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SPU Wastewater Rates FISC EXH A
August 14, 2018
Version #2



Seattle Public Utilities
2019-2021
Drainage and Wastewater
Rate Study

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PREFACE - STRATEGIC BUSINESS PLAN COMPARISON

Seattle City Council Resolution 31760, adopted November 13, 2017, adopted a six-year Strategic Business Plan Update (“SBP”) for Seattle Public Utilities (“SPU”) which guides utility investments, service levels, and rate paths through 2023. While not a formal rate package, the SBP provides guidance and accountability for the rate setting process, which occurs every three years and which should reflect the SBP and any necessary financial or policy changes. **Table P-1** compares overall wastewater and drainage rate increases required to provide sufficient revenue for 2019-2021 with those in the SBP.

Table P-1: Comparison of Overall Wastewater and Drainage Revenue Requirement Increases

	2019	2020	2021
<u>Wastewater</u>			
Strategic Business Plan	8.1%	9.9%	8.9%
Rate Study	7.5%	7.4%	7.3%
<u>Drainage</u>			
Strategic Business Plan	9.2%	9.7%	9.9%
Rate Study	8.0%	8.0%	8.0%

The increases above include a pass-through of a 2.5% rate increase in 2019 and a 4.5% rate increase in 2021 of the rates charged to SPU by the King County Wastewater Treatment Division. King County treats 99% of Seattle’s sewage and associated rate increases are adopted through a ‘pass-through’ mechanism between rate study years.

Since the adoption of the SBP, strong financial performance and lower than anticipated King County Wastewater Treatment rate increases resulted in lower increases than predicted in the SBP. The impact of these changes for Wastewater and Drainage rates are shown below in **Tables P-2** and **P-3** respectively.

Table P-2: Rate Impacts of Changes Since SBP on Proposed Rate Increases - Wastewater

	2019 \$ Change from SBP	% Change in Revenue Requirement	2020 \$ Change from SBP	% Change in Revenue Requirement	2021 \$ Change from SBP*	% Change in Revenue Requirement
Expenditure						
O&M & Taxes	(3.1)	-1.0%	(1.7)	-0.5%	(0.7)	-0.2%
Capital Financing	(25.9)	-8.6%	38.6	11.7%	2.9	0.8%
Treatment Costs	(11.5)	-3.8%	(11.6)	-3.5%	(10.0)	-2.8%
Total Expenditure Requirement	(40.5)	-13.5%	25.3	7.7%	(7.8)	-2.2%
Other Funding Sources	39.4	13.1%	(32.0)	-9.7%	(0.7)	-0.2%
Change in Revenue Requirement	(1.1)	-0.4%	(6.6)	-2.0%	(8.5)	-2.4%
Strategic Business Plan Rate Increases		8.1%		9.9%		8.9%
Change in Revenue Requirement		-0.4%		-2.0%		-2.4%
Consumption, UDP, Financial Policies		-0.2%		-0.5%		0.8%
Proposed Increases		7.5%		7.4%		7.3%

(\$ in millions)

*Includes estimated passthrough for projected 2021 King County WTD rate increases.

Table P-3: Rate Impacts of Changes Since SBP on Proposed Rate Increases - Drainage

	2019 \$ Change from SBP	% Change in Revenue Requirement	2020 \$ Change from SBP	% Change in Revenue Requirement	2021 \$ Change from SBP*	% Change in Revenue Requirement
Expenditure						
O&M and Taxes	1.9	1.3%	(0.5)	-0.3%	(3.5)	-2.0%
Capital Financing	13.8	9.5%	4.0	2.5%	0.6	0.3%
Treatment Cost	(0.8)	-0.5%	(0.7)	-0.4%	(0.7)	-0.4%
Total Expenditure Requirement	14.9	10.2%	2.8	1.7%	(3.6)	-2.0%
Other Funding Sources	(15.2)	-10.4%	(5.8)	-3.6%	(3.1)	-1.8%
Change in Revenue Requirement	(0.3)	-0.2%	(3.0)	-1.9%	(6.7)	-3.8%
Strategic Business Plan Rate Increases		9.2%		9.7%		9.9%
Change in Revenue Requirement		-0.2%		-1.9%		-3.8%
Consumption, UDP, Financial Policies		-1.0%		0.2%		1.9%
Proposed Increases		8.0%		8.0%		8.0%

(\$ in millions)

*Includes estimated passthrough for projected 2021 King County WTD rate increases.

Projected O&M expenses are lower than projected in the SBP by \$3.1 million in 2019, \$1.7 million in 2020, and \$0.7 million in 2021 for wastewater, and higher in 2019 by \$1.9 million for drainage, but lower by \$0.5 million in 2020 and \$3.5 million in 2021. Overall, this is a \$7.6 million savings over the rate period.

Capital financing needs have risen by \$34.0 million over the rate period. Compared with the SBP, wastewater capital financing needs are projected to be \$25.9 million lower in 2019 but \$38.6 million higher in 2020, while drainage is \$13.8 million higher in 2019 and \$4.0 million higher in 2020. Capital financing is paid through a combination of bonds and operating cash.

These capital financing requirements are balanced by increases in Other Funding Sources, which includes drawdowns of the DWF’s cash balances. These drawdowns are patterned to provide rate stability, resulting in consistent rate increases. Overall, Other Funding Sources reduce the revenue necessary to be collected through rates by \$17.3 million compared to the SBP.

While generally not revenue requirement drivers, Utility Discount Program (UDP) participation and changing consumption patterns are significant rate drivers. UDP discounts are a reduction in rates to certain customers. As a result, increased revenue requirement results in higher overall rates to make up the UDP-related revenue reduction. Proposed rates include an expansion in the UDP program to meet the City and SPU’s affordability goals. Increased sewer consumption can allow the revenue requirement to be spread over more units, which lowers rates. But while the City’s population has significantly increased over the past decade, conservation efforts have offset commensurate increases in consumption. In keeping, SPU anticipates relatively flat growth in consumption, with small increases as construction on new housing and commercial space is completed and filled with consumers. **Table P-4** compares the sewer consumption forecast used in the SBP and the current projection.

Table P-4: Sewer Consumption Forecast (CCF)

	2018	2019	2020	2021
Strategic Business Plan Consumption	21.6	21.6	21.6	21.6
Proposed Consumption	20.3	20.5	20.8	21.0

(CCF in millions)

1. EXECUTIVE SUMMARY

The Drainage and Wastewater Utility provides wastewater and stormwater management services to Seattle residences and businesses, and to a small number of wastewater customers outside city limits. It is supported almost entirely by utility fee revenue. For wastewater, SPU collects fees from based on metered water usage via the SPU combined utility bill. For drainage, SPU charges Seattle property owners based on property characteristics contributing to stormwater run-off. The drainage fee appears as a line item on King County property tax bills. Wastewater and drainage rates consist of a system component, set to recover SPU expenses, and a treatment component, set to recover payments to King County and Southwest Suburban Sewer District, whose facilities treat the wastewater conveyed by SPU's system.

Drainage and wastewater rates were last increased on January 1, 2018, when wastewater rates were increased by 4.1 percent and drainage rates were increased by 10.7 percent. These rates were higher than the 2016-2018 Rate Study due to Council Action in Fall 2017 to smooth rates between 2017-2019. Rate increases for both drainage and wastewater will be necessary in all three years of the rate study period for the DWF to cover increasing operating and capital expenses, which are required to address significant needs for both systems. Cash and debt financing of new capital projects is a major driver of rates for both drainage and wastewater. Some of the major capital programs proposed for 2019-2021 are:

- Consent Decree projects including:
 - Lake Washington Ship Canal Water Quality Project
 - Green Stormwater Infrastructure
- Accelerated infrastructure replacement in conjunction with Move Seattle
- Pipe renewal and rehabilitation
- South Park Pump Station

Per Seattle Municipal Code 21.28.040, the King County treatment rate is adopted via a pass-through mechanism. A 2019 treatment rate increase of 2.5% was adopted by County Council in June 2018 and is incorporated into this rate study; a future increase in 2021, currently projected at 4.5%, will not be adopted until 2020. As a result, legislation adjusting SPU rates for the 2021 treatment rate change will be submitted separately in 2020.

The total projected DWF direct service rate revenue requirement is \$429.5 million in 2019, \$465.8 million in 2020, and \$504.9 million in 2021. Table 1-1 presents the annual revenue requirements and the monthly impact of the proposed fees for different drainage customers and the typical residential wastewater customer. Table 1-1 includes adopted and projected King County treatment rate increases where noted. The 2021 increase has not been adopted by County Council and is subject to change.

Table 1-1: Proposed DWF Revenue Requirement and Bill Impacts with Projected 2021 King County Rate Increase

	2018 Existing Rates	2019 Proposed Change from 2018		2020 Proposed from 2019		2021 Proposed from 2020	
Net Revenue Requirement (\$M)¹							
Wastewater ²	\$274.7	\$288.1	\$13.4	\$313.2	\$25.1	\$340.0	\$26.8
Drainage	\$130.1	\$141.4	\$11.3	\$152.7	\$11.3	\$164.9	\$12.2
Total DWF	\$404.8	\$429.5	\$24.7	\$465.9	\$36.4	\$504.9	\$39.0
Wastewater							
Rate per CCF							
Treatment	\$8.34	\$8.84	\$0.50	\$8.84	\$0.00	\$9.26	\$0.92
System	\$5.12	\$5.64	\$0.51	\$6.71	\$1.07	\$7.42	\$0.72
Wastewater Rate^{1,3}	\$13.46	\$14.48	\$1.01	\$15.55	\$1.07	\$16.68	\$1.14
Typical Monthly Residential Bill ⁴	\$57.88	\$62.26	\$4.38	\$66.87	\$4.61	\$71.72	\$4.85
Typical Monthly Drainage Bills with Passthrough¹							
Typical Residential (5,000-6,999 sq. ft.)	\$40.07	\$43.06	\$2.99	\$46.52	\$3.46	\$50.27	\$3.75
Convenience Store (8,700 sq. ft.)	\$97.77	\$103.75	\$5.98	\$112.09	\$8.34	\$121.12	\$9.03
Supermarket (125,000 sq. ft.)	\$1,404.69	\$1,490.63	\$85.94	\$1,610.42	\$119.79	\$1,740.21	\$129.79

Table I-1 Notes:

1. Bill impacts include an adopted 2.5% increase in the King County treatment rate in 2019 and a projected 4.5% increase in 2021.
2. Wastewater revenue excludes industrial surcharge.
3. "CCF" is an acronym for 'one hundred cubic feet' and is equivalent to 748 gallons.
4. The typical monthly residential wastewater bill is based on 4.3 CCF per month.

2. FINANCIAL POLICY OVERVIEW

The City of Seattle operates an integrated storm and sanitary sewerage system. Although funded through separate rate structures, the City's stormwater ("drainage") and sanitary sewer ("wastewater") systems share common infrastructure, administrative and maintenance services, debt financing, and financial budgeting and reporting systems.

SPU finances the acquisition, operation, and maintenance of Seattle's drainage and wastewater system through the Drainage & Wastewater Fund. An enterprise fund functions like a self-supporting business that must generate operating revenues, predominantly through user charges (or "rates"), which are sufficient to cover all operating costs and meet financial policy targets. Separate drainage and wastewater service charges, or rates, are the source of most revenues. Non-rate revenues include permit fee revenue, operating grants, capital grants, and contributions in aid of construction ("CIAC"). These non-rate revenues reduce the amount of revenue that must be recovered through rates.

Financial policies provide a guiding framework for DWF finances. The policies help determine how much DWF revenue SPU must collect from its customers each year to remain financially healthy while meeting its financial obligations. These policies provide a comprehensive, inter-connected framework wherein each policy reinforces the others. For example, debt service coverage is maintained by raising enough excess operating revenue over the minimum cash obligations to meet ongoing operations and debt service payments. This in turn leads to higher levels of operating cash and a lower debt-to-asset ratio. Build ups in operating cash can be contributed to CIP, lessening the need for future debt issuances, lowering the revenue required to meet debt service coverage.

The financial policy that requires the highest level of revenue to be satisfied is the "binding constraint." If revenue were to be lowered beyond that level, the binding constraint financial policy would not be met. Currently, the DWF is very close to bumping up against three binding constraints. The first is debt service coverage with taxes, followed by cash contributions to CIP, and finally year-end operating cash balance. Reducing rate increases below the proposal would hamper SPU's ability to meet the necessary year-end debt service coverage target and put at risk the Fund's bond rating.

In addition, financial policies:

- Shape the financial profile that SPU presents to lenders and other members of the financial community
- Establish DWF's exposure to financial risk
- Allocate DWF's costs between current and future ratepayers

DWF financial policies were adopted by City Council in 2003 by Resolution 30612 and reviewed in 2012 under Statement of Legislative Intent No. 13-1-A-1. The policies and associated targets, as well as their importance are as follows:

Operating Cash Balance

The year-end operating cash balance should be at least equal to one month's contract expenses.

The purpose of the cash balance target is to have sufficient cash on hand to pay operating expenses, taking into account the lag between cash disbursements and cash receipts, and to provide a reserve against projection variances. Contract costs for treatment of sewage and stormwater by King County is the DWF's largest expense, thus it is used as a proxy for the DWF cash balance target. In 2017, one month of treatment expenses was \$13.6 million. SPU uses an internal planning target of 45-days operating expenses. In 2017 this target was \$42.5 million. SPU's rate proposal maintains a higher year-end cash balance of \$77 million in 2021. This higher cash balance, in addition to maintaining a high debt service coverage ratio as described above, will enable the DWF to better manage its bond rating as it places SPU closer to peer utilities to which rating agencies compare when determining the DWF's rating

before a bond issuance. Part of the evaluation criteria rating agencies utilize is to benchmark various financial metrics of the DWF to utilities of similar size and services. Reducing proposed rates would reduce DWF revenue below the level required to achieve the target of \$77 million, making this level of operating cash a binding constraint. Operating cash is a binding constraint in addition to cash contribution to the capital improvement program below.

Cash Contribution to the Capital Improvement Program

The cash contribution to the CIP should be at least 25% of total CIP expenses based on a four-year average.

This policy helps to prevent a rapid increase in debt levels and limits the escalation in the debt-to-asset ratio. The four-year rolling average of cash contribution to the CIP is expected to be 25% for the rate study period. SPU has proposed rates that enable the DWF to collect enough revenue which along with balanced operating cash drawdowns will allow a contribution of \$215 million to a projected \$845 million in investment (25.4%). Reducing proposed rates would not produce enough revenue to meet the 25% cash contribution target without lowering operating cash revenues below \$77 million. These two policies are the joint binding constraints in the rate period.

Debt Service Coverage Ratio

Debt Service Coverage should be at least 1.8 times debt service cost in each year on a planning basis.

A higher debt service coverage ratio means that more revenue is available after debt payments are made. This reduces financial risk and provides more flexibility to respond to revenue shortfalls. SPU rates assume maintaining a higher debt service coverage ratio of at least 2.0 without taxes and 1.5 with taxes based on feedback from the City's financial advisors and rating agencies (Standard and Poors' and Moody's). This level of debt service will defend the DWF's bond rating during a time of increased capital investment. SPU plans to issue, on average, over \$200 million of debt each year of the rate period resulting in an additional \$56 million of debt service. A potential downgrade would lead to higher interest rates, raising the annual debt service obligation by at least \$1.0 million per year. In addition to increased monetary obligations to be incurred in the coming years, the downgrade is long-term damage to SPU's credit worthiness, which is not easily reversible, and would limit SPU's financial flexibility in meeting future capital investment or resiliency needs for the coming decades.

A growing Capital Improvement Program (CIP) necessitates the issuance of debt and maintaining a strong bond rating will enable debt financing at continued favorable interest rates, ensure future financial flexibility, and ultimately lower long-term rates for customers.

Projected coverage, including coverage for a new bond issue in each year of the rate period, is above both the legal bond covenant requirement (1.25) and the policy target (1.80).

Net Income

Net income should be generally positive.

Positive net income is a contingency against projection variances and uncertainties regarding revenues. It is also a signal to bond rating agencies that the City is committed to establishing fees that cover costs. Net income is projected to be positive for 2019, 2020, and 2021.

Debt to Asset Ratio

The ratio of debt to assets should not exceed 70%.

This ratio is an indicator of reliance on debt for infrastructure financing. A high ratio suggests less flexibility, as a greater portion of each year's revenues is used to repay debt. Over the rate period, the debt-to-asset ratio is expected to remain below the 70% threshold.

Variable Rate Debt

No more than 15% of total debt should be variable rate debt.

A cap on variable rate debt balances the advantages of lower interest costs with the risk of unexpected increases in interest rates. The DWF currently does not have any variable rate debt and does not plan to issue any variable rate debt.

Financial Policy Performance

Table 2-1 presents DWF actual and projected performance of financial policy targets from 2017 to 2023.

Table 2-1: DWF Financial Policy Performance 2017-2023

Policy / Target	2017 Actual	2018 Projected	2019 Proposed	2020 Proposed	2021 Proposed	2022 Estimated	2023 Estimated
Net Income <i>Generally Positive</i>	\$30.7	\$18.6	\$30.2	\$42.8	\$50.3	\$58.5	\$63.4
Debt Service Coverage <i>1.8x (without taxes)</i>	2.7	2.0	2.4	2.2	2.2	2.1	2.1
Debt Service Coverage ¹ <i>1.5x (with taxes)</i>	1.8	1.3	1.6	1.5	1.5	1.5	1.5
Cash Balance Year End ¹ <i>45 Days of Operating Expense²</i>	\$164.5	\$168.0	\$138.7	\$92.2	\$77.2	\$72.2	\$72.2
Cash Financing of CIP ¹ <i>25% (4-year average)</i>	30%	14%	30%	33%	21%	27%	35%
Debt-to-Asset Ratio <i>Less than or equal to 70%</i>	65%	57%	62%	64%	65%	64%	62%
Variable Rate Debt <i>Less than or equal to 15%</i>	0%	0%	0%	0%	0%	0%	0%

¹Debt service coverage with Taxes, cash balance at year end, and cash financing of the CIP are the binding constraints

²Internal planning target. Official target is 1-month treatment contract expense

3. REVENUE REQUIREMENT

Financial policies provide a guiding framework for drainage and wastewater finances. The policies help determine how much DWF revenue SPU must collect from its customers each year to remain financially healthy. In any year (on a planning basis), the desired revenue requirement is the lowest amount of money necessary to simultaneously satisfy all financial policies in that year. At this desired revenue, some financial policies may be exceeded, but none will be missed – the financial target that is met last is known as the “binding constraint.” For this rate proposal, the binding constraints are debt service coverage with taxes, the sum of cash required to meet year-end cash balance, and CIP cash financing targets. The rates revenue requirement is equal to the total revenue requirement necessary to meet the binding constraint, less any non-rates revenues. Drainage and wastewater service fees (or “rates revenues”) typically account for over 95 percent of drainage and wastewater revenues. Non-rate revenues include permit fees, miscellaneous operating revenues, interest income, operating grants, capital grants, and contributions in aid of construction.

Tables 3-1 and 3-2 summarize the components of change in the drainage and wastewater revenue requirement for 2019, 2020, and 2021. These tables include the impact of the King County treatment increase in 2019 and a projected increase in 2021. No increase is expected in 2020. The top sections of these tables present the components of expense which make up the total revenue requirement. The bottom section of these tables presents other sources of funding which reduce the amount of expense which must be recovered through direct service rates. Following the tables below is a more detailed description of the components of change in the revenue requirement.

Table 3-1: Components of the Change in the Wastewater Revenue Requirement

Expense	2018	2019	\$ Change in Rev Req	% Change in Rev Req	2020	\$ Change in Rev Req	% Change in Rev Req	2021	\$ Change in Rev Req	% Change in Rev Req
O&M										
Base O&M	\$49.7	\$54.5	\$4.8	1.7%	\$58.6	\$4.1	1.4%	\$62.9	\$4.3	1.4%
Taxes	\$35.5	\$38.6	\$3.1	1.1%	\$42.3	\$3.7	1.3%	\$46.1	\$3.8	1.2%
Total	\$85.2	\$93.1	\$7.9	2.9%	\$100.9	\$7.8	2.7%	\$109.0	\$8.1	2.6%
King County Treatment	\$151.1	\$154.1	\$3.0	1.1%	\$156.2	\$2.0	0.7%	\$165.3	\$9.1	2.9%
Capital Financing										
Cash	\$21.1	\$31.3	\$10.2	3.7%	\$67.4	\$36.1	12.5%	\$45.4	(\$22.0)	-7.0%
Debt Financing	\$23.6	\$27.5	\$3.9	1.4%	\$34.0	\$6.5	2.2%	\$39.1	\$5.1	1.6%
Total	\$44.7	\$58.8	\$14.1	5.1%	\$101.4	\$42.6	14.8%	\$84.5	(\$16.9)	-5.4%
Total Revenue Requirement	\$281.0	\$306.1	\$25.1	9.1%	\$358.5	\$52.4	18.2%	\$358.7	\$0.3	0.1%
Other Funding Sources										
Non-Rates Revenue	(\$5.4)	(\$9.3)	(\$3.9)	-1.4%	(\$9.0)	\$0.3	0.1%	(\$9.1)	(\$0.0)	0.0%
Cash Balance Adjustment	(\$9.1)	(\$8.7)	\$0.4	0.1%	(\$36.3)	(\$27.6)	-9.6%	(\$9.7)	\$26.6	8.5%
Net Rates Revenue Requirement	\$274.7	\$288.1	\$13.6	4.9%	\$313.2	\$25.1	8.7%	\$340.0	\$26.9	8.6%
Impact of Demand/UDP				2.6%			-1.3%			-1.3%
Effective Change in Rate				7.5%			7.4%			7.3%

(\$ millions); Total net rates revenue requirement does not include industrial surcharge

Table 3-2: Components of the Change in the Drainage Revenue Requirement

Expense	2018	2019	\$ Change in Rev Req	% Change in Rev Req	2020	\$ Change in Rev Req	% Change in Rev Req	2021	\$ Change in Rev Req	% Change in Rev Req
O&M										
Base O&M	\$59.6	\$68.9	\$9.3	7.2%	\$70.7	\$1.8	1.3%	\$72.2	\$1.5	1.0%
Taxes	\$16.4	\$18.4	\$2.0	1.5%	\$19.9	\$1.5	1.0%	\$21.5	\$1.6	1.0%
Total	\$76.0	\$87.3	\$11.3	8.7%	\$90.6	\$3.2	2.3%	\$93.6	\$3.1	2.0%
King County Treatment										
	\$9.5	\$9.9	\$0.4	0.3%	\$10.1	\$0.1	0.1%	\$10.6	\$0.6	0.4%
Capital Financing										
Cash	\$5.2	\$25.7	\$20.5	15.8%	\$11.9	(\$13.9)	-9.8%	\$7.4	(\$4.5)	-2.9%
Debt Financing	\$40.9	\$43.4	\$2.5	1.9%	\$53.6	\$10.2	7.2%	\$61.7	\$8.1	5.3%
Total	\$46.1	\$69.1	\$23.0	17.7%	\$65.5	(\$3.7)	-2.6%	\$69.1	\$3.6	2.4%
Total Revenue Requirement										
	\$131.6	\$166.4	\$34.8	26.8%	\$166.1	(\$0.3)	-0.2%	\$173.4	\$7.3	4.7%
Other Funding Sources										
Non-Rates Revenue	(\$3.3)	(\$4.5)	(\$1.2)	-0.9%	(\$3.5)	\$1.0	0.7%	(\$3.5)	(\$0.1)	0.0%
Cash Balance	(\$2.0)	(\$20.4)	(\$18.4)	-14.2%	(\$9.9)	\$10.5	7.4%	(\$4.9)	\$5.0	3.3%
Adjustment	\$3.8									
Net Rates Revenue Requirement										
	\$130.1	\$141.4	\$11.3	8.8%	\$152.7	\$11.3	8.0%	\$164.9	\$12.2	8.0%
Impact of Demand/UDP				-0.8%			0.0%			0.0%
Effective Change in Rate				8.0%			8.0%			8.0%

(\$ millions)

3.1. Operations and Maintenance (O&M)

The drainage and wastewater O&M revenue requirement includes direct operating expense associated with managing sanitary sewer and stormwater programs (i.e., regulatory oversight, community outreach and education) and aggressively maintaining the system infrastructure, as well as a portion of DWF shared administrative expense. As operating expenses are budgeted for the DWF as a whole and not by line of business (wastewater or drainage), operating expenses must be assigned to each line of business in order to establish separate revenue requirements for rate-setting purposes. The factors used to assign expense between the two lines of business are periodically updated, which can result in changes in the share of expense paid by either wastewater or drainage.

The O&M enables SPU to continue to provide core services to customers, invest in critical capital assets, and meet federal mandates. The majority of SPU's increases since the 2016-2018 rate study are related to updated inflation assumptions and new expenses identified in the SBP. These include increased regulatory requirements, transportation-related projects, and various projects further discussed in the following sections.

Allocation Revision in Detail

Operating expenses are budgeted for the DWF as a whole and individually between wastewater or drainage. Consequently, operating expenses must be assigned to each line of business to establish separate revenue requirements for rate-setting purposes. SPU has developed a series of factors to assign cost, by budget activity, to wastewater and to drainage.

The DWF budgeted O&M expenses include both line-of-business-specific expenses (e.g., water quality monitoring or wastewater treatment), as well as shared administrative and business support expense. Shared expenses are assigned to each line of business based on prior period actual direct labor expense or on management estimates (where labor expense is not appropriate).

As part of the current rate study, SPU reviewed the existing labor-based cost assignment factors and adjusted the allocation based on 2017 actual spending. While some areas saw increases in the wastewater share, the net cost shift because of this update was a shift from wastewater to drainage. Table 3-3 presents a summary of 2017 cost assignment changes by program. The change in allocation based on 2017 actual data shifts the allocation of O&M to drainage from 52.4% of total pre-adjusted base O&M to 53.6%. Appendix D provides more detailed information on the cost assignment process.

Table 3-3: Change in Drainage Share of DWF O&M Spending

Program	2016-2018 Allocation	Updated Allocation
Customer Service	31.9%	34.3%
Director's Office	59.6%	55.7%
Project Delivery	58.8%	57.1%
Pre-Capital Planning & Development	50.4%	53.4%
Field Operations	47.2%	55.3%
Finance & Administration	52.5%	50.8%
Utility Systems Management	69.3%	55.0%
SPU General Expenses	55.1%	57.8%
Drainage Weighted Average	52.4%	53.6%
Total DWF O&M	\$123.4	\$123.4
Drainage Share of Total O&M	\$64.7	\$66.2
<i>Wastewater Share</i>	<i>\$58.7</i>	<i>\$57.2</i>

(\$ in millions)

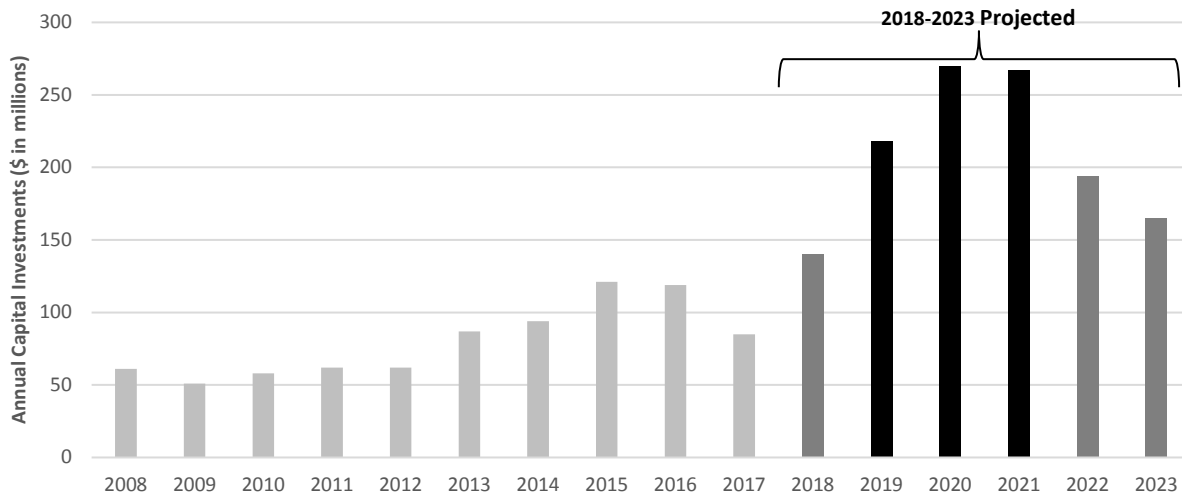
3.2. Capital Financing Expense

The DWF funds capital projects through a combination of cash (from direct service and non-rates revenue) and debt financing (revenue bonds).

Capital Improvement Program

The 2019-2021 rate proposal includes an average of \$245 million of capital investment annually, up from an average of \$80 million per year over the past decade. The increase is driven primarily by the Ship Canal Water Quality Project and other activities intended to bring SPU into compliance with Federal water quality regulations. The remainder of planned investment consists of rehabilitation and upgrade of pipes and pump stations, flood control, and dispersed green stormwater infrastructure projects, with smaller amounts for operations facilities and decant and dewatering facilities. SPU has also identified opportunities to reduce long term capital investment program expenses by moving up planned replacement and upgrade of pipes to coincide with Seattle Department of Transportation levy-related transportation work. The CIP plan includes \$78 million for transportation-related utilities work.

Figure 3-1: Annual Historic and 2018-2023 Planned Capital Investments



Financial policies require the DWF to fund a minimum of 25% of CIP through operating cash over a 4-year average. For the proposed 3-year rate period, the 4-year average is calculated using the years 2018-2021. The target minimum requirement for these 4-years is \$211 million out of a total CIP of \$845 million (\$861 million planned less an accomplishment rate of 97.5% except for 100% on combined sewer overflow (CSO) projects including the Ship Canal WQ project). However, SPU plans to fund an additional \$3.5 million of CIP through operating cash as part of its cash management policies.

Debt Service

SPU has typically issued \$60 to \$100 million in new DWF revenue bonds every other year. Increased investment in the current SBP period (2018-2023) will require larger, more frequent issues including \$240 million in 2019, \$210 million in 2020, and \$169 million in 2021. These issues will add, respectively, \$22 million, \$19 million, and \$15.4 million to debt service in the year following each issue. SPU will continue to pursue alternative forms of financing including grants and Washington State Department of Ecology State Revolving Fund (SRF) and US Environmental Protection Agency Water Infrastructure and Finance Innovation Act (WIFIA) loans when these alternative financing options provide long-term rate relief.

Annual debt service is proportioned between drainage and wastewater based on the net book value of current fixed assets (“asset basis”). This methodology, which is similar to that used by SPU’s Water and Solid Waste funds, correlates financing expense with the assets actually financed.

Cash Financing

Financial policy targets are directed toward the financial performance of the total DWF. No formal, separate policy targets have been adopted for the drainage and wastewater program. SPU meets financial targets by balancing revenue requirements and rate changes between wastewater and drainage.

The cash-financing target of 25% is determined using an average over a 4-year period, which includes the year before the rate study period. For 2029-2021 rates, the target of 25% must be met over the 4-year period of 2018 through 2021. Due to lower than anticipated CIP in 2017, bond funds were not drawn down as quickly as projected at the time of issue. In order to draw down bond funds, 2018 cash-to-CIP will be lowered from the standard 25% to 14%. At this level of 2018 funding, the 2015-2018

average will be 25%. Cash contributions to CIP will be increased in the years 2019-2021 to achieve a 25% average as displayed in Table 3-4.

Table 3-4: Projected Cash Financing of CIP

	2018	2019	2020	2021	Total / Average
Cash and Grant Funded	\$17.2	\$59.8	\$82.1	\$55.5	\$214.6*
Bond-Funded	\$109.7	\$142.5	\$169.5	\$208.7	\$630.4
Total CIP	\$126.9	\$202.3	\$251.5	\$264.2	\$844.9
Cash-Funded %	14%	30%	33%	21%	25%

(\$ in millions)

* The minimum cash contribution is \$211 million

3.3. Use of Cash Balances

Revenue generated by rates is used to fund current operating expenses, maintain a cash balance as a safeguard against unexpected expense, and fund a portion of the current CIP. Net cash revenue is equal to total cash revenue less total cash expense, and for a given year net cash revenue may be positive or negative. This differs from net income which includes non-cash items such as depreciation, amortization, and environmental liabilities, and excludes cash expenses such as debt service principal payments. A change in net cash revenue from one rate period to the next will impact the revenue requirement. An increase in total net cash revenue will drive a revenue requirement increase while a decrease will reduce the revenue requirement.

DWF cash balances will be reduced from \$166 million at the beginning of 2018 to \$77 million by the end of 2021. The reduction in cash balances is intended to provide rate smoothing against increased investment needs and debt service obligations. Cash balance reductions will reduce the wastewater revenue requirement by \$8.7M in 2019, and \$36.3 million in 2020, and \$9.7 million in 2021. The drainage revenue requirement is lowered by \$20.4 million in 2019, \$9.9 million in 2020, and \$4.9 million in 2021.

3.4. Non-Rate Revenue

Non-rate revenue includes permit fees, operating and capital grants, contributions in aid of construction, interest income, other miscellaneous revenues, and capital contributions. An increase in non-rate revenues has the effect of reducing the revenue requirement that must be recovered through rates. Grants, contributions, miscellaneous revenues, and permit fees are conservatively held flat in this proposal as it is not fiscally prudent to pattern rates on unsecured revenue, however SPU expects to increase outside sources of funding wherever opportunities can be identified.

4. PROPOSED WASTEWATER RATE

4.1. Overview

City of Seattle residents pay a single fee per CCF of wastewater based on water consumption. This single fee is composed of two components, a system rate and a treatment rate, which are adopted through two discrete processes. The system rate is proposed by the Executive and formally adopted by Council. The treatment rate, which is adopted by King County, is presented to Council in the form of a memorandum and adopted outside of the formal rate study process as a pass-through.

4.2. Proposed 2019-2021 Wastewater Rates

Table 4-1 presents the proposed 2019 through 2021 wastewater rates, and the impact of the adopted 2019 and proposed 2021 King County treatment rate increases.

Table 4-1: Proposed 2019-2021 Wastewater Rate (per CCF)

	2018	2019	2020	2021
	Adopted	Proposed	Proposed	Proposed
System Rate (SPU)	\$5.12	\$5.64	\$6.71	\$7.42
Treatment Rate (KC)	\$8.34	\$8.84	\$8.84	\$8.84
Future Estimated Pass Through (KC)*				\$0.42
Total Wastewater Rate	\$13.46	\$14.48	\$15.55	\$16.68

**The passthrough assumes a 4.5% increase in the King County treatment rate in 2021*

4.3. Treatment Rate

Payments to King County¹ for wastewater treatment are the single largest component of both wastewater and total DWF operating expense. The inability to fully recover this expense through rates could seriously impact DWF financial performance. To mitigate this risk the Council adopted Ordinance 122292, providing for an annual adjustment to the treatment rate when there is a change in the underlying cost drivers. The formula for this adjustment is defined in the ordinance, allowing for the treatment rate to be adopted outside of a normal rates process. The formula is as follows:

$$\text{Projected wastewater treatment expense} / \text{Projected annual wastewater volumes} \\ \times$$

A 18.7 percent multiplier (to recover revenue reductions and revenue taxes)

Projected treatment expense includes an adjustment for cash lags in the full recovery of treatment expense in years in which there is a rate increase. For the purposes of this calculation, treatment expense excludes the portion of budgeted treatment expense associated with King County's High Strength Industrial and Contaminated Stormwater Surcharges. These expenses are recovered directly from applicable customers and not through the wastewater direct service rate.

The City recovers wastewater expense exclusively through a volume-based fee. However, the County charges a fixed rate per residential premise, while commercial water volumes are converted to a "Residential Equivalent Unit" (REU) and charged accordingly based on flow treated. Residential flows account for about 36 percent of total sewer volumes (and therefore total City revenues). Charges for residential premises account for about 40 percent of total treatment expense paid to the County.

¹ King County treats over 99 percent of the City's sewage. The Southwest Suburban Sewer District treats the remainder.

Consequently, if the County treatment rate is held constant but Seattle billed wastewater volumes decline, the resulting decrease in the City’s wastewater revenues will be greater than the associated decline in treatment expense paid to King County.

4.4. SPU System Rate

The system component of the SPU wastewater rate is proposed by the Executive via ordinance, with this rate study document as an exhibit, and adopted through City Council’s normal legislative process. The system rate recovers all other operating expense, including operations and maintenance expense, capital financing expense (debt service and cash), and related revenue taxes. This component of the rate is also set to ensure that financial policy targets are met in the case that the revenue required to meet the targets exceeds the revenue required to recover operating expense (see Section II of this proposal for more detail).

The current proposed wastewater system rates are presented in Table 4-2.

Table 4-2: 2019-2021 Wastewater System Expense

	2019	2020	2021
Net Revenue Requirement (\$ in millions)	\$288.1	\$313.2	\$340.0
Revenue Lags & Leads	(\$0.3)	\$0.0	\$0.0
Non-Payment & UDP	\$4.4	\$5.1	\$5.3
Less Unadjusted Treatment Expense	\$152.7	\$154.8	\$163.8
Less Tax	\$23.7	\$24.2	\$25.7
Total Expense Increase	\$115.8	\$139.3	\$155.9
Projected CCF	20.5	20.8	21.0
System Rate per CCF	\$5.64	\$6.71	\$7.42

(CCF millions)

Tables 4-3, 4-4 and 4-5 present the 2019 through 2021 Sources and Uses of system and treatment revenue/expense, assuming proposed rates and spending.

Table 4-3: 2019 Change in Wastewater System & Treatment Expense

	System	Treatment	Total Wastewater
Wastewater Rates	\$112.2	\$175.9	\$288.1
Other Operating Revenue	\$6.4		\$6.4
Non-Operating Revenue	\$2.9		\$2.9
Total Sources	\$121.5	\$175.9	\$297.4
O&M	\$54.5	\$154.1	\$208.6
Taxes	\$15.8	\$22.9	\$38.6
Debt Service	\$27.5		\$27.5
Cash Financing of CIP	\$31.3		\$31.3
Total Uses	\$129.1	\$177.0	\$306.1
Sources net of Uses	\$(7.6)	\$(1.1)	\$(8.7)

Table 4-4: 2020 Change in Wastewater System & Treatment Expense

	System	Treatment	Total Wastewater
Wastewater Rates	\$135.1	\$178.1	\$313.2
Other Operating Revenue	\$6.4		\$6.4
Non-Operating Revenue	\$2.6		\$2.6
Total Sources	\$144.1	\$178.1	\$322.2
O&M	\$58.6	\$156.2	\$214.7
Taxes	\$18.9	\$23.4	\$42.3
Debt Service	\$34.0		\$34.0
Cash Financing of CIP	\$67.4		\$67.4
Total Uses	\$178.9	\$179.6	\$358.5
Sources net of Uses	\$(34.8)	\$(1.5)	\$(36.3)

Table 4-5: 2021 Change in Wastewater System & Treatment Expense

	System	Treatment	Total Wastewater
Wastewater Rates	\$151.3	\$188.7	\$340.0
Other Operating Revenue	\$6.6		\$6.6
Non-Operating Revenue	\$2.5		\$2.5
Total Sources	\$160.3	\$188.7	\$349.1
O&M	\$62.9	\$165.3	\$228.2
Taxes	\$21.2	\$24.9	\$46.1
Debt Service	\$39.1		\$39.1
Cash Financing of CIP	\$45.4		\$45.4
Total Uses	\$168.5	\$190.2	\$358.7
Sources net of Uses	\$(8.2)	\$(1.5)	\$(9.7)

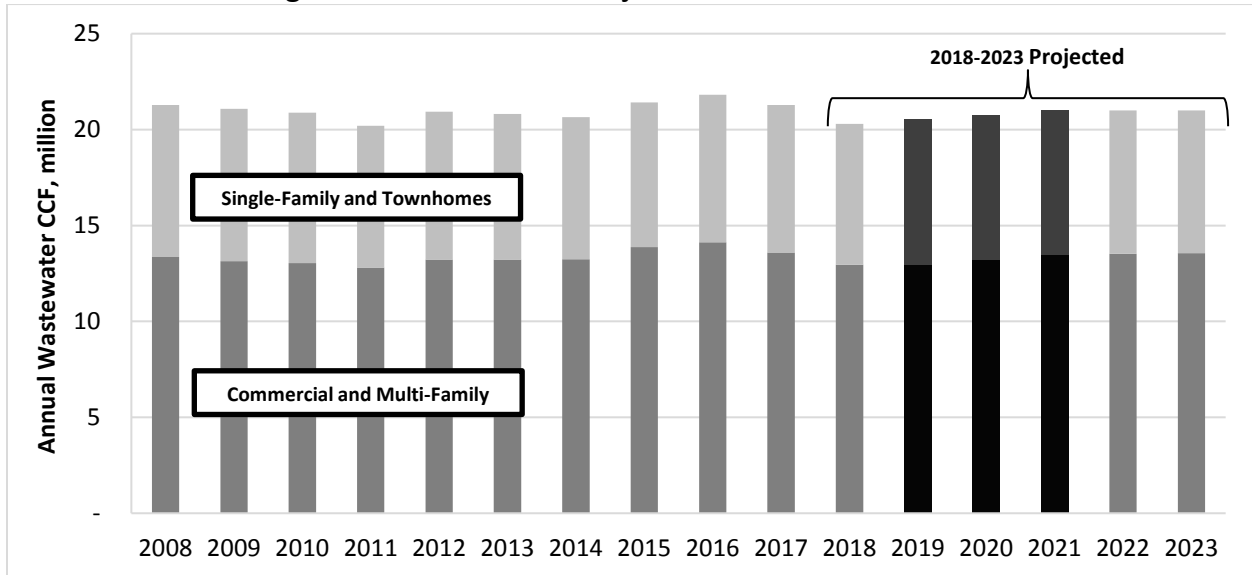
Includes a projected 4.5% increase in the King County treatment rate

4.5. Wastewater Demand

Since the 2008 Financial Crisis, the City has increased in population by 21% and increased the number of housing units by 18%. The increase in population was accommodated through infill development primarily replacing older, less-efficient single-family houses with modern townhomes and multi-family buildings built to stricter resource efficiency standards. Due to these standards, conservation work on existing buildings, and more resource-conscious customer behavior, total wastewater volumes remained unchanged at 21 million CCF between 2008 and 2017. Volumes from the commercial and multi-family sector have been increasing 0.2% per year, balanced by a 0.3% average annual decrease in single-family and townhome volumes. This proposal starts from an expected down year of 20.5 million CCF in 2018 based on YTD results as of June 2018 and historical patterns and increases volumes to return to 21 million CCF by 2021.

Overall consumption is expected to remain at close to 21 million CCF per year, with a slight increase in commercial consumption balancing out a slight decline in single-family consumption. Consumption through the end of the SBP period in 2023 is expected to remain at 21 million CCF.

Figure 4-1: Historic and Projected Wastewater Volumes



As overall sewer consumption declines, sewer rates must rise to obtain required revenues. Most costs to the line of business do not vary with volume. There is very little expense elasticity relative to changes in wastewater volumes for several reasons, including:

- SPU system operating expenses are typically not capacity-driven, with maintenance focused on the existing network;
- SPU customer service expense is account, not demand driven;
- A large component of the rate base, existing debt service, is fixed;
- New capital investments are typically not capacity-driven; and
- The King County treatment bill is volume-based for commercial customers but premise-based for residential customers.

5. DRAINAGE COST ALLOCATION / RATE DESIGN

Once the rates revenue requirement is set, it is assigned to different customer classes. A customer class is a group of customers that places a unique cost on the utility or is administratively easier to serve as a group. In the case of drainage, there is a unique cost of service associated with the management of stormwater run-off from different types of land cover found on customer properties. These land cover types essentially act as customer classes for drainage cost allocation purposes.

The steps required to allocate drainage system costs to land surface types and then to drainage customer rates can be summarized as follows:

- Drainage costs are grouped into two broad classifications: account-allocated expense and flow-allocated expense
- Flow-related costs are further allocated between four surface type categories based on cost weighted average run-off
- A unit rate for account costs and for each surface type is developed based on the total number of accounts and square footage of land surface by type city-wide
- Rates are developed for each customer class by applying the surface type unit rates to the typical surface type composition for each tier

5.1. Drainage Allocation Classifications

Drainage rates are composed of four distinct components, in addition to the account rate: impervious surface rate, managed grass rate, unmanaged grass rate, and good forest rate.

The account rate recovers costs related to customer billing and customer service, including King County charges for Drainage Billing System administration, SPU customer property data management expense and SPU customer service support. These expenses are driven by the number of customers served rather than by property characteristics.

The four surface type rates recover all other drainage system expense contained in the drainage rate revenue requirement, as further described in Chapter 3 of this rate study. Total flow-related expense is allocated based on the cost of managing the run-off from any given surface type, as further described in Section 5.2.

Below, Table 5-1 breaks out the flow-allocated expense and the account-allocated expense components of the rates revenue requirement by year.

Table 5-1: Drainage Rates Revenue Requirement by Allocation Classification

	2019	2020	2021
Flow-allocated expense	\$120,707	\$130,448	\$141,004
Account-allocated expense	\$2,329	\$2,390	\$2,440
Total	\$123,036	\$132,838	\$143,444

(\$ in thousands)

5.2. Flow-related Expense Allocation

The amount of run-off from any given parcel depends on the type of surface it contains. Impervious surface absorbs less run-off than pervious, or porous surface, and therefore generates more stormwater run-off during a given storm event. Likewise, pervious surface with significant ground and tree cover will generate less run-off than a highly managed pervious surface such as a lawn. The more intense the storm, the greater the run-off for all surface types.

Four surface types are considered in setting Seattle drainage rates:

- Impervious
- Pervious-managed grass
- Pervious-unmanaged grass
- Pervious-good forest

Impervious surface is hard or compacted surface from which most water runs off when exposed to rainwater. Common impervious surfaces include roof tops, concrete or asphalt paving, compact gravel and packed earth. Pervious managed grass is the most common type of pervious area in the City and includes such surfaces as lawns, landscaped parks, and golf courses. Managed grass absorbs nearly all rainwater during average storms but produces increasing amounts of run-off with more intense storm events due to its greater soil compaction. The last two types of pervious area, woods and unmanaged grass and good forest, are vegetated surfaces of a specific types such as forests or non-forested land that are in the natural progression back to a forested state. This category includes large undeveloped areas in places such as Seward Park, Carkeek Park, and various greenbelts throughout the City. These surface types perform similarly to managed grass during average storm events but infiltrate significantly more rainwater during more intense storms.

To determine the cost of managing the run-off from any given surface type, SPU looked at two factors:

- The expected volume of run-off from each surface type during differing intensities of storms
- The cost of O&M and infrastructure oriented towards the management of the run-off during each of these storm event

The resultant cost weighted run-off percentages, as presented in Table 5-2 below, represent the percentage of the flow-allocated revenue requirement assigned to each surface type. See Appendix E for the step by step calculation underlying these cost shares.

Table 5-2: Revenue Requirement Cost Shares by Surface Type

	% of Drainage Revenue Requirement
Account*	1.8%
Impervious	81.1%
Pervious – Managed Grass	15.2%
Pervious – Woods and Unmanaged Grass	1.4%
Pervious – Good Forest	0.5%

**Account costs are the per-account costs of drainage billing*

5.3. Revenue Requirement Allocation

Table 5-3 presents the revenue requirement allocation for account and surface type rates. The surface type rate allocations are calculated by applying the flow-based cost share percentages found in Table 5-2 to total flow-allocated expense. These cost class allocations are then used in the development of drainage rates for each customer tier, as further described in Section 5.4.

Table 5-3: Revenue Requirement Allocation by Type

	2019	2020	2021
Account	\$2.6	\$2.8	\$3.0
Impervious	\$114.7	\$123.9	\$133.7
Pervious – Managed Grass	\$21.5	\$23.2	\$25.1
Pervious – Woods and Unmanaged Grass	\$2.0	\$2.1	\$2.3
Pervious – Good Forest	\$0.7	\$0.8	\$0.8
Total Revenue Requirement	\$141.5	\$152.7	\$164.9

(\$ in millions)

5.4. Drainage Rate Design

Drainage customer bills are intended to recover the cost of service associated with managing the stormwater run-off from individual parcels. In the first part of this chapter, SPU defines the cost of service associated with managing the run-off from different land surface types and with account-related services. The following steps are required to develop drainage rates which assign these costs to individual customer parcels:

- Define customer classes and rate tiers for parcels with similar surface type characteristics (and therefore similar costs of service)
- Develop unit rates for each surface type and account classification
- Determine an average customer land composition profile for each rate tier
- Apply the surface type and account unit rates to applicable profile factors for each tier

Customer Classes and Tiers

Small Residential

Small residential customers with billable areas less than 10,000 square feet are homogeneous in terms of surface cover, which makes property size the key determinant of parcel stormwater flow contribution. Small residential customers are assigned to one of five size-based categories, each representing a range of total area (e.g., 3,000 to 4,999 square feet).

Large Residential and General Service

Large single family and duplex parcels 10,000 square feet or greater (“large residential”) and general service parcels (all sizes), pay a unit rate (per 1,000 square feet of billable area) based on their actual property characteristics (percent impervious and parcel size) rather than category averages. There is too much variation between these properties in terms of parcel size and surface characteristics to be fairly captured by a flat rate structure like that applied to small residential customers. SPU has five impervious

surface-based rate categories. Each category represents a range of impervious surface (e.g., 66-85% impervious).

General service and large residential parcels which contain significant amounts of highly pervious (absorbent) area, such as forested land or other unmanaged vegetated areas such as pasturelands and meadows, and which are composed of no more than 65% impervious area, may also qualify for discounted low impact rates. Parcels with these surface types generate significantly less stormwater run-off than parcels with similar amounts of impervious surface but whose pervious area is less absorbent (e.g., a highly managed lawn).

Account and Surface Type Unit Rates

Unit rates for each surface type and for account-allocated expense are calculated as described below.

Surface Type Rates

Unit rates are calculated by dividing the expense allocated to each surface type by the total citywide area for that surface type (as expressed in thousands of square feet). Area by surface type is collected from aerial photos in the City’s Geographic Information System (GIS). This same data source is used to identify the area of each surface time for each city parcel, used for drainage billing purposes.

Table 5-4 presents the area units and calculated unit rates for each surface type.

Table 5-4: Surface Type Unit Rates (per 1,000 square feet) & Area by Type Citywide

	Thousands of sq. ft.	2019	2020	2021
Impervious	794,846	\$147.15	\$158.98	\$171.79
Pervious - Managed Grass	659,787	\$33.31	\$35.99	\$38.89
Pervious - Woods and Unmanaged Grass	105,934	\$18.70	\$20.21	\$21.83
Pervious - Good Forest	54,389	\$12.39	\$13.38	\$14.46

Account Rates

Account expense is driven by the number of customers rather than by the volume of run-off. To determine these rates, the account-allocated component of the revenue requirement is first assigned to small residential and general service/large residential customer groups based on the number of customers in each group. Small residential parcels (139,200) account for 78 percent of the total and general service and large residential parcels (38,700) account for 22 percent of the total.

The account costs assigned to each group are then broken into a flat rate per customer parcel for small residential customers, and a rate per 1,000 square feet for general service and large residential customers. The units used vary due to the drainage rate structure for each type of customer, as further described in Section 5.6.

Table 5-5: Account Unit Rates

	# of Units	Rate Type	2019	2020	2021
General Service	883,761 sq. ft..	per 1,000 sq. ft.	\$0.60	\$0.65	\$0.70
Small Residential	143,667 parcels	per parcel	\$14.29	\$15.44	\$16.69

Surface Type Profile by Tier

Drainage bills for each customer are intended to reflect the cost of managing the run-off from that parcel. Each tier rate is composed of a flow and an account component. Both components reflect the average cost for a tier composed of properties with similar characteristics.

The flow component of each tier rate is based on the average percentage of total area attributable to each surface type, as calculated using GIS data for individual parcels assigned to a given tier. For small

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August 14, 2018
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residential customers, averages are based on a random sample of properties assigned to each flat rate tier. For general service and large residential customers, the percentages are based on citywide GIS data for all parcels assigned to a given tier.

Table 5-6 presents the average land cover profile by tier used to calculate the flow component of the tier drainage rate.

Table 5-6: Surface Type Average Profile by Tier (sq. ft)

	Impervious	Pervious - Managed Grass	Pervious - Woods and Unmanaged Grass	Pervious - Good Forest	Total Area	
Small Residential						
< 2000 sq. ft.	979	344	-	-	1,323	
2000-2999	1,565	959	-	-	2,524	
3000-4999 sq. ft.	2,046	2,046	-	-	4,091	
5000-6999 sq. ft.	2,722	3,043	20	6	5,792	
7000-9999 sq. ft.	3,247	4,756	114	0	8,117	
General Service/Large Residential						
Undeveloped	(0-15% impervious)					
	<i>Regular</i>	87	840	53	20	1,000
	<i>Low Impact</i>	38	209	446	307	1,000
Light	(16-35% impervious)					
	<i>Regular</i>	272	645	76	7	1,000
	<i>Low Impact</i>	206	328	346	120	
Moderate	(36-65% impervious)					
	<i>Regular</i>	505	445	47	4	1,000
	<i>Low Impact</i>	390	297	242	71	1,000
Heavy	(66-85% impervious)	756	232	11	0	1,000
Very Heavy	(86-100% impervious)	959	40	0	-	1,000

Rate Calculation by Tier

The rate assigned to each customer tier is equal to the sum of a flow component and an account component.

For all customers, the flow component of the rate is calculated by multiplying the surface type rates (Table 5-4) by the average area assumptions for the tier found in Table 5-6. The formula for this calculation is as follows:

$$\text{Flow component} = (IA/1,000 * I\$) + (MGA/1,000 * MG\$) + (UMGA/1,000 * UMG\$) + (GF/1,000 * GF\$)$$

Where:

- IA=Tier average impervious area
- I\$=Impervious surface rate per 1,000 sq. ft..
- MGA=Tier average managed grass area
- MG\$=Managed grass surface rate per 1,000 sq. ft.
- UMGA=Tier average unmanaged grass area
- UMG\$=Unmanaged grass surface rate per 1,000 sq. ft.
- GF=Tier average good forest area
- GF\$=Good Forest surface rate per 1,000 sq. ft.

The account component for small residential customers is the same flat rate per customer. For general service and large residential customers, the account rate is multiplied by parcel area.

The proposed rates presented in Tables 5-7, 5-8 and 5-9 below are equal to the sum of the flow component and the account component for each tier.

Table 5-7: 2019 Annual Proposed Drainage Rates

		Billing Unit	Treatment Rate	System Rate	Total Rate
Small Residential					
	Under 2000 sq. ft.	per parcel	\$12.71	\$157.10	\$169.81
	2000-2999 sq. ft.	per parcel	\$21.98	\$254.53	\$276.51
	3000-4999 sq. ft.	per parcel	\$30.32	\$353.11	\$383.43
	5000-6999 sq. ft.	per parcel	\$41.27	\$475.45	\$516.72
	7000-9999 sq. ft.	per parcel	\$52.43	\$600.18	\$652.61
General Service/Large Residential					
Undeveloped	(0-15% impervious)				
	Regular	per 1000 sq. ft.	\$3.45	\$39.17	\$42.62
	Low Impact	per 1000 sq. ft.	\$2.03	\$23.33	\$25.36
Light	(16-35% impervious)				
	Regular	per 1000 sq. ft.	\$5.18	\$58.46	\$63.64
	Low Impact	per 1000 sq. ft.	\$4.05	\$45.80	\$49.85
Moderate	(36-65% impervious)				
	Regular	per 1000 sq. ft.	\$7.39	\$83.19	\$90.58
	Low Impact	per 1000 sq. ft.	\$5.97	\$67.34	\$73.31
Heavy	(66-85% impervious)	per 1000 sq. ft.	\$9.80	\$110.06	\$119.86
Very Heavy	(86-100% impervious)	per 1000 sq. ft.	\$11.70	\$131.40	\$143.10

Table 5-8: 2020 Annual Proposed Drainage Rates

		Billing Unit	Treatment Rate	System Rate	Total Rate
Small Residential					
	Under 2000 sq. ft.	per parcel	\$12.88	\$170.59	\$183.47
	2000-2999 sq. ft.	per parcel	\$22.29	\$276.46	\$298.75
	3000-4999 sq. ft.	per parcel	\$30.74	\$383.52	\$414.26
	5000-6999 sq. ft.	per parcel	\$41.85	\$516.42	\$558.27
	7000-9999 sq. ft.	per parcel	\$53.16	\$651.93	\$705.09
General Service/Large Residential					
Undeveloped	(0-15% impervious)				
	Regular	per 1000 sq. ft.	\$3.50	\$42.55	\$46.05
	Low Impact	per 1000 sq. ft.	\$2.06	\$25.34	\$27.40
Light	(16-35% impervious)				
	Regular	per 1000 sq. ft.	\$5.25	\$63.50	\$68.75
	Low Impact	per 1000 sq. ft.	\$4.10	\$49.75	\$53.85
Moderate	(36-65% impervious)				
	Regular	per 1000 sq. ft.	\$7.49	\$90.37	\$97.86
	Low Impact	per 1000 sq. ft.	\$6.06	\$73.15	\$79.21
Heavy	(66-85% impervious)	per 1000 sq. ft.	\$9.93	\$119.57	\$129.50
Very Heavy	(86-100% impervious)	per 1000 sq. ft.	\$11.87	\$142.73	\$154.60

Table 5-9: 2021 Annual Proposed Drainage Rates

	Billing Unit	Treatment Rate	System Rate	Total Rate	Estimated Impact of Passthrough*	Total Rate w/ Estimated Passthrough	
Small Residential							
	Under 2000 sq. ft.	per parcel	\$12.88	\$184.60	\$197.48	\$0.77	\$198.25
	2000-2999 sq. ft.	per parcel	\$22.29	\$299.22	\$321.51	\$1.32	\$322.83
	3000-4999 sq. ft.	per parcel	\$30.74	\$415.09	\$445.83	\$1.82	\$447.65
	5000-6999 sq. ft.	per parcel	\$41.85	\$558.94	\$600.79	\$2.47	\$603.26
	7000-9999 sq. ft.	per parcel	\$53.16	\$705.60	\$758.76	\$3.15	\$761.91
General Service/Large Residential							
Undeveloped	(0-15% impervious)						
	Regular	per 1000 sq. ft.	\$3.50	\$46.05	\$49.55	\$0.21	\$49.76
	Low Impact	per 1000 sq. ft.	\$2.06	\$27.43	\$29.49	\$0.12	\$29.61
Light	(16-35% impervious)						
	Regular	per 1000 sq. ft.	\$5.25	\$68.73	\$73.98	\$0.31	\$74.29
	Low Impact	per 1000 sq. ft.	\$4.10	\$53.85	\$57.95	\$0.24	\$58.19
Moderate	(36-65% impervious)						
	Regular	per 1000 sq. ft.	\$7.49	\$97.81	\$105.30	\$0.45	\$105.75
	Low Impact	per 1000 sq. ft.	\$6.06	\$79.18	\$85.24	\$0.35	\$85.59
Heavy	(66-85% impervious)	per 1000 sq. ft.	\$9.93	\$129.42	\$139.35	\$0.59	\$139.94
Very Heavy	(86-100% impervious)	per 1000 sq. ft.	\$11.87	\$154.49	\$166.36	\$0.70	\$167.06

**Passthrough is based on a projected 4.5% increase in the King County treatment rate*

As discussed in Section 5.4, tier rates for small residential customers are flat rates which assume the same average total area for each customer in the tier. Consequently, the tier rate is equal to the drainage bill. Due to the wide variance in lot areas, tier rates for general service and large residential customers are expressed in units of 1,000 square feet. The drainage bill is calculated by multiplying the tier rate by the total area of each property (in 1,000 square feet).

5.5. Other Drainage Credits and Discounts

Drainage bill discounts are available for property owners that help reduce the impact of stormwater on the City's system. Billing exemptions (which reduce the overall drainage bill) are also available for large natural areas that offer systemic benefits greater than those offered by other types of undeveloped lands or which clearly do not benefit from or impact the stormwater system.

A. Low Impact Rates

Discounts² of 19 to 41 percent are applied to the rate for undeveloped natural areas of 0.5 acres or greater containing sufficient amounts of qualifying “highly infiltrative” surface (i.e. forested areas, unmanaged grasslands, etc.). Certain athletic facilities with engineered designs that mimic the stormwater retention benefits of these large natural areas are also eligible for low impact rates.

B. Stormwater Facility Credit Program (SFCP)

This program offers credits of up to 50 percent for privately-owned systems that slow down stormwater flow and/or provide water quality treatment for run-off from impervious area, thus lessening the impact to the City’s stormwater system, creeks, lakes or Puget Sound. Stormwater systems are structures such as vaults, rain gardens, permeable pavements and filtration systems. SPU offers a 10 percent discount for any new or remodeled commercial building that utilizes a rainwater harvesting system meeting credit requirements. Those systems that involve indoor uses of rainwater must be permitted by Seattle-King County Department of Health to qualify for the rate reduction. Systems must meet the applicable stormwater and drainage code requirements for the building and site.

C. Rainwater Harvest Credit

SPU offers a 10 percent discount for any new or remodeled commercial building that utilizes a rainwater harvesting system meeting credit requirements. Those systems that involve indoor uses of rainwater must be permitted by Seattle-King County Department of Health to qualify for the rate reduction. Systems must meet the applicable stormwater and drainage code requirements for the building and site.

D. Undeveloped Riparian Corridor Exemption

Developed riparian corridors³ with small buffers and bank armoring increase the risk of flooding and downstream property damage. In contrast, undeveloped riparian corridors with a sufficient buffer act as floodplains which allow creeks to expand during peak period, mitigating downstream flood damage.

The discount assumes exemption of the entire 100-foot qualifying creek buffer from the parcel’s billable area. Qualifying criteria for this exemption is found in SPU Director’s Rule FIN-211.2.

E. Wetlands Exemption

Wetlands act like natural drainage systems, protecting and improving water quality and storing floodwaters which are slowly released over time. Wetlands also serve as an important habitat for fish and wildlife. Only wetlands of at least 1,000 square feet in area and with no development within the wetland area will be considered for this exemption.

An application is required to qualify for this exemption, including the provision of supporting documentation demonstrating that the wetland meets all required criteria, as defined in SPU Director’s Rule FIN-211.3

F. Undeveloped Islands Exemption

This credit applies to undeveloped islands with less than ten percent impervious area. These islands do not benefit from, nor do they impact, the drainage system or surrounding receiving waters.

² Relative to the rates for non-qualifying properties with like amounts of impervious surface.

³ Riparian corridor is defined in SMC 25.09.020.B.5.A.

6. UTILITY DISCOUNT PROGRAM

The City subsidizes qualified low-income customers by giving them discounts on their utility services. Low income assistance customers may receive their discount in one of three ways: 1) as a credit to their SPU wastewater bill; or 2) where no wastewater bill is received, as a credit to the customer's City Light Bill; or 3) in the form of a credit voucher. The latter two options are typically applicable to renters who pay drainage, wastewater, and water utility fees indirectly as part of their rental payment. For customers who do not receive a wastewater bill, a fixed credit is calculated which is equal to 50 percent of a typical residential bill for the class of customer receiving the credit⁴. Proposed discounts are shown in Tables 6-1 and 6-2. Credits do not include projected changes in the King County treatment rate. Increases in the treatment rate will result in increases to credits through the pass-through mechanism established by SMC 21.28.040.

Table 6-1: Wastewater Utility Discount Program Credits

	2019	2020	2021*
Receives SPU bill	50% discount		
Receives SCL bill only			
Single-Family	\$31.13	\$33.43	\$34.96
Multi-Family	\$21.72	\$23.32	\$24.39

*Does not include passthrough changes to the proposed 2021 King County treatment rate.

Table 6-2: Monthly Drainage Low Income Utility Credit

	2019	2020	2021*
Single-Family	\$21.53	\$23.24	\$25.02
Duplex	\$10.77	\$11.62	\$12.51
Multi-Family	\$2.30	\$2.49	\$2.68

*Does not include passthrough changes to the proposed 2021 King County treatment rate.

⁴ The typical residential bill is calculated by multiplying the rate per CCF by average monthly consumption. The discounts assume an average monthly usage of 4.3 CCF for a single family and 3.0 CCF for multi-family.

APPENDIX A — FINANCIAL SUMMARY

Table A-1: Drainage and Wastewater Fund Financial Summary

	2017	2018	2019	2020	2021	2022	2023	2024
	Actuals	Projected	Proposed	Proposed	Proposed	Projected	Projected	Projected
Operating Revenue								
Wastewater ¹	\$273.9	\$266.5	\$290.2	\$315.3	\$342.3	\$357.4	\$365.7	\$404.1
Drainage	\$119.6	\$131.0	\$141.4	\$152.7	\$164.9	\$178.0	\$194.0	\$202.1
Other	\$6.8	\$6.0	\$6.0	\$6.0	\$6.0	\$6.0	\$6.0	\$6.0
Total Operating Revenue	\$400.3	\$403.4	\$437.7	\$474.0	\$513.2	\$541.4	\$565.7	\$612.2
Operating Expenses								
Treatment	\$162.8	\$159.8	\$164.1	\$166.2	\$175.9	\$176.6	\$181.4	\$187.6
O&M	\$98.2	\$116.6	\$123.9	\$129.7	\$135.5	\$141.7	\$148.2	\$169.3
City Taxes	\$46.7	\$47.1	\$51.1	\$55.4	\$60.1	\$63.4	\$66.2	\$71.8
State Taxes	\$5.2	\$5.2	\$5.9	\$6.8	\$7.5	\$8.1	\$8.5	\$9.6
Depreciation	\$31.7	\$28.9	\$29.4	\$29.9	\$30.4	\$30.9	\$31.4	\$31.9
Total Operating Expenses	\$344.6	\$357.5	\$374.4	\$388.1	\$409.5	\$420.8	\$435.8	\$470.2
Net Operating Income	\$55.6	\$45.9	\$63.2	\$85.9	\$103.7	\$120.6	\$129.9	\$142.0
Other Income (Expenses)								
Investment Income	\$5.0	\$3.8	\$3.6	\$2.3	\$2.3	\$2.3	\$2.2	\$0.7
Net Interest Expense	(\$26.7)	(\$35.0)	(\$40.3)	(\$48.9)	(\$59.1)	(\$67.6)	(\$72.1)	(\$73.6)
Other Non-Operating	(\$5.9)	\$0.6	\$0.3	\$0.1	\$0.0	\$0.0	\$0.0	\$0.0
Total Other Income (Expenses)	(\$27.6)	(\$30.6)	(\$36.4)	(\$46.5)	(\$56.8)	(\$65.4)	(\$69.9)	(\$72.9)
Grants and Contributions	\$2.6	\$3.3	\$3.3	\$3.3	\$3.3	\$3.3	\$3.3	\$3.3
Net Income (Loss)	\$30.7	\$18.6	\$30.2	\$42.8	\$50.3	\$58.5	\$63.4	\$72.5

(\$ in millions)

¹Includes industrial surcharge

APPENDIX B — DWF COST ASSIGNMENT DETAIL

Drainage and Wastewater Cost Assignment Methodology

SPU conducted its last review of DWF cost assignment factors in 2016, using 2015 actual data. Those factors were used to determine the 2016-2018 drainage and wastewater system cost of service. This rate study uses the methodology described below for assigning operating expenses between drainage and wastewater lines of business. The cost assignment methodology is consistent with that of the rate studies used to propose rates for 2004 through 2018. The current rate study uses 2014 actual labor expense as the basis for labor related cost splits. Consistent use of actual expense over time helps to minimize errors in cost assignment resulting from variations between actual and budgeted spending. DWF Operating Expenses are grouped into three categories:

Direct Operating Expense

Some expenses are assigned 100 percent to the applicable line of business (e.g., drainage billing administration). The majority of shared direct operating expenses are assigned based on actual direct labor expenses of an identified proxy. For example, most regulatory direct operating expense is related to water quality and combined sewer overflow (CSO) issues. Therefore, these activities are assigned based on actual direct labor expense for a subset of water quality and CSO-related capital and operating activities. The use of a programmatic proxy is useful in capturing any shifts in the focus of regulatory support over time

Management estimates are used to identify the cost assignment factors for a limited number of activities. The bulk of activities using management estimates are related to billing and customer service activities. SPU is responsible for wastewater billing and for drainage and wastewater customer service.⁵ Management estimates are used to identify labor effort associated with the support of each line of business for a targeted subset of customer service budgeted activities.

Administration

Except for Project Delivery and Engineering (PDE), the cost assignment of all general management expense is based on the sum of actual direct labor expenses for direct operating activities. Administrative expense for PDE is assigned based on actual direct labor expense charged to capital projects by each division. This methodology creates a direct link between administrative functions and the activities they support. In addition, this methodology provides a consistent mechanism for updating administration cost assignment from year to year in the event that the programmatic focus changes.

General and Administrative Expense

Finance and Administration (F&A) expense is assigned based on the sum of actual direct labor expense for all direct operating and administrative activities which charge to the DWF budget.

Cost Assignment Factor

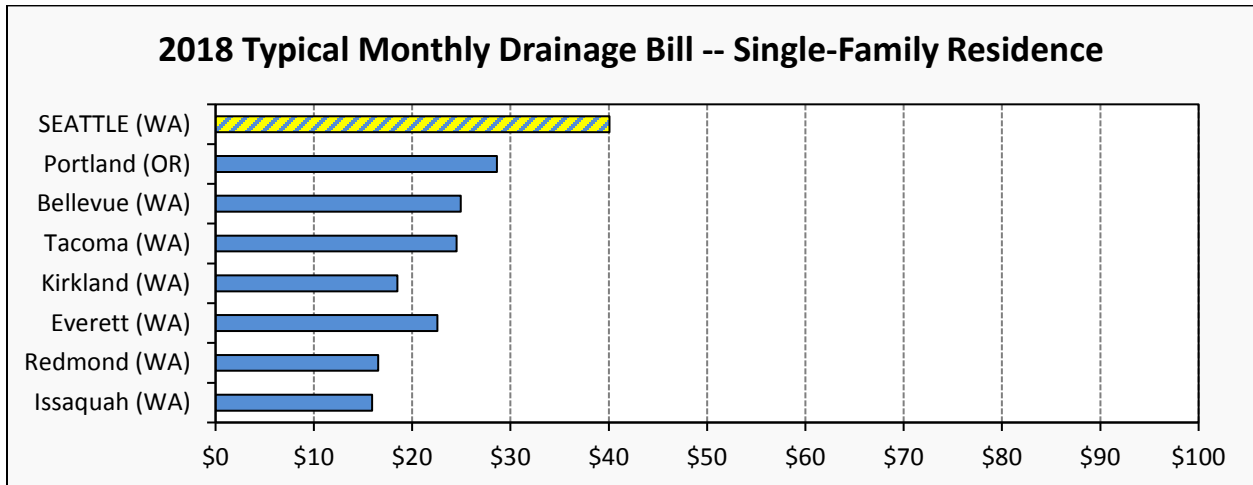
The DWF total operating budget for each operating activity is divided between the wastewater and drainage lines of business using cost assignment factors. These factors represent the typical amount of support provided to each line of business in carrying out a specific type of activity. Therefore, drainage and wastewater each receive their proportional shares of activities.

⁵ King County administers billing for drainage.

APPENDIX C — COMPARATIVE RATES

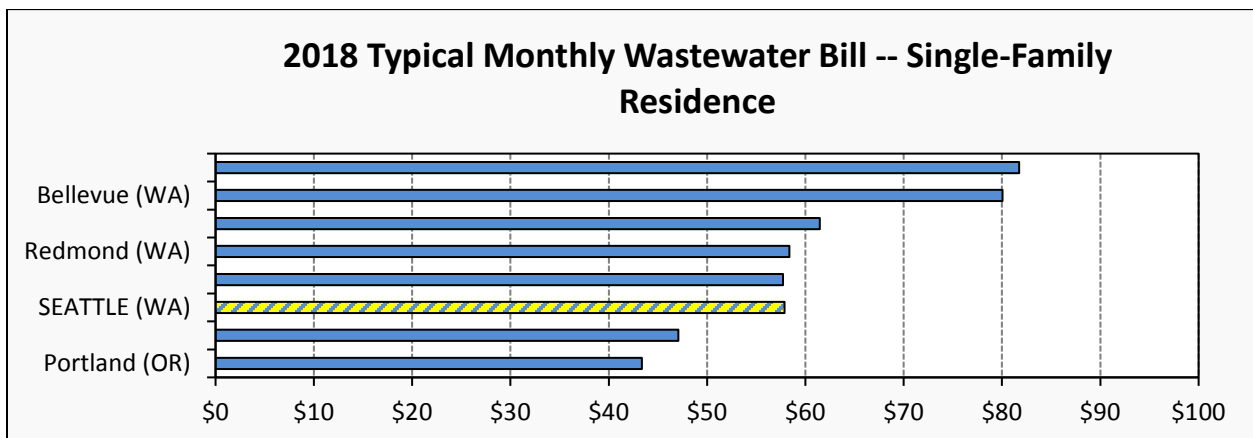
The following tables compare 2018 City of Seattle drainage and wastewater fees to those of other regional utilities.

Figure C-1: 2018 Monthly Drainage Bill Comparison - Typical Single-Family Residence



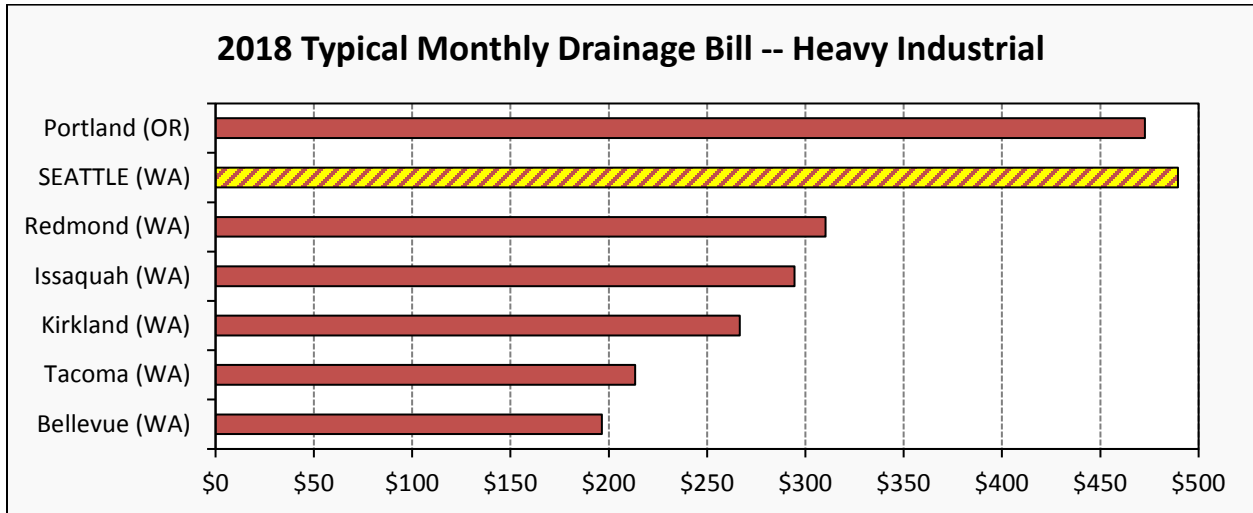
Note: Based on actual bills from respective cities, except Issaquah and Kirkland are estimated.

Figure C-2: 2018 Monthly Wastewater Bill Comparison - Typical Single-Family Residence



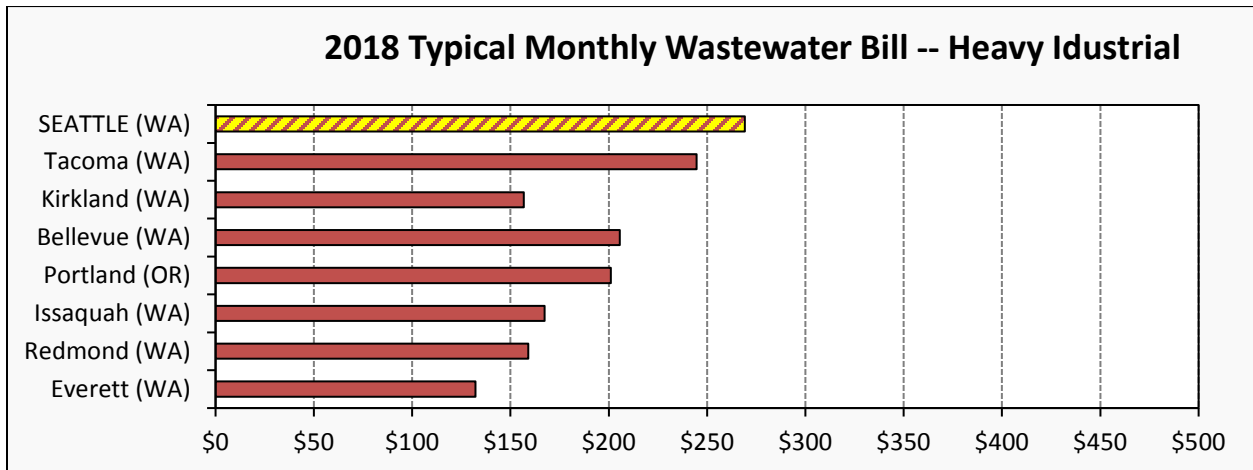
Note: Based on actual bills from respective cities, except Issaquah and Kirkland are estimated.

Figure C-3: Monthly Drainage Bill Comparison - Commercial



Note: Actual bills from respective cities, except Issaquah and Kirkland are estimated.

Figure C-4: Monthly Wastewater Bill Comparison - Commercial



Note: Actual bills from respective cities, except Issaquah and Kirkland are estimated.

APPENDIX D— DRAINAGE COST ALLOCATION DETAIL

Run-off is a factor of area and run-off coefficients. Run-off coefficients, or flow factors, represent a mathematical calculation of the portion of rainfall that becomes direct run-off during a storm event. For example, a 0.35 co-efficient means that 35 percent of the rain falling on a particular surface ends up as run-off, while 65 percent is infiltrated.

Flow factors for a particular surface type will vary depending on the underlying storm assumptions. Storms are classified by intensity (how many inches of rain fall in a given time), duration (how long the storm lasts), and recurrence interval. Storms which occur more frequently (i.e. once 2 years) are considered to be less severe than storms with higher recurrence intervals (i.e. a 25-year storm). The infrastructure and operation and maintenance expenses of the drainage system are oriented to the frequency of storm events, as noted below.

- **25-year events.** The flood management service goal is to prevent flooding of private property in 25-year storm events, defined as the maximum rainfall received in 24 hours for the largest storm expected over a 25-year period. This means that pipes and some other portions of the drainage system designed for peak storm events must be sized to manage these 25-year volumes.
- **2-year events.** The regulatory goal for combined sewer overflows is an average of not more than one overflow per site per year. In practice, this means controlling CSOs in a 2-year event, defined as the rainfall that would be received in a recurrence of the second-largest storm in one year during the period of record. Both the King County treatment system and Seattle’s Drainage and Wastewater Utility have incurred substantial CSO control costs and expect to continue to incur them in the future.
- **6-month events.** Water quality infrastructure focuses on high-frequency events, defined as storms that occur on average twice per year. These investments are an increasingly significant portion of infrastructure costs as water quality regulations become more stringent and Seattle moves to reduce impacts on creeks and other receiving waters.
- **Average storm events.** A variety of the remaining SPU drainage assets and activities, ranging from Customer Service to general operations, are not associated with any of the preceding significant storm events, but are designed to serve the overall needs of the drainage system and its customers. These are assigned based on average storm events, defined as the average of all storm events over the course of a year.

Surface Type Cost Share Definition Methodology

The following steps are used to determine the percentage of total flow related expense to be allocated to each surface area type.

Step 1: Identify run-off coefficients and area for each surface type city wide.

Run-off coefficients and surface type area are the inputs used to calculate total run-off by surface type for each storm event.

Table D-1 presents the run-off coefficients assumed for the four storm events underlying surface type flow calculation.

Table D-1: Run-off Coefficients by Surface Type and Storm Event

Surface Type	25-Year Storm	2-Year Storm	6-Month Storm	Average Storm
--------------	---------------	--------------	---------------	---------------

Impervious	0.925	0.890	0.848	0.613
Pervious - Managed Grass	0.564	0.433	0.314	0.022
Pervious - Woods and Unmanaged Grass	0.349	0.214	0.114	0.021
Pervious - Good Forest	0.249	0.127	0.048	0.020

Run-off coefficients represent the percentage of rainfall which results in stormwater run-off. A run-off coefficient of 0.56 means that 56 percent of the rainfall landing on a surface ends up as run-off while the remaining 44 percent is infiltrated into the ground or cracks. The table above demonstrates that impervious surface has the most amount of run-off under all storm events, but that run-off increases for ALL surface types with an increase in the intensity of the storm.

Table D-2 provides a summary of area by surface type for the City of Seattle. These area calculations were derived from aerial photos present in the City's GIS system.

Table D-2: Square Footage by Surface Type (City of Seattle)

Surface Type	Sq. Ft	% of Total
Impervious	794,845,588	49%
Pervious - Managed Grass	659,787,474	41%
Pervious - Woods and Unmanaged Grass	105,933,522	7%
Pervious - Good Forest	54,388,783	3%
Total	1,614,955,368	100%

Step 2: Calculate run-off for each surface type for each storm event

In Table D-3, the run-off coefficients found in Table D-1 are multiplied by the applicable surface type square footage to calculate total run-off by surface type and storm event. Table D-3 presents this data in both flow-units and as a percentage of total flow for each storm event.

Table D-3: Run-off Volumes by Surface Type

Surface Type	25-Year Storm		2-Year Storm		6-Month Storm		Average Storm	
	Flow Units	% of Flow	Flow Units	%	Flow Units	%	Flow Units	%
Impervious	735,232,169	63%	707,412,573	69%	674,029,059	75%	487,240,345	96%
Pervious - Managed Grass	372,120,136	32%	285,687,976	28%	207,173,267	23%	14,515,324	3%
Pervious - Woods and Unmanaged Grass	36,970,799	3%	22,669,774	2%	12,076,422	1%	2,224,604	0%
Pervious - Good Forest	13,542,807	1%	6,907,375	1%	2,610,662	0%	1,087,776	0%
Total	1,157,865,911	100%	1,022,677,699	100%	895,889,409	100%	505,068,050	100%

Step 3: Determine Cost Weights for each Storm Event

In order to develop a single percentage of total cost represented by each storm event, the total flow percentages for each storm event found in Table D-3 are weighted by the percent of total drainage system expense associated with managing each storm event.

The first step in determining cost weights by storm event is to assign pre-tax flow expense to storm event categories. Most capital expense and O&M infrastructure maintenance expense is allocated to the storm event(s) which the associated infrastructure is designed to manage, with the exception of pipe expense which is allocated between storm events using an incremental cost approach. Flow allocated

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expenses not directly related to a specific type of infrastructure are typically assigned to the Average Storm event.

Table D-4 presents actual 2017 pre-tax flow expense by category. The cost weights by storm event found at the bottom of the table represent the percent of total expense associated with each storm event

Table D-4: Pre-Tax Flow Expense by Storm Event

Category	25 Year	2 Year	6 Month	Avg Storm	Total
SPU CSOs Assets	-	37,504	-	-	37,504
Pipe Assets	39,950	-	39,950	-	79,901
WQ Assets	-	-	1,013	-	1,013
Other Assets	10,680	6,919	4,565	10,961	33,125
O&M-Billing/Customer	-	-	-	-	-
O&M-Treatment	-	30,627	-	-	30,627
O&M Other	16,918	12,249	15,915	164,903	209,985
Total Pre-Tax Expense	67,548	87,299	61,444	175,864	392,155
Cost Weight by Storm Event	17%	22%	16%	45%	100%

(\$ in thousands)

Step 4: Determine Flow-Based Cost Shares by Surface Type

By applying the applicable storm event cost weight from Table D-4 to the percentage of flow represented by each surface type under each design storm scenario (found in Table D-3), SPU can calculate a cost weighted run-off share for each surface type. These shares are used to allocate the flow-based revenue requirement between different surface types in the development of surface type rates, as further described in Section 5.

Table D-5: Flow-Based Cost Share by Surface Type

	% of Drainage Revenue Requirement
Account	1.8%
Impervious	81.1%
Pervious - Managed Grass	15.2%
Pervious - Woods and Unmanaged Grass	1.4%
Pervious - Good Forest	0.5%