FCS GROUP
Solutions-Oriented Consulting

| Memorandum

To: Vince Johnston, East Wenatchee Water District **Date:** November 24, 2021

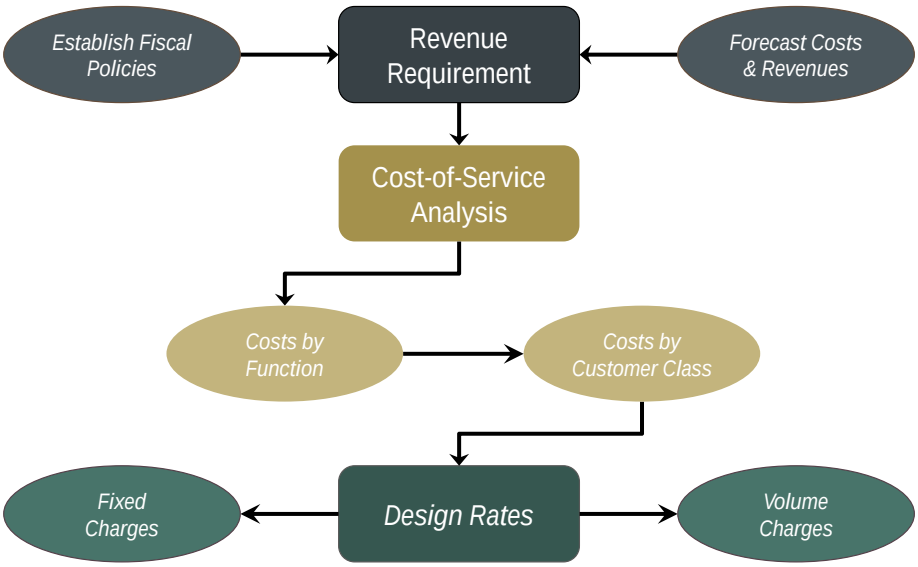
From: Chris Gonzalez, Senior Project Manager
John Ghilarducci, Principal
Amanda Levine, Analyst

RE Ongoing Service Rates for Private Fire Lines

INTRODUCTION

East Wenatchee Water District (District) engaged FCS GROUP in 2020 to complete a comprehensive cost-of-service rate study. **Exhibit 1** summarizes the methodology used in to complete the study, which is consistent with industry standards established by the American Water Works Association:

Exhibit 1: Rate Study Methodology



The revenue requirement analysis, or financial plan, is the first phase of the study and focuses on determining the amount of annual revenue needed by the District to sustain operations and support capital investment in its infrastructure. The second phase of the study, the cost-of-service analysis, allocates the annual revenue requirement among the District's customer classes based on the level and nature of service provided. Once this allocation has been determined, the final phase develops a set of fixed and variable charges for each customer class to recover the cost allocated to them.

One of the District's goals for the study was to determine a fair and defensible allocation of costs to private fire lines, recognizing that it has not historically charged these customers for the ongoing availability of service despite having to size its infrastructure to meet their demands. This memorandum documents the process used to develop the fire line rates that the District adopted on November 3rd, 2021.

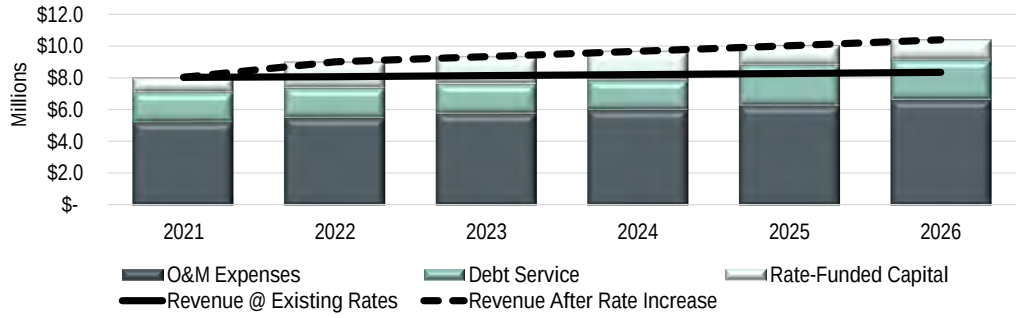
A. REVENUE REQUIREMENT ANALYSIS

The revenue requirement analysis determines the amount of revenue that the District's rates must generate to enable it to meet its various financial obligations, and involves the following elements:

- Forecasting operating revenues and expenses, based initially on the 2021 Budget with adjustments for inflation and other anticipated changes (e.g. converting to monthly billing).
- Developing a strategy to fund the District's capital improvement plan (CIP) that considers available cash balances, anticipated third-party contributions, projected revenues from plant investment fees and fire connection charges, cash funding from rates, and debt (if needed).
- Determining other needs driven by the District's fiscal policies (e.g. reserve funding)

Exhibit 2 summarizes the revenue requirement forecast for the 2022 – 2026 planning period.

Exhibit 2: 2022 – 2026 Financial Plan



Water Rate Revenue Forecast	Existing	Proposed	Projected			
	2021	2022	2023	2024	2025	2026
Annual Rate Revenue Increase	0.0%	12.5%	3.0%	3.0%	3.0%	3.0%

Exhibit 2 shows a proposed revenue increase of 12.5% in 2022, which is largely attributable to the District's decision to forgo the 10.5% increase that the 2015 rate study recommended for 2021 – this increase was the final step in a five-year plan to ramp up annual cash funding for the District's steel main replacement program. Beyond 2022, the plan envisions annual revenue increases of 3.0% to keep up with rising operating costs, cover payments on existing debt as well as $18.4 million in anticipated new borrowing to fund the CIP, and generate additional cash funding for the CIP. The plan presented in **Exhibit 2** results in a cumulative five-year increase of 26.6% over current rates.

B. COST-OF-SERVICE ANALYSIS

Citing recent concerns about rate affordability, the rate study included a cost-of-service analysis to determine a fair and defensible allocation of the District's annual costs to its customers. As part of this rate study, the District requested the development of rates for private fire lines. As discussed in further detail below, the cost-of-service analysis provides a defensible basis for allocating costs to these users as well as the District's other customers.

Consistent with guidelines established by the American Water Works Association, this analysis involves allocating costs to functions of service and then allocating the costs assigned to each function to customer classes based on their demands and service characteristics.

Functional Cost Allocation

The first step involves allocating the annual revenue requirement to functions of service:

- **Customer:** Fixed costs that do not vary with meter size or water usage and are thus equally attributable to all customers. Examples include utility billing, customer service, and postage.
- **Meters & Services:** Fixed costs associated with the installation, maintenance, and repairs of meters and service lines; these costs typically increase with meter or service line size.
- **Base Capacity:** Costs attributable to providing system capacity to meet "base" demands consistent with winter-average usage patterns (no peaking). Though this category includes a share of some variable costs such as power, most of the costs are fixed in nature.
- **Peak Capacity:** Costs attributable to providing incremental capacity to meet peak demands. Though this category includes a share of some variable costs such as power, most costs are fixed.
- **Fire Protection:** Fixed costs associated with providing capacity to convey fire flow, including both direct facilities (e.g. hydrants) as well as the oversizing of other facilities (e.g. mains, pump stations, reservoirs) to accommodate fire flow.

Given that many of the District's cost accounts are not readily separable among these functions, a significant portion of the District's operating costs are allocated based on a functional allocation of the cost of water system assets. The sections below discuss the asset allocation in greater detail for each functional category, focusing primarily on the allocation of costs to fire protection (as the sole function allocable to private fire lines) versus other functions of service.

Supply & Treatment

Given that the District provides fire protection service on a "standby" basis, this analysis assumes that the District primarily uses its water supply to meet customer water demands and does not allocate supply or related treatment facilities to fire protection.

Storage

The allocation of the District's reservoirs to fire protection considers the functional breakdown of applicable storage requirements outlined in the 2014 Water System Plan. The following principles guided the allocation of the storage capacity of each reservoir to fire protection:

- ***Operating Storage:*** As operating storage supports the routine operations of pumps and flow-control valves, it is not allocated to fire protection.
- ***Equalizing Storage:*** As equalizing storage helps manage short-term peak demands, it is not allocated to fire protection.

- ***Fire Suppression Storage:*** Fully allocated to fire protection.

- ***Standby Storage:*** Recognizing that standby storage primarily serves as a replacement for the District's source of supply during short-term emergencies, it is not allocated to fire protection.

Exhibit 3 summarizes the allocation of the District's reservoir capacity to fire protection.

Exhibit 3: Allocation of Reservoir Capacity to Fire Protection

Function	Storage Capacity (Millions of Gallons)	Allocation of Capacity	
		Fire Protection	Other Functions
Operational	1.43 MG	43.0%	57.0%
Equalizing	0.37 MG	0.0%	100.0%
Fire Suppression	3.20 MG	100.0%	0.0%
Standby	3.87 MG	0.0%	100.0%
Total	8.87 MG	43.0%	57.0%

Mains

Water mains serve a dual purpose, delivering water for domestic consumption and providing adequate flow for fire suppression. There is more than one reasonable method that can be used to allocate the cost of water mains to fire protection. While a utility has discretion to consider its specific operational circumstances and policy choices when choosing a method, it is important that it applies the chosen method consistently and reasonably in allocating costs to customers and designing rates. In this analysis, the allocation of the replacement cost of water mains to fire protection considers pipe size along with the following operating assumptions confirmed with District staff:

- Mains that are 4" in diameter or smaller generally do not have any capacity available to convey fire flow. The cost of these mains is not allocated to fire protection.

- Mains that are 6" in diameter could generally be 4" mains without fire flow. The portion of the cost of these mains that is attributable to this oversizing (55.6%, based on the difference in capacity of the two pipe sizes as defined by cross-sectional area) is allocated to fire protection.

- Mains that are 8" in diameter could generally be 6" mains without fire flow. The portion of the cost of these mains that is attributable to this oversizing (43.8%, based on the difference in capacity of the two pipe sizes as defined by cross-sectional area) is allocated to fire protection.

- Mains that are 10" in diameter could generally be 8" mains without fire flow. The portion of the cost of these mains that is attributable to this oversizing (36.0%, based on the difference in capacity of the two pipe sizes as defined by cross-sectional area) is allocated to fire protection.

- Mains that are 12" in diameter are typically located in areas with commercial or multi-family zoning and could generally be 10" mains without fire flow. The portion of the cost of these mains that is attributable to oversizing (30.6%, based on the difference in capacity of the pipe sizes as defined by cross-sectional area) is allocated to fire protection.

- Mains that are larger than 12" in diameter are generally considered to be supply transmission mains that are not attributable to fire protection.

Exhibit 4 summarizes the allocation of mains to fire protection.

Exhibit 4: Allocation of Water Mains to Fire Protection

Pipe Size	Total Length	Estimated 2020 Replacement Cost	% Allocated to Fire Protection
4" or Smaller	271,043 LF	$ 60,984,675	0.0%
6"	132,637 LF	36,077,264	55.6%
8"	308,678 LF	98,468,282	43.8%
10"	69,563 LF	24,416,613	36.0%
12"	179,339 LF	68,686,837	30.6%
Larger than 12"	41,304 LF	20,792,906	0.0%
Total	1,002,564 LF	$309,426,577	30.7%

Pumping

The allocation of pump stations to fire protection considers the underlying purpose of the pumps in each pump station. The District generally attributes its booster pump stations to source of supply rather than fire protection, though the 1170 Zone has a 1,500-gpm pump that is primarily dedicated to fire flow. **Exhibit 5** summarizes the allocation of booster pump stations to fire protection.

Exhibit 5: Allocation of Booster Pump Stations to Fire Protection

Facility	Pumping Capacity	% Allocated to Fire Protection
Witte Wells No. 4 – Standby Emergency	1,100 gpm	0.0%
Witte Wells No. 5 – Standby Emergency	870 gpm	0.0%
Cascade Wells No. 7 – Standby Emergency	1,300 gpm	0.0%
Regional Supply No. 2	5,800 gpm	0.0%
Regional Supply No. 3	3,800 gpm	0.0%
Regional Supply No. 4	3,800 gpm	0.0%
1170 Zone No. 5	1,500 gpm	90.0%
1170 Zone No. 6	350 gpm	0.0%
5th and Grover No. 1	1,320 gpm	0.0%
5th and Grover No. 2	1,320 gpm	0.0%
5th and Grover No. 3	1,320 gpm	0.0%
15th Street No. 1	1,670 gpm	0.0%
15th Street No. 2	1,670 gpm	0.0%
Grant and Nile No. 1	1,000 gpm	0.0%
Grant and Nile No. 2	1,050 gpm	0.0%
Daniels Drive No. 1	910 gpm	0.0%
Daniels Drive No. 2	910 gpm	0.0%
Canyon Hills No. 1	190 gpm	0.0%
Canyon Hills No. 2	255 gpm	0.0%
Baker Flats No. 1 (Recirculation Pump)	400 gpm	0.0%
Total	30,535 gpm	4.4%

Meters & Services

This analysis does not allocate costs associated with water meters or service lines to fire protection.

Hydrants

Recognizing how the District uses hydrants, this analysis fully allocates their cost to fire protection.

General

Assets not attributable to a specific category (e.g. equipment, vehicles, and buildings or land not linked to a specific facility) are allocated proportionately based on the allocation of other asset costs.

Exhibit 6 summarizes the functional allocation of the original cost of water system assets, indicating an allocation of 29.8% to fire protection.

Exhibit 6: Functional Allocation of Water System Assets

Asset Type	Original Cost	% Allocated to Fire Protection
Supply & Treatment	$ 1,254,141	0.0%
Storage	8,716,056	43.0%
Mains	46,845,510	30.7%
Pumping	3,055,245	4.4%
Meters & Services	6,378,690	0.0%
Hydrants	1,951,753	100.0%
General	3,095,210	29.6%
Total	$71,296,605	29.6%

Functional Allocation of Annual Revenue Requirement

The next step in the process is to allocate the annual rate revenue requirement to fire protection. Because the District expressed a preference to phase the results of the cost-of-service analysis in over a five-year planning period, **Exhibit 7** shows the allocation of the projected 2026 revenue requirement (which is generally based on inflationary adjustments to the 2021 Budget).

Exhibit 7: Functional Allocation of 2026 Revenue Requirement

Allocation of Operating Expenses	2026 Projection	% Allocated to Fire Protection	Notes
Water Supply	$1,049,697	0.0%	Not Allocated to Fire Protection
Operation & Maintenance			
Pumps	13,911	4.4%	Allocated as Pumping (See Exhibit 5)
Reservoirs	23,185	43.0%	Allocated as Reservoirs (See Exhibit 3)
Mains & Valves	69,556	30.7%	Allocated as Mains (See Exhibit 4)
Meters & Service Lines	185,484	0.0%	Not Allocated to Fire Protection
Hydrants	17,389	100.0%	Allocated Fully to Fire Protection
Other	180,847	29.6%	Based on Allocation of Total Assets
Administration			
Customer Service/Utility Billing	362,115	0.0%	Not Allocated to Fire Protection
Engineering Services	275,598	29.6%	Based on Allocation of Total Assets
Operator Salaries	2,175,079	29.6%	Based on Allocation of Total Assets
Admin/Commissioner Salaries	1,148,093	19.0%	Proportionately Based on Other O&M Costs
Taxes	417,651	19.0%	Proportionately Based on Other O&M Costs
Other General/Overhead	695,260	19.0%	Proportionately Based on Other O&M Costs
Total	$6,613,866	19.0%	

Revenue Requirement Allocation	2026 Projection	% Allocated to Fire Protection	Notes
Operating Expenses	$ 6,613,866	19.0%	Per Operating Expense Allocation
Debt Service – Mains	256,711	30.7%	Allocated as Mains (See Exhibit 4)
Debt Service – Reservoirs	234,326	43.0%	Allocated as Reservoirs (See Exhibit 3)
Debt Service – Other	2,003,996	29.6%	Based on Allocation of Total Assets
Less: Offsetting Revenues	(247,632)	22.3%	Proportionately Based on Other Costs
Net Cash Flow After Rate Increases	1,398,561	22.3%	Proportionately Based on Other Costs
Total	$10,259,828	22.3%	

Allocation of Annual Revenue Requirement to Private Fire Lines

Exhibit 7 indicates that 22.3% of the 2026 revenue requirement (approximately $2,289,000) is allocable to fire protection. This cost is further allocated between public fire protection and private fire lines based on equivalent device units (EDUs), summarized below in **Exhibit 8**:

Exhibit 8: Inventory of Public/Private Fire Protection Devices

Inventory of Fire Protection Devices	Equivalent Device Units (EDUs)	Number of Devices		
		Public Hydrants	Private Fire Lines	Total
8" and Smaller	1.5	1,200	106	1,306
Larger Than 8"	2.5	0	30	30
Total		1,200	136	1,336
Number of EDUs		1,800	234	2,034
Percent of EDUs		88.5%	11.5%	100.0%

Exhibit 8 groups customers with devices that are 8" or smaller separately from those with devices that are larger than 8" – this distinction intends to recognize that devices larger than 8" are typically associated with industrial users with the highest fire flow requirements. Based on the number of

EDUs that receive standby fire protection service from the District, private fire lines would be allocated 11.5% of the District's annual cost of fire protection. Applying this percentage to the fire protection share of the 2026 revenue requirement ($2,289,000) results in an allocation of approximately $263,000 in annual costs to private fire lines. The remainder of annual fire protection cost is allocated among the District's other water customers based on their fire flow requirements.

C. RATE DESIGN

The District generally recovers its costs from customers through a series of fixed and variable charges – given that standby fire protection services are typically not expected to use any water except for in unpredictable emergencies, the private fire line rate structure recovers costs exclusively through fixed charges. **Exhibit 9** presents the proposed rate structure for private fire lines:

Exhibit 9: Proposed Rate Structure for Private Fire Lines

Monthly Rate for Private Fire Lines	2022	2023	2024	2025	2026
Devices 8" or Smaller	$85.00	$91.00	$100.00	$105.00	$110.00
Devices Larger Than 8"	$150.00	$155.00	$160.00	$165.00	$170.00

It is worth noting that the rate structure presented in **Exhibit 9** is expected to recover approximately $212,000 per year from private fire lines by 2026, which represents 81% of the cost allocated to them. We recommend that the District re-evaluate these rates periodically as part of future updates to the cost-of-service analysis.