Virginia Retirement System

Annual Actuarial Valuation Report
June 30, 2022 – Hampton Roads Sanitation District (55411)

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March 2023

Hampton Roads Sanitation District (55411)

In Care of:
Virginia Retirement System
1200 E. Main Street
Richmond, Virginia 23219

The results of the June 30, 2022 Annual Actuarial Valuation of the Virginia Retirement System (VRS) for Hampton Roads Sanitation District ("The Plan"), a participating political subdivision in VRS, are presented in this report.

This report was prepared at the request of the VRS and is intended for Hampton Roads Sanitation District and those designated or approved by Hampton Roads Sanitation District. This report may be provided to parties other than Hampton Roads Sanitation District only in its entirety and only with the permission of Hampton Roads Sanitation District. GRS is not responsible for unauthorized use of this report.

The purposes of the valuation are to measure The Plan's funding progress and to determine the informational employer contribution rate for the fiscal year ending June 30, 2024. This report should not be relied on for any purpose other than the purposes described herein. Determinations of financial results, associated with the benefits described in this report, for purposes other than those identified above may be significantly different. This report does not include actuarial information needed to satisfy reporting requirements under Governmental Accounting Standards Board (GASB) Statement Nos. 67 or No. 68.

This valuation assumed the continuing ability of the plan sponsor to make the contributions necessary to fund The Plan. A determination regarding whether or not the plan sponsor is actually able to do so is outside our scope of expertise and was not performed.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on The Plan's funded status); and changes in plan provisions or applicable law. This report does not include a robust assessment of the risks of future experience not meeting the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment. We encourage a review and assessment of the investment and other significant risks that may have a material effect on The Plan's financial condition.

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The findings in this report are based on data and other information through June 30, 2022. The valuation was based upon information furnished by the VRS, concerning Retirement System benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal reasonability and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of the information provided by the VRS.

This report was prepared using assumptions adopted by the Board. All actuarial assumptions used in this report are reasonable for the purposes of this valuation. All actuarial assumptions and methods used in the valuation follow the guidance in the applicable Actuarial Standards of Practice. For a full list of all the assumptions used, please refer to the Appendix available on the VRS website.

Valuation results are developed through the use of multiple models.

Valuation liabilities were prepared using ProVal's valuation model, a software product of Winklevoss Technologies. We are relying on the ProVal model. We performed tests of the ProVal model with this assignment and made a reasonable attempt to understand the developer's intended purpose of, general operation of, major sensitivities and dependencies within, and key strengths and limitations of the ProVal model. In our professional judgment, the ProVal valuation model has the capability to provide results that are consistent with the purposes of the valuation and has no material limitations or known weaknesses.

Financial results were prepared using our financing model which, in our professional judgment, has the capability to provide results that are consistent with the purposes of the valuation, and has no material limitations or known weaknesses. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.

This report was prepared during the COVID-19 pandemic, which is likely to influence demographic, economic, and healthcare cost experience, at least in the short term. Results in this report are developed based on available data without adjustment. We will continue to monitor these developments and their impact on the VRS. Actual experience will be reflected in each subsequent report, as experience emerges.

This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge, the information contained in this report is accurate and fairly presents the actuarial position of Hampton Roads Sanitation District as of the valuation date. All calculations have been made in conformity with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board.

Rebecca L. Stouffer, James D. Anderson, Richard C. Koch Jr., and Michael D. Kosciuk are Members of the American Academy of Actuaries. These actuaries meet the Academy's Qualification Standards to render the actuarial opinions contained herein. The signing actuaries are independent of the plan sponsor.

Respectfully submitted,
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Executive Summary

1. Purpose

This report contains the Virginia Retirement System actuarial valuation results, as of June 30, 2022, for Hampton Roads Sanitation District. The participating political subdivision bears responsibility for the employer contributions needed to provide benefits to its employees and former employees. The purposes of this valuation are:

- To measure funding progress as of the valuation date, June 30, 2022; and
- To develop the informational employer contribution rate for the fiscal year ending June 30, 2024.

Throughout this report, there may be cases when the schedules do not add due to rounding.

2. Funded Ratio

The funded ratio of The Plan is the percentage of the dollar value of the accrued liability that is covered by the actuarial value of assets. While the funded ratio may be a useful plan measurement, understanding a plan's funding trend may be more important than a particular point in time. The chart below compares the funded ratio for the current valuation with the results of the prior valuation.

Valuation Date	June 30, 2022	June 30, 2021
Funded Ratio	87.61%	88.74%

3. Computed Employer Contribution Rates

Employer contributions are made to support the costs of The Plan. These contributions are invested by the VRS and the combined amount (employer contributions plus member contributions and investment income) support the benefit payments and expenses (administrative and investment) of The Plan. Each valuation year, an employer contribution rate is developed, considering updated inputs (demographic data, benefit provisions, and financial information) in combination with current assumptions and methods. Odd valuation years set the level of employer contributions for two future fiscal years. Even valuation years are *informational*, determining an employer contribution rate that is an indication of what the employer contribution rate *would have been* if it was a rate setting year. The chart below compares the computed employer contribution rate for the current valuation with the results of the prior valuation.

Valuation Date	June 30, 2022	June 30, 2021
Applicable Fiscal Year(s) Ending	Informational for June 30, 2024	June 30, 2023 and June 30, 2024
Total Employer Contribution Rate	7.57%	7.01%

Executive Summary (Concluded)

4. How and Why the Numbers Change

There are three general reasons why contribution rates change from one valuation to the next.

- Changes in benefit provisions;
- Changes in actuarial assumptions and methods; and
- Experience of The Plan (investment and demographic experience); this is the difference between actual experience of The Plan from that expected under the actuarial assumptions.

This valuation reflects provisions of the Virginia Retirement System applicable to participating political subdivision employers as of the June 30, 2022 valuation date. There were no changes in benefit provisions since the last valuation.

Plan experience differed from expectations as follows:

- For the period ending June 30, 2022, the VRS reported investment return of 0.6% on a market value basis, compared to the assumed level of 6.75%. Under the asset valuation method, investment gains and losses are spread over a 5-year period, subject to a corridor. Partial recognition of this year's loss, combined with the continued phase-in of investment gains and losses from prior years resulted in a net recognized asset gain for the funding value of assets.
- Cost-of-Living Adjustments (COLA) were greater than expected for eligible recipients:
    - An actual COLA of 3.85% for Plan 1 recipients compared to a 2.50% assumption; and
    - An actual COLA of 3.00% for Plan 2 / Hybrid recipients compared to a 2.25% assumption.
- The net impact of plan experience will depend upon the specific make up (demographic and financial) of Hampton Roads Sanitation District and is reflected in the computed Total Employer Contribution Rate determined in this report.

5. Change in Service Provider

There was a change in actuarial service provider during calendar year 2022. Throughout this report, information provided prior to 2022 was provided by the prior actuarial service provider.

Other Observations

General Implications of Contribution Allocation Procedure or Funding Policy on Future Expected Plan Contributions and Funded Status

Given The Plan's contribution allocation procedure, if all actuarial assumptions are met (including the assumption of The Plan earning 6.75% on the actuarial value of assets), it is expected that:

(1) The normal cost as a percentage of pay will trend to the level associated with Plan 2 and/or Hybrid as members are replaced into the ultimate benefit tier.

(2) The unfunded liability will decrease in dollar amount until it is fully funded.

(3) The funded status of The Plan will move toward a 100% funded ratio.

Limitations of Funded Status Measurements

Unless otherwise indicated, a funded ratio measurement presented in this report is based upon the actuarial accrued liability and the actuarial value of assets. Unless otherwise indicated, with regard to any funded status measurements presented in this report:

(1) The measurement is inappropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling The Plan's benefit obligations; in other words, of transferring the obligations to an unrelated third party in an arm's-length market-value-type transaction.

(2) The measurement is dependent upon the actuarial cost method which, in combination with The Plan's amortization policy, affects the timing and amounts of future contributions. The amount of future contributions will most certainly differ from those assumed in this report due to future actual experience differing from assumed experience based upon actuarial assumptions. A funded ratio measurement in this report of 100% is not synonymous with no required future contributions. If the funded ratio were 100%, The Plan would still require future normal cost contributions (i.e., contributions to cover the cost of the active membership accruing an additional year of service credit).

(3) The measurement would produce a different result if the market value of assets were used instead of the actuarial value of assets, unless the market value of assets is used in the measurement.

Valuation Data

Valuation Date	June 30, 2022				June 30, 2021	
Status	Number	Covered Payroll	Average Age	Average Vesting Service	Number	Covered Payroll
Active	774	$ 57,093,270	43.9	13.0	816	$ 55,737,215
Inactive, Non-Vested[1]	177	-	-	-	161	-
Total Inactive (With Benefit)	692	-	63.5	-	624	-
Long Term Disability	-	-	-	-	-	-
Retirees and Beneficiaries	430	-	-	-	379	-
Retirees and Beneficiaries Elsewhere	61	-	-	-	55	-
Inactive, Vested	120	-	-	-	112	-
Inactive, Active Elsewhere in VRS	81	-	-	-	78	-
Total Participants	1,643	-	-	-	1,601	-

1 *Inactive, Non-Vested members are no longer working and are entitled to a refund of their contributions.*

Valuation Results

Valuation Date	June 30, 2022	June 30, 2021[3]
1. Development of the Unfunded Accrued Liability and Funded Ratio		
a. Present Value of Future Benefits - Active	$ 153,460,744	$ 160,298,812
b. Present Value of Future Normal Costs - Active	27,646,651	
c. Accrued Liability		
i. Active Employees [1.a. - 1.b.]	125,814,092	134,482,526
ii. Total Inactive Liability	161,480,792	135,020,517
iii. Total [1.c.i. + 1.c.ii.]	287,294,885	269,503,043
d. Actuarial Value of Assets	251,710,320	239,166,435
e. Unfunded Accrued Liability (UAL) [1.c.iii. - 1.d.]	35,584,565	30,336,608
f. Funded Ratio [1.d. / 1.c.iii.]	87.61%	88.74%
g. Market Value of Assets	259,238,155	268,159,647
h. Funded Ratio on Market Value [1.g. / 1.c.iii.]	90.23%	99.50%
2. Employer Contribution Rate Development for Fiscal Year Ending	**Informational for June 30, 2024**	**June 30, 2023 and June 30, 2024**
a. Total Normal Cost Rate	7.40%	7.63%
b. Member Contribution Rate	4.55%	4.60%
c. Employer Normal Cost Rate [2.a. - 2.b.]	2.85%	3.03%
d. Amortization Charge/(Credit)[1,2]	3.22%	2.63%
e. Administrative Expenses[2]	0.30%	0.27%
f. Additional Funding Contribution	0.00%	0.00%
g. Plan Surcharge	0.00%	0.00%
h. Employer Defined Benefit Contribution Rate [2.c. + 2.d. + 2.e. + 2.f. + 2.g., minimum of zero]	6.37%	5.93%
i. Employer Defined Contribution Rate for Hybrid Members	1.20%	1.08%
j. Total Employer Contribution Rate [2.h. + 2.i.]	7.57%	7.01%
3. Amortization Period (Years)	12 - 21	13 - 22
4. Expected Benefit Payments	$ 14,600,319	

1 *Refer to the Amortization Schedule for additional detail.*
2 *Includes a timing adjustment factor of 1.018041.*
3 *Select results for 2021 are not available. These will be provided on a prospective basis.*

Valuation Results (Continued)

The Total Employer Contribution Rate shown on the prior page consists of the following elements:

- **Employer Normal Cost Rate** – The ongoing annual cost of active employees accruing benefits under The Plan.

- **Amortization Charge/(Credit)** – The payment/(credit) towards the unfunded accrued liability (UAL) for the year. The UAL is the amount by which the actuarial value of assets falls short of, or exceeds, the accrued liability for this plan. Under the funding arrangement adopted by the Board, the UAL is being amortized following a layered policy in which a new 20-year amortization layer is created for new UAL arising during each valuation. Preexisting UAL continues to be amortized based on each layer's scheduled end date. The layered amortization policy is described further in the Appendix on the VRS website.

- **Administrative Expenses** – Estimated administrative expenses to be paid out of the trust in the upcoming fiscal year, based on actual prior year experience. Administrative expenses are set to the average level, across all political subdivisions, for new employers where no actual prior year experience exists.

- **Additional Funding Contribution** – The additional contribution rate needed to allow for the use of the 6.75% investment return as the single equivalent investment return assumption for purposes of GASB Statement Nos. 67 and 68.

- **Plan Surcharge** – The additional contribution rate applied to plans below 75% funded in order to maintain a total employer contribution rate at the same level as the previous rate setting actuarial valuation.

Valuation Results by Membership Category

Valuation Date	June 30, 2022	June 30, 2021
1. Covered Payroll		
a. General Employees Benefit Coverage	$ 57,093,270	$ 55,737,215
b. Enhanced Hazardous Duty Benefit Coverage	N/A	N/A
c. Total	57,093,270	55,737,215
2. Informational Employer Contribution Rate Detail		
a. General Employees Benefit Coverage	7.57%	7.01%
b. Enhanced Hazardous Duty Benefit Coverage	N/A	N/A

Looking Ahead

Employer Normal Cost

The employer normal cost rate represents the long-term cost of The Plan benefits. As shown below in the difference of columns (2) and (1), the employer normal cost is expected to change as the impact of the 2012 pension reform is realized. Once the active population is fully comprised of Plan 2 and Hybrid members, as applicable, the long-term expected impact is expected to be 0.00%. Please note that actuarial results vary from one valuation year to the next, sometimes significantly, if the group valued is very small (fewer than 30 lives).

	Employer Normal Cost Rate as of June 30, 2022[1,2]	
	Current Population (1)	After Full Impact of 2012 Pension Reform (2)
General Employees	4.05%	4.31%
Enhanced Hazardous Duty Employees	N/A	N/A
Total Blended Rate	4.05%	4.31%
Long-Term Impact		0.26%

1 *Net of member contribution rate(s), 5.00% for Plan 1 and Plan 2 members, and 4.00% for Hybrid Plan members.*

2 *Rate(s) include an assumed employer defined contribution rate of 2.67% for members in the Hybrid Plan, based upon prior year experience.*

Five Year Projection of Biennial Contribution Rates

The following table shows projected employer contribution rates for the next five years, based on The Plan's future experience matching actuarial assumptions. The rates **do not** include the employer contribution to the defined contribution portion of the Hybrid Plan.

It is important to note that calculations in this report are mathematical estimates based upon assumptions regarding future events, which may or may not materialize. As noted above, actuarial calculations can and do vary from one valuation to the next, sometimes significantly, depending on the group’s size. Projections are not predictions. Future valuations will be based on actual future experience.

Valuation Date June 30,	Fiscal Year Ending June 30,	Projected Employer Defined Benefit Contribution Rate
2019	2022	6.26%
2021	2023	5.93%
2021	2024	5.93%
2023	2025	5.81%
2023	2026	5.81%
2025	2027	4.59%

Amortization Schedule

Description		Original Amount	Outstanding Balance as of June 30, 2021	BOY 2021/2022 Amortization Payment	Outstanding Balance as of June 30, 2022	BOY 2022/2023 Amortization Payment	Years Remaining as of June 30, 2022
Total Dollar			$ 30,336,608	$ 1,439,175	$ 35,584,565	$ 1,808,021	
Total UAL Amortization Charge				2.63%		3.22%	
Breakdown of Total Dollar by Year:							
2022	(Gain) / Loss	$ 4,736,555			$ 4,736,555	$ 325,671	20 years
2021	(Gain) / Loss	(2,593,992)	$ (2,593,992)	$ (178,355)	(2,578,692)	(183,706)	19 years
2020	(Gain) / Loss	1,914,452	1,903,160	135,581	1,886,891	139,648	18 years
2019	(Gain) / Loss	6,695,641	6,599,249	488,409	6,523,322	503,061	17 years
2018	(Gain) / Loss	(2,581,001)	(2,516,824)	(194,091)	(2,479,517)	(199,914)	16 years
2017	(Gain) / Loss	(7,018,390)	(6,748,551)	(544,109)	(6,623,242)	(560,432)	15 years
2016	(Gain) / Loss	(3,567,074)	(3,369,345)	(285,100)	(3,292,432)	(293,653)	14 years
2015	(Gain) / Loss	(2,887,846)	(2,667,992)	(237,959)	(2,594,060)	(245,098)	13 years
2014	(Gain) / Loss	(11,410,367)	(10,259,297)	(969,343)	(9,917,026)	(998,423)	12 years
2013	Original Unfunded	47,444,210	49,990,200	3,224,142	49,922,767	3,320,866	21 years

Risk Commentary

Determination of the accrued liability, the employer contribution rate, and the funded ratio requires the use of assumptions regarding future economic and demographic experience. Risk measures, as illustrated in this report, are intended to aid in the understanding of the effects of future experience differing from the assumptions used in the course of the actuarial valuation. Risk measures may also help with illustrating the potential volatility in the accrued liability, the Total Employer Defined Benefit Contribution Rate and the funded ratio that result from the differences between actual experience and the actuarial assumptions.

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 due to changing conditions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period, or additional cost or contribution requirements based on The Plan's funded status); and changes in plan provisions or applicable law. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

Examples of risk that may reasonably be anticipated to significantly affect The Plan's future financial condition include:

1. **Investment Risk** – actual investment returns may differ from the expected returns;

2. **Asset/Liability Mismatch** – changes in asset values may not match changes in liabilities, thereby altering the gap between the accrued liability and assets, consequently altering the funded status and contribution requirements;

3. **Salary and Payroll Risk** – actual salaries and total payroll may differ from expected, resulting in actual future accrued liability and contributions differing from expected;

4. **Longevity Risk** – members may live longer or shorter than expected and receive pensions for a period of time other than assumed; and

5. **Other Demographic Risks –** members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liability and contributions differing from expected.

The effects of certain trends in experience can generally be anticipated. For example, if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate, the cost of The Plan can be expected to increase (or decrease). Likewise, if longevity is improving (or worsening), increases (or decreases) in cost can be anticipated.

Risk Commentary (Concluded)

PLAN MATURITY MEASURES

Risks facing a pension plan evolve over time. A young plan with virtually no investments and paying few benefits may experience little investment risk. An older plan with a large number of members in pay status and a significant trust may be much more exposed to investment risk. Generally accepted plan maturity measures include the following:

Plan Maturity Measure	June 30, 2022
1. Ratio of the Market Value of Assets to Covered Payroll	4.54
2. Ratio of Actuarial Accrued Liability to Covered Payroll	5.03
3. Ratios of Actives to Retirees and Beneficiaries	1.80
4. Ratio of Net Cash Flow to Market Value of Assets (BOY)	(3.3%)

RATIO OF MARKET VALUE OF ASSETS TO PAYROLL

The relationship between assets and payroll is a useful indicator of the potential volatility of contributions. For example, if the market value of assets is 2.0 times the payroll, a return on assets 5% different than assumed would equal 10% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in plan sponsor contributions as a percentage of payroll.

RATIO OF ACTUARIAL ACCRUED LIABILITY TO PAYROLL

The relationship between actuarial accrued liability and payroll is a useful indicator of the potential volatility of contributions for a fully funded plan. A funding policy that targets a funded ratio of 100% is expected to result in the ratio of assets to payroll and the ratio of liability to payroll converging over time.

RATIO OF ACTIVES TO RETIREES AND BENEFICIARIES

A young plan with many active members and few retirees will have a high ratio of actives to retirees. A mature open plan may have close to the same number of actives to retirees resulting in a ratio near 1.0. A super-mature or closed plan may have significantly more retirees than actives resulting in a ratio below 1.0.

RATIO OF NET CASH FLOW TO MARKET VALUE OF ASSETS

A positive net cash flow means contributions exceed benefits and expenses. A negative net cash flow means existing funds are being used to make payments. A certain amount of negative net cash flow is generally expected to occur when benefits are prefunded through a qualified trust. Large negative net cash flows as a percent of assets may indicate a super-mature plan or a need for additional contributions.

Summary of Benefit Provisions

The benefits available to participating Political Subdivisions are summarized in the Appendix, available on the VRS website. The summary is not a substitute for the Code of Virginia or VRS administrative procedures. If any conflict occurs between the information in this summary and the Code of Virginia or VRS administrative procedures, the Code of Virginia and VRS administrative procedures govern.

Statutes Governing Participating Political Subdivisions: Code of Virginia, Title 51.1, Pensions, Benefits, and Retirement, Chapter 1. Art. 5. Participation of Political Subdivisions in Retirement System, §§51.1-130 to 51.1-139.

Included below is a brief grid of individual employer elections as of the valuation date.

	Eligible[1]	Hazardous Duty Multiplier	Effective Date
General Employees	Yes		7/1/1955
Hazardous Duty Employees			
Sheriff	N/A	N/A	N/A
Deputy Sheriff	N/A	N/A	N/A
Emergency Medical Technician	N/A	N/A	N/A
Fire	N/A	N/A	N/A
Law Enforcement Officer	N/A	N/A	N/A
Jail Superintendent	N/A	N/A	N/A
Regional Jail	N/A	N/A	N/A

1 *Hazardous Duty Employees indicated as N/A are eligible for General Employee Benefits.*