Cost of Service Study for Small Potomac Interceptor Users

April 3, 2025

Amawalk
Consulting Group LLC

April 3, 2025

Mr. Syed Khalil
Vice President, Rates and Revenue
District of Columbia Water and Sewer Authority
1385 Canal Street SE
Washington, DC 20003

Subject: Cost of Service Study for Small Potomac Interceptor Users

Dear Mr. Khalil:

The Amawalk Consulting Group ("Amawalk") is pleased to present this Report on the Cost of Service Study for the Small Potomac Interceptor ("PI") Users to the District of Columbia Water and Sewer Authority ("DC Water"). There are three purposes for this Study: a) to determine the cost of providing service to the Small PI Users for fiscal years 2022, 2023, and 2024; b) to compare the cost of service with the amounts paid during those years; i.e., calculate a true-up that would be an added charge or a credit, depending upon the results; and c) to compute the recommended Small PI User wastewater rates to be assessed by DC Water to recover the cost of service for fiscal years 2026 through 2028. The Executive Summary of the Report concisely presents our findings and recommendations. The remainder of the Report presents our methodology, calculations and supporting information.

We wish to acknowledge, with thanks, the data, information and assistance provided by DC Water personnel throughout the Study.

We appreciate the opportunity to work with DC Water and would be pleased to answer any questions that you may have.

Very truly yours,

Shan Lin

Amawalk Consulting Group LLC

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1 Executive Summary

Background and Purpose

The District of Columbia Water and Sewer Authority ("DC Water" or "Authority") conveys wastewater through its Potomac Interceptor ("PI") from the Town of Vienna ("Vienna"), the Dulles International Airport ("Dulles"), the National Park Service ("NPS"), and the Department of the Navy ("Navy"), collectively referred to herein as, the "Small PI Users". The wastewater is ultimately transported to the Blue Plains Advanced Wastewater Treatment Plant ("Blue Plains"), a treatment facility owned and operated by DC Water.

This Cost of Service ("COS") Study was prepared for DC Water by the Amawalk Consulting Group LLC ("Amawalk") for the following purposes: a) determining the actual cost of providing service to the Small PI Users for fiscal years 2022, 2023, and 2024 (the "Historical Period"), b) comparing the COS with the revenue received to prepare a true-up that may show overpayments or underpayments for the Historical Period, and c) calculating proposed Small PI User wastewater rates to be used by DC Water to recover the projected COS in 2026 through 2028 (the "Forecast Period"). The year that this Report was prepared is 2025; the true-up of actual costs and receipts for this year will be prepared as part of the next COS Study in three years. All references to years reflect the fiscal years of the Authority which begin on October 1st of the prior year and end on September 30th of the year shown.

Cost-Sharing Methodology

The Small PI Users pay a proportionate share of DC Water's operating and capital costs on the basis of a rate per million gallons ("MG") of wastewater in accordance with the service agreements that were executed in the 1960's ("Small PI User Agreements"). The Small PI User Agreements specify that the Small PI Users must pay their share of the following:

1. Operation, repair, and maintenance costs of the PI, including overhead, where applicable;
2. Operation, repair, maintenance, and replacement costs, as well as overhead, of DC Water facilities that handle, pump, or treat wastewater conveyed by the PI to Blue Plains;
3. Amortized planning, design, construction ("capital costs"), and initial operational costs associated with the PI;
4. Amortized capital costs of pipelines and pumping facilities that provide for the transport of flows from the PI to Blue Plains; and
5. Amortized capital costs associated with additional treatment facilities to accommodate flows from the PI.

This COS Study was completed in accordance with terms of the Small PI User Agreements; it determined the actual cost of providing wastewater service to the Small PI Users for the Historical Period, and the projected COS for the Forecast Period.

Cost of Service Findings for the Historical Period

The calculated sum of the COS for the Small PI Users for 2022 through 2024 is $10,728,088. Compared to each prior year, costs increased by 5.6% in 2022, 4.2% in 2023 and 2.9% in 2024, resulting in an average annual increase of 4.2%. The 2022 increase recognizes that 2021 costs[1] were impacted to some extent (i.e., reduced) by the impacts of the COVID-19 pandemic. Ongoing capital investments were a component of the increasing COS in the three years.

Comparison of Cost of Service and Small PI User Payments (True-up)

Amawalk compared the COS with the payments received from each Small PI User in each year to determine if the user had overpaid or underpaid for service. As part of this comparison, payments received during the period were adjusted to take into account prior true-up credits or payments. A concise summary of the COS and payments is shown in Table 1-1. In years where the amount paid exceeded the calculated COS total, the customer overpaid for wastewater service; alternatively, in years where the amount paid was less than the calculated COS, the customer underpaid for service. All payments were based on the rates in effect for those years.

Table 1-1, Results of the Small PI User True-Up Analysis (All Amounts in $)

Year/Description	Vienna	Dulles	NPS	Navy	Total
2022					
Cost of Service	$ 1,798,168	$ 1,541,763	$ 24,142	$ 80,250	$ 3,444,322
Amount Paid	1,986,534	1,276,268	6,361	81,280	3,350,443
Difference	$ 188,366	$ (265,495)	$ (17,781)	$ 1,030	$ (93,879)
2023					
Cost of Service	$ 1,819,811	$ 1,661,488	$ 24,189	$ 84,908	$ 3,590,396
Amount Paid	1,978,418	1,689,543	10,362	86,846	3,765,169
Difference	$ 158,606	$ 28,055	$ (13,827)	$ 1,937	$ 174,772
2024					
Cost of Service	$ 1,824,014	$ 1,756,436	$ 25,328	$ 87,592	$ 3,693,370
Amount Paid	1,823,957	1,823,772	11,072	87,085	3,745,886
Difference	$ (57)	$ 67,336	$ (14,256)	$ (507)	$ 52,516
Total Underpayment/Overpayment	$ 346,916	$ (170,104)	$ (45,864)	$ 2,461	$ 133,409
(Positive is Overpayment, Negative is Underpayment)					

As shown in Table 1-1, a net overpayment of $133,409 from the Small PI Users is calculated on a combined basis for 2022 through 2024. A brief discussion of each Small PI User's overpayment or underpayment by year is included in the following paragraphs. It is noted that changes in wastewater flows directly impact the assignment of operating expenses to the User; however, actual wastewater flows have no impact on the assignment of capital costs since reserve capacity is used to assign such costs.

[1] The total costs for Small PI Users for 2021 used in this comparison are from the Prior COS Study: Cost of Service Study for Small Potomac Interceptor Users, Arcadis District of Columbia, P.C., April 19, 2022

Vienna
Compared to the COS, the Town of Vienna overpaid in 2022 and 2023 and underpaid in 2024, resulting in a net overpayment for these three years of $346,916.

Dulles
Compared to the COS, Dulles International Airport underpaid for service in 2022 and overpaid in 2023 and 2024. The sum of the results for the three years is a net underpayment of $170,104.

NPS
Compared to the COS, the National Park Service underpaid for service in 2022, 2023 and 2024, resulting in a total underpayment of $45,864 over these three years.

Navy
Compared to the COS, the Navy overpaid in 2022 and 2023 and underpaid in 2024, resulting in a net overpayment for these three years of $2,461.

Cost of Service Findings for the Forecast Period
Amawalk prepared a COS analysis for the Forecast Period to calculate proposed wastewater rates for the Small PI Users in these years. The COS methodology includes projecting eligible operating expenses using 2025 budgeted expenses as the base, identifying DC Water's planned capital costs and then amortizing those costs, estimating annual wastewater flows, as well as using existing reserve capacity shares, to calculate an average rate per MG of wastewater flow for each Small PI User. This calculated rate for each User is proposed for use by DC Water to recover the respective COS over the Forecast Period.

The calculated 2026 through 2028 sum of the COS for the Small PI Users is $15,594,705, which represents an increase of 45.4% compared to the Historical Period. Projected cost recovery rates for Small PI Users are calculated by totaling the COS projections for 2026 through 2028 for each Small PI User and dividing this amount by the total projected wastewater flows for each user over this same period. This results in an average cost recovery rate for the Forecast Period. This calculation is summarized in Table 1-2. A uniform average cost recovery rate for the three-year period is proposed, rather than calculating different cost recovery rates for each of the three years, to be consistent with the pricing provisions contained in the Small PI User Agreements; these agreements specify that the cost recovery rate shall not be changed more frequently than once every three years.

Table 1-2 Calculated Wastewater Rates for Small PI Users for 2026 – 2028

Description	Vienna	Dulles	NPS	Navy
Total before True-Up Adjustment	$ 7,631,782	$ 7,483,202	$ 113,823	$ 365,898
Projected 2026-2028 Flows (MG)	1,062.66	987.91	1.78	54.73
Projected Rate (per MG)	$7,181.77	$7,574.76	$63,789.14	$6,685.80
Current Rate per MG	$5,072.41	$5,706.26	$18,616.15	$4,773.69
Increase (Decrease)	$2,109.36	$1,868.50	$45,172.99	$1,912.11
Increase (Decrease) %	41.6%	32.7%	242.7%	40.1%

Proposed Rates for the Forecast Period

As shown in Table 1-2 above, the calculated proposed rates for Small PI Users range from $6,685.80 per MG to $63,789.14 per MG. The projected rates are higher than the existing rates due to a combination of factors: projected increases in operating expenses, amortized capital costs, and changes in flow projections. Capital cost increases are substantial and reflect the expectations of significant spending on PI improvements by DC Water during the Forecast Period. It has been many years since investments were made in the PI; major PI Improvements and resulting capital costs begin in 2025. The estimated capital costs in 2025 through 2028 for the Interceptor are $341 million; the effects on DC Water debt service will increase to $25 million in 2028. Small PI Users pay a portion of debt service for the Interceptor, the Pump Station and other Improvements.

Key assumptions are identified in this Report. The percentage increases are uneven among the individual Small PI Users due, in part, to the use of reserve capacity to assign amortized capital costs. The costs to be recovered and projected rates are prior to the application of true-up credits and charges as shown in Table 1-1. Such credits and charges are recommended to be applied separately during the Forecast Period.

NPS has the largest percentage increase as a result of decreased wastewater flows, consistent with the findings of the Prior COS Report. These increases are primarily attributable to a reduction in NPS flow which, according to the Prior COS Report, has been observed since 2018. In accordance with the Small PI User Agreements, capital costs are assigned to small users based on their reserve capacity. Since capital costs (the numerator) remain unaffected if flows increase or decline (the denominator), there is a resulting increase in the unit rate if flows decline.

2 Introduction

2.1 Background

The District of Columbia Water and Sewer Authority ("DC Water" or "Authority") conveys wastewater through its Potomac Interceptor ("PI") from the Town of Vienna ("Vienna"), the Dulles International Airport ("Dulles"), the National Park Service ("NPS"), and the Department of the Navy ("Navy"), hereinafter, the "Small PI Users". The wastewater is ultimately transported to the Blue Plains Advanced Wastewater Treatment Plant ("Blue Plains"), an internationally-recognized advanced wastewater treatment facility owned and operated by DC Water.

From the DC Water website:

The PI was built as a result of the enactment of Public Law 86-515 (the "Act"), by the 86th Congress, on June 12, 1960. The Act authorized the District of Columbia to plan, construct, operate, and maintain a sanitary sewer to connect Dulles to the Washington, DC sewer system. The PI sanitary sewer system carries about 60 million gallons of wastewater daily from areas near Dulles Airport to the Potomac Pumping Station in Washington, DC. Flows from the pump station are then sent to Blue Plains for treatment before discharge into the Potomac River.

Segments

The PI system consists of four primary interceptor segments including the PI main trunk, the Upper Potomac Interceptor ("UPI"), the Upper Potomac Interceptor Relief Sewer ("UPIRS"), and the Maryland Upper Potomac Interceptor ("MUPI").

- The PI main trunk is located in Maryland and Virginia and includes the Sugarland Run Extension, the Difficult Run Extension, and the Upper Maryland Spur.
- The MUPI is located in Montgomery County, Maryland and conveys flows into the UPI at the DC line.
- The UPI starts at the Maryland/DC border and currently conveys flows from the MUPI and other service connections in the District to the UPIRS.
- The UPIRS begins at the D.C. border and conveys flow from the PI main trunk and other service connections to Blue Plains.

DC Water operates and maintains the PI system with the exception of the MUPI, which is operated and maintained by the Washington Suburban Sanitary Commission. In addition to the Small PI Users, the PI also serves Loudoun County (VA)**,** Fairfax County (VA) and Washington Suburban Sanitary Commission ("WSSC"). Figure 1 on the following page provides a diagram of the PI.

The PI varies in size from 30-inch to 96-inch diameter round, reinforced concrete pipe in the main trunk to 13-foot by 7.75-foot rectangular, reinforced concrete pipe in the lower reaches of the sewer system. The original sewer design included provisions for interceptor venting at the manholes and access shafts along most of the sewer system to promote the exhaust of sewer gases or the intake of air as needed.

Between 2012 and 2015, DC Water constructed six odor control facilities along the PI to mitigate the release of sewer gases and odors to surrounding parks and public spaces, minimizing off-site impacts and the potential for odor complaints pertaining to the Potomac Interceptor.

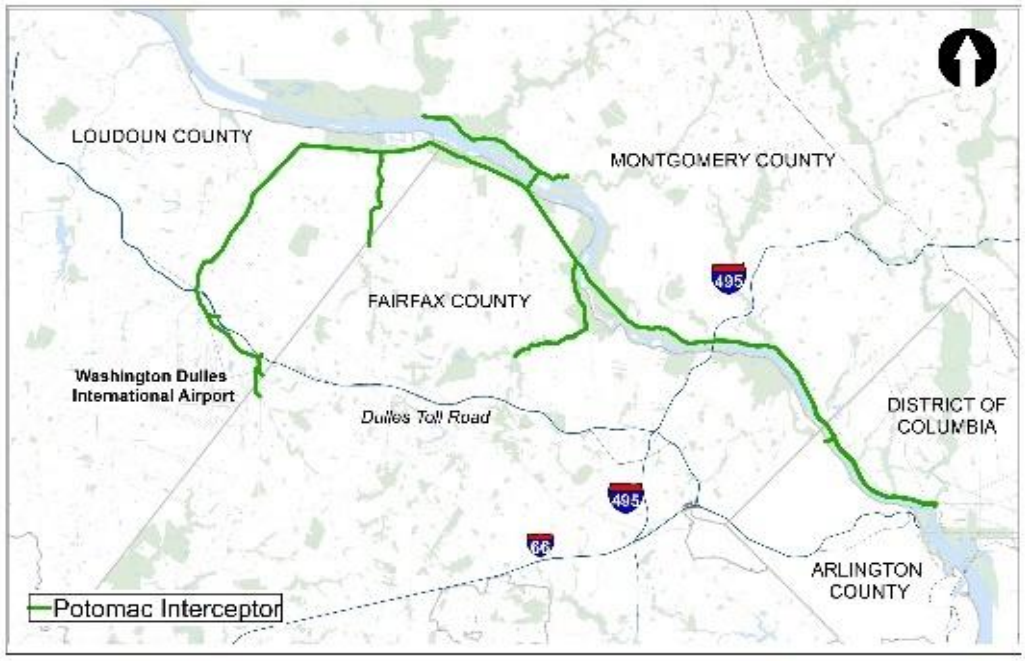
Inspection and Rehabilitation of the Potomac Interceptor

Between 2011 and 2015, DC Water inspected the entire PI. The individual pipe segments inspected indicate the majority of the pipe segments show signs of corrosion, and some show settled deposits. DC Water plans to rehabilitate corroded pipe segments, and to clean pipe segments that have significant settled deposits. DC Water is taking corrosion prevention measures to reduce the rate of pipe corrosion.

Planned PI Improvements – Amawalk Summary of DC Water Plans

For many years, there were no capital costs shown for the Potomac Pumping Station and Interceptor. Rehabilitation of portions of the Potomac Interceptor has been identified as a priority by DC Water; the highest priority section is expected to be rehabilitated in early 2025 under an emergency contract. The Authority further advises that a Request for Proposals ("RFP") to complete over 10,000 linear feet of work will be issued in February 2025, while a master PDB RFP will be issued in July 2025, with the expectation that capital construction will begin in 2026. Over the total project period through 2034, the current estimate of costs is $684.3 million; $38.8 million of which is expected to be spent in 2025 and a total of $341.0 million over the period of 2025 through 2028. In addition, there are $53.6 million in planned improvements to the Potomac Pump Station; $13.1 million of which is expected in 2025 through 2028.

Figure 1 Potomac Interceptor Diagram



2.2 Study Purpose

This Cost of Service ("COS") study was prepared for DC Water by the Amawalk Consulting Group LLC ("Amawalk") for the following purposes: a) determining the actual cost of providing

service to the Small PI Users for fiscal years 2022, 2023, and 2024 (the "Historical Period"), b) comparing the cost of service with the revenue received to prepare a true-up that may show overpayments or underpayments, and c) calculating proposed Small PI User wastewater rates to be used by DC Water to recover the projected cost of service in 2026 through 2028 (the "Forecast Period"). The year that this Report was prepared is 2025; the true-up of actual costs and receipts for this year will be prepared as part of the next cost of service study in three years. All references to years reflect the fiscal years of the Authority which begin on October 1st of the prior year and end on September 30th of the year shown.

2.3 Small PI User Agreements

The Small PI Users pay a proportionate share of DC Water's operating and capital costs on the basis of a rate per MG of wastewater in accordance with the service agreements that were executed in the 1960's ("Small PI User Agreements"). The Small PI User Agreements specify that the Small PI Users must pay their share of the following:

1. Operation, repair, and maintenance costs of the PI, including overhead, where applicable;
2. Operation, repair, maintenance, and replacement costs, as well as overhead, of DC Water facilities that handle, pump, or treat wastewater conveyed by the PI to Blue Plains;
3. Amortized planning, design, construction ("capital costs"), and initial operational costs associated with the PI;
4. Amortized capital costs of pipelines and pumping facilities that provide for the transport of flows from the PI to Blue Plains; and
5. Amortized capital costs associated with additional treatment facilities to accommodate flows from the PI.

These agreements specify that the rates charged to the Small PI Users are to be adjusted at three-year or greater intervals, with periodic billing reconciliations as necessary. The agreements also have provisions for the sharing of pre-1964 costs but these are no longer relevant to current calculations.

Section 3 of this Report presents the COS for 2022-2024 (the "Historical Period") and 2026-2028 (the "Forecast Period"). Section 4 provides the true-up of costs and receipts for the Historical Period; it also presents the proposed unit rates per MG for the Forecast Period for each Small PI User. The Appendix concisely summarizes the contents and data sources for each of the Report tables. The Appendix also summarizes highlights from the terms of a PI Agreement.

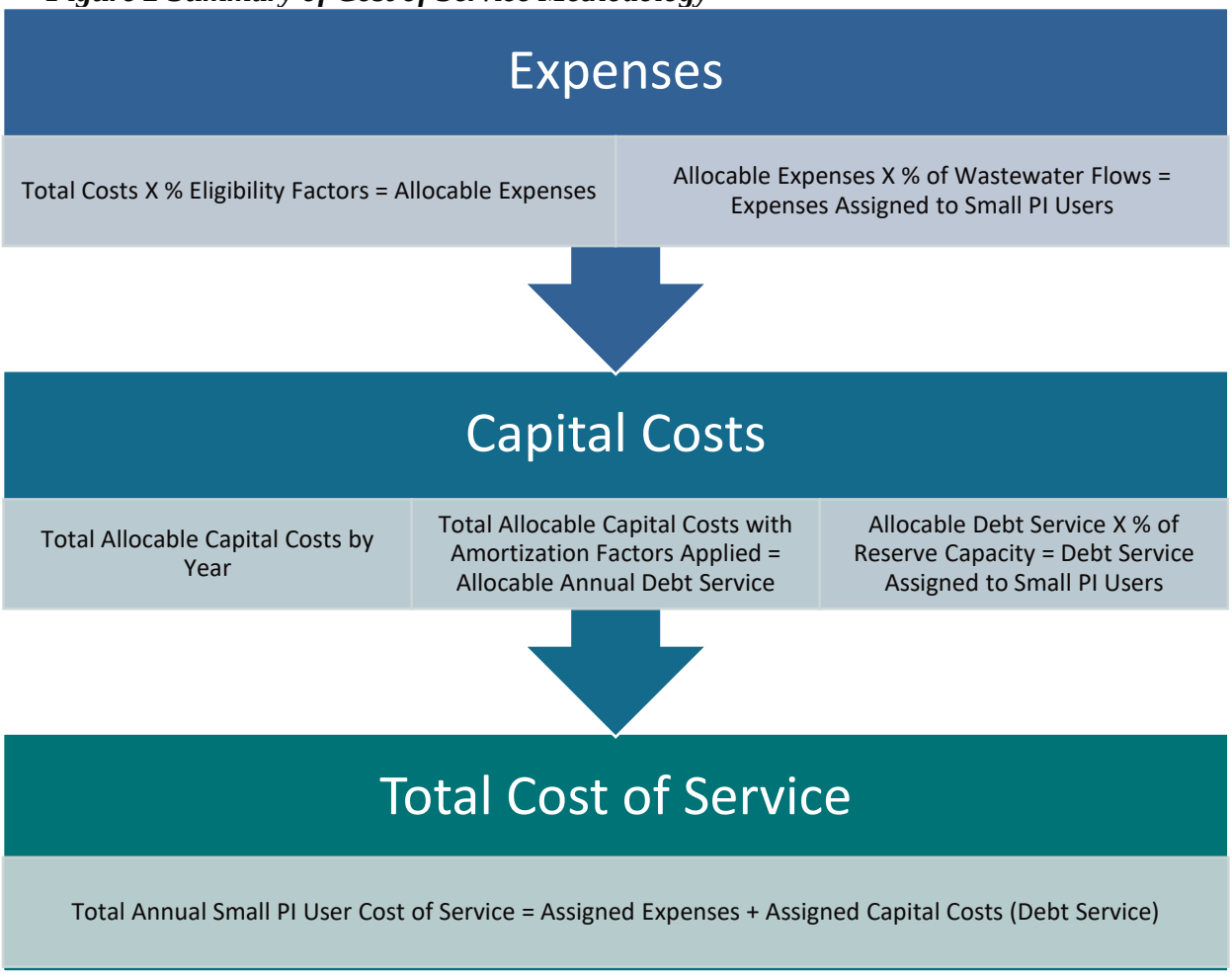
3 Cost of Service

The COS analysis includes a series of steps; a listing of each step and references for tables presented in this chapter to illustrate data and results are provided below.

1. Identifying historical total operating expenses for DC Water in 2022, 2023, and 2024; shown by department and summarized in the categories of Operations (Table 3-1), Administration (Table 3-2), and Other Adjustments and Capital Equipment (Table 3-3).
2. Listing the budgeted operating expenses for DC Water in 2025, and making projections of expenses for 2026, 2027 and 2028; using 2025 as a base year and applying assumptions identified herein to compute projected expenses for Operations (Table 3-4), Administration (Table 3-5), and Other Adjustments and Capital Equipment (Table 3-6).
3. Applying expense eligibility factors times each line of the total operating expenses in Tables 3-1 through 3-6 to compute the expenses that are allocable to Small PI Customers. For example, Water Operations has an eligibility factor of 0% since it is not relevant to the PI; biosolids has an eligibility factor of 100% because it relates to the treatment process byproducts produced at Blue Plains. The eligibility results are shown in Tables 3-7 and 3-8.
4. Identifying capital costs of DC Water that are eligible to be amortized and assigned to Small PI Users in Table 3-9 for the Historical Period and in Table 3-10 for more recent historical years, the current year, and the Forecast Period.
5. Amortizing the identified capital costs in Table 3-11 for the Historical Period and in Table 3-12 for more recent historical years, the current year, and the Forecast Period.
6. Presenting in Table 3-13 the actual amount of wastewater flows attributable to each Small PI User together with the total actual flows received at Blue Plains in 2022, 2023, and 2024, as well as projecting wastewater flows for each User in the current year and each year of the Forecast Period. Wastewater flows are presented on a percentage basis in Table 3-14 and then used to assign operating expenses to Small PI Users in Table 3-17.
7. Listing each Small PI User's reserve capacity share of the total capacity of the Potomac Pumping Station and Blue Plains on a volume basis in Table 3-15 and on a percentage basis in Table 3-16. Reserve capacity shares are then used to assign amortized capital costs to Small PI Users in Table 3-18.
8. Determining the historical and projected annual cost of providing wastewater service to Small PI Users based on the sum of assigned operating expenses and amortized capital costs, as summarized in Table 3-19.

Figure 2 below provides a concise summary of the above steps.

Figure 2 Summary of Cost of Service Methodology



The projected COS considers plans and assumptions over the Forecast Period relating to a number of important factors, including the following:

- Changes in DC Water's operating expenses, including extraordinary expenses, if any.
- Planned eligible capital projects by year, apart from the PI
- Planned capital improvements by year for the PI and the Potomac Pump Station
- Interest rates on debt
- Wastewater flows by year for each Small PI User
- Changes in reserve capacity shares for each Small PI User, if any

Actual results are used herein for 2022 and 2023; results for 2024 are preliminary and subject to change. In a similar manner, all references and comparisons to 2021 results recognize that such results were unaudited at the time of the prior Report. Subsequent changes to 2021 or 2024 data, if any, are assumed to be not material to the findings and conclusions presented. Plans and assumptions impacting the COS for the Forecast Period are noted in the respective parts of this Section.

After completing the COS, a true-up analysis is then prepared and presented in Section 4 to determine the over- or under-payment of wastewater service costs by the Small PI Users to DC Water by comparing the actual cost of providing service to the Small PI Users with the amounts paid by those Users in 2022 through 2024. The results of the true-up are proposed to be credited or charged, as appropriate, to the Small PI Users during the period of 2026 through 2028.

3.1 Operating Expenses

Pursuant to their User Agreements, Small PI Users are to share in certain operating expenses of DC Water: 1) the expenses of the PI and the facilities that convey flow from the PI to Blue Plains, and 2) the expenses of Blue Plains itself. In addition to the direct expenses, the Small PI Users share in the administrative expenses and other related costs incurred by the Authority for the operation, maintenance and improvement of the PI and Blue Plains. Observations regarding the overall methodology for expenses are presented below.

Operations

The expenses of water and wastewater (including stormwater) operations are tracked and reported on for each department of DC Water. The costs to operate, maintain and repair/improve Blue Plains or Water Operations, for example, are relatively straightforward to separate from all other DC Water operations-related expenses. However, it is not practical to separate out the costs of operating, maintaining and repairing specific pipe sections or conduits such as the PI from the entire wastewater conveyance system in order to assign such costs directly to the Small PI Users and other PI users. A multi-step process, described later in this Chapter, is used to assign a portion of the costs of DC Water operations to the Small PI Users.

Administration

Similar to other water and wastewater utilities, DC Water incurs expenses for human resources, procurement, legal, finance, information technology and other services that are necessary to manage, administer and support the operating, maintenance and repair functions. A portion of these expenses are also assigned to Small PI Users through the process presented herein.

Adjustments, Capital Equipment and Other Expenses

The third component of all operating expenses is for adjustments, capital equipment and other expenses. The adjustments are for biosolids expenses. DC Water advises that is necessary to subtract biosolids related expenses that have been captured under "Wastewater Treatment – Operations", since the full amount of biosolids expenses were not included under this departmental total. "Total Biosolids Cost" adds-in the full amount of biosolids expenses that should be included as actual expenses. Similar to the practice for prior years and studies, these amounts were provided by DC Water for 2022 through 2024 and serve the purpose described above.

Capital Equipment costs related to Blue Plains and the Distribution and Conveyance System are included in total operating expenses. These were incurred by the Authority and are recoverable expenses under the provisions of the Small PI User Agreements.

The final component of this part is the cost of preparing and presenting the PI COS Study every three years. This expense differs from all other expenses in that it is assignable solely to the PI Small Users.

We present total historical expenses and total projected expenses and then show the assignment of such expenses to the PI Small Users in a two-step process: first, determining which expenses are eligible to be allocated to Small PI Users, and second, using the actual wastewater flows of the Small PI customers and all other customers to assign the proportionate share of allocable costs to the Small PI customers.

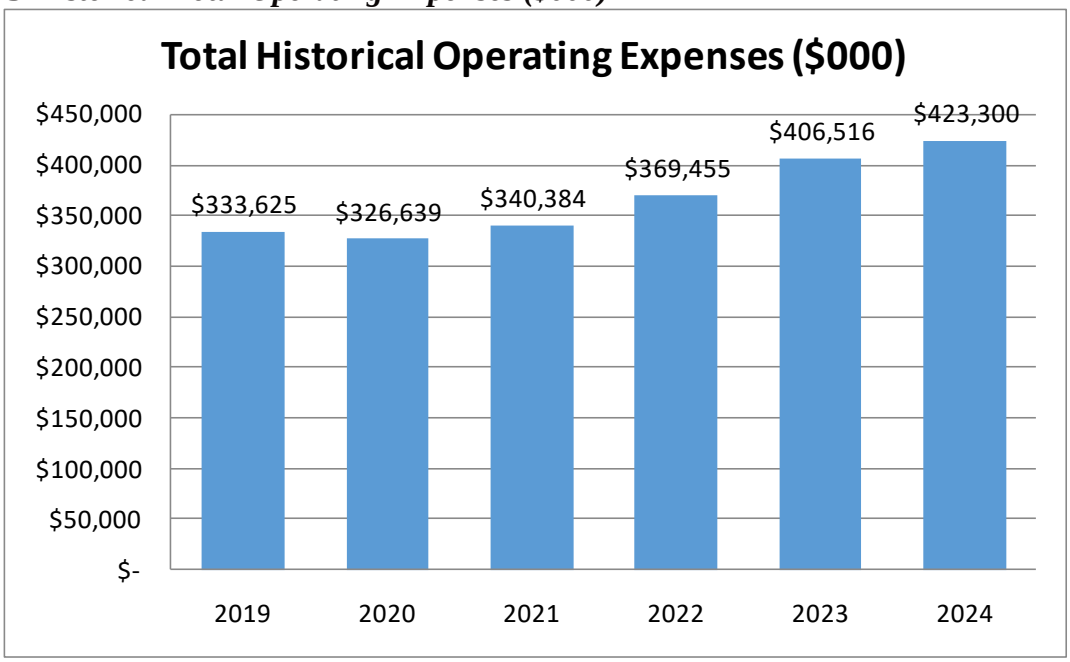
3.1.1 Historical Expenses

Table 3-1 presents a summary of the actual expenses by department for DC Water Operations for 2022 through 2024. In a similar format, the actual operating expenses by department for Administration services of DC Water are presented in Table 3-2. Costs for Other Expenses and Equipment, as well as the total operating expenses prior to allocations and assignments, are shown in Table 3-3. Figure 3 illustrates historical operating expenses for years 2019 through 2024.

The results shown in 2022 may reflect some residual effects of the COVID-19 coronavirus period. Most restrictions in the District related to COVID-19 were lifted on May 21, 2021 (nearly eight months through the 2021 fiscal year). Total expenses of $340.384 million in 2021 were reflected in the prior PI COS Study. The percentage increase in total 2022 expenses compared to the prior year results were 8.5%. The total expenses in 2020 and 2021 were lower than expected[2], impacted by COVID-19 restrictions and other effects of the pandemic.

The percentage increases in total expenses compared to the prior year in 2023 and 2024 were 10.0% and 4.1%, respectively. Figure 3 below shows the total operating expenses by year for the period of 2019 through 2024.

Figure 3 Historical Total Operating Expenses ($000)



[2] Expenses in 2020 decreased 2.1% from the prior year and 2021 expenses were 4.2% higher than in 2020.

In order to facilitate the comparison of historical and projected expenses, Tables 3-1, 3-2 and 3-3 also provide the projected expenses for 2025 which reflect the approved budget of DC Water.

Table 3-1 Historical Operations Expenses, All Amounts in $000

Department	2022 Actual	2023 Actual	2024 Preliminary	2025 Budgeted
Operations:				
Customer Service	16,951	19,177	19,218	21,117
Clean Rivers	3,364	3,120	3,412	4,108
Engineering and Technical Services	19,801	23,280	23,308	25,395
CIP Infrastructure Management	4,289	4,731	1,514	5,965
Wastewater Engineering	2,531	2,226	4,206	3,722
Permit Operations	3,877	4,637	4,942	5,286
Wastewater Treatment Operations	83,179	91,639	92,883	99,254
Clean Water and Technology	2,431	3,686	3,876	5,055
Resource Recovery	5,762	6,670	6,833	7,775
Maintenance Services	20,363	21,627	24,202	24,763
Process Engineering	6,453	7,862	6,423	8,534
Water Operations	63,576	66,140	74,082	80,716
Pumping and Sewer Operations	37,049	40,866	41,557	45,092
Subtotal	$ 269,629	$ 295,661	$ 306,455	$ 336,782

Compared to the prior year, the percentage increases by year in 2022, 2023, 2024 and 2025 are 8.0%, 9.7%, 3.7% and 9.9%, respectively. Results in 2022 were somewhat affected in the form of lower than expected net costs by the remaining effects of the pandemic including a higher than typical level of personnel vacancies, higher commodity prices and delays in the deliveries of supplies and materials. Results in 2023 and 2024 were not materially impacted by the pandemic, recognizing that water and wastewater utilities nationwide have experienced higher prices for treatment chemicals, supplies and parts.

Table 3-2 Historical Administrative Expenses, All Amounts in $000

Department	2022 Actual	2023 Actual	2024 Preliminary	2025 Budgeted
Administration:				
Secretary to the Board	$ 469	$ 385	$ 808	$ 875
Office of Chief Executive Officer	3,092	3,177	2,866	2,712
Internal Audit	750	780	815	839
Marketing and Communication	3,209	3,102	3,891	4,349
Office of Chief Operation Officer	1,176	2,113	1,585	1,692
Office of Chief Administration Officer	-	-	491	1,466
Office of Emergency Management	1,277	1,605	1,560	1,682
Fleet Management	7,014	6,596	7,515	7,191
Occupational Safety	2,323	2,259	2,647	2,859
Facilities Management	9,231	9,691	11,285	10,778
Security	8,600	9,686	10,157	11,057
Finance	18,978	22,991	24,246	30,062
Procurement	6,626	6,664	6,490	7,611
Non-Ratepayer Revenue Fund	0	-	-	500
Compliance & Business Development	775	1,141	1,687	2,318
Strategy and Performance	2,804	2,991	2,925	2,738
People and Talent	6,527	8,169	10,128	9,685
Information Technology	10,873	10,960	11,037	11,006
Government and Legal Affairs	6,968	8,951	5,934	8,312
Subtotal	$ 90,694	$ 101,260	$ 106,067	$ 117,732

The percentage increases in the expenses of Administration compared to the prior year were 7.7%, 11.7%, 4.7% and 11.0% in 2022, 2023, 2024 and 2025, respectively.

Table 3-3 Historical Other Expenses, Equipment & Total Expenses, All Amounts in $000

Department	2022 Actual	2023 Actual	2024 Preliminary	2025 Budgeted
Operations Subtotal (Table 3-1):	$ 269,629	$ 295,661	$ 306,455	$ 336,782
Administration Subtotal (Table 3-2):	$ 90,694	$ 101,260	$ 106,067	$ 117,732
Other Adjustments:				
Biosolids Cost (from GL)	$ (1,584)	$ (1,918)	$ (1,944)	$ (2,077)
Total Biosolids Cost	4,087	4,544	4,605	4,921
Subtotal	$ 2,504	$ 2,626	$ 2,661	$ 2,844
Capital Equipment:				
Blue Plains - Operations	$ 38	$ -	$ -	$ 20
Blue Plains - Process Engineering	605	1,565	971	625
Blue Plains - Maintenance Services	4,262	3,640	5,025	4,200
Pumping & Sewer Operations (DPSO)	1,725	1,737	1,947	2,287
Clean Water Quality and Technology	-	27	172	80
Cost of Service Study	-	-	-	70
Subtotal	$ 6,629	$ 6,969	$ 8,116	$ 7,282
Total	$ 369,455	$ 406,516	$ 423,300	$ 464,640

DC Water advises that there were no extraordinary or additional expenses having a material impact during the Historical Period and in 2025. Amawalk included the budgeted fees for this COS Study in 2025; the purpose of which is for the Small PI Users. The percentage increases in the Total Expenses compared to the prior year are 8.5%, 10.0%, 4.1% and 9.8% in 2022, 2023, 2024 and 2025, respectively.

3.1.2 Projected Expenses

The operating expenses contained in DC Water's approved budget for 2025 are presented herein as the budgeted expenses for 2025; those expenses also serve as the base from which operating expenses are projected over the Forecast Period. DC Water advises that there are no anticipated extraordinary or additional expenses that will have a material impact during the Forecast Period. Estimated expenses in 2026 through 2028 reflect an assumed annual rate of increase of 4.1% in 2026 and then 4.0% per year in 2027 and 2028; these rates of change are the annual percentage increases in operating expenses (excluding PILOT/ROW) for the period of 2026 through 2028 in the DC Water FY 2025 – FY 2034 Financial Plan dated December 13, 2024. Tables 3-4 through 3-6 present the budgeted and projected total expenses, beginning with Operations Expenses in Table 3-4.

Table 3-4 Projected Operations Expenses, All Amounts in $000

Department	2025 Budgeted	2026 Estimated	2027 Estimated	2028 Estimated
Operations:				
Customer Service	21,117	$ 21,983	$ 22,862	$ 23,777
Clean Rivers	4,108	4,276	4,448	4,625
Engineering and Technical Services	25,395	26,436	27,494	28,594
CIP Infrastructure Management	5,965	6,210	6,458	6,716
Wastewater Engineering	3,722	3,875	4,030	4,191
Permit Operations	5,286	5,503	5,723	5,952
Wastewater Treatment Operations	99,254	103,324	107,457	111,756
Clean Water and Technology	5,055	5,262	5,473	5,692
Resource Recovery	7,775	8,094	8,418	8,754
Maintenance Services	24,763	25,779	26,810	27,882
Process Engineering	8,534	8,884	9,239	9,609
Water Operations	80,716	84,026	87,387	90,883
Pumping and Sewer Operations	45,092	46,941	48,819	50,772
Subtotal	$ 336,782	$ 350,593	$ 364,617	$ 379,202

In a similar manner, Tables 3-5 and 3-6 present the 2025 budgeted and 2026-2028 estimated expenses for Administration and Other Expenses, Equipment and Total Expenses, respectively.

Table 3-5 Projected Administrative Expenses 2025, All Amounts in $000

Department	2025 Budgeted	2026 Estimated	2027 Estimated	2028 Estimated
Administration:				
Secretary to the Board	$ 875	$ 911	$ 947	$ 985
Office of Chief Executive Officer	2,712	2,823	2,936	3,054
Internal Audit	839	873	908	945
Marketing and Communication	4,349	4,527	4,708	4,897
Office of Chief Operation Officer	1,692	1,761	1,832	1,905
Office of Chief Administration Officer	1,466	1,526	1,587	1,651
Office of Emergency Management	1,682	1,751	1,821	1,894
Fleet Management	7,191	7,486	7,785	8,097
Occupational Safety	2,859	2,976	3,095	3,219
Facilities Management	10,778	11,220	11,669	12,136
Security	11,057	11,510	11,971	12,450
Finance	30,062	31,295	32,547	33,849
Procurement	7,611	7,923	8,240	8,570
Non-Ratepayer Revenue Fund	500	521	541	563
Compliance & Business Development	2,318	2,413	2,510	2,610
Strategy and Performance	2,738	2,850	2,964	3,083
People and Talent	9,685	10,082	10,485	10,905
Information Technology	11,006	11,457	11,916	12,392
Government and Legal Affairs	8,312	8,653	8,999	9,359
Subtotal	$ 117,732	$ 122,560	$ 127,463	$ 132,561

Table 3-6 Projected Other Expenses, Equipment & Total Expenses 2025, All Amounts in $000

Department	2025 Budgeted	2026 Estimated	2027 Estimated	2028 Estimated
Operations Subtotal (Table 3-1):	$ 336,782	$ 350,593	$ 364,617	$ 379,202
Administration Subtotal (Table 3-2):	$ 117,732	$ 122,560	$ 127,463	$ 132,561
Other Adjustments:				
Biosolids Cost (from GL)	$ (2,077)	$ (2,163)	$ (2,249)	$ (2,339)
Total Biosolids Cost	4,921	5,123	5,328	5,541
Subtotal	$ 2,844	$ 2,961	$ 3,079	$ 3,202
Capital Equipment:				
Blue Plains - Operations	$ 20	$ 50	$ 50	$ 50
Blue Plains - Process Engineering	625	775	725	725
Blue Plains - Maintenance Services	4,200	5,940	4,500	4,500
Pumping & Sewer Operations (DPSO)	2,287	2,265	2,265	2,265
Clean Water Quality and Technology	80	80	80	80
Cost of Service Study	70	-	-	77
Subtotal	$ 7,282	$ 9,110	$ 7,620	$ 7,697
Total	$ 464,640	$ 485,224	$ 502,779	$ 522,662

The estimated expenses in 2028 include the costs of the next COS Study for Small PI Users. The expenses shown in Tables 3-1 through 3-6 reflect total expenses; the eligible portion of which (to be computed in the following tables) represents an estimate of the PI interceptor and common-to-all (i.e., DC Water retail customers and all non-retail users) portions of these expenses. This approach is consistent with how these expenses were handled as part of the prior Small PI Users COS Studies.

Table 3-7 shows the eligible percentages and the resulting eligible dollar amount of expenses allocable to PI Users from each DC Water department in 2022 through 2025. The eligible percentages of expenses were provided by DC Water for the prior COS Study Report based on the Authority's detailed tracking of the expenses allocable to Small PI Users for each department in the three-year period of 2019-2021. DC Water advises that the percentages are unchanged for the period of 2022 through 2024; and are expected to remain the same in 2025 through 2028.

Table 3-7 Historical Allocation of Expenses, All Amounts in $000

Department	% Actual that is Eligible	2022 Actual	2022 Eligible	2023 Actual	2023 Eligible	2024 Preliminary	2024 Eligible	2025 Budgeted	2025 Eligible
Operations									
Customer Service	0.0%	$ 16,951	$ -	$ 19,177	$ -	$ 19,218	$ -	$ 21,117	$ -
Clean Rivers	0.0%	3,364	-	3,120	-	3,412	-	4,108	-
Engineering and Technical Services	0.0%	19,801	-	23,280	-	23,308	-	25,395	-
CIP Infrastructure Management	0.0%	4,289	-	4,731	-	1,514	-	5,965	-
Wastewater Engineering	0.0%	2,531	-	2,226	-	4,206	-	3,722	-
Permit Operations	0.0%	3,877	-	4,637	-	4,942	-	5,286	-
Wastewater Treatment Operations	95.0%	83,179	79,020	91,639	87,057	92,883	88,238	99,254	94,291
Clean Water and Technology	0.0%	2,431	-	3,686	-	3,876	-	5,055	-
Resource Recovery	0.0%	5,762	-	6,670	-	6,833	-	7,775	-
Maintenance Services	100.0%	20,363	20,363	21,627	21,627	24,202	24,202	24,763	24,763
Process Engineering	100.0%	6,453	6,453	7,862	7,862	6,423	6,423	8,534	8,534
Water Operations	0.0%	63,576	-	66,140	-	74,082	-	80,716	-
Pumping and Sewer Operations	35.3%	37,049	13,078	40,866	14,426	41,557	14,670	45,092	15,917
Subtotal		$ 269,629	$ 118,915	$ 295,661	$ 130,972	$ 306,455	$ 133,533	$ 336,782	$ 143,506
Administration									
Subtotal	31.3%	$ 90,694	$ 28,396	$ 101,260	$ 31,705	$ 106,067	$ 33,210	$ 117,732	$ 36,862
Other Adjustments									
Biosolids Cost (from GL)	100.0%	$ (1,584)	$ (1,584)	$ (1,918)	$ (1,918)	$ (1,944)	$ (1,944)	$ (2,077)	$ (2,077)
Total Biosolids Cost	100.0%	4,087	4,087	4,544	4,544	4,605	4,605	4,921	4,921
Subtotal		$ 2,504	$ 2,504	$ 2,626	$ 2,626	$ 2,661	$ 2,661	$ 2,844	$ 2,844
Capital Equipment:									
WWTP - Operations	95.0%	$ 38	$ 36	$ -	$ -	$ -	$ -	$ 20	$ 19
WWTP - Process Engineering	100.0%	605	605	1,565	1,565	971	971	625	625
WWTP - Maintenance Services	100.0%	4,262	4,262	3,640	3,640	5,025	5,025	4,200	4,200
Pumping & Sewer Operations (DPSO)	35.3%	1,725	609	1,737	613	1,947	687	2,287	807
Clean Water Quality and Technology	0.0%	-	-	27	-	172	-	80	-
Subtotal		$ 6,629	$ 5,511	$ 6,969	$ 5,818	$ 8,116	$ 6,684	$ 7,212	$ 5,651
Total		$ 369,455	$ 155,326	$ 406,516	$ 171,121	$ 423,300	$ 176,088	$ 464,570	$ 188,863
Cost of Service Study	100.0%	$ -	$ -	$ -	$ -	$ -	$ -	$ 70	$ 70

The Table 3-7 figures in the Actual and Budgeted columns above reflect the expenses shown by year in Tables 3-1 through 3-3. Expenses are presented above by line item for Operations, Other Adjustments and Capital Equipment. Expenses for Administration are shown in the total for that category given the assumption that the eligibility percentage is uniform for each line item in Administration.

Eligible expenses by line in each year reflect the actual or budgeted amounts by line times the eligibility percentage for each line.

In a similar manner, eligible expenses by line are computed by year for the Forecast Period; the results are presented in Table 3-8.

Table 3-8 Projected Allocation of Expenses, All Amounts in $000

Department	Estimated % that is Eligible	2025 Budgeted	2025 Eligible	2026 Estimate	2026 Eligible	2027 Estimate	2027 Eligible	2028 Estimate	2028 Eligible
Operations									
Customer Service	0.0%	$ 21,117	$ -	$ 21,983	$ -	$ 22,862	$ -	$ 23,777	$ -
Clean Rivers	0.0%	4,108	-	4,276	-	4,448	-	4,625	-
Engineering and Technical Services	0.0%	25,395	-	26,436	-	27,494	-	28,594	-
CIP Infrastructure Management	0.0%	5,965	-	6,210	-	6,458	-	6,716	-
Wastewater Engineering	0.0%	3,722	-	3,875	-	4,030	-	4,191	-
Permit Operations	0.0%	5,286	-	5,503	-	5,723	-	5,952	-
Wastewater Treatment Operations	95.0%	99,254	94,291	103,324	98,158	107,457	102,085	111,756	106,168
Clean Water and Technology	0.0%	5,055	-	5,262	-	5,473	-	5,692	-
Resource Recovery	0.0%	7,775	-	8,094	-	8,418	-	8,754	-
Maintenance Services	100.0%	24,763	24,763	25,779	25,779	26,810	26,810	27,882	27,882
Process Engineering	100.0%	8,534	8,534	8,884	8,884	9,239	9,239	9,609	9,609
Water Operations	0.0%	80,716	-	84,026	-	87,387	-	90,883	-
Pumping and Sewer Operations	35.3%	45,092	15,917	46,941	16,570	48,819	17,233	50,772	17,922
Subtotal		$ 336,782	$ 143,506	$ 350,593	$ 149,391	$ 364,617	$ 155,367	$ 379,202	$ 161,581
Administration									
Subtotal	31.3%	$ 117,732	$ 36,862	$ 122,560	$ 38,374	$ 127,463	$ 39,909	$ 132,561	$ 41,505
Other Adjustments									
Biosolids Cost (from GL)	100.0%	$ (2,077)	$ (2,077)	$ (2,163)	$ (2,163)	$ (2,249)	$ (2,249)	$ (2,339)	$ (2,339)
Total Biosolids Cost	100.0%	4,921	4,921	5,123	5,123	5,328	5,328	5,541	5,541
Subtotal		$ 2,844	$ 2,844	$ 2,961	$ 2,961	$ 3,079	$ 3,079	$ 3,202	$ 3,202
Capital Equipment:									
WWTP - Operations	95.0%	$ 20	$ 19	$ 50	$ 48	$ 50	$ 48	$ 50	$ 48
WWTP - Process Engineering	100.0%	625	625	775	775	725	725	725	725
WWTP - Maintenance Services	100.0%	4,200	4,200	5,940	5,940	4,500	4,500	4,500	4,500
Pumping & Sewer Operations (DPSO)	35.3%	2,287	807	2,265	800	2,265	800	2,265	800
Clean Water Quality and Technology	0.0%	80	-	80	-	80	-	80	-
Subtotal		$ 7,212	$ 5,651	$ 9,110	$ 7,562	$ 7,620	$ 6,072	$ 7,620	$ 6,072
Total		$ 464,570	$ 188,863	$ 485,224	$ 198,287	$ 502,779	$ 204,426	$ 522,585	$ 212,360
Cost of Service Study	100.0%	$ 70	$ 70	$ -	$ -	$ -	$ -	$ 77	$ 77

Once again, we point out that no expectations of extraordinary increases in expenses are anticipated by DC Water during the Forecast Period. Expenses shown above in 2025 include the budgeted cost of this PI COS Study; an allowance for the cost of the next Study is included in estimated 2028 expenses.

Amawalk concludes that the trends in expenses are reasonable & consistent with the overall pace of increases in DC Water expenses.

3.2 Capital Costs

Capital costs for the Small PI Users are calculated differently from expenses. Expenses begin with total expenses, which are then refined through allocation to eligible expenses, and then assigned to Small PI Users based on actual wastewater volumes as a percentage of the total wastewater volumes. Capital costs begin with eligible total capital spending by year, which is then converted to debt service (amortized in the form of principal and interest payments), and then assigned to Small PI Users based on reserved wastewater capacity volumes as a percentage of the total reserved wastewater capacity volumes.

3.2.1 Historical Capital Costs

As specified in the Small PI User Agreements, the capital costs (and applicable repayment periods) that are eligible to be shared by the Small PI Users include the following:

1. Capital costs of the PI (original costs, amortized over 40 years)
2. Capital costs of conveyance from the PI to Blue Plains (amortized over 30 years)
3. Capital costs of Blue Plains (incurred pre-1964, amortized over 30 years)
4. Additional capital costs of Blue Plains (incurred post-1964, amortized over 30 years)

DC Water advises that there are no remaining unamortized capital costs associated with the PI (item #1 above) or the Blue Plains costs pre-1964 (item #3 above). Therefore, amortized costs pertaining to these facilities were not included in the COS and true-up analysis for 2022 through 2024. The focus of this part of the Study for historical and true-up purposes is on costs for item #2 and item #4 above. It is noted that capital costs for PI improvements are anticipated to be spent during 2025 and in the Forecast Period of 2026 through 2028.

Tables in this Chapter provide a summary of the historical actual capital project costs incurred by DC Water for the period of 1993 to 2024 for item #2 and item #4; shown under the headings of Potomac Pumping Station & Interceptor from the PI to Blue Plains, additional capital costs of Blue Plains, including the Montgomery County Composting Facility, and other common-to-all facilities (i.e., combined sewer overflow and sanitary sewer facilities).

Pursuant to the Small PI User Agreements, these costs are first shown in terms of construction and related costs incurred in Tables 3-9 and 3-10; later they are amortized (i.e., presented as principal and interest payments) over 30 years to develop annual costs (Tables 3-11 and 3-12) and then assigned to Small PI Users based on each customer's reserve capacity share of the Potomac Pumping Station ("PS") and Blue Plains.

3.2.2 Projected Capital Costs

A listing of the planned future capital project costs anticipated to be incurred by DC Water that are associated with conveyance infrastructure from the PI to Blue Plains, the additional capital costs of Blue Plains, the Montgomery County Composting Facility, and for other common to all facilities (i.e., combined sewer overflow and sanitary sewer facilities), for the period from 2025 to 2028, is shown in Table 3-10. All figures except those for the PI and PS are derived from the DC Water Capital Improvement Plan ("CIP") that is part of the Authority's current financial plan model. The Sanitary Sewer total by year in the CIP includes all costs of the PI and PS. The PI and PS amounts by year were separately provided by DC Water; the amounts shown by year for Sanitary Sewers herein reflect the gross amount presented in the CIP less the PI and PS amounts shown. For example, the CIP provides $345.60 million for Sanitary Sewers in 2028. With anticipated PI capital spending of $174.17 million and PS capital spending of $2.05 million in 2028, that remaining amount for the Sanitary Sewers is $169.38 million.

For many years, there were no capital costs shown for the Potomac Pumping Station and Interceptor. Rehabilitation of portions of the Potomac Interceptor that has been identified as priority by DC Water; the highest priority section is expected to be rehabilitated in early 2025 under an emergency contract. Over the total project period through 2034, the current estimate of

PI costs is $684.3 million; $38.8 million of which is expected to be spent in 2025 and a total of $341.0 million over the period of 2025 through 2028. The current estimate of PS costs is $53.6 million for the period of 2025 through 2034.

Under the Small PI User Agreements, capital costs are amortized over 30 years and then assigned to Small PI Users based on each customer's reserve capacity share of the Interceptor, the Potomac Pumping Station, Blue Plains and Other Common-to-All Facilities.

Table 3-9 Eligible Capital Project Costs 1993 through 2018 ($)

					Other Common-to-All Facilities		
Year	Potomac Interceptor	Potomac PS	Blue Plains	Montgomery Co. Composting Facility	CSO-Related	Sanitary Sewers	Total Capital Costs by Year
1993		89,000	54,614,000	3,962,000	-	-	58,665,000
1994		878,000	35,311,000	660,500	-	-	36,849,500
1995		560,000	41,432,000	431,600	-	-	42,423,600
1996		95,000	26,268,000	330,500	-	-	26,693,500
1997		6,000	20,224,000	-	-	-	20,230,000
1998	-	-	27,610,775	-	115,233	30,715	27,756,723
1999	-	-	34,901,203	-	847,841	414,353	36,163,397
2000	-	-	60,473,044	-	562,093	42,970	61,078,107
2001	-	-	40,866,059	-	1,315,394	119,546	42,300,999
2002	-	-	71,860,266	-	461,667	375,933	72,697,866
2003	-	-	122,113,548	-	-	697,372	122,810,920
2004	-	-	108,294,288	-	2,308,475	915,998	111,518,761
2005	-	-	82,533,690	-	1,124,081	2,023,238	85,681,009
2006	-	-	68,101,669	-	3,183,104	4,513,656	75,798,429
2007	-	-	51,059,719	-	774,209	937,107	52,771,035
2008	-	-	88,921,808	-	1,101,424	3,297,517	93,320,749
2009	-	-	99,314,038	-	863,631	1,645,191	101,822,860
2010	-	-	102,564,000	-	(721,202)	2,456,005	104,298,803
2011	-	-	125,879,000	-	4,866,549	6,169,651	136,915,201
2012	-	-	253,305,000	-	5,987,308	6,683,662	265,975,970
2013	-	-	309,897,429	-	13,531,218	36,059,222	359,487,870
2014	-	-	315,943,137	-	19,918,688	20,098,132	355,959,957
2015	-	-	192,476,210	-	14,129,533	18,692,148	225,297,891
2016	-	-	149,158,976	-	230,424,422	44,505,413	424,088,811
2017	-	-	141,602,396	-	221,898,941	44,219,600	407,720,937
2018	-	-	87,025,390	-	168,285,106	46,296,092	301,606,588

Table 3-10 Eligible Capital Project Costs 2019 through 2028 ($)

					Other Common-to-All Facilities		
Year	Potomac Interceptor	Potomac PS	Blue Plains	Montgomery Co. Composting Facility	CSO-Related	Sanitary Sewers	Total Capital Costs by Year
2019	-	-	54,116,528	-	203,951,447	32,992,573	291,060,548
2020	-	-	63,632,587	-	188,483,127	26,126,027	278,241,741
2021	-	-	61,185,121	-	159,510,576	30,518,227	251,213,923
2022	-	-	62,252,586	-	106,344,057	33,324,896	201,921,539
2023	-	-	43,084,874	-	82,758,881	63,831,825	189,675,580
2024	-	-	50,524,178	-	156,903,509	84,841,367	292,269,054
2025	38,802,000	1,978,000	68,281,747	-	223,831,717	106,121,344	439,014,808
2026	48,399,000	4,681,000	106,353,233	-	250,385,714	95,716,218	505,535,165
2027	79,641,000	4,348,000	111,659,200	-	237,348,541	86,942,100	519,938,841
2028	174,170,000	2,053,000	195,570,400	-	197,096,066	169,380,200	738,269,666

The capital costs identified by year through 2021 are amortized using historical bond yields sourced from the Bond Buyer Revenue Bond Index for each year; consistent with the practices of prior COS Studies. In 2022 through 2025, we use the average interest cost on recently-issued DC Water debt. DC Water is highly-rated by the bond rating agencies enabling it to borrow funds at very competitive interest rates, on a tax-exempt basis. For the Forecast Period, we use the assumed average annual interest rate of 6.0% that DC Water uses in its financial projections. Tax-exempt borrowing rates are higher at the time of this Report than in past years. We note that the New York City Municipal Water Finance Authority, also a highly-rated issuer, currently assumes a 6.0% on its future debt obligations for financial forecast purposes.

The amortized capital costs in each year shown in Tables 3-11 and 3-12 reflect the costs incurred and resulting computed debt service payable over the prior 30 years; as outlined below.

- 2022 includes costs incurred in 1993 through 2022.
- 2023 includes costs incurred in 1994 through 2023.
- 2024 includes costs incurred in 1995 through 2024.

A similar approach is used for 2025 through 2028:

- 2025 includes costs incurred in 1996 through 2024, plus anticipated costs in 2025.
- 2026 includes costs incurred in 1997 through 2024, plus anticipated costs in 2025 and 2026.
- 2027 includes costs incurred in 1998 through 2024, plus anticipated costs in 2025, 2026 and 2027.
- 2028 includes costs incurred in 1999 through 2024, plus anticipated costs in 2025, 2026, 2027 and 2028.

Actual costs prior to 1993 that were amortized over 30 years are considered fully repaid for purposes of the Small PI User Agreements and not included herein for either historical or projected costs.

Table 3-11Amortized Eligible Capital Costs 1993 through 2018 ($)

						Other Common-to-All Facilities		
Year	Rate	Potomac Interceptor	Potomac PS	Blue Plains WWTP	Montgomery Co. Composting Facility	CSO-Related	Sanitary Sewers	Total Debt Service by Year
1993	6.000%	-	6,466	3,967,648	287,835	-	-	4,261,948
1994	6.625%	-	68,108	2,739,156	51,237	-	-	2,858,501
1995	6.000%	-	40,683	3,009,990	31,355	-	-	3,082,028
1996	6.000%	-	6,902	1,908,342	24,010	-	-	1,939,254
1997	7.000%	-	484	1,629,779	-	-	-	1,630,263
1998	5.407%	-	-	1,880,204	-	7,847	2,092	1,890,143
1999	5.420%	-	-	2,380,214	-	57,822	28,258	2,466,294
2000	6.061%	-	-	4,421,826	-	41,101	3,142	4,466,069
2001	5.527%	-	-	2,820,152	-	90,775	8,250	2,919,177
2002	5.418%	-	-	4,899,934	-	31,480	25,634	4,957,048
2003	5.153%	-	-	8,082,635	-	-	46,159	8,128,794
2004	5.132%	-	-	7,151,114	-	152,438	60,487	7,364,040
2005	4.923%	-	-	5,322,184	-	72,486	130,468	5,525,138
2006	5.126%	-	-	4,493,924	-	210,048	297,849	5,001,821
2007	4.604%	-	-	3,172,969	-	48,111	58,234	3,279,315
2008	4.994%	-	-	5,780,561	-	71,601	214,362	6,066,524
2009	5.756%	-	-	7,027,520	-	61,111	116,415	7,205,046
2010	4.861%	-	-	6,566,409	-	(46,173)	157,240	6,677,475
2011	5.294%	-	-	8,464,922	-	327,258	414,887	9,207,067
2012	4.767%	-	-	16,042,307	-	379,188	423,290	16,844,785
2013	4.516%	-	-	19,060,824	-	832,263	2,217,890	22,110,977
2014	5.099%	-	-	20,784,260	-	1,310,347	1,322,152	23,416,759
2015	4.317%	-	-	11,563,899	-	848,897	1,123,017	13,535,814
2016	3.518%	-	-	8,128,502	-	12,557,109	2,425,348	23,110,959
2017	3.895%	-	-	8,085,279	-	12,670,088	2,524,871	23,280,239
2018	4.452%	-	-	5,312,589	-	10,273,204	2,826,211	18,412,005

Table 3-12 Amortized Eligible Capital Costs 2019 through 2028 ($)

						Other Common-to-All Facilities		
Year	Rate	Potomac Interceptor	Potomac PS	Blue Plains WWTP	Montgomery Co. Composting Facility	CSO-Related	Sanitary Sewers	Total Debt Service by Year
2019	3.895%	-	-	3,089,612	-	11,643,963	1,883,607	16,617,182
2020	2.762%	-	-	3,147,355	-	9,322,634	1,292,229	13,762,219
2021	2.537%	-	-	2,937,541	-	7,658,216	1,465,202	12,060,959
2022	2.553%	-	-	2,995,340	-	5,116,841	1,603,458	9,715,639
2023	2.553%	-	-	2,073,068	-	3,982,019	3,071,327	9,126,414
2024	3.625%	-	-	2,790,257	-	8,665,180	4,685,464	16,140,902
2025	6.000%	2,818,923	143,700	4,960,595	-	16,261,131	7,709,600	31,893,948
2026	6.000%	3,516,135	340,070	7,726,447	-	18,190,250	6,953,679	36,726,579
2027	6.000%	5,785,832	315,877	8,111,919	-	17,243,113	6,316,249	37,772,991
2028	6.000%	12,653,261	149,148	14,207,977	-	14,318,815	12,305,287	53,634,488

In the period of 2020 through 2024, the average annual percentage increase in cumulative debt service was about 2.8%; the estimated average annual percentage increase in cumulative debt service for 2024 through 2028 is 10.8%. DC Water is making significant investments to support the ability of its assets to continue providing reliable, quality service. With the identification of annual debt service costs eligible to be assigned to the Small PI Users, the next step is to assign those costs based on the proportionate share of reserved wastewater capacity.

3.3 Units of Service

Based on the Small PI User Agreements and as noted previously, projected eligible operating expenses are to be assigned to Small PI Users according to each user's projected wastewater flow in proportion to the total wastewater flow received at Blue Plains in each year of both the Historical Period and in the Forecast Period. The recent (2022 through 2024) and projected (2025 through 2028) wastewater flows for each Small PI User, as well as the flows for Blue Plains, are shown in Table 3-13.

The Authority generally assumes that water consumption will decline at an average of 1.0% per year for its retail customer base. Wastewater flows for Vienna declined by 11.9% and 7.8% from 2022 to 2023 and from 2023 to 2024, respectively. The 2024 wastewater flows, despite declining in recent years, are 25.4% higher than the wastewater flows in 2019, the last year before the coronavirus period. The Authority has advised that it is not aware of significant factors that could influence wastewater flows significantly higher or lower during the period of 2025 through 2028. Recognizing that water usage is a major component, but not the sole constituent, of wastewater flow, this Report assumes that wastewater flows for Blue Plains as a whole as well as for Vienna specifically will decline at the rate of 0.5% per year.

Wastewater flows at Dulles increased in 2022, 2023 and 2024 compared to the prior year. The Metropolitan Washington Airports Authority is preparing a Master Plan for Dulles. Recognizing that passengers are not the only consumers of water and generators of wastewater, a forecast of enplaned passengers by year showed a long-term baseline growth projection of 0.9% per year and

an accelerated pace of 1.5% per year[3]. Given these expectations, for COS Study purposes, we assume a growth rate of 1.0% per year in wastewater flows for Dulles.

Wastewater flows for NPS increased slightly in 2024 compared to 2023 but continued to be much lower than in 2022. Wastewater flows at Navy increased slightly in 2024 compared to 2023 and 2022 but are relatively flat over the three years. This Report assumes that wastewater flows for NPS and the Navy will be relatively constant in each year, consistent with the 2024 level of wastewater flows.

Eligible operating expenses are allocated to Small PI Users according to each user's actual wastewater flow in proportion to the total wastewater flow received at Blue Plains in each fiscal year. The actual and projected wastewater flows for each Small PI User from 2022 through 2028 are shown in Table 3-13. Eligible expenses are assigned to Small PI Users based on the actual and projected wastewater flow percentages which are calculated based on the figures from Table 3-13 and shown in percentage form in Table 3-14.

Table 3-13 User Flows: Small PI Customers & All Customers (MG/Year)

	Annual Wastewater Flow (MG)					
Description	**Vienna**	**Dulles**	**NPS**	**Navy**	**All Other**	**Total**
Actual						
2022	442.90	269.62	0.87	18.19	104,242.42	104,974.00
2023	390.04	296.09	0.56	18.19	100,838.13	101,543.00
2024	359.58	319.61	0.59	18.24	103,465.57	104,163.60
Projected						
2025	357.79	322.81	0.59	18.24	102,943.35	103,642.78
2026	356.00	326.03	0.59	18.24	102,423.70	103,124.57
2027	354.22	329.29	0.59	18.24	101,906.60	102,608.95
2028	352.45	332.59	0.59	18.24	101,392.03	102,095.90

[3] Presentation at the Regional Stakeholders Working Group Meeting #2, November 30, 2021

Table 3-14 Percentages of User Flows: Small PI Customers & All Customers

	% Share of Wastewater Flows					
Description	**Vienna**	**Dulles**	**NPS**	**Navy**	**All Other**	**Total**
Actual						
2022	0.422%	0.257%	0.001%	0.017%	99.303%	100.000%
2023	0.384%	0.292%	0.001%	0.018%	99.306%	100.000%
2024	0.345%	0.307%	0.001%	0.018%	99.330%	100.000%
Projected						
2025	0.345%	0.311%	0.001%	0.018%	99.325%	100.000%
2026	0.345%	0.316%	0.001%	0.018%	99.320%	100.000%
2027	0.345%	0.321%	0.001%	0.018%	99.316%	100.000%
2028	0.345%	0.326%	0.001%	0.018%	99.311%	100.000%

The eligible amortized capital costs are then assigned to each Small PI User according to each Small PI User's reserve capacity shares as compared to the total capacities of the Potomac Pumping Station and the Blue Plains WWTP, based on the terms of the Small PI User Agreements. The capacities for each Small PI User were provided by DC Water and are shown in Table 3-15. DC Water advises that reserve capacities are unchanged from previous years and are not expected to change during the Forecast Period. Actual eligible amortized common-to-all CSO and sanitary sewer capital costs were allocated to Small PI Users based on their capacity shares at Blue Plains, which is consistent with how these costs were allocated as part of the prior Small PI Users COS Study. Eligible amortized capital costs associated with the Montgomery County Composting Facility are allocated to Small PI Users based on their capacity shares at Blue Plains as well.

Table 3-15 Reserve Capacity Flow Shares (MGD)

	Wastewater Flow Reserve Capacity					
Description	**Vienna**	**Dulles**	**NPS**	**Navy**	**All Other**	**Total**
Potomac Interceptor	3.480	3.480	0.070	0.160	192.910	200.100
Potomac PS	3.480	3.480	0.070	0.160	458.850	466.040
Blue Plains	1.500	1.500	0.030	0.070	366.900	370.000
Montgomery County Composting Facility	1.500	1.500	0.030	0.070	366.900	370.000
CSO-Related Common-to-All Facilities	1.500	1.500	0.030	0.070	366.900	370.000
Sanitary Sewer Common-to-All Facilities	1.500	1.500	0.030	0.070	366.900	370.000
Capital Equipment - Blue Plains	1.500	1.500	0.030	0.070	366.900	370.000
Capital Equipment - Conveyance	3.480	3.480	0.070	0.160	192.910	200.100
Capital Equipment - Sewer Services	1.500	1.500	0.030	0.070	366.900	370.000

The capacities presented in percentage terms are shown in Table 3-16, reflecting the figures provided in Table 3-15.

Table 3-16 Reserve Capacity Percentage Shares

	% Share of Wastewater Capacity					
Description	**Vienna**	**Dulles**	**NPS**	**Navy**	**All Other**	**Total**
Potomac Interceptor	1.739%	1.739%	0.035%	0.080%	96.407%	100.000%
Potomac PS	0.747%	0.747%	0.015%	0.034%	98.457%	100.000%
Blue Plains	0.405%	0.405%	0.008%	0.019%	99.162%	100.000%
Montgomery County Composting Facility	0.405%	0.405%	0.008%	0.019%	99.162%	100.000%
CSO-Related Common-to-All Facilities	0.405%	0.405%	0.008%	0.019%	99.162%	100.000%
Sanitary Sewer Common-to-All Facilities	0.405%	0.405%	0.008%	0.019%	99.162%	100.000%
Capital Equipment - Blue Plains	0.405%	0.405%	0.008%	0.019%	99.162%	100.000%
Capital Equipment - Conveyance	1.739%	1.739%	0.035%	0.080%	96.407%	100.000%
Capital Equipment - Sewer Services	0.405%	0.405%	0.008%	0.019%	99.162%	100.000%

3.4 Calculated Cost of Service

A summary of the actual 2022 through 2024 total costs to serve the Small PI Users as well as projected costs for 2025 through 2028 is provided in this part. These costs were derived by multiplying the eligible operating and amortized capital costs by the units of service percentages for each Small PI User as described previously; operating expenses by year are presented in Table 3-17 and annual capital costs are shown in Table 3-18.

Table 3-17 Expenses Assigned to Small PI Customers ($)

Year	Vienna	Dulles	NPS	Navy	Total
Historical					
2022	$ 655,343	$ 398,938	$ 1,286	$ 26,918	$ 1,082,485
2023	657,288	498,965	938	30,658	1,187,848
2024	607,875	540,298	1,005	30,839	1,180,018
Total	$ 1,920,506	$ 1,438,201	$ 3,229	$ 88,415	$ 3,450,351
Projected					
2025 Budgeted	$ 652,011	$ 588,264	$ 1,084	$ 33,244	$ 1,274,603
2026	684,509	626,894	1,144	35,077	1,347,624
2027	705,701	656,046	1,185	36,344	1,399,277
2028	733,129	691,819	1,237	37,947	1,464,132

The unit cost for expenses is uniform among all Small PI users at the following rates per million gallons: $1,479.66, $1,685.20 and $1,690.50 in 2022, 2023 and 2024, respectively. The year-to-year percentage change in the rate per million gallons is 13.9% and 0.3% 2023 and 2024, respectively. Year-to-year changes are affected by expenses allocable for assignment and differences in flows (Small PI Users and all other Users) from year to year.

Projected increases in 2025 through 2028 reflect annual percentage changes of 8.0%, 5.7%, 3.8% and 4.6%, respectively, compared to the prior year.

Table 3-18 Amortized Capital Costs Assigned to Small PI Customers ($)

Year	Vienna	Dulles	NPS	Navy	Total
Historical					
2022	$ 1,142,825	$ 1,142,825	$ 22,857	$ 53,331	$ 2,361,837
2023	1,162,523	1,162,523	23,251	54,250	2,402,548
2024	1,216,138	1,216,138	24,323	56,753	2,513,353
Total	$ 3,521,486	$ 3,521,486	$ 70,430	$ 164,335	$ 7,277,737
Projected					
2025 Budgeted	$ 1,370,892	$ 1,370,892	$ 27,424	$ 63,940	$ 2,833,148
2026	1,559,954	1,559,954	31,212	72,719	3,223,840
2027	1,784,722	1,784,722	35,719	83,138	3,688,302
2028	2,163,765	2,163,765	43,326	100,674	4,471,530

The annual debt service payments assigned to Small PI Users increased at a relatively modest pace in 2023 and 2024, rising by 1.7% and 4.6%, respectively. Debt service in each year reflects, of course, both the addition of debt service in the then-current year as well as the removal from the calculations of the figures from the year that was 30 years prior.

The annual debt service payments assigned to Small PI Users during the Forecast Period are projected to increase at a much greater pace in 2025 through 2028 compared to previous years, rising by 12.7%, 13.8%, 14.4% and 21.2%, respectively. Debt service in each year reflects the significant planned spending for capital improvements in those years, including funds for the PI, the PS and other wastewater assets.

The total COS by Small PI User by year is shown in Table 3-19, reflecting the sum of the results presented in Tables 3-17 and 3-18.

Table 3-19 Total Cost of Service Assigned to Small PI Customers ($)

Year	Vienna	Dulles	NPS	Navy	Total
Historical					
2022	$ 1,798,168	$ 1,541,763	$ 24,142	$ 80,250	$ 3,444,322
2023	1,819,811	1,661,488	24,189	84,908	3,590,396
2024	1,824,014	1,756,436	25,328	87,592	3,693,370
Total	$ 5,441,993	$ 4,959,687	$ 73,659	$ 252,750	$ 10,728,088
Projected					
2025 Budgeted	$ 2,022,903	$ 1,959,156	$ 28,508	$ 97,185	$ 4,107,751
2026	2,244,463	2,186,849	32,356	107,796	4,571,464
2027	2,490,424	2,440,769	36,904	119,482	5,087,579
2028	2,896,895	2,855,584	44,563	138,620	5,935,663

The total annual COS assigned to Small PI Users increased in 2023 and 2024 by 4.2% and 2.9%, respectively. The annual total COS assigned to Small PI Users during the Forecast Period is projected to increase at a greater pace in 2025 through 2028, rising by 11.2%, 11.3%, 11.3% and 16.7%, respectively.

4 True-Up and Rate Projections

4.1 Comparison of Cost of Service to Actual Payments

The actual amounts paid by Small PI Users in 2022 through 2024 are presented in Table 4-1. Since there were both credits and supplemental charges resulting from the true-up calculations in the previous COS Study, we deduct the true-up credits and charges to illustrate the net amounts paid for services by customers in each year.

Table 4-1 Actual Amounts Paid by Small PI Users ($)

Description	Vienna	Dulles	NPS	Navy	Total
2022					
Quarter 1	$ 476,578	$ 273,322	$ 2,097	$ 20,487	$ 772,484
Quarter 2	520,627	273,076	1,195	20,042	814,940
Quarter 3	545,749	379,735	2,035	20,264	947,783
Quarter 4	443,580	350,135	1,034	20,487	815,236
Credit/Charge for 2019-22 True-Up	-	-	-	7,202	7,202
Total 2022	$ 1,986,534	$ 1,276,268	$ 6,361	$ 88,482	$ 3,357,645
Charges for 2022 Service	$ 1,986,534	$ 1,276,268	$ 6,361	$ 81,280	$ 3,350,443
2023					
Quarter 1	$ 511,487	$ 395,141	$ 2,293	$ 21,890	$ 930,811
Quarter 2	532,172	379,780	1,488	21,414	934,854
Quarter 3	478,815	409,812	3,228	21,652	913,507
Quarter 4	455,944	504,810	3,353	21,890	985,997
Credit/Charge for 2019-22 True-Up	$ (27,278)	616,053	$ 50,355	$ 1,792	640,922
Total 2023	$ 1,951,140	$ 2,305,596	$ 60,717	$ 88,638	$ 4,406,091
Charges for 2023 Service	$ 1,978,418	$ 1,689,543	$ 10,362	$ 86,846	$ 3,765,169
2024					
Quarter 1	$ 412,275	$ 425,636	$ 3,207	$ 21,890	$ 863,008
Quarter 2	519,384	456,261	2,608	21,652	999,905
Quarter 3	486,708	424,203	2,510	21,653	935,074
Quarter 4	405,590	517,672	2,747	21,890	947,899
Credit/Charge for 2019-22 True-Up	-	-	-	-	-
Total 2024	$ 1,823,957	$ 1,823,772	$ 11,072	$ 87,085	$ 3,745,886
Charges for 2024 Service	$ 1,823,957	$ 1,823,772	$ 11,072	$ 87,085	$ 3,745,886

A comparison of the COS for the Small PI Users in 2022 through 2024 with the actual bills and amounts paid by these customers in those years is shown in Table 4-2. In years where the amount paid exceeded the calculated COS total, the customer overpaid for wastewater service (shown as a positive differential).

In years where the amount paid was less than the calculated COS total, the customer underpaid for service (shown as a negative differential). The Amount Paid figures represent what each customer paid for service for each year and does not include past due balances (there were none identified as noted below) or payments related to previous true-up periods.

DC Water has advised that all bills to PI Users were paid and there was no receivable balance for 2022 through 2024 at the date of this Report. In addition, all true-up amounts were paid.

On a combined basis for 2022 through 2024, it is our finding that Small PI Users overpaid by an aggregate of $133,409. A further discussion of the over- or underpayments for each Small PI User is contained in the paragraphs following Table 4-2.

Table 4-2 True-up: Comparison of 2022-2024 Amounts Paid Versus the Costs of Service ($)

Year/Description	Vienna	Dulles	NPS	Navy	Total
2022					
Cost of Service	$ 1,798,168	$ 1,541,763	$ 24,142	$ 80,250	$ 3,444,322
Amount Paid	1,986,534	1,276,268	6,361	81,280	3,350,443
Difference	$ 188,366	$ (265,495)	$ (17,781)	$ 1,030	$ (93,879)
2023					
Cost of Service	$ 1,819,811	$ 1,661,488	$ 24,189	$ 84,908	$ 3,590,396
Amount Paid	1,978,418	1,689,543	10,362	86,846	3,765,169
Difference	$ 158,606	$ 28,055	$ (13,827)	$ 1,937	$ 174,772
2024					
Cost of Service	$ 1,824,014	$ 1,756,436	$ 25,328	$ 87,592	$ 3,693,370
Amount Paid	1,823,957	1,823,772	11,072	87,085	3,745,886
Difference	$ (57)	$ 67,336	$ (14,256)	$ (507)	$ 52,516
Total Underpayment/Overpayment	$ 346,916	$ (170,104)	$ (45,864)	$ 2,461	$ 133,409
(Positive is Overpayment, Negative is Underpayment)					

Vienna:
The Town of Vienna paid more than the COS in 2022 and 2023 and slightly less than the COS in 2024, resulting in a net overpayment for these three years of $346,916. Payments made by Vienna, as well as payments for other Small PI Users, were made at the rates in effect for the three-year period.

Dulles:
Dulles paid less than the COS in 2022, and somewhat more than the COS in 2023 and 2024. This resulted in a total underpayment of $170,104 for the three years.

NPS:
The National Park Service paid less than the COS in 2022, 2023 and 2024. This resulted in a total underpayment of approximately $45,864 for the three years.

Navy:
The Navy paid somewhat more than the COS in 2022 and 2023 and then paid slightly less than the COS in 2024. This resulted in a total overpayment of approximately $2,461 for these three years.

4.2 Calculation of Cost Recovery Rates

Projected expenses and capital costs for Small PI Users for 2025 through 2028 are presented in Tables 4-3 and 4-4, respectively. Table 4-5 adds the expenses and capital costs to arrive at the total projected cost of service in each year.

The proposed cost recovery rates for Small PI Users were calculated by totaling the COS projections for 2026 through 2028 for each user and dividing this amount by the total projected wastewater flows for each user over this same time period. This results in an average cost recovery rate for the rate-setting period. This calculation is shown in Table 4-6. An average cost recovery rate for the three-year period was calculated, rather than calculating different cost recovery rates for each of the three years, to be consistent with the pricing provisions contained in the Small PI User Agreements, since these agreements specify that the cost recovery rate shall not be changed more frequently than once every three years.

Table 4-3 Expenses Assigned to Small PI Customers ($)

Year	Vienna	Dullles	NPS	Navy	Total
2026	$ 684,509	$ 626,894	$ 1,144	$ 35,077	$ 1,347,624
2027	705,701	656,046	1,185	36,344	1,399,277
2028	733,129	691,819	1,237	37,947	1,464,132
Total	$ 2,123,340	$ 1,974,760	$ 3,566	$ 109,368	$ 4,211,033

The expenses eligible to be assigned to Small PI Users are the same for all four customers. As a result, the unit cost for expenses is uniform among all Small PI users, both for the Historical Period and for the Forecast Period. The following rates are calculated per MG in 2026, 2027 and 2028, respectively: $1,922.79, $1,992.28 and $2,080.12. These unit costs reflect annual changes from the prior year of 5.5%, 3.6% and 4.4%, respectively, or about 4.4% per year on average.

Table 4-4 Amortized Capital Costs Assigned to Small PI Customers ($)

Year	Vienna	Dulles	NPS	Navy	Total
2026	$ 1,559,954	$ 1,559,954	$ 31,212	$ 72,719	$ 3,223,840
2027	1,784,722	1,784,722	35,719	83,138	3,688,302
2028	2,163,765	2,163,765	43,326	100,674	4,471,530
Total	$ 5,508,442	$ 5,508,442	$ 110,257	$ 256,531	$ 11,383,672

Amortized capital costs can differ depending on the percentage of each user's reserve capacity and the projected annual flows.

Table 4-5 Total Cost of Service Assigned to Small PI Customers ($)

Year	Vienna	Dulles	NPS	Navy	Total
2026	$ 2,244,463	$ 2,186,849	$ 32,356	$ 107,796	$ 4,571,464
2027	2,490,424	2,440,769	36,904	119,482	5,087,579
2028	2,896,895	2,855,584	44,563	138,620	5,935,663
Total	$ 7,631,782	$ 7,483,202	$ 113,823	$ 365,898	$ 15,594,705
2022-2024 True-Up (credit)	(346,916)	170,104	45,864	(2,461)	(133,409)
Total after True-Up Adjustment	$ 7,284,866	$ 7,653,305	$ 159,687	$ 363,438	$ 15,461,296

Table 4-6 Calculated Cost Recovery Rates for Small PI Users for 2026 - 2028

Description	Vienna	Dulles	NPS	Navy
Total before True-Up Adjustment	$ 7,631,782	$ 7,483,202	$ 113,823	$ 365,898
Projected 2026-2028 Flows (MG)	1,062.66	987.91	1.78	54.73
Projected Rate (per MG)	$7,181.77	$7,574.76	$63,789.14	$6,685.80
Current Rate per MG	$5,072.41	$5,706.26	$18,616.15	$4,773.69
Increase (Decrease)	$2,109.36	$1,868.50	$45,172.99	$1,912.11
Increase (Decrease) %	41.6%	32.7%	242.7%	40.1%

As shown in the in Table 4-6, the calculated rates for Small PI Users range from $6,685.80 per MG to $63,789.14 per MG. Compared to existing rates, the projected rates are higher for each of the Small PI Users due to projected increases in expenses and, more importantly, due to increases in amortized capital costs. Anticipated increases in expenses are primarily driven by inflation; increases in amortized capital costs are driven by increases in capital spending, including very large investments in the PI.

The very substantial difference between the unit rates for NPS compared to Vienna, Dulles and the Navy is due to the relatively low flows of the NPS versus the reserve capacity that is used to assign amortized capital costs. The projected wastewater flows for Vienna, Dulles and the Navy in 2026 range from 60% to 71% of the annual reserve capacity for these customers for Blue Plains and CSO-related facilities. By comparison, the projected wastewater flow for the NPS in 2026 is only about 5% of the reserve capacity for Blue Plains and CSO-related facilities. Amortized capital costs are assigned based on reserve capacity (the significantly higher percentage), but are recovered through rates based on actual use (and the actual use is substantially lower). Reserve capacity shares remain unchanged for both the Historical Period and the Forecast Period.

4.3 Comparison of Changes

Comparisons of projected costs and flows from the prior Report and actual costs and flows for 2022 through 2024 are summarized in Table 4-7. Projected and actual reserve capacities remain unchanged from the prior Report. A summary of the differences in costs and flows and how they contribute to over- and under-payment amounts calculated for each Small PI User from 2022 through 2024 is provided in

Table 4-8. Table 4-9 provides a summary of changes that lead to difference between projected rates and existing rates.

Table 4-7 Comparison of Projected and Actual Costs and Flows

Description	FY 2022	FY 2023	FY 2024
Total Operating Expenses:			
Projected	$ 367,636,271	$ 386,350,904	$ 399,313,525
Actual	369,454,723	406,516,215	423,300,207
Difference	$ 1,818,452	$ 20,165,310	$ 23,986,682
Eligible Operating Expenses:			
Projected	$ 152,504,782	$ 162,759,960	$ 168,157,518
Actual	155,325,605	171,120,501	176,088,159
Difference	$ 2,820,824	$ 8,360,541	$ 7,930,641
Eligible Capital Costs:			
Projected	$ 306,329,000	$ 299,661,000	$ 345,677,000
Actual	201,921,539	189,675,580	292,269,054
Difference	$ (104,407,461)	$ (109,985,420)	$ (53,407,946)
Eligible Amortized Capital Costs:			
Projected	$ 16,672,453	$ 16,309,536	$ 18,814,032
Actual	9,715,639	9,126,414	16,140,902
Difference	$ (6,956,814)	$ (7,183,122)	$ (2,673,130)
Wastewater Flows (MG):[1]			
Projected	676.33	679.28	682.82
Actual	731.58	704.87	698.03
Difference	55.25	25.59	15.21

[1]Wastewater flows attributable to Small PI Users only.

During the Historical Period, the total wastewater flows of all Small PI Users was higher than assumed in the prior Report while total flows at Blue Plains were lower than assumed. Eligible operating expenses were greater than projected and eligible amortized capital costs were lower.

Table 4-8 summarizes the relative changes (actual versus projected/assumed) in costs and flow in each year for each Small PI User. The projected/assumed figures are derived from the prior COS Report. Actual results are provided by DC Water. For example, actual wastewater flows for Vienna in 2022 were about 86 MG higher than projected/assumed in the prior Report, representing an increase of 24.1%. Greater wastewater flows result in higher expenses being allocated to Vienna for that year; allocated expenses are shown as higher. Capital costs are allocated based on reserve capacity which doesn't change; total allocated capital costs were less than projected/assumed and the capital costs assigned to Vienna were less than projected.

Table 4-8 Detailed Changes Per Small PI User for 2022 Through 2024

Description	Town of Vienna	Dulles International Airport	National Park Service	Department of the Navy
2022	*Overpaid $188,366*	*Underpaid $265,495*	*Underpaid $17,781*	*Overpaid $1,030*
Operating Costs	+ $166,471, or 34.1% increase	- $11,890, or 2.9% decrease	- $770, or 37.5% decrease	+ $1,911, or 7.6% increase
Amortized Capital	- $28,203 or 2.4% decrease	- $28,203, or 2.4% decrease	- $564, or 2.4% decrease	- $1,316, or 2.4% decrease
WW Flow (MG)	+ 86.13, or 24.1% increase	- 30.20, or 10.1% decrease	-0.63, or 42.1% decrease	-0.06, or 0.3% decrease
WW Flow % of Total	31.6% increase	4.7% decrease	38.6% decrease	5.7% increase
Reserve Capacity Share	No Change	No Change	No Change	No Change
2023	*Overpaid $158,606*	*Overpaid $28,055*	*Underpaid $13,827*	*Overpaid $1,937*
Operating Costs	+ $138,038, or 26.6% increase	+ $60,621, or 13.8% increase	- $1,240, or 56.9% decrease	+ $4,160, or 15.7% increase
Amortized Capital	- $57,324, or 4.7% decrease	- $57,324, or 4.7% decrease	- $1,146, or 4.7% decrease	- $2,675, or 4.7% decrease
WW Flow (MG)	+ 32.41, or 9.1% increase	- 5.82, or 1.9% decrease	- 0.94, or 62.9% decrease	-0.06, or 0.3% decrease
WW Flow % of Total	20.4% increase	8.3% increase	59.0% decrease	10.0% increase
Reserve Capacity Share	No Change	No Change	No Change	No Change
2024	*Underpaid $57*	*Overpaid $67,336*	*Underpaid $14,256*	*Underpaid $507*
Operating Costs	+ $74,153, or 13.9% increase	+ $86,788, or 19.1% increase	- $1,228, or 55.0% decrease	+ $3,667 or 13.5% increase
Amortized Capital	- $68,161, or 5.3% decrease	- $68,161, or 5.3% decrease	- $1,363, or 5.3% decrease	- $3,181, or 5.3% decrease
WW Flow (MG)	+ 1.11, or 0.3% increase	+ 15.01, or 4.9% increase	- 0.91, or 60.3% decrease	- 0.01, or 0.04% decrease
WW Flow % of Total	8.8% increase	13.8% increase	57.0% decrease	8.4% increase
Reserve Capacity Share	No Change	No Change	No Change	No Change

Table 4-9 Detailed Changes per Small PI User in Projected Rates as Compared to Existing Rates

Description	Town of Vienna	Dulles International Airport	National Park Service	Department of the Navy
Projected Rate per MG	*$7,181.77*	*$7,574.76*	*$63,789.14*	*$6,685.80*
Difference from Current Rate	+ $2,109, or 41.6% increase	+ $1,868, or 32.7% increase	+ $45,173, or 242.7% increase	+ $1,912, or 40.1% increase
Operating	+ $521,987, or 32.6% increase	+ $613,892, or 45.1% increase	- $3,135, or 46.8% decrease	+ $27,847, or 34.2% increase
Amortized Capital	+ $1,654,839, or 42.9% increase	+ $1,654,839, or 42.9% increase	+ $33,185, or 43.1% increase	+ $76,697, or 42.6% increase
WW Flow (MG)	- 12.76, or 1.2% decrease	+ 74.10, or 8.1% increase	- 2.72, or 60.3% decrease	- 0.02, or 0.04% decrease
Reserve Capacity Share	No Change	No Change	No Change	No Change

Section 5 of the Report is the Appendix which provides excerpts from one of the Small PI User agreements as well as a listing of all tables and figures in the Report noting their contents and sources.

5 Appendix

5.1 PI User Agreement

A summary of the pertinent pricing provisions of the PI User Agreements are as follows:[4]

(A) Pursuant to the provisions of P.L. 86-515, it is the intent of the parties hereto that the Government shall pay:

(1) The actual costs to the District for handling, pumping and treating all sewage discharged from Government sewers into the Potomac Interceptor System and thence into the sewerage systems of the Districtof Columbia;

(2) The proportionate costs of operation, maintenance and amortization of the cost of planning and construction (including acquisition of rights-of-way) of the Potomac Interceptor System, excluding anyFederal Grants made for these purposes;

(3) In proportion to its usage of the Potomac Interceptor System, the construction and amortization costs incurred by the District, excluding any Federal Grants applicable thereto, for the provision of facilities for handling, pumping and treating sewerage discharged or to be discharged by the Government thru connectionsto the Potomac Interceptor System; all as hereinafter more particularly set forth.

(B) All of the elements of cost recited above shall be reflected in a single charge or service rate which when multiplied by the total volume of sewage, expressed in millions of gallons, delivered to the Interceptor from Government sewers will constitute the total cost to the Government for the sewage service provided hereunder for the period during which such sewage flows were recorded, or estimated, provided, however, that the amount of the charge or service rate shall be adjusted from time to time to cover fully the actual costs to the District of providing the services and amortizing, as required by law, or otherwise reflecting the capital costs of facilities devoted to suchservices. At any time, the charge or service rate per million gallons shall consist of the aggregate of the following amounts:

(1) An amount equal to the actual cost per million gallons of the total flow in the Interceptor, as recorded or estimated from all users thereof, for the total operation, repair and maintenance costs of the Interceptor including the rights-of-way and access roads therefore, the testing of meters and the services of engineers and others engaged to direct and perform these operations, administer the regulations and provide the services called for under this and similar agreements between the District and other users of the Interceptor, includingoverhead where applicable.

(2) An amount which shall be the actual cost to the District per million gallons for the operation, repair, maintenance and replacement, including overhead, of each District facility which handles, pumps or treatssewage or wastes conveyed by the Interceptor to the sewerage systems of the District.

(3) An amount, expressed as a unit cost per million gallons, which reflects the proportionate annual share of the historical cost of the District's sewage treatment

[4] Agreement No. DCF-A-2530/I between DC Water and the National Park Service, dated August 18, 1964.

plant, up to the date of connection of the Interceptor to theDistrict's sewerage systems, devoted to the treatment of sewage and wastes received from the Interceptor. As used herein the proportionate annual share of the historical cost of the plant shall be such portion of the cost as the total annual flow of sewage received from the interceptor bears to the total annual flow of all sewage received at the plant, computed on the historical costs of:

a. Conduits and piping at one percent (1%)

b. Buildings and tanks at one-and-one-half percent (1-1/2%)

c. Equipment at four percent (4%)

At such time as any facility as to which the amount under this Section is being paid shall be replaced, supplemented or augmented by another facility toward the cost of whose construction of Government shall bemaking payments pursuant to Section 4 (B) (6) shall be reduced in proportion to the resulting reduction in the use of the initial facilities for the treatment of sewage from the Interceptor.

(4) An amount which shall be the charge per million gallons necessary to amortize over a period of forty yearsthe loans from the United States to the Metropolitan Area Sewage Works Fund for the planning, design, construction, and initial operation, if necessary, of the Interceptor; such charges to be graduated over the life of the loans from zero, if warranted, to such maximum as may ultimately be necessary to fulfill the requirements of law.

(5) An amount which shall be the charge per million gallons necessary to amortize, over a period of thirty years, the loans from the United States to the District of Columbia sewage Works Fund for the planning, design and construction of those portions of the pipe lines and pumping facilities which are provided for the transport of flows from the Interceptor to the District of Columbia Sewage Treatment Plant; such charges to be graduated over the life of the loans from zero, if warranted, to such maximum as may ultimately be necessary to fulfill the requirements of law. The proportion of the cost of the pipe lines and pumping facilitiesprovided for the transport of flows from the Interceptor shall be so much of the total cost of each such facility to the District as the maximum design capacity assigned therein for interceptor flows bears to the maximum design capacity assigned therein for all flows.

(6) An amount expressed as a charge per million gallons which shall be sufficient to cover the cost to the District of Columbia, exclusive of Federal Grants, if any, for planning, designing and constructing additionaltreatment facilities at the District of Columbia Sewage Treatment Plant as may become necessary from time to time to accommodate flows received from the Interceptor, or to enhance the degree of treatment provided such flows. The cost to the District as used in this subsection shall be taken to include long and short term loans taken by the District as well as current receipts of the District, if used for such purpose, all of which shall be amortized as to principal and interest over a period of not less than thirty years exclusively from the charges provided for in this Section 4 (B)(6).

It should be noted that the agreement provisions included above are from the NPS Agreement with DC Water and that these and other provisions included in the agreement are essentially the same among the agreements with the Small PI Users, except for the agreement with Dulles. The agreement with Dulles contains the same pricing provisions as above, except that item (B)(4) is not included in the agreement. It is understood that the initial cost of the PI was partially funded by federal government grants that were made on behalf of Dulles; therefore, Dulles was not required to make any debt service payments associated with these loans.

5.2 Inventory of Tables and Data Sources

1-1 Total cost of service by year for 2022-2024 for each customer and amounts paid by year by each customer and true-up from Table 4-2

1-2 Proposed rates for 2026-2028 from Table 4-6

Figure 1 – PI Diagram

3 Figure 2 – Summary of Cost of Service Methodology

3-1 Operating expenses by year; prior Report for 2019 through 2021; for 2022 through 2024, file: Operating Expenses - Actuals 2022 -2024 for O&M and Admin, from DC Water; 2025 is from FY 2025 Approved Budget, Departmental Summaries, page 220

Figure 3 – graph of expenses from the prior Report and uses data from Table 3-1 through 3-6

3-2 Administrative expenses by year; prior Report for 2019 through 2021; for 2022 through 2024, file: Operating Expenses - Actuals 2022 -2024 for O&M and Admin, from DC Water; 2025 is from FY 2025 Approved Budget, Departmental Summaries, page 220

3-3 Capital equipment by year; prior Report for 2019 through 2021; for 2022 through 2025, file: Q.5 – COS Capital Equipment, from DC Water; Other adjustments by year; prior Report for 2019 through 2021; for 2022 through 2023, file: Q.11-11.2 Operating Expenses Allocation Summary FY 22 and FY 23, from DC Water

3-4 Projected operating expenses by year; 2025 is from FY 2025 Approved Budget, Departmental Summaries, page 220 by line item from DC Water, inflated by Amawalk for 2026-2028 – Amawalk inflator is 4.101% in 2026 and 4.000% in 2027 and 2028, matching the % change in Total Operating Expenditures less PILOT/ROW from the (file: 11 Fin Plan FY 2025 – FY 2034 Run 3C-CIP $9.623b_FINAL_12_13_2024), from DC Water

3-5 Projected administrative expenses by year; FY 2025 Approved Budget, Departmental Summaries, page 220, expenses by line item from DC Water, inflated by Amawalk for 2026-2028 as noted above

3-6 Projected capital equipment expenses by year; budgeted 2025 expenses and 2026 – 2028 figures by line item from DC Water, Q.5 – COS Capital Equipment, from DC Water; Other adjustments by year; Amawalk used the ratio of FY 2024 to FY 2023 wastewater treatment operations expenses times 2023 adjustments to estimate 2024 adjustments. The same type of calculation was used for 2025 through 2028

3-7 Allocation of eligible expenses to Small PI Users for 2022 through 2025 – Figures from Tables 3-1, 3-2 and 3-3 times percentage eligibility factors that are the same as used in the prior Report – DC Water confirms the eligibility factors are unchanged

3-8 Allocation of eligible expenses to Small PI Users for 2025 through 2028 – Figures from Tables 3-4, 3-5 and 3-6 times percentage eligibility factors that are the same as used in the prior Report – DC Water confirms the eligibility factors are unchanged

3-9 Total Capital Costs; Figures for 1993 through 2018 Equals the numbers for those years from the prior Report

3-10 Total Capital Costs; Figures for 2019 through 2021 equals the numbers for those years from the prior Report; Figures for 2022 through 2024 are from DC Water (file: PI COS Study Dashboard QU3C and 6C); figures for 2026 through 2028 for all capital cost categories are from DC Water (file: 11 Fin Plan FY 2025 – FY 2034 Run 3C-CIP $9.623b_FINAL_12_13_2024) and figures for 2025 through 2028 for PI capital costs are from DC Water (file: Q.8); confirmation that PI costs are a subset of total sanitary sewer capital $ - e-mail from DC Water of 02.06.25)

3-11 Amortized Capital Costs; Figures for 1993 through 2018 Equals the numbers for those years from Table from the prior Report

3-12 Amortized Capital Costs; Amortized costs for 2019-2021 from the prior Report and from the capital costs in Table 3-10 from this Report for 2022-2028 times assumptions for bond interest rates and financing terms; Source for 2022 – 2024 (file: Question 3-g, provided by DC Water). Amawalk uses assumed interest rates of 6.0% from the DC Water Financial Plan for 2025-2028

3-13 Units of Service – from prior Report for 2019-22 and from DC Water for 2022-2024 (file: Amounts Billed and Paid Small PI Users 2022-24); projected by Amawalk after 2024

3-14 % share of Units of Service calculated from Table 3-13 from this Report

3-15 Reserve capacity from prior Report for 2022-2024; DC Water advises that it will be unchanged in the future; i.e., 2025 through 2028 – answer to Amawalk Q7

3-16 % share of reserve capacity calculated from Table 3-15 from this Report

3-17 Amortized Capital Costs; Figures for 1993 through 2018 equal the numbers for those years from the prior Report

3-18 Amortized Capital Costs; Figures for 2019 through 2028 Equal the capital spending numbers for 2019-2021 from the prior Report and from Table 3-10 from this Report for 2022-2028

3-19 Cost of Service – from this Report, Table 3-17 + Table 3-18 for 2022 through 2028

4-1 Billings and Collections (the calculations net out the true-up costs recovered from the prior Report; file: 5. Amounts billed and paid Small Users 2022-2024

4-2 True-up for 2022-2024, calculated from Tables 3-19 and 4-1

4-3 Expenses for 2026-2028 from Table 3-17

4-4 Amortized capital costs for 2026-2028 from Table 3-18

4-5 Projected Cost of Service for 2026-2028, equals Table 3-19

4-6 Proposed rate calculation for 2026-2028; Table 4-5 divided by projected units of service, Table 3-13

4-7 Comparison of Projected and Actual Costs and Flows for 2022-2024

4-8 Detailed Changes per each Small PI User for 2022-2024

4-9 Comparison of Changes from existing rates to projected rates

Prior Report: Cost of Service Study for Small Potomac Interceptor Users, Arcadis District of Columbia, P.C., April 19, 2022