WASHINGTON SUBURBAN SANITARY COMMISSION
EMPLOYEES' RETIREMENT PLAN

ACTUARIAL VALUATION
AS OF
JUNE 30, 2019

April 2020

CONTENTS

BOOMERSHINE CONSULTING GROUP, L.L.C.
ACTUARIAL & RETIREMENT PLAN SOLUTIONS

EXECUTIVE SUMMARY

This report contains the results of an actuarial valuation of the Washington Suburban Sanitary Commission Employees' Retirement Plan (the Plan) as of June 30, 2019. The contents of this report reflect generally accepted actuarial principles.

This study relies on the following information supplied by WSSC Water: data on plan participants, plan provisions, the amount of contributions, and a reconciliation of the plan's assets from the prior year.

Boomershine Consulting Group did not audit the participant data or financial information used in this report. Based on our review of this information, we believe that it is sufficiently complete and reliable, and that it is appropriate for the purposes intended.

It is our understanding that WSSC Water maintains a fixed 16.9% of covered payroll contribution to the Plan. This rate continues to be adequate to finance Plan benefits and lead to improved funding. The funding ratio is now 83.7% (83.0% based on the market value of assets), and is expected to improve going forward, given continued contributions at the fixed rate, as shown in Section 3.2.

Section 1 herein contains the results of the valuation, including evaluation of the fixed contribution rate, per the Actuarial Funding Policy.

Plan experience since the prior valuation includes the following:

Favorable

- *Cost-of-Living Adjustments–Open Plan*. Benefits increased 1.91% for non-active participants in the open group. This is less than the assumed 2.50% cost-of-living increase for the open group.

- *Cost –of-Living Adjustments – Closed Plan.* There was no benefit increase for non-active participants in the closed group as compared to the assumed 2.50% cost-of-living increase.

- *Mortality.* There were 65 deaths among retirees including disabled retirees and beneficiaries, for the plan year, compared to 51 expected. There were 24 new beneficiaries associated with these deaths.

- *Employee Turnover.* The number of active participants who terminated during the plan year for reasons other than retirement, disability, death or leave of absence, was 67, which is slightly more than the expected 65 terminations.

- *Retirements.* The number of active participants who retired during the plan year totaled 55, compared to the expected 62 retirements.

The experience gains from all of the items listed above caused decreases in the actuarial cost and liability of the Plan.

Unfavorable

- *Investment Return* On a market-value basis, the Plan's return was 3.67% for the year ended June 30, 2019. The smoothed value basis return was 5.75%. In each case, this is unfavorable compared to the assumed rate of 7.00% per year.

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- *Compensation.* This year's total payroll for continuing actives increased by 4.87% over the prior valuation, slightly higher than assumed. The projected salaries provided by WSSC Water for 2018 were based on 27 pay periods during the calendar year, and thus were adjusted for valuation purposes.

The experience losses from above caused increases in the actuarial cost and liability of the Plan.

The net impact of the experience gains and losses for the prior Plan year is a slight decrease in actuarial cost as a percent of payroll.

New Entrants. The number of active participants increased by 0.43% from 1,644 as of June 30, 2018 to 1,651 as of June 30, 2019.

Section 2 describes the basis of the valuation. That section summarizes the plan provisions, as well as the actuarial assumptions and methods used to develop the figures herein.

To the best of our knowledge, the information contained in this actuarial valuation report as of June 30, 2019 is complete and accurate. The undersigned are available to provide further information and answer any questions with respect to this report. The first two undersigned are members of the American Academy of Actuaries, and meet the qualification standards required to render the actuarial opinions presented herein.

Gregory M. Stump, FSA, EA, MAAA, FCA
Chief Actuary

David S. Boomershine, EA, MAAA, FCA, MSPA
Senior Actuary and President

Darlene A. Morgan, CEBS

SECTION 1: SUMMARY OF VALUATION RESULTS

1.1: Plan Assets

An adjusted market value of assets, or Actuarial Value of Assets (AVA), is used for the valuation to gradually recognize investment gains and losses. This method reflects five-year smoothing, such that 20% of each gain or loss is recognized per year until the entire amount has been recognized.

To ensure that the adjusted market value of assets remains reasonably close to the market value, a corridor is applied that requires the adjusted market value of assets be no less than 80% and no more than 120% of the market value.

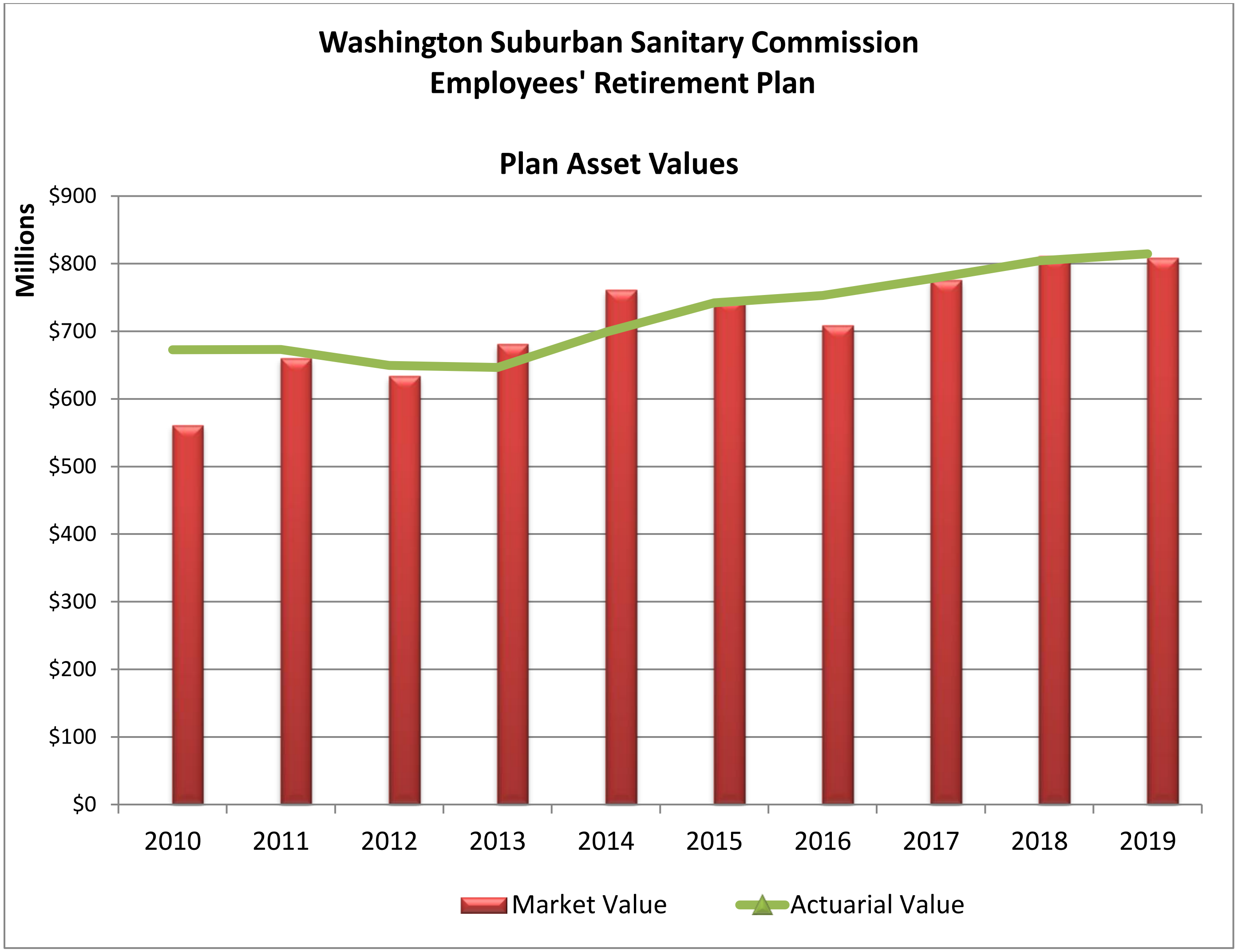
Historical Values

The following table shows the most recent five years of market values as well as smoothed asset values, and the accompanying annual returns.

Year Ending	Market Value		Actuarial Value	
June 30	Value	Annual Return	Value	Annual Return
2015	$774,079,199	2.33%	$743,884,530	11.50%
2016	708,236,238	-1.11%	752,824,819	5.79%
2017	775,046,158	14.12%	777,857,053	7.97%
2018	810,937,596	8.79%	804,356,892	7.89%
2019	807,675,683	3.67%	814,596,098	5.75%
Five Year Compound Return		5.43%		7.77%

As expected, some years the Adjusted Value is greater than the Market Value, and some years it is less. Therefore, the smoothing method has had the intended effect.

Included in the remainder of this section are: the reconciliation of the market value of assets from June 30, 2018 to June 30, 2019; development of the actuarial value of assets; a comparative summary of assets; and summary of historical returns and experience.



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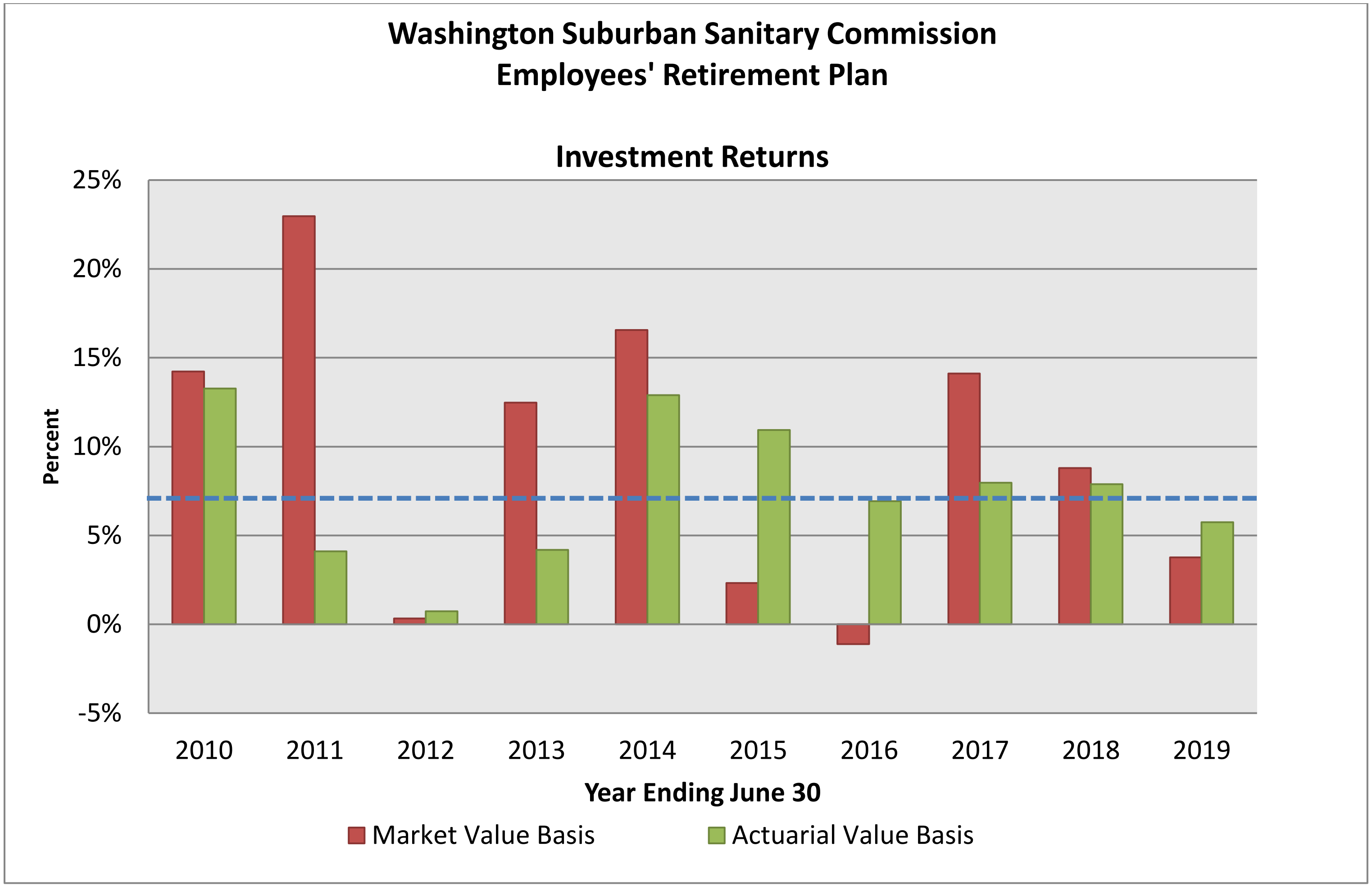

------- Assumed Return (7%)

Earnings Experience for Fund on Plan Year Basis

Plan Year Ending

	6/30/2016	6/30/2017	6/30/2018	6/30/2019
Market Basis				
Net Investment Income*	$ 9,862,883	$ 9,786,553	$ 13,395,239	$ 13,595,076
Capital Gains (Losses)	(17,963,152)	88,018,680	53,396,826	15,535,021
Total Income	$ (8,100,269)	$ 97,805,233	$ 66,792,065	$ 29,130,097
Average Mean Market Value of Assets**	$ 751,707,853	$ 692,738,582	$ 692,738,582	$ 794,741,591
Rate of Return*				
Net Investment Income	1.35%	1.41%	1.76%	1.71%
Capital Gains (Losses)	-2.45%	12.71%	7.03%	1.95%
Total Investment Return	-1.11%	14.12%	8.79%	3.67%

* Net of investment expenses
** [Beginning of Year Value + End of Year Value - Total Income] divided by 2
Note: Percentages may not sum to total due to rounding.

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Annual Compounded Market Value Rate of Investment Return

	Period Ending on June 30									
Period Beginning July 1	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
2009	14.23%	18.51%	12.12%	12.20%	13.05%	11.20%	9.35%	9.93%	9.81%	9.18%
2010		22.96%	11.09%	11.54%	12.77%	10.60%	8.56%	9.33%	9.27%	8.63%
2011			0.33%	6.23%	9.58%	7.71%	5.89%	7.23%	7.44%	6.96%
2012				12.47%	14.49%	10.29%	7.32%	8.65%	8.67%	7.95%
2013					16.56%	9.21%	5.66%	7.71%	7.94%	7.21%
2014						2.33%	0.60%	4.92%	5.87%	5.43%
2015							-1.11%	6.26%	7.09%	6.22%
2016								14.12%	11.43%	8.79%
2017									8.79%	6.23%
2018										3.67%

Statement of Plan Assets (Market Value Basis)

	June 30, 2019	June 30, 2018
1. Cash	$0	$0
2. Investment	807,370,427	810,890,562
3. Subtotal (1 + 2)	807,370,427	810,890,562
4. Accrued Contributions		
a. Employer	0	0
b. Employee	321,405	263,956
c. Total	321,405	263,956
5. Accrued Income	515,591	476,578
6. Total Assets (3 + 4c + 5)	808,207,423	811,631,096
7. Accrued Liabilities	(531,740)	(693,500)
8. Net Plan Assets (6 + 7)	$ 807,675,683	$ 810,937,596

Statement of Receipts and Disbursements of Plan Assets

	Year ending June 30, 2019	Year ending June 30, 2018
Market Value as of the beginning of the year	$ 810,937,596	$ 775,046,158
Receipts		
Contributions:		
Employer Basic Contributions	$ 25,406,900	$ 24,193,212
Employer (Restoration Plan)	74,110	72,995
Employee	4,253,881	5,403,481
Subtotal	$ 29,734,891	$ 29,669,688
Investment Income:		
Interest and Dividends	$ 16,240,214	$ 16,044,922
Investment Expenses	(2,65,138)	(2,649,683)
Capital Gain (Loss)	15,535,021	53,396,826
Net Investment Income	$ 29,130,097	$ 66,792,065
Total Additions	$ 58,864,988	$ 96,461,753
Disbursements and Deferrals		
Benefit Payments and Refunds of Employee Contributions	$ 62,126,901	$ 60,570,315
Total Disbursements	$ 62,126,901	$ 60,570,315
Market Value as of the end of the year	$ 807,675,683	$ 810,937,596

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Development of Actuarial Value of Assets

The Actuarial Value of Assets equals the Market Value of Assets, adjusted for unrecognized gains and losses from prior years. Gains and Losses are determined by calculating the expected asset return based on Plan assumptions and subtracting the actual Plan return. Gains and losses are phased in 20% per year over a 5-year period. The Actuarial Value of Assets is adjusted, if necessary, to fall within a corridor of 80% to 120% of the Market Value of Assets on the valuation date.

	Year Ending 6/30/2019	**Year Ending 6/30/2018**
1. Market Value of Assets as of beginning of year	$810,937,596	$775,046,158
2. Total Contributions for the year	29,734,891	29,669,688
3. Total Disbursements during the year	62,126,901	60,750,315
4. Expected Return	56,523,747	54,021,027
5. Actual Return for the year	29,130,097	66,792,065
6. Investment Gain/(Loss)	(27,393,650)	12,771,038
7. Amount Unrecognized	(21,914,920)	10,216,830
8. Gains/(Losses) Unrecognized for Prior Years:		
First Prior Year	7,662,623	29,113,382
Second Prior Year	19,408,922	(24,154,080)
Third Prior Year	(12,077,040)	(8,595,428)
Total Unrecognized Gains/(Losses)	14,994,505	(3,636,126)
9. Market Value of Assets as of end of year	807,675,683	810,937,596
10. Actuarial Value of Assets as of end of year: [(9) - (7) - (8)]	814,596,098	804,356,892
11. Final Actuarial Value of Assets (AVA) with 80% - 120% Corridor Limitation Applied	$814,596,098	$804,356,892
Ratio of Actuarial Value to Market Value	100.9%	99.2%

1.2: Development of Unfunded Actuarial Accrued Liability

	June 30, 2019	June 30, 2018
1. Actuarial Accrued Liability (AAL)		
a. Active Participants		
(i) Retirement (Immediate Pension)	$ 252,344,947	$252,170,641
(ii) Vested Termination (Deferred to Normal Retirement)*	(1,735,242)	(1,924,356)
(iii) Death - Spouse's Benefit*	3,862,922	3,910,990
(iv) Disability*	8,257,884	8,275,541
(v) Total Active Participants	$ 262,730,511	$ 262,432,816
b. Retired and Disabled Participants Receiving Benefits	699,915,102	688,628,733
c. Terminated Participants with Deferred Benefits **	10,383,522	8,992,352
d. Refunds		
(i) Accumulated Employee Contributions Credited to Account of Terminated Participants and Beneficiaries of Deceased Participants who have not received a refund	$ 438,952	$ 207,453
(ii) Participants on Leave of Absence or Military Leave	10,949	18,275
(iii) Total Refunds	$ 449,901	$ 225,728
e. Total Actuarial Accrued Liability	$ 973,479,036	$ 960,279,629
2. Actuarial Value of Assets	814,596,098	804,356,892
3. Funding Ratio (2 / 1e)	83.7%	83.8%
4. Unfunded Actuarial Accrued Liability (UAAL) (1e - 2)	$158,882,938	$ 155,922,737

*Including liability for refund of employee contributions for Active Participants.
**Including liability for vested Participants on Leave of Absence or Military Leave. Non-vested Participants who are on Leave of Absence or Military Leave are included with Refunds in line 1d(ii).

1.3: Actuarially Determined Contribution

	June 30, 2019	June 30, 2018
1. Total Normal Cost, Entry Age Cost Method	$12,369,580	$11,955,223
As a percentage of payroll	7.97%	7.95%
2. 20-Year Amortization of Unfunded Actuarial Accrued Liability	14,016,285	13,755,143
3. Expected Employee Contributions	4,667,665	4,526,452
4. Actuarially Determined Employer Contribution [(1) + (2) - (3)]	21,178,200	21,183,914
5. Expected Payroll for the Year	155,224,491	150,415,530
6. Net Employer Cost as a % of Payroll [(4) / (5)]	13.99%	14.08%
7. Fixed WSSC Water Contribution Rate, % of Payroll	16.90%	16.90%
Equivalent Amortization Years Implied by Fixed Rate	12.2	12.4
Fixed Contribution Adequate to cover Actuarial Cost:	YES	YES
Estimated Additional Contributions Needed:	N/A	N/A

The calculation above is based on WSSC Water's current Actuarial Funding Policy for the Retirement Plan.

History of Equivalent Amortization Years

Year	Equivalent Years
2016	14.2
2017	13.0
2018	12.4
2019	12.2

The equivalent amortization period has decreased steadily since 2015, indicating strengthened funding of the Plan and continued adequacy of the fixed contribution rate.

1.4: Present Value of Plan Benefits

	June 30, 2019	June 30, 2018
Number of Plan Participants		
Active Participants	1,651	1,644
Retired and Disabled Participants Receiving Benefits	1,639	1,618
Terminated Participants with Deferred Benefits or Refunds Due	120	115
Participants on Leave of Absence or Military Leave	6	5
Total	3,416	3,382
Total Annual Earnings of Active Participants	$ 156,371,107	$ 151,595,466
Total Annual Benefits of Retired and Disabled Participants	63,135,440	62,031,641
Present Value of Plan Benefits		
1. Active Participants		
a. Retirement (Immediate Pension)	$ 336,447,719	$ 333,886,785
b. Vested Termination (Pension Deferred to Normal Retirement)*	9,138,800	8,698,491
c. Death - Spouse's Benefit*	5,451,397	5,461,786
d. Disability*	15,737,266	15,508,969
e. Total Actives (a + b + c + d)	$ 366,775,182	$ 363,556,031
2. Retired and Disabled Participants Receiving Benefits	699,915,102	660,334,797
3. Terminated Participants with Deferred Benefits**	10,383,522	8,992,352
4. Refunds		
a. Accumulated Employee Contributions Credited to Account of Terminated Participants and Beneficiaries of Deceased Participants who have not received a refund	$ 438,952	$ 207,453
b. Participants on Leave of Absence or Military Leave	10,939	18,275
c. Total Refunds (a + b)	$ 449,901	$ 225,728
Total Present Value (1e + 2 + 3 + 4c)	$ 1,077,523,707	$1,061,402,844

*Including liability for refund of employee contributions for Active Participants.
**Including liability for vested Participants on Leave of Absence or Military Leave. Non-vested Participants who are on a Leave of Absence or Military Leave are included with Refunds in line 4.

1.5: Present Value of Accumulated Plan Benefits

	June 30, 2019	June 30, 2018
1. Actuarial present value of vested benefits		
a. Participants currently receiving payments		
(retired and disabled participants and beneficiaries)	$ 699,915,102	$ 688,628,733
b. Other participants		
i. Active participants	190,410,712	192,593,273
ii. Deferred vested participants/refunds	10,833,423	9,218,080
iii. Total	201,244,135	201,811,353
c. Total (a. + b.)	$ 901,159,237	$ 890,440,086
2. Actuarial present value of non-vested benefits	16,040,614	15,621,044
3. Total actuarial present value of accumulated plan benefits (PVAB) (1.c. + 2.)	$ 917,199,851	$ 906,061,130
4. Market value of assets	807,675,683	810,937,596
5. Ratio of Assets to PVAB (4. ÷ 3.)	88.1%	89.5%

The calculation of the actuarial present value of accumulated plan benefits is based on the unit credit cost method and the actuarial assumptions shown in Section 2.3.

1.6: Change in Present Value of Accumulated Plan Benefits

1. Actuarial present value of accumulated plan benefits as of July 1, 2018	$ 906,061,130
2. Change due to plan amendments	0
3. Change due to changes in assumptions and/or methods	0
4. Change due to passage of time	61,249,837
5. Change due to benefits paid	(62,126,901)
6. Change due to benefits accumulated and actuarial experience	12,015,785
7. Actuarial present value of accumulated plan benefits as of June 30, 2019: (sum of above)	$ 917,199,851

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SECTION 2: BASIS OF VALUATION

2.1: Summary of Plan Provisions

The salient features of the retirement plan are presented below.

1. Effective date	May 1, 1967. The most recent amendment was adopted January 1, 2016.
2. Closed version	Closed version means the retirement plan in effect on June 30, 1978. Membership in this version is mandatory for employees hired prior to July 1, 1978 who did not elect to transfer membership to the open version.
3. Participation	Each permanent full-time employee automatically becomes a participant on his hire date. A contract employee may be excluded by contractual agreement.
4. Gross compensation	Gross compensation is defined as total compensation paid to the employee by WSSC Water excluding merit bonuses, lump sum pay awards, and General Manager's awards, plus any amounts of compensation for which the employee has entered into a deferred compensation agreement and/or employer pick-up contributions. It does not include the employee's final pay period unless he receives compensation for the full pay period.
5. Final average monthly compensation	Final average monthly compensation is defined as an amount equal to the participant's gross compensation during each of the three years prior to termination which were the highest (to include 78 pay periods), divided by 36 months.
6. Credited service	Credited service means the years and fractional years (measured to the nearest month) of an employee's latest period of continuous service but excludes periods of non-military leaves of absence without pay which are not otherwise purchased. Additional "purchased" years of WSSC Water service, military service, prior agency service and authorized leave(s) of absence are added. Credited service includes accumulated unused sick leave that counts at the rate of .000481 year's credited service for each hour of unused sick leave. For purposes of computing benefits, credited service, excluding credit for unused sick leave, is limited to a maximum of 36 years.
7. Closed version credited service	Closed version credited service means all credited service earned by an employee hired prior to July 1, 1978 until the date he transfers his membership to the open version. Also included is purchased service if the employee is a member at the time of purchase.

8. Open version credited service	Open version credited service means all credited service earned by an employee hired after June 30, 1978. Any employee hired prior to July 1, 1978 who transfers his membership to the open version shall have all credited service earned after his transfer counted as open version credited service. Also included is purchased service if the employee is a member at the time of purchase.
9. Employee contributions	• Mandatory: Each participant in the closed version is required to contribute 6% of his gross compensation with respect to each pay period. Each participant in the open version is required to contribute 3% of his gross compensation with respect to each pay period. All contributions are credited with 5% interest per annum.
10. Normal retirement	• Eligibility: A participant in the closed version is eligible to retire upon the earlier of (i) attainment of age 60 and completion of one year credited service and (ii) the completion of 30 years of credited service. A participant in the open version hired before March 31, 1994 is eligible to retire upon the earlier of (i) attainment of age 62 and completion of three years credited service, and (ii) the date on which he has completed at least 30 years credited service and the sum of his credited service and attained age total at least 85. A participant in the open version hired after March 31, 1994 is eligible to retire upon the earlier of (i) attainment of 65 and completion of five years credited service, and (ii) the date on which he has completed at least 30 years credited service and the sum of his credited service and attained age total at least 85. • Monthly benefit amount: 2.1% x final average monthly compensation x closed version credited service <u>plus</u> 1.4% x final average monthly compensation x open version credited service.
11. Early retirement	• Any employee in the closed version may retire early provided he has completed 15 or more years of credited service and has attained age 45, and further provided that the sum of his age and credited service at termination total at least 65. Any employee in the open version may retire early provided he has completed 15 or more years of credited service and has attained age 50.

Early Retirement (continued)

Monthly benefit amount: The annual monthly benefit is determined in accordance with the normal retirement formula but using final average monthly compensation and credited service at the time of termination. This benefit is reduced to reflect early commencement. The percentage payable is as follows (provided, however, that the Open Version reductions for years 13, 14 and 15 shall be effective only with respect to Employees hired on and after January 21, 2009):

	Percentage of Benefit Payable	
Years Early	Closed Version	Open Version
1	98%	95%
2	95%	90%
3	91%	85%
4	86%	80%
5	80%	75%
6	74%	70%
7	68%	65%
8	62%	60%
9	56%	55%
10	50%	50%
11	44%	45%
12	38%	40%
13	32%	35%
14	26%	30%
15	20%	25%

If a participant defers the commencement of benefits, his benefit will be adjusted by any cost-of-living increases made effective during the deferral period.

12. Temporary supplemental benefit

- Any participant in the Open Version whose benefit commencement date is prior to age 62 shall receive a benefit equal to 0.6% of his final average monthly compensation at termination multiplied by his Open Version credited service at termination, reduced to reflect early commencement, if applicable. The percentage of benefit payable is determined in accordance with the percentages in the previous table. The benefit is payable through the month in which he attains age 62 or dies, if earlier.

13. Disability retirement

- Eligibility: A participant is eligible for a disability benefit if he has one year of credited service and is found by the Social Security Administration to be disabled under its criteria for a period of at least 24 months.

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Disability Retirement (continued)

- Monthly benefit amount: The disability benefit is determined under the normal retirement formula using credited service and final average monthly compensation at the time of termination. This benefit is subject to a minimum of 35% of final average monthly compensation, or 50% of final average monthly compensation if disabled as a result of a job-related accident.

14. Deferred vested retirement

- Eligibility: Any participant of the plan who terminates after completing five years of credited service is eligible for a deferred vested benefit beginning on his normal retirement date.
- Monthly benefit amount: The deferred vested benefit is determined using the normal retirement formula based on final average monthly compensation and credited service at the time of termination.
- In lieu of this benefit the participant may elect a withdrawal benefit and thereby forfeit his deferred vested benefit.

15. Withdrawal benefit

- Eligibility: Each participant, who terminates before becoming eligible for a normal, early, disability or deferred retirement benefit, automatically receives a withdrawal benefit. Any participant eligible for a normal, early, disability or deferred vested retirement benefit, which will not commence within one month of termination, may elect a withdrawal benefit.
- Amount: The withdrawal benefit shall be the sum of all contributions made by the employee which have not been withdrawn previously, plus credited interest.

16. Pre-retirement death

If any employee completes at least 15 years of Credited Service, the spouse if named as beneficiary will receive a spousal benefit equal to the benefit payable had the participant retired on a joint and 100% survivor option on the day before death. Alternatively, the spouse may elect a refund of contributions and interest.

If not married at date of death, the sum of all contributions made by the employee plus credited interest will be paid to the employee's designated beneficiaries.

17. Consumer Price Index increase

All benefits payable to pensioners and beneficiaries retired under the Closed Version shall be increased following two months during which the Consumer Price Index is at least 3% higher than the Consumer Price Index of the base month.

All benefits payable to pensioners and beneficiaries retired under the Open Version shall be increased each March 1 following retirement in accordance with increases in the Consumer Price Index from the prior calendar year. In the event the participant retired during the preceding calendar year, a pro rata increase to reflect the partial year during which he was retired will be provided.

18. Normal and optional forms of payment

- Pensions are normally payable for the life of the participant; however, a participant may elect to receive any other form of benefit provided under the plan which is actuarially equivalent in value. The following optional forms of payment are available under the plan:
- A reduced pension which is payable during the lifetime of the pensioner and continues to the surviving spouse at a rate equal to 100%, 75%, 66-2/3% or 50% of the reduced initial pension.
- A reduced pension which is payable as long as both the pensioner and the spouse are surviving. In addition, if the spouse survives the pensioner, a lifetime pension will continue to the spouse at a rate equal to 100%, 75%, 66-2/3% or 50% of the reduced initial pension. However, if the pensioner survives the spouse, the lifetime benefit will be increased to the original standard form of pension.
- A reduced pension to the participant during his lifetime with benefit payments guaranteed for at least 120 months or 180 months.

If a participant marries following his Benefit Commencement Date, the Participant may revoke any existing election and in its place elect a joint and contingent survivor option, provided such election is made within one year of the date of marriage and the Participant names his spouse as contingent annuitant.

A pensioner who elects a joint and contingent survivor option and subsequently divorces may revoke the existing election. After such revocation, a lifetime pension will continue to the pensioner at a rate equal to the unreduced initial pension.

There have been no changes in Plan provisions since the prior valuation.

2.2: Demographic Information

Participant Summary

	June 30, 2019		June 30, 2018	
1. Closed Plan Active Participants				
a. Number	5		5	
b. Average Age	67.72		66.72	
c. Average Years of Service	43.82		42.82	
d. Total Pay	$ 668,082		$ 597,103	*
e. Average Pay	133,616		119,421	
2. Open Plan Active Participants				
a. Number	1,646		1,639	
b. Average Age	47.42		47.43	
c. Average Years of Service	12.13		12.35	
d. Total Pay	$ 149,156,378		$ 144,712,834	*
e. Average Pay	90,617		88,293	
3. All Active Participants				
a. Number	1,651		1,644	
b. Average Age	47.49		47.49	
c. Average Years of Service	12.22		12.43	
d. Total Pay	$ 149,824,460		$ 145,309,937	*
e. Average Pay	90,748		88,388	
4. Retired Participants and Beneficiaries				
a. Number	1,592		1,569	
b. Average Age	70.69		70.46	
c. Total Annual Pension	$ 62,259,196		$ 61,131,496	
d. Average Annual Pension	39,108		38,962	
5. Disabled Participants				
a. Number	47		49	
b. Average Age	65.37		64.80	
c. Total Annual Pension	$ 876,243		$ 900,144	
d. Average Annual Pension	18,643		18,370	
6. Deferred Vested Participants				
a. Number	124	**	118	**
b. Average Age	51.62		51.22	
c. Total Annual Pension	$ 1,451,272		$ 1,353,556	
d. Average Annual Pension	11,704		11,471	

*The projected salary provided by WSSC Water for 2018 reflects 27 pay periods. The above Pay with salary limit has been adjusted to reflect a calendar year with 26 pay periods. The total projected limited salary with 27 pay periods is $620,068 for the closed group, $150,268,096 for the open group, for a total of $150,888,164.

**Including vested Participants on Leave of Absence or Military Leave (3 for 2018 and 4 for 2019). Non-vested Participants who are on a leave of Absence or Military Leave are not shown above (2 for 2018 and 2 for 2019).

Reconciliation of Closed Plan Participants

	Active*	Inactive	Retired and Beneficiaries	Deferred Vested	Disabled	Total
As of June 30, 2018	5	0	796	1	9	811
Retired	0	0	0	0	0	0
Disabled	0	0	0	0	0	0
Died:						
With Beneficiary	0	0	-15	0	0	-15
Without Beneficiary	0	0	-30	0	-1	-31
Refund Paid to Beneficiary	0	0	0	0	0	0
Refund Payable to Beneficiary	0	0	0	0	0	0
Beneficiaries Added	0	0	15	0	0	15
Terminated						
Vested	0	0	0	0	0	0
Non-vested: Refund Paid	0	0	0	0	0	0
Non-vested: Refund Payable	0	0	0	0	0	0
Vested and Paid Employee Contributions	0	0	0	0	0	0
Added	0	0	0	0	0	0
Went on Leave	0	0	0	0	0	0
Returned from Leave	0	0	0	0	0	0
Reinstated	0	0	1	0	0	1
Adjustments*	0	0	1	0	0	1
As of June 30, 2019	5	0	768	1	8	782

*Retiree payments were resumed for one retiree and one Alternate Payee was added.

Reconciliation of Open Plan Participants

	Active*	Inactive	Retired and Beneficiaries	Deferred Vested	Disabled	Total
As of June 30, 2018	1,639	5	773	114	40	2,571
Retired	-55	-2	59	-2	0	0
Disabled	0	0	0	0	0	0
Died:						
With Beneficiary	-2	0	-6	0	-1	-9
Without Beneficiary	0	0	-12	0	0	-12
Refund Paid to Beneficiary	-1	0	0	-4	0	-5
Refund Payable to Beneficiary	-1	0	0	-1	0	-2
Beneficiaries Added	0	0	9	0	0	9
Terminated						
Vested	-13	-1	0	14	0	0
Non-vested: Refund Paid	-18	-1	0	0	0	-19
Non-vested: Refund Payable	-34	0	0	0	0	-34
Vested and Paid Employee Contributions	-2	0	0	0	0	-2
Added	137	0	0	-1	0	136
Went on Leave	-6	6	0	0	0	0
Returned from Leave	1	-1	0	0	0	0
Reinstated	1	0	0	0	0	1
Adjustments**	0	0	1	-1	0	0
As of June 30, 2019	1,646	6	824	119	39	2,634

*Those with retiree payments stopped while reemployed are included in the active count.

** Two new Alternate Payees were added, one retiree was rehired with payments temporarily stopped, and one deferred vested participant received a refund of employee contributions.

Active Participant Age/Service Distribution

YEARS OF SERVICE

Age Group	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40+	Total
MALE										
0 - 19	1	0	0	0	0	0	0	0	0	1
20 - 24	24	0	0	0	0	0	0	0	0	24
25 - 29	62	9	1	0	0	0	0	0	0	72
30 - 34	63	31	11	0	0	0	0	0	0	105
35 - 39	58	58	33	6	1	0	0	0	0	156
40 - 44	37	40	21	5	10	3	0	0	0	116
45 - 49	53	33	33	13	18	24	1	0	0	175
50 - 54	24	46	26	8	12	28	25	0	0	169
55 - 59	27	32	23	8	19	37	34	8	0	188
60 - 64	13	21	18	7	5	24	23	5	2	118
65 - 69	4	7	5	7	5	5	4	2	2	41
70+	2	0	1	1	2	0	0	1	2	9
Total	368	277	172	55	72	121	87	16	6	1,174
FEMALE										
0 - 19	0	0	0	0	0	0	0	0	0	0
20 - 24	0	0	0	0	0	0	0	0	0	0
25 - 29	18	0	0	0	0	0	0	0	0	18
30 - 34	26	7	0	0	0	0	0	0	0	33
35 - 39	31	19	8	2	0	0	0	0	0	60
40 - 44	29	14	6	4	3	0	0	0	0	56
45 - 49	17	15	12	7	5	6	0	0	0	62
50 - 54	22	13	11	4	8	9	10	0	0	77
55 - 59	14	9	12	9	12	11	18	2	0	87
60 - 64	10	5	10	1	8	9	14	4	1	62
65 - 69	2	0	4	2	2	1	6	2	1	20
70+	0	1	0	0	0	0	1	0	0	2
Total	169	83	63	29	38	36	49	8	2	477

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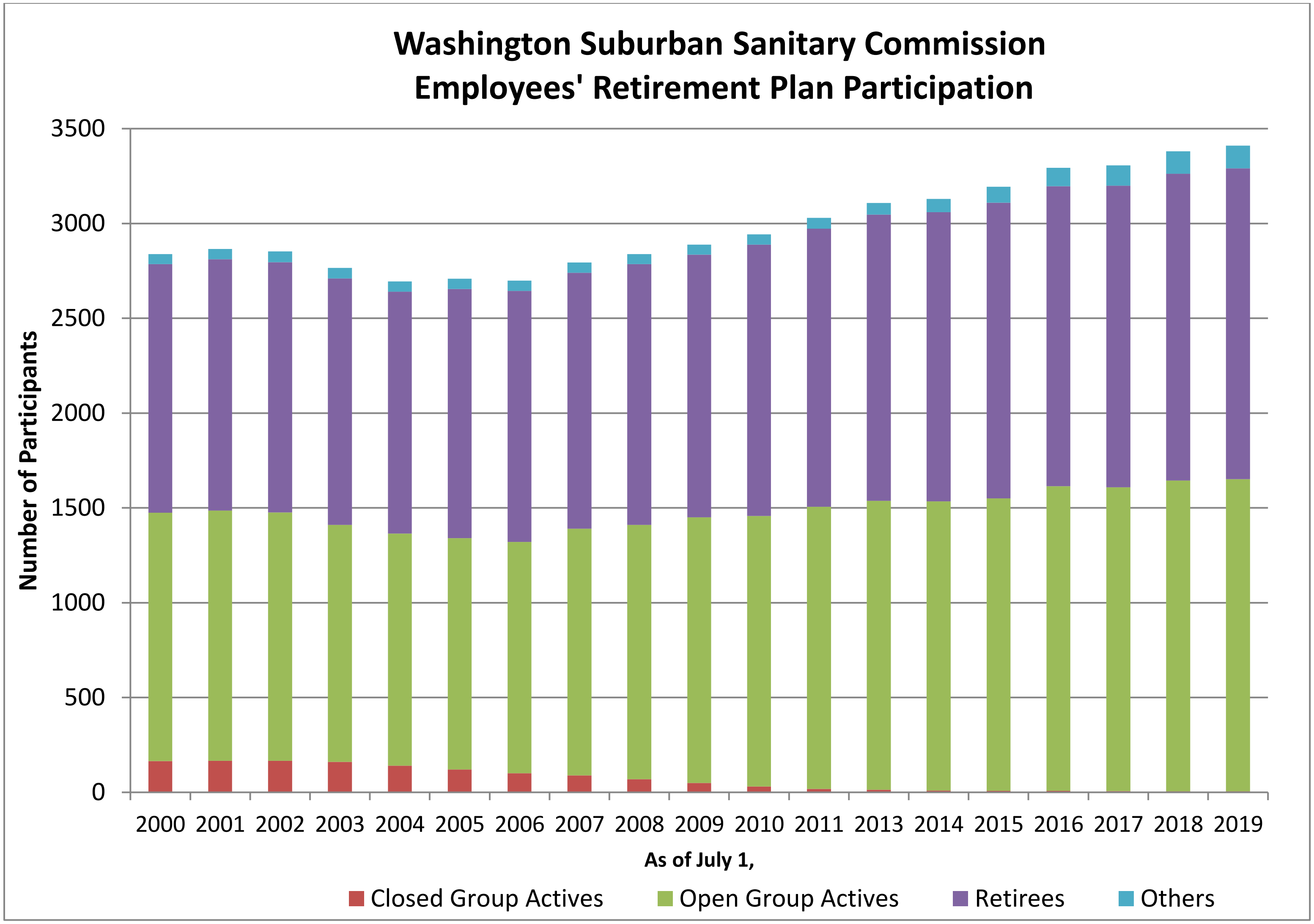

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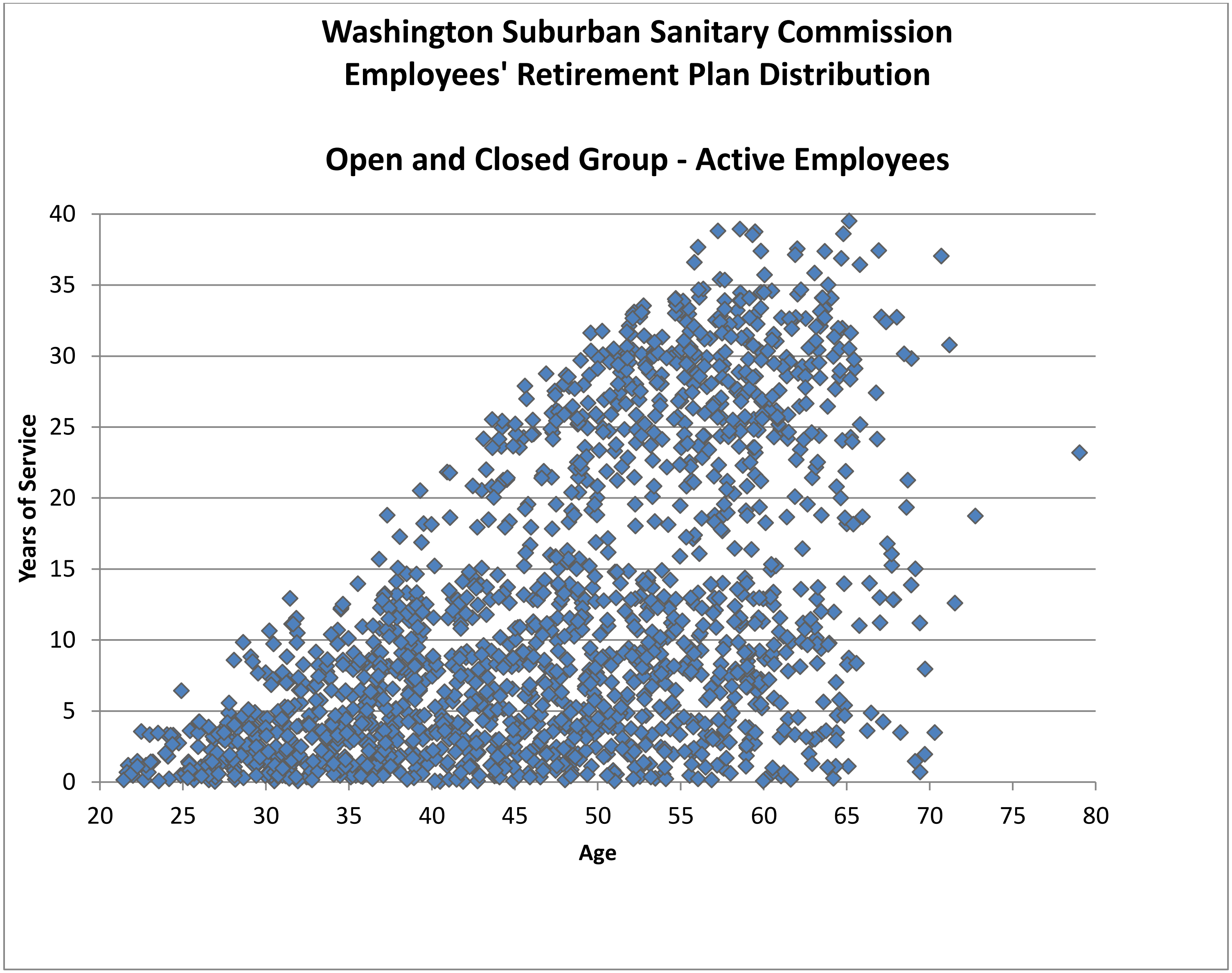

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2.3: Actuarial Assumptions and Methods

The funding methods and assumptions are used in determining the actuarial costs and liabilities presented in this Report. The assumptions were developed from the actuarial assumption review and experience study prepared in 2016, covering Plan experience from July 1, 2011 through June 30, 2015. The next study and assumption review will cover 2015 through 2020.

1. Employee data	The employee data used in the determination of cost estimates consist of pertinent information with respect to active participants and pensioners of the Washington Suburban Sanitary Commission Employee's Retirement Plan.
2. Valuation date	June 30, 2019
3. Actuarial funding method	The Entry Age Normal Cost Method is used. The contributions equal the Normal Cost plus an amount to amortize the Unfunded Actuarial Accrued Liability over a period no longer than 30 years. Beginning with the June 30, 2018 valuation, a 20-year amortization period is used for the purpose of comparing the actuarial cost to WSSC Water's contribution rate. The Normal Cost is the level annual payment that would be required to fund the Plan if paid from the date each employee became eligible to participate to the date of exit. The Actuarial Accrued Liability is the accumulated value of the Normal Cost for each employee from date of participation to the present. The Unfunded Actuarial Accrued Liability is the Actuarial Accrued Liability minus the Actuarial Value of Assets. Actuarial gains and losses reduce or increase the Unfunded Actuarial Accrued Liability.
4. Valuation of assets	The Average Value Method is used to determine the Actuarial Value of Assets. This method determines the value of assets so that asset appreciation or depreciation is only partially recognized in the year of occurrence. The result is a gradual recognition of 20% per year over a 5-year period of each year's appreciation or depreciation in excess of or less than that which was assumed. The Actuarial Value of Assets must be within 80% to 120% of the Market Value of Assets.
5. Rate of investment return	A rate of 7.00% per year, net of investment expenses, is assumed as the annual investment return for the trust.
6. Cost-of-living	An annual retiree cost-of-living increase of 2.50% is assumed.
7. Expenses	No allowance has been made in the valuation for non-investment expenses because all non-investment related expenses are paid directly by WSSC Water.

8. Salary Increases

The total pay increase assumption, including wage growth and career increases, is:

Years of Service	Increase
Up to 5	7.50%
6+	2.75%

9. Mortality tables for employees and annuitants

For non-disability annuitant mortality, the RP-2000 Blue Collar Combined Healthy mortality tables (separately for males and females) with a one year set-forward and projected to 2025 with Scale BB.

Mortality for pre-retirement deaths is 50% of the annuitant mortality.

For disability retirement pension mortality, the RP2000 Disabled Retiree tables (males and females) are assumed, projected to 2025 with Scale BB.

10. Rates of age retirement

Age	Rate
50-59	7.5%
60	9.4%
61	11.7%
62	14.6%
63	18.3%
64	22.9%
65-69	28.6%
70+	100%

11. Withdrawal Rates

Years of Service	Male	Female
0	11.0%	16.5%
1	9.4%	14.0%
2	7.9%	11.9%
3	6.8%	10.1%
4	5.7%	8.6%
5	4.9%	7.3%
6	4.1%	6.2%
7	3.5%	5.3%
8	3.0%	4.5%
9	2.5%	3.8%
10	2.2%	3.2%
11	1.8%	2.8%
12	1.6%	2.3%
13	1.3%	2.0%
14	1.1%	1.7%
15	1.0%	1.4%
16	0.8%	1.2%
17	0.7%	1.0%
18	0.6%	0.9%
19	0.5%	0.8%
20+	0.0%	0.0%

12. Disability rates

The assumed rates of disability are illustrated by the following table:

Age	Rate per 100 Lives Male	Female
20	.021	.026
25	.021	.035
30	.028	.041
35	.035	.055
40	.048	.069
45	.069	.104
50	.124	.179
55	.248	.338
60	.621	.835
64	1.532	1.994

13. Marital status

It is assumed that 70% of the participants are married. Husbands are assumed to be three years older than their wives.

14. Option election

It is assumed that one-half of retiring participants will elect a joint and two-thirds survivor pension.

There have been no changes in the actuarial assumptions and methods since the prior valuation.

SECTION 3: PROJECTIONS OF PLAN FUNDING

3.1: 15 Year Projection of Cash Flows

Based on 16.9% of Payroll Level Contribution Rate

Plan Year Beginning July 1	MVA at Beginning of Year	AVA at Beginning of Year	Contributions		Benefit Payments	Estimated Investment Income*	Net Increase in Fund
			WSSC Water	Employee			
2019	$807,675,683	$814,596,098	$26,232,939	$4,667,665	$64,925,393	$55,366,571	$21,341,782
2020	829,017,465	830,640,779	26,669,624	4,742,260	66,173,560	56,835,141	22,073,465
2021	851,090,930	859,494,182	27,239,060	4,841,150	67,832,227	58,346,208	22,594,191
2022	873,685,121	879,163,851	27,851,051	4,946,402	69,603,418	59,891,537	23,085,572
2023	896,770,693	896,770,693	28,571,847	5,072,533	71,385,710	61,475,343	23,734,013
2024	920,504,705	920,504,705	29,390,252	5,217,646	73,037,460	63,113,043	24,683,481
2025	945,188,186	945,188,186	30,361,729	5,389,656	74,736,089	64,821,786	25,837,082
2026	971,025,268	971,025,268	31,470,538	5,586,486	76,513,337	66,614,154	27,157,841
2027	998,183,109	998,183,109	32,742,490	5,812,276	78,265,912	68,506,435	28,795,289
2028	1,026,978,398	1,026,978,398	34,154,671	6,062,959	79,911,962	70,522,684	30,828,352
2029	1,057,806,750	1,057,806,750	35,729,923	6,342,590	81,361,699	72,694,608	33,405,422
2030	1,091,212,172	1,091,212,172	37,462,294	6,650,111	82,784,885	75,054,208	36,381,728
2031	1,127,593,900	1,127,593,900	39,364,538	6,987,788	83,934,822	77,638,433	40,055,937
2032	1,167,649,837	1,167,649,837	41,424,993	7,353,549	84,964,170	80,490,412	44,304,784
2033	1,211,954,621	1,211,954,621	43,674,049	7,752,790	85,790,928	83,654,422	49,290,333

*Assuming 7.00% returns each year.

MVA = Market Value of Assets
AVA = Actuarial Value of Assets

Additional Assumptions for Projections:

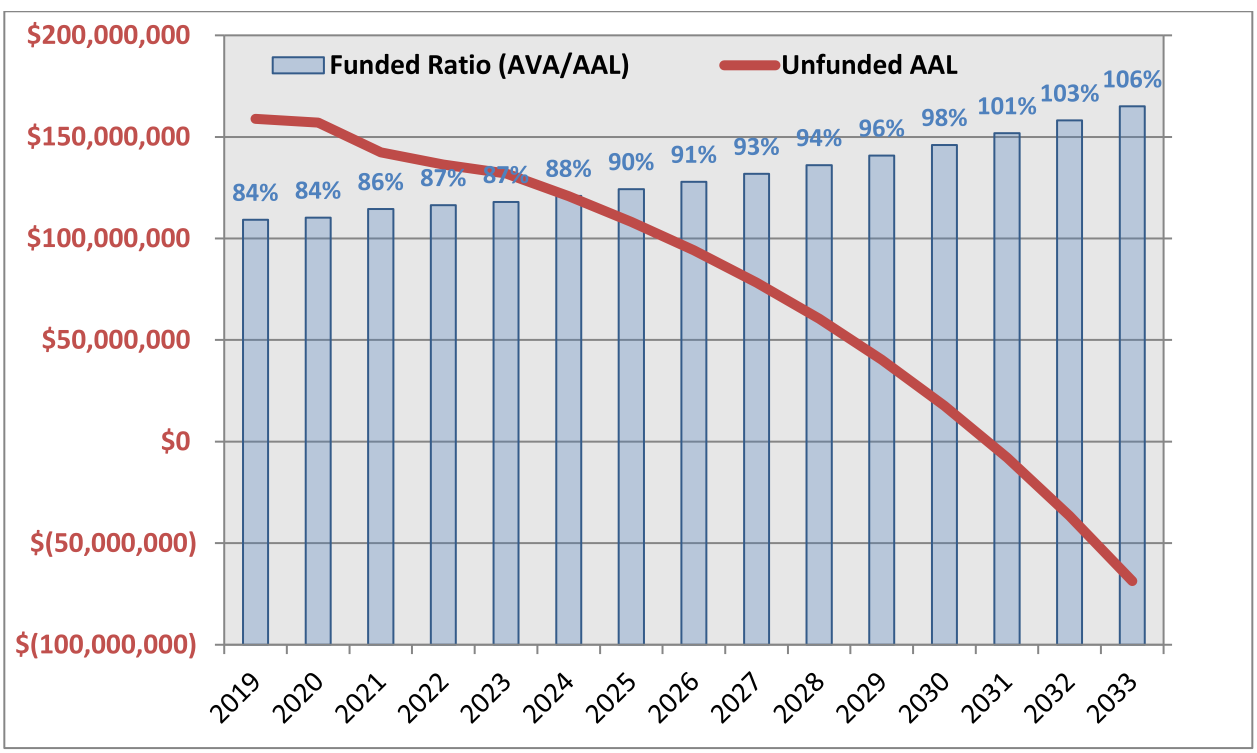
The cost of future entrants is estimated by projecting future replacements of assumed decrements (retirements, terminations, disablements or deaths).

We also assumed that future participants are similar to those who entered the plan since the last four actuarial valuation reports were issued, including this current report -- specifically 67% male and 33% female, with average age = 38, and a starting salary equal to the current average of $72,100. We assumed salary at entry would increase each year at the assumed salary scale.

3.2: 15 Year Projection of Funding Progress

Based on 16.9% of Payroll Level Contribution Rate

Plan Year Beginning July 1	AVA at Beginning of Year	Actuarial Accrued Liability (AAL)	Funded Ratio (AVA/AAL)	Unfunded AAL	Present Value of Future Benefits (PVFB)	Percent of PVFB Funded
2019	$814,596,098	$973,479,036	84%	$158,882,938	$1,077,523,707	75%
2020	830,640,779	987,698,670	84%	157,057,891	1,080,755,459	77%
2021	859,494,182	1,001,842,888	86%	142,348,706	1,095,008,140	78%
2022	879,163,851	1,015,548,763	87%	136,384,912	1,109,221,924	79%
2023	896,770,693	1,028,690,687	87%	131,919,994	1,123,123,528	80%
2024	920,504,705	1,041,272,595	88%	120,767,890	1,137,032,485	81%
2025	945,188,186	1,053,439,567	90%	108,251,381	1,150,890,607	82%
2026	971,025,268	1,065,191,298	91%	94,166,029	1,164,743,305	83%
2027	998,183,109	1,076,486,682	93%	78,303,573	1,178,291,871	85%
2028	1,026,978,398	1,087,401,612	94%	60,423,214	1,191,772,925	86%
2029	1,057,806,750	1,098,090,394	96%	40,283,645	1,205,273,676	88%
2030	1,091,212,172	1,108,822,543	98%	17,610,372	1,218,924,369	90%
2031	1,127,593,900	1,119,707,830	101%	(7,886,070)	1,232,785,579	91%
2032	1,167,649,837	1,131,125,333	103%	(36,524,504)	1,247,187,219	94%
2033	1,211,954,621	1,143,316,868	106%	(68,637,754)	1,262,620,831	96%



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