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Subject: Supplemental Study for Determining a Capital Charge for the District's Long-Term Pipeline Replacement Program

Introduction

Crescenta Valley Water District ("CVWD" or "the District") undertook its most recent rate adoption process in 2021, when three years of rates through 2024 were adopted. Since then, several unanticipated events have occurred, including the early stages of a mega-drought – which turned into a historically wet winter last year – both of which reduced already low water demand to unprecedented levels (more than 15% reduction). The District has also faced increased water supply costs, historically high inflation, and a heightened need to develop and fund a pipeline replacement program during this time.

The District is committed to a proactive pipeline replacement program to ensure water service reliability and fire safety, which are critical needs not only in terms of the mission and vision of the District, but particularly so for the Crescenta Valley community, as it borders the Angeles National Forest and the San Gabriel Mountains in an active earthquake-prone region. Aging infrastructure is one of the key issues facing water agencies across the United States, and CVWD is no exception. The challenge is to develop reliable and sufficient funding for a proactive pipeline replacement program while balancing multiple policy considerations and economic limitations. The District conducted a series of workshops with the Board of Directors exploring various financial options to fund its pipeline replacement program, with the goals of establishing a nexus between the costs and benefits of increased water availability to the property owner, specifically, general affordability, and revenue stability. Based on this series of discussions and presentations, a charge based on meter size and assessed on the county property tax roll was determined to be the most suitable option.

This report will provide brief context on the economic conditions and recent events which have combined to create financial uncertainty for CVWD. Next, will be a review of the District's current overall financial situation including cash reserves, debt service, capital and operating expenses, and projected revenues to develop a "status quo" Statement of Cash Flows. This "status quo" financial model will inform the question: With its current (or projected future) rates, can the District afford to maintain operations,

satisfying all debt service, capital improvement plan, and reserve requirements? The report will conclude with a review of the District's pipeline replacement needs and propose a pipeline replacement program charge to be assessed on the county property tax roll, including a discussion on the allocation of costs and overall methodology. This report references the 2021 "Water and Wastewater Rate Study Report" conducted by Raftelis Financial Consultants, Inc. ("Raftelis") is for demand ratios as provided by American Water Work Association ("AWWA"), fire pipeline diameters, and the 15% designation of allocation of pipeline capacity to fire flows. These are also included as an appendix.

"Status Quo" Financial Plan

Since CVWD's most recent rate adoption and long-term financial planning model development in 2021, the COVID-19 global pandemic and unbridled inflation have significantly impacted every sector of the economy. Materials and construction costs, including labor, the primary drivers of large CIP projects like pipeline replacement, continue to climb sharply. These external factors have combined to significantly alter the trajectory of the District's ability to commit to its "Roadmap" plan going forward. The "Roadmap" refers to the Infrastructure Funding and Reliability plan which was developed between the Board, the community, and staff over several years, the primary result for which was a commitment to proactive pipeline replacement and a 20-year plan for ramping up and then ramping down replacement based on availability of funds and operational impact to the community.

Internally, CVWD experienced more than a 15% reduction in metered revenues due to its customers' response to a historic drought. The historically wet winter last year, further compounded the downward pressure on revenues by reducing water demand. The District has deferred spending on pipeline replacement in previous years and has a heightened need to complete the project in order to bolster its fire protection capacity. Thus, it is important to construct a new baseline financial model and cash flow statement based on current data to reassess the District's overall financial health.

The District has one outstanding long-term debt obligation with annual debt service averaging $581k through 2029. While this is a low debt service level given the District's positive projected Net Operating Income over the life of this analysis, it is important to maintain the flexibility and capacity to issue future debt if the need arises or an opportunity like low interest rates presents itself. The District also needs to monitor its cash reserves. The reserve levels were established by implementation of the Reserve Policy in July 2020, based on the Board's recognition that financial health includes setting funds aside for unexpected repairs and liabilities.

The District's projected Capital Expenses through 2029 are detailed in the following table (Table 1). The table shows that Pipeline Replacement represents approximately half of the total capital budget in most years.

Table 1: Capital Expenses through 2029

Capital Expense Category	2023	2024	2025	2026	2027	2028	2029
Water Supply	$ 219,000	$ 360,000	$ 308,000	$ 159,000	$ 264,000	$ 282,000	$ 282,000
Water Storage	$ 732,000	$ 739,200	$ 865,200	$ 3,055,000	$ 1,275,000	$ 1,135,300	$ 1,135,300
Water Distribution	$ 50,000	$ 450,900	$ 1,052,400	$ 490,000	$ 148,000	$ 57,300	$ 57,300
Water Treatment	$ 100,000	$ 75,000	$ -	$ -	$ 225,000	$ 225,000	$ 225,000
Technology	$ 925,000	$ 950,000	$ 395,500	$ 975,000	$ 750,000	$ -	$ -
Public Safety/Emergency Response	$ 170,000	$ 160,000	$ 986,200	$ 890,000	$ 898,000	$ 150,000	$ 150,000
Facilities & Planning	$ -	$ 100,100	$ 151,000	$ 150,000	$ -	$ -	$ -
Pipeline Replacement	$ 1,500,000	$ 3,000,000	$ 2,912,000	$ 2,200,000	$ 5,800,000	$ 6,064,963	$ 8,020,000
Total	**$ 3,696,000**	**$ 5,835,200**	**$ 6,670,300**	**$ 7,919,000**	**$ 9,360,000**	**$ 7,914,563**	**$ 9,869,600**

The District's projected Operating Expenses through 2029 are detailed in the following table (Table 2). Generally, Operating Expenses are projected to increase by at least 5% per year over the course of this analysis.

Table 2: Operating Expenses through 2029

Operating Expense Category	2023	2024	2025	2026	2027	2028	2029
Chemicals	$ 120,000	$ 126,000	$ 132,300	$ 138,915	$ 145,861	$ 153,154	$ 160,811
Contracted Services	$ 781,005	$ 820,055	$ 861,058	$ 904,111	$ 949,316	$ 996,782	$ 1,046,621
Hydrants	$ 20,000	$ 21,000	$ 22,050	$ 23,153	$ 24,310	$ 25,526	$ 26,802
Meters and Services	$ 253,000	$ 265,650	$ 278,933	$ 292,879	$ 307,523	$ 322,899	$ 339,044
Office and General	$ 97,925	$ 102,821	$ 107,962	$ 113,360	$ 119,028	$ 124,980	$ 131,229
Admin	$ 471,625	$ 424,856	$ 446,099	$ 468,404	$ 491,824	$ 516,415	$ 542,236
Distribution	$ 652,960	$ 685,608	$ 719,888	$ 755,883	$ 793,677	$ 833,361	$ 875,029
Other Water Supply	$ 830,000	$ 871,500	$ 915,075	$ 960,829	$ 1,008,870	$ 1,059,314	$ 1,112,279
Water Treatment	$ 461,026	$ 484,077	$ 508,281	$ 533,695	$ 560,380	$ 588,399	$ 617,819
Purchased Water	$ 3,075,000	$ 3,321,000	$ 3,586,680	$ 3,766,014	$ 3,954,315	$ 4,152,030	$ 4,359,632
Salaries and Benefits	$ 3,323,203	$ 3,467,697	$ 3,618,599	$ 3,820,014	$ 3,989,017	$ 4,165,590	$ 4,350,076
Grand Total	**$ 10,085,744**	**$10,590,265**	**$11,196,926**	**$11,777,257**	**$12,344,122**	**$12,938,450**	**$13,561,579**

The District's projected Revenues (Operating and Non-Operating) are detailed in the following table (Table 3). As part of its ongoing "Roadmap" discussion, the District implemented annual rate increases of 8% in 2022, 2023, and 2024, 7% in 2025, 2026, and 2027, and 6% in 2028 and 2029. Revenue projections for the Commodity Charges and Fixed Charges incorporates a modest increase in water sales of 3% in 2024 and 2025 as customer restrictions for drought-related conservation are reduced.

Table 3: Revenue (Operating & Non-Operating) through 2029

Revenue Category	2023	2024	2025	2026	2027	2028	2029
Commodity Charge	$ 8,500,000	$ 9,455,400	$10,420,796	$11,150,252	$11,930,770	$12,646,616	$13,405,413
Fixed Charge	$ 3,540,000	$ 3,823,200	$ 4,090,824	$ 4,377,182	$ 4,683,584	$ 4,964,599	$ 5,262,475
Other Operating Revenue	$ 257,800	$ 257,800	$ 257,800	$ 257,800	$ 257,800	$ 257,800	$ 257,800
Developer Contributions	$ 180,000	$ 180,000	$ 180,000	$ 180,000	$ 180,000	$ 180,000	$ 180,000
Grants	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000
Total	**$ 12,577,800**	**$13,816,400**	**$15,049,420**	**$16,065,234**	**$17,152,154**	**$18,149,015**	**$19,205,688**

The District also aims to maintain a cash reserve under its official Reserve Policy, which is comprised of three components: 1) a Working Capital Reserve equal to 25% of annual operating expenses (less water purchases); 2) a Rate Stabilization Reserve equal to 25% of annual water sales; and 3) a fixed $1 million Emergency Reserve for one or two emergency repairs. These combine to represent the District's Reserve Policy, and their sum should represent the minimum closing cash balance in any given fiscal year. Annual reserve targets are detailed in the following table (Table 4).

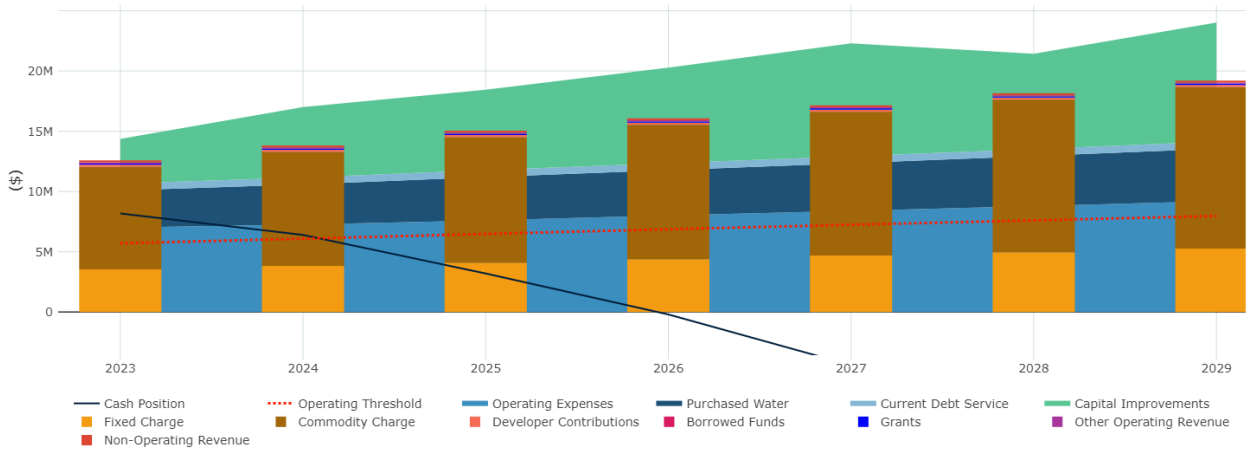
Table 4: Cash Reserve Policy Targets through 2029

Reserve Policy	Reserve Level	2023	2024	2025	2026	2027	2028	2029
Working Capital	**25% of Operating Exp**	$1,690,635	$1,780,642	$1,894,582	$1,989,311	$2,088,776	$2,193,215	$2,302,876
Rate Stabilization	**25% of Water Sales**	$3,010,000	$3,319,650	$3,627,905	$3,881,858	$4,153,589	$4,402,804	$4,666,972
Emergency	**$1M**	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000
Total		**$5,700,635**	**$6,100,292**	**$6,522,487**	**$6,871,169**	**$7,242,365**	**$7,596,019**	**$7,969,848**

The following table combines the District's Expenses (Capital and Operating), Revenues, Debt Service, and Cash Balance as described above to produce the Status Quo Statement of Cash Flows through 2029 (Table 5, Chart 1).

Table 5: Status Quo Cash Flow Statement through 2029

	2023	2024	2025	2026	2027	2028	2029
Cash Position Opening Balance	**$ 8,179,910**	**$ 6,394,966**	**$ 3,204,901**	**$ (193,905)**	**$ (4,405,928)**	**$ (9,538,895)**	**$(12,823,893)**
Revenues							
Fixed Charge	$ 3,540,000	$ 3,823,200	$ 4,090,824	$ 4,377,182	$ 4,683,584	$ 4,964,599	$ 5,262,475
Commodity Charge	$ 8,500,000	$ 9,455,400	$ 10,420,796	$ 11,150,252	$ 11,930,770	$ 12,646,616	$ 13,405,413
Other Operating Revenue	$ 95,000	$ 95,000	$ 95,000	$ 95,000	$ 95,000	$ 95,000	$ 95,000
Developer Contributions	$ 180,000	$ 180,000	$ 180,000	$ 180,000	$ 180,000	$ 180,000	$ 180,000
Non-Operating Revenue	$ 162,800	$ 162,800	$ 162,800	$ 162,800	$ 162,800	$ 162,800	$ 162,800
Grants	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000
Revenue Subtotal	$ 12,577,800	$ 13,816,400	$ 15,049,420	$ 16,065,234	$ 17,152,154	$ 18,149,015	$ 19,205,688
Operating Expenses							
Purchased Water	$ 3,075,000	$ 3,321,000	$ 3,586,680	$ 3,766,014	$ 3,954,315	$ 4,152,030	$ 4,359,632
O&M	$ 7,010,744	$ 7,269,265	$ 7,610,246	$ 8,011,243	$ 8,389,807	$ 8,786,419	$ 9,201,947
Operating Expenses Subtotal	$ 10,085,744	$ 10,590,265	$ 11,196,926	$ 11,777,257	$ 12,344,122	$ 12,938,450	$ 13,561,579
Net Income	**$ 2,492,056**	**$ 3,226,135**	**$ 3,852,495**	**$ 4,287,977**	**$ 4,808,032**	**$ 5,210,565**	**$ 5,644,109**
Capital Expenses							
Capital Improvements	$ 3,696,000	$ 5,835,200	$ 6,670,300	$ 7,919,000	$ 9,360,000	$ 7,914,563	$ 9,869,600
Debt Service							
Current Debt Service	$ 581,000	$ 581,000	$ 581,000	$ 581,000	$ 581,000	$ 581,000	$ 581,000
Total Debt Service	$ 581,000	$ 581,000	$ 581,000	$ 581,000	$ 581,000	$ 581,000	$ 581,000
Cash Position							
Net Surplus/Deficit	$ (1,784,944)	$ (3,190,065)	$ (3,398,805)	$ (4,212,023)	$ (5,132,968)	$ (3,284,998)	$ (4,806,491)
Cash Position Closing Balance	**$ 6,394,966**	**$ 3,204,901**	**$ (193,905)**	**$ (4,405,928)**	**$ (9,538,895)**	**$(12,823,893)**	**$(17,630,384)**
Reserve Target	$ 5,700,635	$ 6,100,292	$ 6,522,487	$ 6,871,169	$ 7,242,365	$ 7,596,019	$ 7,969,848
Coverage Ratio	**4.29**	**5.55**	**6.63**	**7.38**	**8.28**	**8.97**	**9.71**



The above chart represents a summary of cash flows, and the graphic shows that the District cannot meet its operational needs under the status quo financial plan. The District currently has cash reserves that approximate the reserve target. However, this is due to significantly deferred capital maintenance and, in part, an initial influx of cash into the reserve fund when it was formalized in July 2020. Despite its current reserve levels and projected annual rate increases, if all factors were held constant, the District would end 2025 well below its cash reserve target and its overall cash balance would go negative sometime in 2026. While the District maintains positive Net Operating Income in each year of our projections, its Capital Improvements spending – primarily driven by the pipeline replacement program – will quickly eliminate any cash reserves.

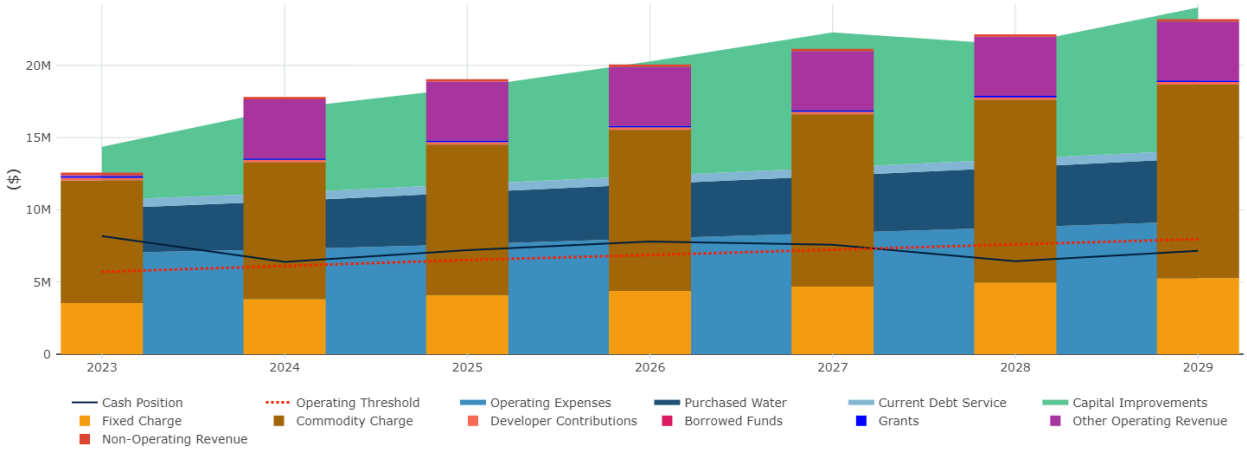
Proposed Financial Plan – Pipeline Replacement Charge

The Pipeline Replacement Program, the District's largest Capital Improvement expenditure, cannot be funded appropriately within the current rate structure. The solution is to develop a dedicated revenue stream to fund the pipeline replacement program. This revenue stream would come from a newly implemented Pipeline Replacement Program charge implemented on the county property tax roll. The mechanism promotes equity because the financial impact on the property owner who, on average, property owners have more ability to pay than tenants. The mechanism also promotes equity by tying the benefit of reliable water delivery to the property, including its usefulness and ultimately property value. The pipeline replacement program's aim is to maintain this property-related water service and thus shows a clear nexus between the cost of the service and the associated benefit to property owners.

This revenue stream also promotes financial resilience for the District and resultant water delivery reliability for property owners, the community, and emergency services. The revenue stream unlinks the dependence for an absolute need from variables that fluctuate water sales such as temperature and precipitation.

The below table combines the Pipeline Replacement Charge with the Status Quo Financial Plan, which results in the Proposed Cash Flow Statement through 2029 (Table 6, Chart 2).

Table 6: Proposed Cash Flow Statement through 2029							
	2023	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
Cash Position Opening Balance	**$ 8,179,910**	**$ 6,394,966**	**$ 7,200,293**	**$ 7,796,881**	**$ 7,580,250**	**$ 6,442,675**	**$ 7,153,070**
Revenues							
Fixed Charge	$ 3,540,000	$ 3,823,200	$ 4,090,824	$ 4,377,182	$ 4,683,584	$ 4,964,599	$ 5,262,475
Commodity Charge	$ 8,500,000	$ 9,455,400	$ 10,420,796	$ 11,150,252	$ 11,930,770	$ 12,646,616	$ 13,405,413
Pipeline Replacement Program	**$ -**	**$ 3,995,393**	**$ 3,995,393**	**$ 3,995,393**	**$ 3,995,393**	**$ 3,995,393**	**$ 3,995,393**
Other Operating Revenue	$ 95,000	$ 95,000	$ 95,000	$ 95,000	$ 95,000	$ 95,000	$ 95,000
Developer Contributions	$ 180,000	$ 180,000	$ 180,000	$ 180,000	$ 180,000	$ 180,000	$ 180,000
Non-Operating Revenue	$ 162,800	$ 162,800	$ 162,800	$ 162,800	$ 162,800	$ 162,800	$ 162,800
Grants	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000
Revenue Subtotal	$ 12,577,800	$ 17,811,793	$ 19,044,813	$ 20,060,626	$ 21,147,547	$ 22,144,408	$ 23,201,081
Operating Expenses							
Purchased Water	$ 3,075,000	$ 3,321,000	$ 3,586,680	$ 3,766,014	$ 3,954,315	$ 4,152,030	$ 4,359,632
O&M	$ 7,010,744	$ 7,269,265	$ 7,610,246	$ 8,011,243	$ 8,389,807	$ 8,786,419	$ 9,201,947
Operating Expenses Subtotal	$ 10,085,744	$ 10,590,265	$ 11,196,926	$ 11,777,257	$ 12,344,122	$ 12,938,450	$ 13,561,579
Net Income	**$ 2,492,056**	**$ 7,221,527**	**$ 7,847,887**	**$ 8,283,369**	**$ 8,803,425**	**$ 9,205,958**	**$ 9,639,502**
Capital Expenses							
Capital Improvements	$ 3,696,000	$ 5,835,200	$ 6,670,300	$ 7,919,000	$ 9,360,000	$ 7,914,563	$ 9,869,600
Debt Service							
Current Debt Service	$ 581,000	$ 581,000	$ 581,000	$ 581,000	$ 581,000	$ 581,000	$ 581,000
Total Debt Service	$ 581,000	$ 581,000	$ 581,000	$ 581,000	$ 581,000	$ 581,000	$ 581,000
Cash Position							
Net Surplus/Deficit	$ (1,784,944)	$ 805,327	$ 596,587	$ (216,631)	$ (1,137,575)	$ 710,395	$ (811,098)
Cash Position Closing Balance	**$ 6,394,966**	**$ 7,200,293**	**$ 7,796,881**	**$ 7,580,250**	**$ 6,442,675**	**$ 7,153,070**	**$ 6,341,972**
Reserve Target	$ 5,700,635	$ 6,100,292	$ 6,522,487	$ 6,871,169	$ 7,242,365	$ 7,596,019	$ 7,969,848
Coverage Ratio	**4.29**	**12.43**	**13.51**	**14.26**	**15.15**	**15.85**	**16.59**



The total annual revenue to be collected from the pipeline replacement program charge will be equal to the 5-year average cost of the program, which is calculated from the table below, with the 5-year average cost of the program for 2024 through 2028 being: $3,995,393.

($3,000,000 + $2,912,000 + $2,200,000 + $5,800,000 + $6,064,963) / 5 = $3,995,393

Capital Expense Category	2024	2025	2026	2027	2028
Pipeline Replacement	$3,000,000	$2,912,000	$2,200,000	$5,800,000	$6,064,963

"Based on [International Organization for Standardization] standards, 15% of the [distribution] system costs are assigned to fire flow" (Raftelis, p 26). In other words, 15% of the overall cost for the Pipeline Replacement Program is attributable to Fire Service needs, with that portion being allocated between "Public Fire" and "Private Fire" in proportion to the potential demand of each (Raftelis, p 44). "Public Fire" accounts for fire hydrants and the associated fire lines, while "Private Fire" lines are counted separately. The following tables show the "Public Fire" and "Private Fire" calculations based on CVWD's data (Table 7, Table 8). Note that there are two ratios utilized in this report: AWWA Ratio; and Fire Demand Ratio. Both ratios consider the strain that potable connections put on the system and are measured primarily through their hydrologic capacity. Larger pipelines and meters can instantaneously use much more water and thus provide greater utility and capacity for the owner. The system is designed to withstand these loads, and this is also referred to as "peaking" capacity. For Fire Demand Ratio, it is based on the diameter of the pipeline. For water meters, it is based on the AWWA meter ratio. In both cases, the ratios are normalized to the smallest unit. For Fire Demand, it is the 1" connection, and for potable meters it is the 3/4" meter size. The ratios between fire and AWWA meter are different, and the Fire Demand ratios are higher than AWWA meter ratio. For more information about these ratios, please refer to the Raftelis study.

Table 7: Public Fire Allocation Calculation

Hydrant Fire Pipeline Diameter	Service Count	Demand Ratio	Equivalent Connections	
4"	3	38.32	115	
6"	710	111.31	79,030	
Public Fire Total	**713**		**79,145**	**91%**

Table 8: Private Fire Allocation Calculation

Private Fire Connection Size	Service Count	Demand Ratio	Equivalent Connections	
1"	1	1.00	1	
2"	11	6.19	68	
3"	2	17.98	36	
4"	78	38.32	2,989	
6"	18	111.31	2,004	
8"	6	237.21	1,423	
10"	2	426.58	853	
Private Fire Total	**118**		**7,374**	**9%**

The above table shows that roughly 9% of the total fire flow amount is allocable to "Private Fire". This figure is then multiplied by 15% (the overall system costs assigned to fire flow) to arrive at the final "Private Fire" allocation of 1.3% of total pipeline replacement program costs, or $51,079.

*15% * 9% = 1.3%*

*1.3% * $3,995,393 = $51,079*

The total "Private Fire" cost ($51,079) is then divided by the number of "Private Fire" Equivalent Meter Units ("EMUs") (7,374) to arrive at the final "Private Fire" annual cost of $6.93 per EMU.

$51,079 / 7,374 EMUs = $6.93/EMU

This figure is then multiplied by the appropriate Demand Ratio for each meter size to determine each individual private fire customer's annual charge based on their meter size (Table 9).

Table 9: "Private Fire" Annual Costs by Meter Size

Meter Size	Number of Meters	Demand Ratio	Annual Cost
1"	1	1.00	$ 6.93
2"	11	6.19	$ 42.88
3"	2	17.98	$ 124.55
4"	78	38.32	$ 265.44
6"	18	111.31	$ 771.03
8"	6	237.21	$ 1,643.13
10"	2	426.58	$ 2,954.88

This leaves 98.7% of the program cost, or $3,944,314, to be collected from all potable District customers through the Pipeline Replacement Program charge.

$3,995,393 - $51,079 = $3,944,314

With the annual revenue requirements for the Pipeline Replacement Program determined, the last step is to calculate the total number of potable EMUs in the District. The standard AWWA Demand Ratios are applied to all potable meters in the District, with ¾" as the baseline at 1.00. The results are included below (Table 10, Table 11).

Table 10: Potable EMU Calcuation

Meter Size	Number of Meters	AWWA Ratio	Total EMUs
3/4"	7044	1.00	7,044
1"	885	1.67	1,476
1 1/2"	152	3.33	507
2"	66	5.33	354
3"	29	11.67	333
4"	2	21.00	42
Total	**8,178**		**9,756**

Table 11: Potable Annual Cost by Meter Size

Meter Size	Number of Meters	AWWA Ratio	Annual Cost
3/4"	7,044	1.00	$ 404.30
1"	885	1.67	$ 673.83
1 1/2"	152	3.33	$ 1,347.66
2"	66	5.33	$ 2,156.25
3"	29	11.67	$ 4,718.14
4"	2	21.00	$ 8,490.23
Total	**8,178**		

Applying the AWWA Demand Ratios to the District's 8,178 potable meters yields a total of 9,756 potable EMUs Districtwide. The remaining program cost of $3,944,314 is divided by the total number of potable EMUs of 9,756 to reach the Annual Cost of $404.30 per potable EMU:

$3,944,314 / 9,756 EMUs = $404.30/EMU

As before, this figure is then multiplied by the AWWA Demand Ratio for each meter size to determine each potable customer's annual charge. Customers with ¾" meters (roughly 86% of the District) would see an annual charge of $404.30. Other customer, primarily larger condominium complexes and larger institutional accounts like schools and government agencies with larger meters would see higher annual charges, ranging from $673.83 for 1" meters to $8,490.23 for 4" meters (Table 10).

Conclusion

Implementing the capital charge on the property roll provides a significant step toward balancing long-term infrastructure reliability needs with funding requirements in a stable and equitable manner. The charges as developed represent an equitable and defensible methodology and align with the requirements of Proposition 218. In addition, as part of a separate analysis, the District is developing a bill assistance program for those customers who are most impacted relative to their financial circumstances.