost | | |
| 1. At the valuation date | | |
| a. Total normal cost | 4,975,735 | 4,838,280 |
| b. Employee normal cost | 2,490,902 | 2,389,787 |
| c. Net employer normal cost (a. - b.) | 2,484,833 | 2,448,493 |
| 2. For the contribution year | 2019 | 2018 |
| a. Total normal cost | 5,229,909 | 5,085,433 |
| b. Employee normal cost | 2,618,144 | 2,511,864 |
| c. Net employer normal cost (a. - b.) | 2,611,765 | 2,573,569 |
| D. Key economic assumptions | | |
| 1. Funding interest rate | 7.00% | 7.00% |
| 2. Salary increases | See page 23 | See page 23 |
| 3. Postretirement COLA[3] | 2.8% in 2019 | 2.0% in 2018 |

[1] The value of all future benefits to be paid to the current group of members

[2] The cost allocated to all prior years

[3] Assumed annual Cost of Living Adjustment (COLA) applied to each retiree's pension benefit. The District assumes no long-term COLAs because they are not automatic. Future emerging COLAs create actuarial losses that are amortized over time.

## Amortization Schedule

| Amortization Base | Year Established | Original Amount | Remaining Amortization Period | Outstanding Balance on June 30, 2018 | Annual Contribution for 2019 |
|---|---|---|---|---|---|
| UAAL Base | 2004 | $ 2,107,000 | 1 | $ 211,752 | $226,574 |
| UAAL Base | 2005 | 2,157,000 | 2 | 461,975 | 255,514 |
| UAAL Base | 2006 | 1,223,000 | 3 | 400,417 | 152,580 |
| UAAL Base | 2007 | (4,019,000) | 4 | (1,731,128) | (511,078) |
| UAAL Base | 2008 | 889,000 | 5 | 462,411 | 112,778 |
| UAAL Base | 2009 | 1,657,000 | 6 | 974,192 | 204,381 |
| UAAL Base | 2010 | 8,504,000 | 7 | 5,482,847 | 1,017,360 |
| UAAL Base | 2011 | 6,369,000 | 8 | 4,425,249 | 741,086 |
| UAAL Base | 2012 | 16,207,000 | 9 | 11,950,357 | 1,834,218 |
| UAAL Base | 2013 | (5,815,000) | 10 | (4,498,846) | (640,535) |
| 2014 COLA | 2013 | 759,000 | 10 | 565,545 | 80,521 |
| UAAL Base | 2014 | (2,546,000) | 11 | (2,069,925) | (276,039) |
| 2015 COLA | 2014 | 1,826,000 | 11 | 1,505,326 | 200,746 |
| UAAL Base | 2015 | (1,947,000) | 12 | (1,699,196) | (213,932) |
| 2016 COLA | 2015 | 1,682,000 | 12 | 1,467,453 | 184,755 |
| UAAL Base | 2016 | 5,450,000 | 13 | 5,001,421 | 598,424 |
| 2017 COLA | 2016 | 2,374,000 | 13 | 2,178,443 | 260,652 |
| UAAL Base[1] | 2017 | (2,259,672) | 14 | (2,169,749) | (248,100) |
| 2018 COLA | 2017 | 2,204,671 | 14 | 2,116,937 | 242,061 |
| UAAL Base | 2018 | (1,659,232) | 15 | (1,659,232) | (182,175) |
| 2019 COLA | 2018 | 3,444,201 | 15 | 3,444,201 | 378,155 |
| Total | | | | 26,820,450 | 4,417,946 |

[1] Includes adjustment for prior rounding of earlier amortization bases.

## Actuarially Determined Contribution

| | Contribution Year 2019 | Contribution Year 2018 |
|---|---|---|
| A. Actuarially Determined Contribution (ADC)[1] | | |
| 1. Total normal cost[2] | $ 5,229,909 | $ 5,085,433 |
| 2. Employee normal cost | 2,618,144 | 2,511,864 |
| 3. Employer normal cost (1. - 2.) | 2,611,765 | 2,573,569 |
| 4. Amortization of unfunded liability[3] | 4,039,791 | 3,979,905 |
| 5. Preliminary Actuarially Determined Employer Contribution (ADEC) (3. + 4.) | 6,651,556 | 6,553,474 |
| 6. Effect of COLA | 378,155 | 242,061 |
| 7. Total ADEC with COLA | 7,029,711 | 6,795,535 |
| **B. Projected payroll for contribution year[4]** | 31,801,048 | 30,331,660 |
| C. ADC as a percent of payroll | | |
| 1. Total normal cost | 16.45% | 16.77% |
| 2. Employee normal cost | 8.23% | 8.28% |
| 3. Employer normal cost[5] (1. - 2.) | 8.22% | 8.49% |
| 4. Amortization of unfunded liability | 12.70% | 13.12% |
| 5. Preliminary ADEC (3. + 4.) | 20.92% | 21.61% |
| 6. Effect of COLA[6] | 1.19% | 0.80% |
| 7. Total ADEC with COLA adjustment (5. + 6.) | 22.11% | 22.41% |

## 2019 Employer Contribution Rates by Bargaining Unit[5]

| | Clerical/ Maintenance | Professional/ Supervisory | Unrepresented | Confidential | Directors | Total |
|---|---|---|---|---|---|---|
| 1. Normal cost | 7.85% | 7.65% | 10.87% | 10.73% | 7.03% | 8.22% |
| 2. UAAL Amortization[7] | 12.86% | 13.36% | 19.86% | 14.65% | 8.24% | 13.89% |
| 3. Total rate | 20.71% | 21.01% | 30.73% | 25.38% | 15.27% | 22.11% |
| 4. Projected payroll ($000s) | $ 16,249 | $ 10,856 | $ 3,717 | $ 918 | $ 61 | $ 31,801 |
| 5. Annual amount ($000s) | 3,365 | 2,281 | 1,142 | 233 | 9 | 7,030 |

[1] The Actuarially Determined Contribution (ADC) is defined as "A target or recommended contribution to a defined benefit pension plan for the reporting period, determined in conformity with the Actuarial Standards of Practice based on the most recent measurement available when the contribution for the reporting period was adopted."

[2] The cost allocated to the contribution year. The amounts shown are adjusted to the beginning of the contribution year with interest and payroll growth.

[3] Excludes effect of latest ad-hoc COLA

[4] Adjusted to beginning of contribution year with payroll growth

[5] Does not include any bargained employer-paid employee contributions.

[6] The COLA for 2018 was 2.0%. The COLA for 2019 is 2.8%.

[7] Includes effect of expected 2019 COLA

## Analysis of Contribution Rate Changes

| | Actuarial Accrued Liability (AAL) | Actuarial Value of Assets (AVA) | Unfunded Accrued Liability (UAAL = AAL - AVA) | Contribution Rate Increase/ (Decrease) |
|---|---|---|---|---|
| A. June 30, 2017 actual value | $ 203,469,801 | $ (176,126,394) | $ 27,343,407 | 22.41% |
| B. June 30, 2018 expected value[1] | 210,923,461 | (185,887,980) | 25,035,481 | 21.96% |
| 1. Demographic (gain)/loss[2] | 1,108,131 | - | 1,108,131 | 0.08% |
| 2. Assumption changes[3] | (1,113,532) | - | (1,113,532) | -0.55% |
| 3. Contribution more than expected | - | (555,282) | (555,282) | -0.19% |
| 4. Investment (gain)/loss | - | (1,098,549) | (1,098,549) | -0.38% |
| 5. 2019 retiree COLA | 3,444,201 | - | 3,444,201 | 1.19% |
| C. Total change | 3,438,800 | (1,653,831) | 1,784,969 | 0.15% |
| D. June 30, 2018 actual value | $ 214,362,261 | $ (187,541,811) | $ 26,820,450 | 22.11% |

[1] The contribution rate is expected to decrease as a percent of payroll because the unfunded liability is amortized as a level dollar amount but payroll is assumed to increase each year.

[2] The demographic liability loss was partially offset by lower normal costs.

[3] See page 25 for a summary of assumption changes since the prior valuation.

## PEPRA Contribution Rates

The District's policy for determining the PEPRA contribution rate is:

1. Until the number of actual PEPRA participants is ½ of the number in the initial study group, use the normal cost rate based on the study group.
2. When the number of actual PEPRA participants is ½ of the number in the initial study group, determine the employee normal cost rate as ½ of the rate for the study group and ½ of the rate for the actual PEPRA participants.
3. When the number of actual PEPRA participants equals or exceeds the number in the initial study group, determine the employee normal cost rate as the rate for the actual PEPRA participants.

Below is a comparison of the PEPRA participant counts for the current valuation

| | |
|---|---|
| • Number of participants in initial PEPRA study group established in 2014 | 57 |
| • Number of actual PEPRA participants as of June 30, 2018 | 81 |

Because the number of actual PEPRA participants exceeds the number in the original 2014 study, the employee normal cost rate for PEPRA participants will now be based solely on results for those participants.

## Development of 2019 PEPRA employee normal cost rate

PEPRA employees must contribute at least half of the total normal cost rate, rounded to the nearest 0.25%. Rates are calculated annually but only adjusted if the total normal cost rate has increased or decreased by at least 1% since the date of the last rate change.

| | Total Normal Cost Rate | Half of Total Rate | Employee Normal Cost Rate[2] |
|---|---|---|---|
| 1. 2014 PEPRA normal cost rate (first established) | 12.81% | 6.41% | 6.50% |
| 2. 2015 PEPRA normal cost rate (current basis)[1] | 11.54% | 5.77% | 5.75% |
| 3. 2016 PEPRA normal cost rate | 11.58% | 5.79% | 5.75% |
| 4. 2017 PEPRA normal cost rate | 11.90% | 5.95% | 5.75% |
| 5. 2018 PEPRA normal cost rate | 12.33% | 6.17% | 5.75% |
| 6. 2019 PEPRA normal cost rate | 11.90% | 5.95% | 5.75% |

The above rates should be applied to salary below the PEPRA compensation limit.

Since the 2019 PEPRA total normal cost rate of 11.90% is not more than 1% different from the current basis of 11.54% (the last adjustment to the employee normal cost rate), the employee normal cost rate remains unchanged at 5.75% for 2019.

[1] Year of most recent adjustment to employee normal cost rate

[2] PEPRA employee normal cost rate is adjusted when total normal cost rate changes by at least 1% from the amount used as the current PEPRA normal cost basis.

## Risk Measures

The items below provide pension risk measurements for the Contra Costa Water District Retirement Plan. Evolving pension practice encourages review of these risks on a regular basis to help employers better manage their plans.

| | June 30, 2018 | June 30, 2017 |
|---|---|---|
| A. Payroll for year following valuation date | $ 31,296,545 | $ 29,850,468 |
| B. Risk measures - market value of assets | | |
| 1. Actuarial accrued liability (AAL) | $ 214,362,261 | $ 203,469,801 |
| 2. Market value of assets (MVA) | 189,143,172 | 177,228,515 |
| 3. Unfunded AAL (MVA basis) | 25,219,089 | 26,241,286 |
| 4. Funded ratio (2./1.) | 88.2% | 87.1% |
| 5. UAAL (MVA basis) as a percent of payroll (3. / A.) | 80.6% | 87.9% |
| C. Risk measures - actuarial value of assets | | |
| 1. Actuarial accrued liability | $ 214,362,261 | $ 203,469,801 |
| 2. Actuarial value of assets (AVA) | 187,541,811 | 176,126,394 |
| 3. Unfunded AAL (AVA basis) | 26,820,450 | 27,343,407 |
| 4. Funded ratio (2. / 1.) | 87.5% | 86.6% |
| 5. UAAL (AVA basis) as a percent of payroll (3. / A.) | 85.7% | 91.6% |
| D. Volatility ratios | | |
| 1. Liability volatility ratio (B.1. / A.) | 6.8 | 6.8 |
| 2. Asset volatility ratio (B.2. / A.) | 6.0 | 5.9 |
| E. Maturity ratios | | |
| 1. Participant maturity ratio (# retirees / total participants) | 48.9% | 48.9% |
| 2. Liability maturity ratio (retiree AAL / total AAL) | 61.4% | 61.8% |

## Summary of Membership Data

| | June 30, 2018 | June 30, 2017 |
|---|---|---|
| A. Active employees | | |
| 1. Number | 289 | 288 |
| 2. Average age | 46.6 | 46.3 |
| 3. Average years of service | 10.3 | 10.0 |
| 4. Total salary[1] | $ 31,296,545 | $ 29,850,468 |
| 5. Average salary | 108,293 | 103,647 |
| 6. Projected payroll for contribution year | 31,801,048 | 30,331,660 |
| B. Vested terminated and reciprocals | | |
| 1. Number | 95 | 91 |
| 2. Average age | 49.3 | 49.3 |
| C. Retirees and beneficiaries | | |
| 1. Number | | |
| a. Retired | 313 | 311 |
| b. Disabled | 4 | 4 |
| c. Beneficiaries | 50 | 48 |
| d. Total | 367 | 363 |
| 2. Average age | 68.3 | 67.8 |
| 3. Average monthly benefit | $ 2,751 | $ 2,611 |
| D. Total number of participants (A.1. + B.1. + C.1.d.) | 751 | 742 |

[1] Projected compensation for year beginning on valuation date, with PEPRA compensation limited to statutory amount.

## Summary of Membership Changes

| | Actives | Vested Terminated | Retirees | Disabled | Beneficiaries | Total |
|---|---|---|---|---|---|---|
| A. Number of members on June 30, 2017 | 288 | 91 | 311 | 4 | 48 | 742 |
| B. Changes in membership | | | | | | |
| 1. New entrants | 18 | | | | | 18 |
| 2. Retirements | (7) | (1) | 8 | | | 0 |
| 3. Vested terminations (deferred benefits) | (10) | 10 | | | | 0 |
| 4. Termination/refund of contributions | | (4) | | | | (4) |
| 5. Deaths (no beneficiary) | | | (2) | | (3) | (5) |
| 6. Deaths (with beneficiary) | | | (4) | | 4 | 0 |
| 7. Data corrections | | (1) | | | | (1) |
| 8. Rehires | | | | | | 0 |
| 9. QDRO | | | | | 1 | 1 |
| 10. Total changes | 1 | 4 | 2 | 0 | 2 | 9 |
| C. Number of members on June 30, 2018 | 289 | 95 | 313 | 4 | 50 | 751 |

## Age and Service Distribution of Active Members

| Attained Age | Benefit Service | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Under 1 | 1 - 4 | 5 - 9 | 10 - 14 | 15 - 19 | 20 - 24 | 25 - 29 | 30 - 34 | 35 - 39 | 40 plus | Total |
| Under 25 | 1 | 1 | | | | | | | | | 2 |
| 25 - 29 | 2 | 13 | | | | | | | | | 15 |
| 30 - 34 | 3 | 20 | 4 | 3 | | | | | | | 30 |
| 35 - 39 | 3 | 17 | 7 | 5 | | | | | | | 32 |
| 40 - 44 | 2 | 14 | 9 | 14 | 9 | 1 | | | | | 49 |
| 45 - 49 | 2 | 13 | 4 | 10 | 9 | 2 | 1 | | | | 41 |
| 50 - 54 | | 10 | 8 | 12 | 4 | 11 | 4 | | | | 49 |
| 55 - 59 | 2 | 6 | 4 | 11 | 10 | 5 | 6 | 4 | 1 | | 49 |
| 60 - 64 | | 4 | 4 | 2 | 2 | 1 | 4 | 1 | | | 18 |
| 65 - 69 | | | 1 | | 1 | | | | | | 2 |
| 70 plus | | | | 1 | | | | | | 1 | 2 |
| Total | 15 | 98 | 41 | 58 | 35 | 20 | 15 | 5 | 1 | 1 | 289 |

## Age Distribution of Inactive Members

| Age | Vested Terminated | Retired | Disabled | Beneficiary | Total |
|---|---|---|---|---|---|
| Under 50 | 45 | 0 | 0 | 2 | 47 |
| 50 - 54 | 28 | 6 | 1 | 0 | 35 |
| 55 - 59 | 15 | 44 | 0 | 6 | 65 |
| 60 - 64 | 7 | 74 | 1 | 7 | 89 |
| 65 - 69 | 0 | 76 | 1 | 6 | 83 |
| 70 - 74 | 0 | 59 | 0 | 11 | 70 |
| 75 - 79 | 0 | 30 | 1 | 4 | 35 |
| 80 - 84 | 0 | 19 | 0 | 5 | 24 |
| 85 - 89 | 0 | 2 | 0 | 5 | 7 |
| 90 - 94 | 0 | 3 | 0 | 2 | 5 |
| 95 - 99 | 0 | 0 | 0 | 2 | 2 |
| 100 & over | 0 | 0 | 0 | 0 | 0 |
| Total | 95 | 313 | 4 | 50 | 462 |

## Summary of Plan Provisions

**A. Plan Effective Date**

Originally established effective February 17, 1962. The plan is typically amended annually for ad hoc COLA increases granted by the board.

**B. Plan Year**

July 1 to June 30.

**C. Participation**

All permanent full-time employees, all project employees, and all directors of the District.

**D. Eligibility to Retire**

Meet vesting requirements and:

| | Classic Members | PEPRA Members |
|---|---|---|
| Clerical, Maintenance, Confidential, Professional/Supervisory, and Unrepresented | Age 50 | Age 52 |
| Directors | Age 55 | Age 52 |

**E. Vesting**

100% vested upon first attaining one of the following:

| | Classic Members | PEPRA Members |
|---|---|---|
| Years of service | | |
| Clerical, Maintenance, and Directors | 10 years | 5 years |
| Confidential, Professional/Supervisory, and Unrepresented | 5 years | 5 years |
| Normal retirement age | Age 62 | None |
| Disability | Immediate | Immediate |

Vesting service includes reciprocal service.

**F. Final Average Compensation**

Basic Compensation: Regular salary excluding overtime, shift premium, and all other irregular compensation.

Classic Members:

- Non-directors – Highest 12 consecutive months
- Directors – Highest 36 consecutive months during the last 5 years

PEPRA Members:

- Highest 36 consecutive months up to PEPRA compensation limit ($121,388 in 2018).

## Summary of Plan Provisions (continued)

**G. Service Retirement Benefit**

Benefit factor x Final Average Compensation

Classic Members:

- Non-directors benefit factor = 2.35% at 55
- Directors benefit factor = 2.35% at 62

PEPRA Members: benefit factor = 2.00% at age 62

Inactive Participants: Benefit factor varies by bargaining groups and separation dates

Sample benefit factors are shown below:

| | Age at Retirement = 55 | | | Age at Retirement = 62 | | |
|---|---|---|---|---|---|---|
| Years of Service | 2.35% at 55 | 2.35% at 62 | 2.00% at 62 | 2.35% at 55 | 2.35% at 62 | 2.00% at 62 |
| 10 | 23.50% | 11.02% | 13.00% | 26.58% | 23.50% | 20.00% |
| 15 | 35.25% | 16.53% | 19.50% | 39.87% | 32.25% | 30.00% |
| 20 | 47.00% | 22.04% | 26.00% | 53.16% | 47.00% | 40.00% |
| 25 | 58.75% | 27.55% | 32.50% | 66.45% | 58.75% | 50.00% |
| 30 | 70.50% | 33.06% | 39.00% | 79.74% | 70.50% | 60.00% |
| 35 | 82.25% | N/A | 45.50% | 93.02% | 82.25% | 70.00% |

**H. Termination Benefit**

Non-vested: Return of contributions plus interest in a lump sum

Vested: Return of contributions plus interest in a lump sum, or a deferred benefit

**I. Disability Benefit**

Clerical and Maintenance with 10 years of service and Social Security disability:

- 30% of current Basic Compensation
- Not less than service retirement benefit

Others:

- 100% vested immediately
- Return of contributions plus interest in a lump sum, or a deferred benefit

**J. Death Benefit - Before Retirement**

Non-vested: Return of contributions plus interest in a lump sum

Vested:

- Non-directors – 85% of member’s accrued service retirement benefit
- Directors – 50% of benefit that would have been paid under the 50% J&S option, upon retirement at the later of age 55 and death, and commencing no earlier than age 55

**K. Death Benefit - After Retirement**

Return of contributions plus interest less any monthly payments previously received by retiree. Remaining contribution balance is paid to a designated beneficiary if joint annuitant option not in effect.

## Summary of Plan Provisions (continued)

**L. Benefit Forms**

Normal form of payment: Single life annuity.

Optional forms of payment (actuarial equivalent):

- Joint and survivor annuity
- Joint and survivor annuity with "pop-up"

**M. Cost of Living Increases**

Ad Hoc increases granted by the Board.

Recent history:

| January 1st | Increase | January 1st | Increase |
|---|---|---|---|
| 2007 | 1.8% | 2013 | 1.8% |
| 2008 | 3.0% | 2014 | 1.2% |
| 2009 | 2.0% | 2015 | 2.2% |
| 2010 | 0.0% | 2016 | 1.8% |
| 2011 | 0.0% | 2017 | 2.2% |
| 2012 | 1.8% | 2018 | 2.0% |
| | | 2019 | 2.8% |

**N. Employee Contributions**

Classic Members (% of Basic Compensation):

| Group | Employee Paid | District Paid | Total |
|---|---|---|---|
| Professional/Supervisory | 6.43% | 3.00% | 9.43% |
| Confidential | 6.28% | 3.00% | 9.28% |
| Unrepresented: | | | |
| < 7 years of service | 6.00% | 0.00% | 6.00% |
| 7 to 9 years of service | 5.00% | 1.00% | 6.00% |
| ≥ 10 years of service | 4.00% | 2.00% | 6.00% |
| Clerical and Maintenance | 8.00% | 1.00% | 9.00% |
| Directors | 1.00% | 0.00% | 1.00% |

PEPRA Members: 50% of the normal cost rate of the Plan, rounded to the nearest quarter of 1%. The contribution rate is applied to pay up to each year's PEPRA compensation limit.

**O. Changes since prior year**

A cost of living increase of 2.8% was approved for 2019.

## Actuarial Methods

| | |
|---|---|
| A. Actuarial Cost Method | The Entry Age Normal level percent of pay cost method. Under this method, the normal cost for an individual participant is the level percentage of pay required to accumulate the funds needed to pay the participant's projected benefits by their assumed retirement age, beginning on the date of entry and ending at the last age before 100% retirement. The actuarial accrued liability is the accumulated value of these annual normal costs on a given date. The plan's normal cost and accrued liability are the total of these values for all participants. |
| B. Funding Policy | Each year, unexpected changes in the unfunded actuarial accrued liability are amortized as a level dollar amount over a closed 15-year period beginning on the January 1st following the valuation date. These changes may be due to actuarial gains and losses, assumption changes, or plan changes. |
| | Any ad-hoc cost of living adjustments (COLAs) are separately amortized and funded as employer-paid contributions over a closed 15-year period beginning on the January 1st when the COLA is first effective. |
| | Contribution rates determined in this report are for the calendar year following the valuation date, and are assumed to be applied to the payroll for each pay period during the contribution year. |
| C. Data Methods | The Contra Costa Water District supplied data for all participants and asset information for the years ending June 30, 2017 and June 30, 2018. We have relied on this data in preparing this report. The data was reviewed for reasonableness and consistency, but we have not performed a complete audit. |
| D. Asset Method | The Actuarial Value of Assets is equal to the Market Value of Assets with a 5-year smoothing of investment gains and losses. |
| E. Change in Actuarial Methods | None |

## Actuarial Assumptions

A. Economic Assumptions

| Valuation Date | June 30, 2018 | June 30, 2017 |
|---|---|---|
| Discount Rate | 7.00% | 7.00% |
| General Inflation (CPI-U)[1] | 2.50% | 2.75% |
| Wage Inflation (CPI-W) | 3.00% | 3.00% |
| Payroll Growth[2] | 3.25% | 3.25% |
| Future COLAs | 2.8% in 2019 | 2.0% in 2018 |

Salary Increases

3.00% wage inflation plus pay increase based on years of District service, employment group, and entry age with the District. Sample rates:

| | | | Other (Entry Age) | |
|---|---|---|---|---|
| Service | Clerical | Directors | < 40 | > 40 |
| 2 | 3.75% | 0.00% | 5.25% | 2.75% |
| 7 | 1.00% | 0.00% | 2.25% | 0.75% |
| 12 | 1.00% | 0.00% | 1.75% | 0.75% |
| 17 | 0.75% | 0.00% | 0.75% | 0.75% |

B. Demographic Assumptions

Mortality

Healthy post-retirement: Society of Actuaries base RP-2014 healthy, no-collar table (adjusted to 2006) with generational projection using scale MP-2017.

Disabled: Society of Actuaries base RP-2014 disabled retiree, no-collar table (adjusted to 2006) with generational projection using scale MP-2017.

Termination

Rates vary based on service and classification. Sample rates are:

| Service | Clerical | Other |
|---|---|---|
| 0 | 3.0% | 10.0% |
| 5 | 3.0% | 5.0% |
| 10 | 1.5% | 5.0% |
| 15 | 4.0% | 0.0% |
| 20 | 4.0% | 0.0% |
| 25 | 4.0% | 0.0% |
| 30+ | 0.0% | 0.0% |

[1] Applies to assumed future increases in pensionable compensation limit and benefit limit.

[2] Payroll growth assumption is used to project normal cost and employee payroll from valuation date to the contribution year.

## Actuarial Assumptions (continued)

B. Demographic Assumptions (continued)

**Disability**

Rates based on age and gender. Sample rates are:

| Age | Male | Female |
|---|---|---|
| 40 | 0.06% | 0.08% |
| 45 | 0.10% | 0.11% |
| 50 | 0.11% | 0.11% |
| 55 | 0.11% | 0.09% |
| 60 | 0.11% | 0.07% |
| 65 | 0.11% | 0.06% |
| 70 | 0.09% | 0.06% |
| 75+ | 0.07% | 0.06% |

**Retirement**

Sample rates below are for members in the Classic pension plan:

| Age | Rate | Age | Rate |
|---|---|---|---|
| 50 | 5.0% | 61 | 15.0% |
| 55 | 8.0% | 62 | 18.0% |
| 56 | 13.0% | 63 | 18.0% |
| 57 | 11.0% | 64 | 18.7% |
| 58 | 11.0% | 65 | 25.6% |
| 59 | 11.0% | 70 | 41.6% |
| 60 | 20.0% | 75+ | 100.0% |

Sample rates below are for members in the PEPRA pension plan:

| | Years of Service | | | | | |
|---|---|---|---|---|---|---|
| Age | 5 | 10 | 15 | 20 | 25 | 30 |
| 52 | 1.0% | 1.3% | 1.6% | 1.9% | 2.2% | 2.4% |
| 57 | 3.6% | 4.6% | 5.6% | 6.6% | 7.6% | 8.6% |
| 62 | 9.7% | 12.3% | 15.0% | 17.6% | 20.2% | 22.9% |
| 67 | 10.5% | 13.3% | 16.2% | 19.0% | 21.9% | 24.7% |
| 72 | 12.5% | 16.0% | 19.4% | 22.8% | 26.2% | 29.6% |
| 75+ | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |

**Percent married**

Current retirees: actual spouse coverage.

Future retirees: 80% of employees are assumed to be married.

**Spouse age**

Based on actual spouse birth dates when available. Otherwise husbands are assumed to be three years older than wives.

## Actuarial Assumptions (continued)

B. Demographic Assumptions (continued)

Assumed payment form

| | Single Employees | Married Employees |
|---|---|---|
| Single life annuity | 100% | 25% |
| 50% Joint & Survivor | 0% | 26% |
| 100% Joint & Survivor | 0% | 49% |

Reciprocity and Terminations

50% of terminated vested members are assumed to be employed by reciprocal agencies and receive 3.25% annual pay increases until retirement.

Terminated vested members are assumed to retire at age 60 and elect a single life annuity.

Terminated vested members not meeting the early retirement service requirements are assumed to receive an immediate refund of contributions with interest.

Death Benefit - After Retirement

Total monthly payments received by retirees prior to death are assumed to exceed employee contributions with interest.

C. Changes Since Last Valuation

Since the last valuation the following changes have been made:

- The general inflation assumption was updated from 2.75% to 2.50% to reflect historical data and forward-looking market expectations.
- The mortality assumption was updated to reflect the Society of Actuaries' MP-2017 mortality improvement scale.

## Selection of Economic Assumptions

The Actuarial Standards Board (ASB) provides coordinated guidance for measuring pension and retiree group benefit obligations through a series of Actuarial Standards of Practice (ASOPs). ASOP No. 27, Selection of Economic Assumptions for Measuring Pension Obligations, requires that the actuary disclose the rationale used in selecting each non-prescribed economic assumption and any changes to non-prescribed economic assumptions.

The table below summarizes the rationale for selecting the non-prescribed economic assumptions. The rationale for assumption changes, along with a description of the assumptions themselves, is included in the Actuarial Assumption and Methods section of this report.

| Economic Assumptions (non-prescribed) | |
|---|---|
| **Assumption** | **Rationale for Selecting Assumption** |
| Discount rate / investment return | The expected investment return was selected by the District and is based on expected long-term asset class returns and the District's target asset allocation. We have verified with our own capital market assumption model that their assumption is reasonable. Our model is based on the plan's target asset allocation and a blend of expected asset class returns published in the 2018 Survey of Capital Market Assumions produced by Horizon Actuarial Services. |
| General inflation (CPI-U) | Based on analysis of historical CPI-U inflation rates and the estimated forward-looking inflation rate implied by 30-Year Treasury rates vs. 30-Year TIPS rates. |
| Wage inflation (CPI-W) | Based on historical CPI-W rates for San Francisco, Oakland, San Jose area. |
| Payroll growth | Based on 20-year history of District's total payroll growth. |
| Cost-of-living increases | 2019 COLA assumption was based on information provided by the District. The District assumes no long-term COLAs because they are not automatic. Future emerging COLAs create actuarial losses that are amortized over time. |
| Salary increases | Based on the District's 2009 - 2014 actuarial experience study |

## Selection of Non-Economic Assumptions

The Actuarial Standards Board (ASB) provides coordinated guidance for measuring pension and retiree group benefit obligations through a series of Actuarial Standards of Practice (ASOPs). ASOP No. 35, Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations, requires that the actuary disclosure the rationale used in selecting each non-prescribed non-economic assumption and any changes to the non-prescribed non-economic assumptions.

The table below summarizes the rationale for selecting the non-prescribed non-economic assumptions. The rationale for assumption changes, along with a description of the assumptions themselves, is included in the Actuarial Assumption and Methods section of the report.

| Non-Economic Assumptions (non-prescribed) | |
|---|---|
| Assumption | Rationale for Selecting Assumption |
| Mortality | Based on most recently published table and workforce demographics |
| Retirement | Based on the District's 2009 - 2014 actuarial experience study |
| Termination of employment | Based on the District's 2009 - 2014 actuarial experience study |
| Disability | Based on the District's 2009 - 2014 actuarial experience study |
| Form of payment | Based on the District's 2009 - 2014 actuarial experience study |
| Percent married and spouse ages | Based on the District's 2009 - 2014 actuarial experience study |
| Reciprocity and terminations | Based on the District's 2009 - 2014 actuarial experience study |

## Important Notices

### Purpose and Scope of the Valuation

This valuation has been prepared exclusively for the District and solely to provide contribution information. It is important to recognize that calculations performed for other purposes (such as benefit design, investment policy, or providing GASB 67/68 accounting information) may yield significantly different results.

A valuation report is only a snapshot of a plan's estimated financial condition at a single point in time. A plan's total cost will depend on many factors and variables that are uncertain and unknowable at the current valuation date.

Actuarial valuations are extremely complex and it's possible that data, computer coding, and mathematical errors could occur during the valuation process. Errors in a valuation discovered after its preparation may be corrected by revising the current valuation or in a subsequent year's valuation.

### Assumptions and Methods

Since modeling all possible future outcomes is not possible or practical, the valuation is based on a single set of data, assumptions, methods, and plan provisions. We may also use estimates or simplifications to model future events in an efficient and cost-effective manner, so long as we believe that these simplifying techniques do not affect the reasonableness of the valuation results.

The District is responsible for the assumptions, methods, and funding policies used to prepare the valuation. The assumptions used in this report are among a wide range of possibilities (each of which may be considered reasonable), but have been chosen as a single "best estimate". If the District is interested in analyzing the effect of different assumption sets on the valuation results, then we suggest a sensitivity analysis to be performed at a later date.

To the extent that actual plan experience differs from the valuation assumptions, actuarial gains and losses will occur and be amortized over future periods. A summary of the actuarial assumptions and methods used in this valuation are summarized in this report.

### Accuracy of Substantive Plan Information and Census Data

For purposes of this valuation, we have assumed that the District has validated our summary of the substantive plan provisions and has provided us with any relevant information regarding interpretation of the plan provisions and changes to the plan terms since the prior valuation.

The District is solely responsible for the validity, accuracy and comprehensiveness of this information. If any data or plan provisions supplied are not accurate and complete, the valuation results may differ significantly. Moreover, different interpretations of the substantive plan may produce substantially different valuation results.

## Glossary of Selected Terms

This section provides the definitions of applicable terminology in the actuarial valuation.

Actuarial Accrued Liability (AAL) - the portion of the actuarial present value which is not provided for by future normal costs, determined under the actuarial cost method.

Actuarial Cost Method - the method used, when determining the actuarial accrued liability, for allocating costs between past, current, and future years.

Actuarial Present Value of Benefits - the value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a set of actuarial assumptions.

Discount Rate - the interest rate used to adjust liabilities and obligations for the time value of money.

Long-Term Expected Investment Return - the average expected asset return expected to be earned by the pension investments over time.

Normal Cost - the portion of the actuarial present value which is allocated to the valuation year by the actuarial cost method.

Valuation Date - the date as of which assets and liabilities are measured for this valuation.