



CITY OF TACOMA

Wastewater, Surface Water, and Solid Waste Cost of Service Rate Study

December 31, 2016



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SECTION ES – EXECUTIVE SUMMARY

BACKGROUND

In early 2016, the City of Tacoma Environmental Services Department (Department) engaged Raftelis Financial Consultants, Inc. (RFC) to update the financial plan and cost of service rate study for its three utilities: wastewater management, surface water management, and solid waste management, to ensure that rates are equitable to all customer classes and to recover sufficient revenue to fund the operating and capital expenses of the utilities, thus ensuring financial stability. Rate models for each of the utilities were developed as an important part of the Study and have since been improved and continue to provide financial projections and rate proposals contained in this Report.

The wastewater utility collects and treats wastewater from more than 90,000 customers through more than 700 miles of pipelines and two wastewater treatment plants – the Central Wastewater Treatment Plant and the North End Wastewater Treatment Plant. The surface water utility serves more than 70,000 surface water accounts and maintains more than 500 miles of public stormwater pipe, 22,000-plus catch basins, four pump stations and numerous detention ponds/structure. The solid waste utility provides garbage, recycling, and yard waste services for residential and commercial customers as well as a recycling center, a hazardous waste facility and Call-2-Haul program, which provides residential customers with annual bulk item collection service.

Objectives

The objectives of the rate development process:

- » Ensure that rates are based on *Cost of Service* guidelines used in the industry
- » Plan for *Revenue Stability* to provide for adequate operating and capital reserves and the overall financial health of all three utilities under varying conditions
- » Plan for *Rate Stability* to prevent rate spikes
- » Ensure *Affordability* of wastewater, surface water, and solid waste services for low income elderly/disabled customers
- » Provide for *Fairness and Equitability* in the development of a system of user charges

Rate Development Process

The three major processes involved in the comprehensive cost of service and rate design are as follows:

- » **Financial Planning:** User and usage data from the most recent calendar year is compiled and analyzed to determine revenues that will be collected from each customer class. Operating and capital costs are compiled and revenue requirements are projected for a six-year period from 2017 through 2022. Financial planning involves estimation of annual O&M and capital expenditures, annual debt service and reserve requirements, operating and capital revenue sources and the determination of required annual user revenues from rates and charges.

- » **Cost of Service Analysis:** Cost of Service Analysis involves identifying and apportioning annual revenue requirements to the different cost centers and defining unit costs so that costs can be allocated to the different user classes proportionate to their demand on each utility system.
- » **Rate Design:** Rate Design involves the development of a fixed and variable schedule of rates for each of the different user classes to proportionately recover the costs associated with such user classes. This is also where policy objectives such as increased water conservation can be achieved.

The rate models have been developed to incorporate these processes and allow the Department to update and revise rates and review alternative rate structures and their impacts on customers. The rate plans cover a period of six years from calendar year 2017 through 2022. However, rates are only approved for the 2017-2018 biennium.

Assumptions

The following assumptions are used in this rate development process:

1. Annual O&M and capital expenditures, other revenue sources and reserve requirements, O&M inflation factors and user account growth projections are all based on the Department's 2017 and 2018 adopted budgets and projections.
2. Annual customer accounts and volume data used in the study are based on prior year data from the Department's billing system.

WASTEWATER UTILITY

The proposed revenue adjustments for the wastewater utility for 2017 and 2018 are 5.5 percent and 4.5 percent per year, respectively. All customers will experience approximately the same increase in 2017 and 2018 as rates are increased equally across the board.

Residential customers are charged a monthly fixed charge and variable rate based on average winter water usage from December through March of the previous year. Eligible low-income disabled, elderly (LID/LIE) customers receive 30 percent off the residential wastewater rates. Commercial customers are also charged a monthly fixed charge and a variable rate based on water usage and strength factors. RFC does not propose any change to the current rate structure. The proposed rates are based on the cost of service analysis and rate design process to ensure that the rates meet the stated objectives of the Department.

Table ES-1 shows the proposed wastewater rates for the next two years, effective January 1, 2017 and 2018.

Table ES-1
Proposed Wastewater Rates

| | 2017 | 2018 |
|--|---------|---------|
| Residential | | |
| Monthly Fixed Charge | \$23.88 | \$24.96 |
| Flow Charge (\$/hcf) | \$4.47 | \$4.68 |
| LID/LIE customers receive 30% discount | | |
| Commercial | | |
| Monthly Fixed Charge | \$11.40 | \$11.92 |
| Flow Charge (\$/hcf of water usage) | | |
| Category 1 | \$6.22 | \$6.50 |
| Category 2 | \$6.48 | \$6.78 |
| Category 3 | \$8.16 | \$8.53 |
| Category 4 | \$9.57 | \$10.01 |
| Category 5 | \$9.69 | \$10.13 |
| Category 6 | \$11.13 | \$11.64 |
| Category 7 | \$12.59 | \$13.16 |
| Category 8 | \$13.01 | \$13.60 |
| Commercial, Various | | |
| Flow (\$/hcf) | \$4.32 | \$4.52 |
| BOD (\$/lb) | \$1.01 | \$1.06 |
| SS (\$/lb) | \$0.76 | \$0.80 |
| Septic Tank Wastes (\$/100 gal) | \$13.47 | \$14.08 |

Table ES-2 shows the impacts on average residential and commercial customers within the Department's service area.

**Table ES-2
Customer Impacts**

| Residential Customers | Winter | | | 2018 Bill | Δ from Prior Year | Δ from Prior Year |
|-----------------------|--------|--------------|-----------|-----------|----------------------|----------------------|
| | Usage | Current Bill | 2017 Bill | | | |
| Very low volume | 2 | \$31.39 | \$32.82 | \$34.32 | 4.56% | 4.57% |
| Low volume | 4 | \$39.99 | \$41.76 | \$43.68 | 4.43% | 4.60% |
| Average volume | 6 | \$48.59 | \$50.70 | \$53.04 | 4.34% | 4.62% |
| High volume | 9 | \$61.49 | \$64.11 | \$67.08 | 4.26% | 4.63% |
| Very high volume | 18 | \$100.19 | \$104.34 | \$109.20 | 4.14% | 4.66% |

| Commercial Customer | Average Water | | | 2018 Bill | Δ from Prior Year | Δ from Prior Year |
|---------------------|------------------|--------------|-------------|-------------|----------------------|----------------------|
| | Usage | Current Bill | 2017 Bill | | | |
| Category 1 | 92 | \$538.00 | \$583.64 | \$609.92 | 8.5% | 4.5% |
| Category 2 | 36 | \$229.36 | \$244.68 | \$256.00 | 6.7% | 4.6% |
| Category 3 | 64 | \$499.80 | \$533.64 | \$557.84 | 6.8% | 4.5% |
| Category 4 | 1,047 | \$9,842.17 | \$10,031.19 | \$10,492.39 | 1.9% | 4.6% |
| Category 5 | 21 | \$208.03 | \$214.89 | \$224.65 | 3.3% | 4.5% |
| Category 6 | 61 | \$690.99 | \$690.33 | \$721.96 | -0.1% | 4.6% |
| Category 7 | 117 | \$1,492.06 | \$1,484.43 | \$1,551.64 | -0.5% | 4.5% |
| Category 8 | 61 | \$809.94 | \$805.01 | \$841.52 | -0.6% | 4.5% |

The following figures show the summary of the financial plan for the wastewater utility. It is projected that the Department will have to implement additional revenue increases of 4.0 percent to 4.5 percent per year from 2019 through 2022, as shown in **Figure ES-1**, to meet its operating and capital expenses as well as reserves targets. **Figure ES-1** also shows the projected debt service coverage ratio, given the proposed revenue increases. The red line represents the required debt coverage ratio of 130 percent and the blue line represents the desired coverage ratio of 170 percent per the Department financial policy. The purple line represents the calculated debt coverage ratio on parity debt and the green line represents the calculated coverage ratio on all existing debt service, including state loans. It is projected that the Department will meet the desired debt coverage during the Study period.

**Figure ES-1
Proposed Wastewater Revenue Adjustments and Debt Coverage**

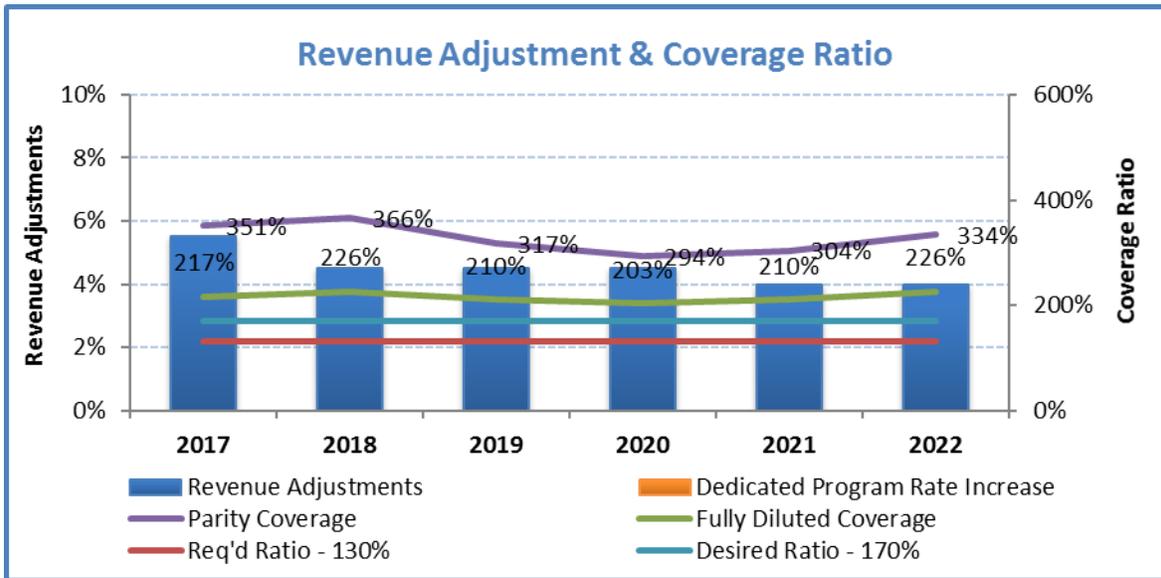


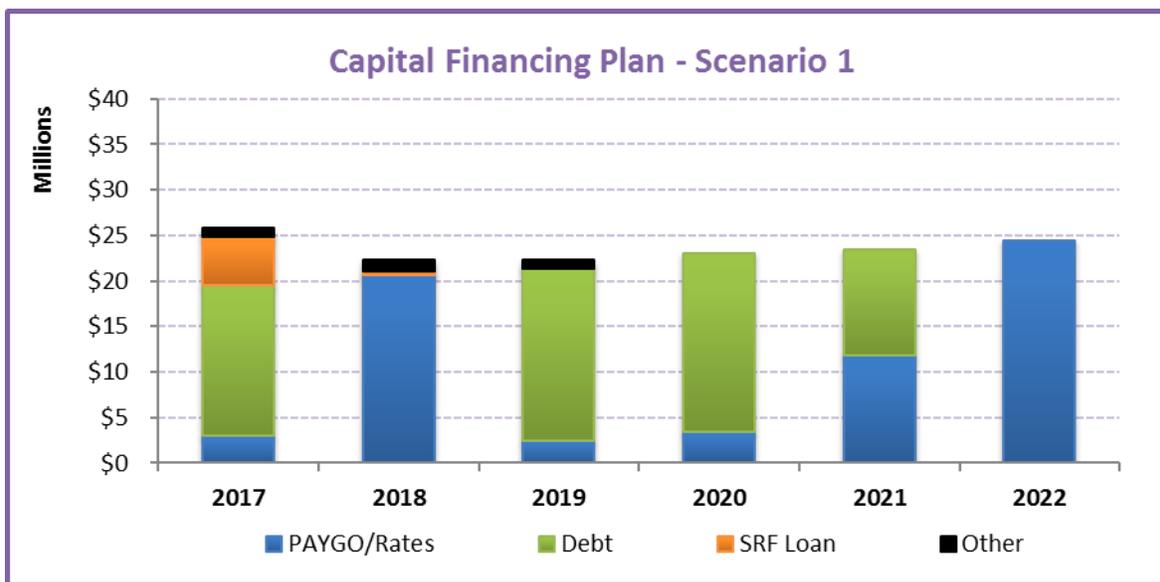
Figure ES-2 shows the operating financial plan of the wastewater utility. The stacked columns represent the different expenses such as operating expenses, debt service, and capital projects funded by rates. The red bars represent the net income based on the proposed revenues with the revenue increases shown in Figure ES-1, represented by the green line. The blue line represents revenues at the existing rates.

**Figure ES-2
Wastewater Operating Financial Plan**



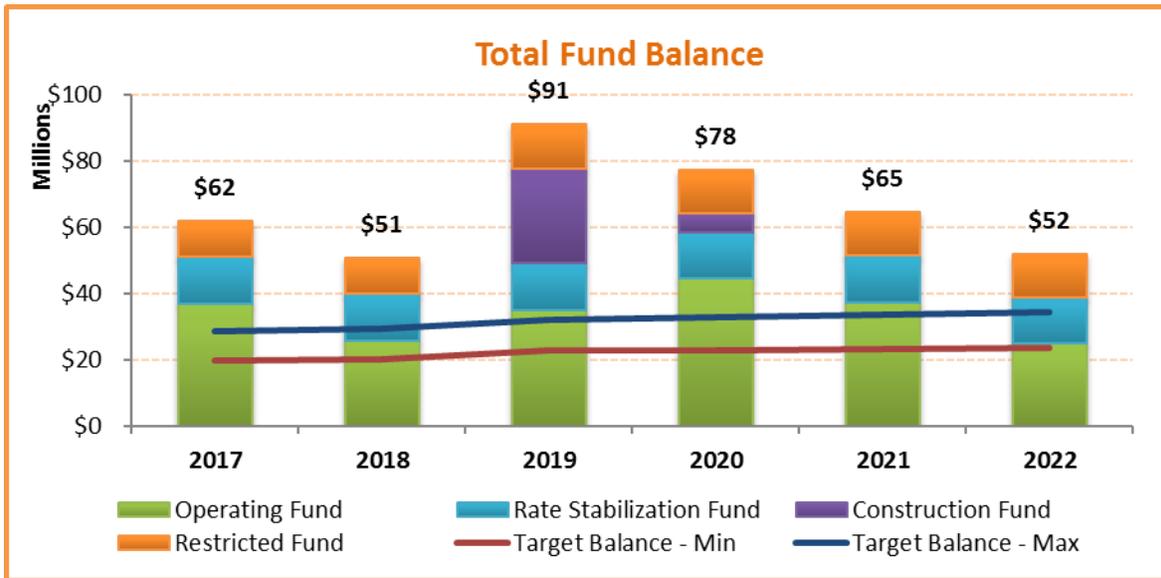
Figure ES-3 shows the capital project expenses over the next five years. The Department is projected to issue additional debt in 2017 and 2019 to fund its capital projects, as shown by the orange bars in 2017 and green bars in 2019 through 2021 in **Figure ES-3**. There is one SRF loan projected over the five years to fund capital projects, as presented by the orange bars. The remaining capital projects are projected to be funded by rates and/or reserves, represented by the blue bars.

**Figure ES-3
Wastewater Capital Financing Plan**



Based on the projected revenue increases and debt issue, the following figure, **Figure ES-4**, shows the total funds balance of the wastewater utility along with the target balances. The blue line represents the maximum target balance, defined as 120 days of O&M expenses for the Operating fund, 10 percent of revenue for the Rate Stabilization fund, and the entirety of the Restricted reserves. The red line represents the minimum target balance, defined as 60 days of O&M expenses for the Operating fund, 10 percent of revenue for the Rate Stabilization fund, and the entirety of the Restricted reserves. The total reserve levels are projected to meet the minimum required target level in all six years of the Study period.

**Figure ES-4
Wastewater Total Funds Balance**



SURFACE WATER UTILITY

The proposed revenue adjustments for the surface water utility for 2017 and 2018 are 5.0 percent per year. All customers will experience approximately the same increase in each year 2017 and 2018, as rates are increased equally across the board.

Customers are charged a monthly fixed charge and variable-rate charge based on square footage of parcel. Waterfront parcels are charged lower rates than non-waterfront parcels since they discharge directly into the bay. Residential customers are considered within the moderate development category. Eligible LID/LIE customers will continue to receive 30 percent off the surface water rates. The proposed rates are based on the cost of service analysis and rate design process to ensure that the rates meet the stated objectives of the Department.

Table ES-3 shows the proposed surface water rates for the next two years, effective January 1, 2017 and 2018.

**Table ES-3
Proposed Surface Water Rates**

| Development Categories | 2017 | | 2018 | |
|--------------------------------------|---------------|--------------------------|---------------|--------------------------|
| | Monthly Fixed | Area Charge per 500 sqft | Monthly Fixed | Area Charge per 500 sqft |
| Undeveloped area <= than 1 acre | \$7.17 | \$0.2793 | \$7.65 | \$0.2865 |
| Undeveloped area in excess of 1 acre | \$7.17 | \$0.0608 | \$7.65 | \$0.0616 |
| Light development | \$7.17 | \$0.8441 | \$7.65 | \$0.8812 |
| Moderate development | \$7.17 | \$1.1506 | \$7.65 | \$1.2054 |
| Heavy development | \$7.17 | \$1.6890 | \$7.65 | \$1.7684 |
| Very heavy development | \$7.17 | \$2.2526 | \$7.65 | \$2.3619 |
| Waterfront Properties | | | | |
| Undeveloped area <= than 1 acre | \$7.17 | \$0.1371 | \$7.65 | \$0.1422 |
| Undeveloped area in excess of 1 acre | \$7.17 | \$0.0608 | \$7.65 | \$0.0616 |
| Light development | \$7.17 | \$0.4150 | \$7.65 | \$0.4350 |
| Moderate development | \$7.17 | \$0.5786 | \$7.65 | \$0.6071 |
| Heavy development | \$7.17 | \$0.8312 | \$7.65 | \$0.8724 |
| Very heavy development | \$7.17 | \$1.1091 | \$7.65 | \$1.1650 |

Table ES-4 shows the impacts on average residential and commercial customers within the Department's service area. Each customer class will experience different increases, ranging from 3.9 percent to 5.8 percent depending on their development category and parcel size.

**Table ES-4
Customer Impacts**

| | Billable | Current Bill | 2017 Bill | 2018 Bill | Δ from Prior Year | Δ from Prior Year |
|---------------------------------|----------|--------------|-----------|-----------|-------------------|-------------------|
| | Area | | | | | |
| Residential Average Lot | 7,000 | \$22.25 | \$23.28 | \$24.53 | 4.6% | 5.4% |
| Residential Waterfront (WF) Lot | 7,000 | \$14.45 | \$15.27 | \$16.15 | 5.7% | 5.8% |
| Light development | 10,000 | \$23.01 | \$24.05 | \$25.27 | 4.5% | 5.1% |
| Heavy development | 25,000 | \$88.11 | \$91.62 | \$96.07 | 4.0% | 4.9% |
| Very heavy development | 50,000 | \$223.73 | \$232.43 | \$243.84 | 3.9% | 4.9% |
| Light development - WF | 10,000 | \$14.65 | \$15.47 | \$16.35 | 5.6% | 5.7% |
| Heavy development - WF | 25,000 | \$46.34 | \$48.73 | \$51.27 | 5.2% | 5.2% |
| Very heavy development - WF | 50,000 | \$112.33 | \$118.08 | \$124.15 | 5.1% | 5.1% |

The following figures show the summary of the financial plan for the surface water utility. It is projected that the Department will have to implement additional revenue increases of 4.5 percent to 5.0 percent in 2019 through 2022, as shown in **Figure ES-5**, to meet its operating and capital expenses as well as reserves targets. **Figure ES-5** also shows the projected debt service coverage ratio, given the proposed revenue increases. The red line represents the required debt coverage ratio of 130 percent and the blue

line represents the desired coverage ratio of 170 percent per Department policy. The purple line, which in this case overlaps the green line, represents the calculated debt coverage ratio on parity debts and the green line represents the calculated coverage ratio on all existing debt service, including state loans. It is projected that the Department will meet the desired debt coverage during the Study period.

Figure ES-5
Proposed Surface Water Revenue Adjustments and Debt Coverage

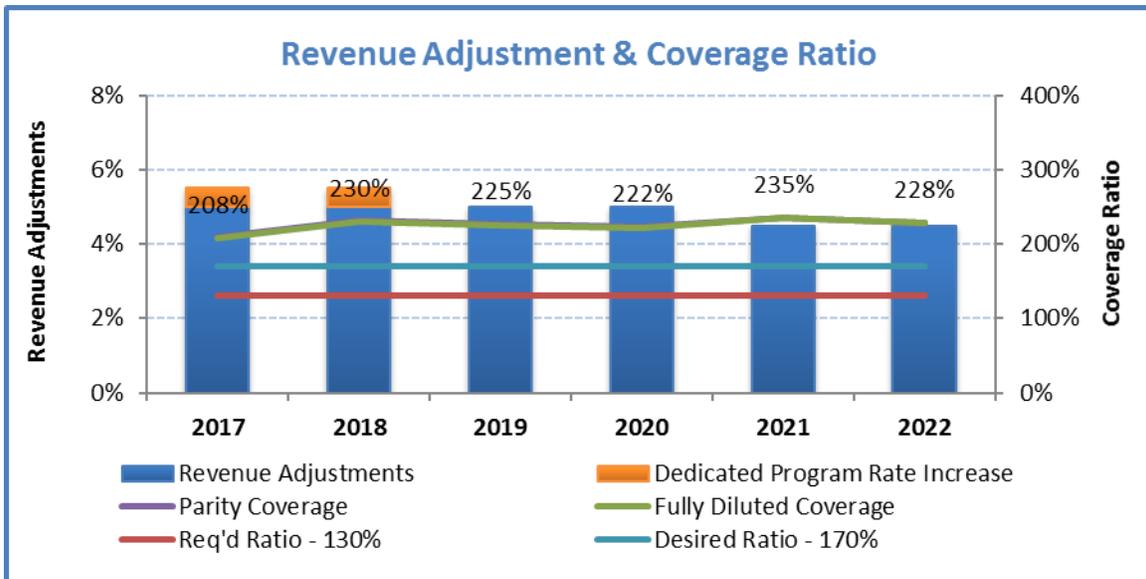


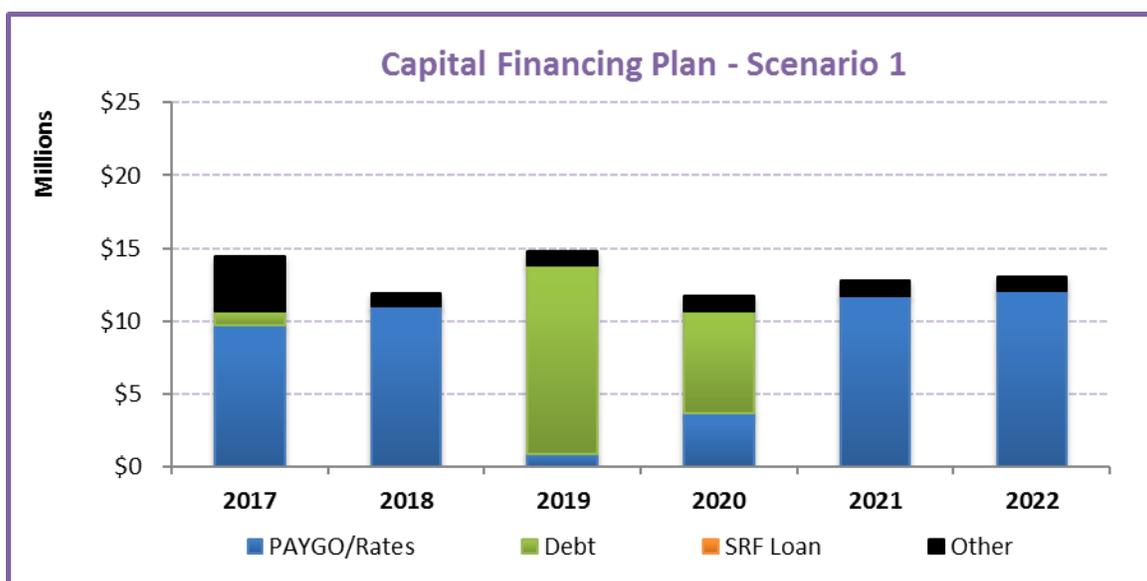
Figure ES-6 shows the operating financial plan of the surface water utility. The stacked columns represent the different expenses such as operating expenses, debt service, and capital projects funded by rates. The red bars represent the net income based on the proposed revenues with the revenue increases shown in Figure ES-5, represented by the green line. The blue line represents revenues at the existing rates.

Figure ES-6
Surface Water Operating Financial Plan



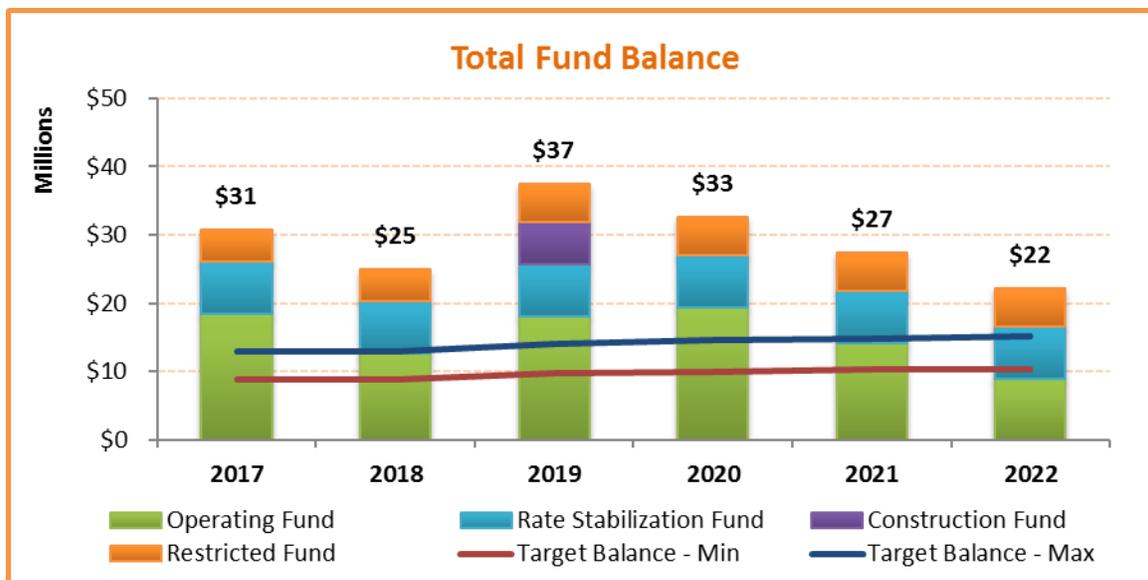
The capital project expenses over the next five years are shown in **Figure ES-7**. The Department is projected to issue additional debt in 2019 to fund its capital projects, as shown by the green bars in 2019 through 2020 in **Figure ES-7**. The Department receives grant revenues to fund specific qualifying projects, shown by the black bar. The remaining capital projects are projected to be funded by rates and/or reserves, represented by the blue bars.

Figure ES-7
Surface Water Capital Financing Plan



Based on the projected revenue increases and debt issue, the following figure, **Figure ES-8**, shows the total funds balance of the surface water utility along with the target balances. The blue line represents the maximum target balance, defined as 120 days of O&M expenses for the Operating fund, 10 percent of revenue for the Rate Stabilization fund, and the entirety of the Restricted reserves. The red line represents the minimum target balance, defined as 60 days of O&M expenses for the Operating fund, 10 percent of revenue for the Rate Stabilization fund, and the entirety of the Restricted reserves. The total reserve levels are projected to meet the minimum required target level in all six years of the Study period.

Figure ES-8
Surface Water Total Funds Balance



SOLID WASTE UTILITY

Operational changes and environmental considerations are impacting rates. Cost of service rate adjustments will continue to be phased in which have an impact on some commercial rates and increases to self-haul disposal rates (tip-fees) at the transfer site. The resultant financial plan and rates reflect these changes.

Residential customers are charged a monthly fixed charge for all garbage, recycling, and yard waste services. Eligible LID/LIE customers receive 30 percent off of the residential solid waste rates. Commercial customers are charged either a monthly rate or a per haul rate, depending on the size of the containers. Additionally, large containers are charged a monthly rental fee. Commercial customers also have a choice of services such as yard waste, food waste, recycling and bulk collection programs.

Table ES-5 shows the proposed residential solid waste rates for each of the next two years, effective January of each year.

Table ES-5
Proposed Residential Solid Waste Rates

| Container Size | 2017 | 2018 |
|-----------------------|----------|----------|
| Monthly Charge | | |
| 30 gal | \$21.14 | \$21.93 |
| 45 gal | \$31.71 | \$32.89 |
| 60 gal | \$42.27 | \$43.85 |
| 90 gal | \$63.42 | \$65.78 |
| 2X60 gal | \$84.54 | \$87.69 |
| 60+90 gal | \$105.69 | \$109.63 |
| 2X90 gal | \$126.84 | \$131.57 |

Table ES-6 shows the impacts of 3.7 percent on average residential customers within the Department's service area.

Table ES-6
Residential Customer Impacts

| Container Size | Current Bill | 2017 Bill | 2018 Bill | Δ from Prior Year | Δ from Prior Year |
|----------------|--------------|-----------|-----------|--------------------------|--------------------------|
| 30 gal | \$20.38 | \$21.14 | \$21.93 | 3.7% | 3.7% |
| 45 gal | \$30.57 | \$31.71 | \$32.89 | 3.7% | 3.7% |
| 60 gal | \$40.75 | \$42.27 | \$43.85 | 3.7% | 3.7% |
| 90 gal | \$61.14 | \$63.42 | \$65.78 | 3.7% | 3.7% |
| 2X60 gal | \$81.50 | \$84.54 | \$87.69 | 3.7% | 3.7% |
| 60+90 gal | \$101.89 | \$105.69 | \$109.63 | 3.7% | 3.7% |
| 2X90 gal | \$122.28 | \$126.84 | \$131.57 | 3.7% | 3.7% |

The following figures show the summary of the financial plan for the solid waste utility. The overall revenue increase is 4.0 percent for 2017 and 2018. It is projected that the Department will have to implement revenue increases of 3.0 percent per year in 2019 through 2022, as shown in **Figure ES-9**, to meet its operating and capital expenses as well as reserves targets. **Figure ES-9** also shows the projected debt service coverage ratio, given the proposed revenue increases. The red line represents the required debt coverage ratio of 125 percent, the purple line represents the calculated debt coverage ratio, and the blue line represents the desired coverage ratio of 170 percent per Department policy. It is projected that the Department will meet the desired debt coverage during the Study period.

**Figure ES-9
Proposed Solid Waste Revenue Adjustments and Debt Coverage**

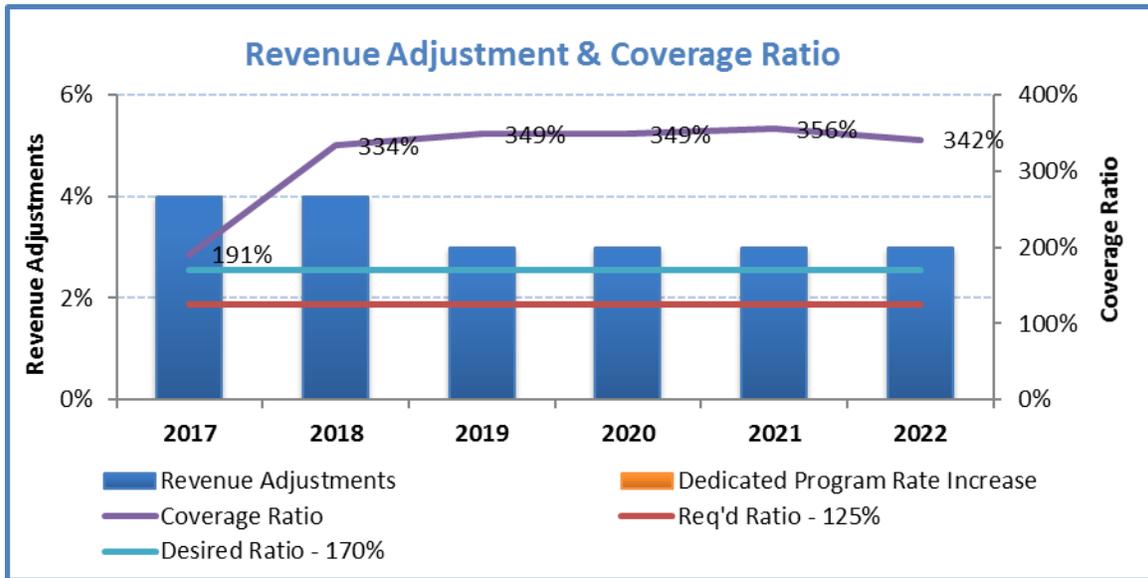


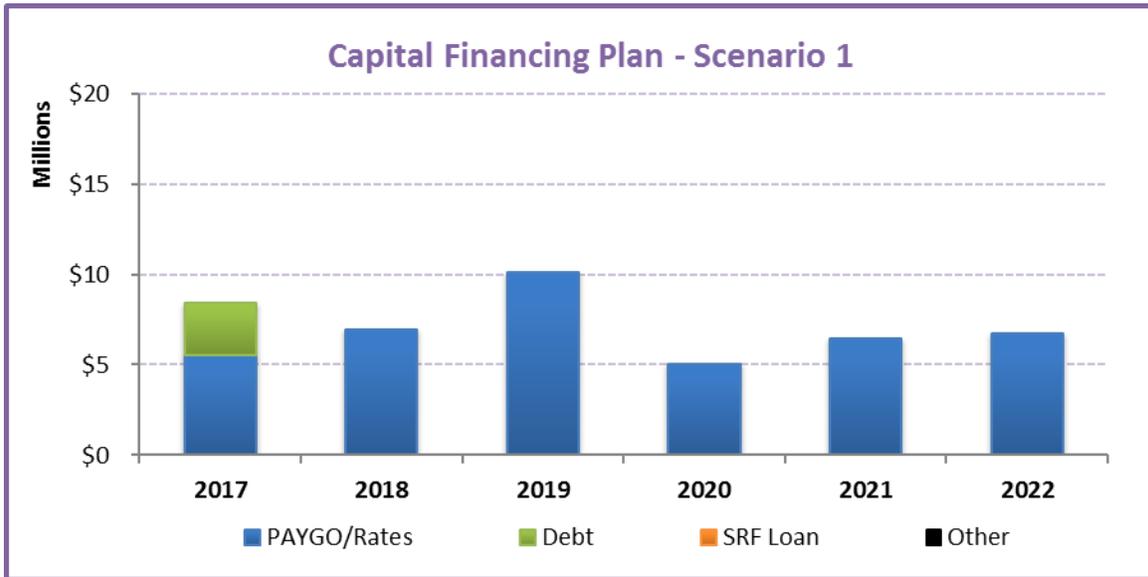
Figure ES-10 shows the operating financial plan of the solid waste utility. The stacked columns represent the different expenses such as operating expenses, debt service, and capital projects funded by rates. The red bars represent the net income based on the proposed revenues with the revenue increases shown in Figure ES-9, represented by the green line. The blue line represents revenues at the existing rates.

**Figure ES-10
Solid Waste Operating Financial Plan**



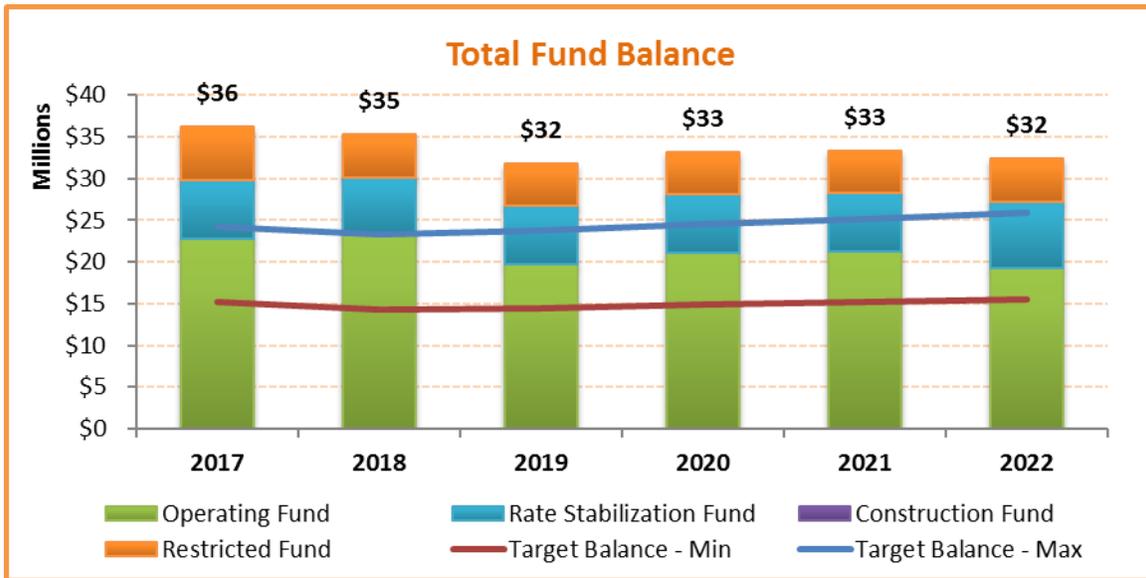
The capital financing plan for the next six years is shown in **Figure ES-11**. The Department is projected to finance the majority of its capital projects through rates.

Figure ES-11
Solid Waste Capital Financing Plan



Based on the projected revenue increases, the following figure, **Figure ES-12**, shows the total funds balance of the solid waste utility along with the target balances. The blue line represents the maximum target balance, defined as 120 days of O&M expenses for the Operating fund, 10 percent of revenue for the Rate Stabilization fund, and the entirety of the Restricted reserves. The red line represents the minimum target balance, defined as 60 days of O&M expenses for the Operating fund, 10 percent of revenue for the Rate Stabilization fund, and the entirety of the Restricted reserves. The total reserve levels are projected to meet the minimum required target level in all six years of the Study period.

**Figure ES-12
Solid Waste Total Funds Balance**



OVERALL CUSTOMER IMPACTS

Table ES-7 shows the wastewater, surface water, and solid waste monthly bills for an average residential customer who discharges 6 hundred cubic feet of wastewater every month, has a 60-gallon container solid waste service, and a 7,000 square foot lot. The total Environmental Services utility bill increases by \$4.66 in 2017 and \$5.17 in 2018 for an average residential customer.

**Table ES-7
Average Residential Utility Bills**

| | Current Bill | 2017 Bill | 2018 Bill |
|---------------------------------|-----------------|-----------------|-----------------|
| Wastewater | \$48.59 | \$50.70 | \$53.04 |
| Surface Water | \$22.25 | \$23.28 | \$24.53 |
| Solid Waste | \$40.75 | \$42.27 | \$43.85 |
| Average Residential Bill | \$111.59 | \$116.25 | \$121.42 |

AFFORDABILITY

To assist its customers with their utility bills, the Department offers two payment assistance programs: the Low-Income Disabled/Elderly (LID/LIE) program, available to customers who have total household income of up to 150 percent of the federal poverty level and are either over 62 years of age or are receiving disability income, and the Family Assistance program, available to all customers who have total household income of up to 150 percent of the federal poverty level. The LID/LIE program provides a discount of 30 percent on all residential utility rates. The Family Assistance program discounts are based

on individual customer's circumstances and are currently available once every 12-month period and will be available monthly starting mid-year in 2017.

Table ES-8 presents the total average residential utility bills as a percentage of the household income to determine whether utility rates are affordable. The Environmental Protection Agency (EPA) has an affordability guideline of four percent of the household income for water, wastewater, and surface water bills. However, it does not have a guideline for solid waste bills. The total average residential bill for all three Environmental Services utilities represents approximately 2.2-2.4 percent of the median household income in 2017 and 2018, which is well within the affordability guideline established by the EPA. For customers who qualify for the assistance programs, without those discounts, the total average residential bill would represent approximately 3.7 to 4.0 percent of their household income in 2017 and 2018. However, with the discounts, the percentages decrease to 2.7 percent in 2017 and 2.8 percent in 2018, bringing them more in line with the median household income calculation.

Table ES-8
Total Utility Bills as Percentage of Income

| Year | Surface Water | Wastewater | Solid Waste | Without Discount | With Discount |
|--|---------------|------------|-------------|------------------|---------------|
| Tacoma Median Income - \$59,711 per year | | | | | |
| Current | 0.4% | 1.0% | 0.8% | 2.2% | |
| 2017 | 0.5% | 1.0% | 0.8% | 2.3% | |
| 2018 | 0.5% | 1.1% | 0.9% | 2.4% | |
| Qualified LIE/LID & Family Assistance for 4 People - \$36,450 per year | | | | | |
| Current | 0.7% | 1.6% | 1.3% | 3.7% | 2.6% |
| 2017 | 0.8% | 1.7% | 1.4% | 3.8% | 2.7% |
| 2018 | 0.8% | 1.7% | 1.4% | 4.0% | 2.8% |
| EPA Guideline is 2% for each utility | | | | | |

SECTION 1 – WASTEWATER MANAGEMENT

WASTEWATER SYSTEM

The wastewater utility collects more than 9,300 million gallons annually of wastewater from residents and businesses through more than 700 miles of pipelines and 50 pump stations. Wastewater is delivered to and treated at two state-of-the-art wastewater treatment plants – the Central Wastewater Treatment Plant (Central Plant) and the North End Wastewater Treatment Plant (North End Plant). The Central Plant, upgraded in 2008, uses high purity oxygen and good bacteria to remove organics from wastewater. The North End Plant, on the other hand, uses chemicals to remove the organics and a filter with good bacteria to treat the wastewater before it enters Puget Sound. It was last upgraded in 1997. Biosolids materials generated at the plants are processed into Tagro, a gardening mix and potting soil.

Current Wastewater Rates

Residential customers are charged a monthly fixed charge and variable-rate charge based on average winter water usage from December through March of the previous year, as shown in **Table 1-1** below. Average winter water usage is used as a proxy to estimate wastewater generation since during the winter there is less need for irrigation usage, which does not enter the wastewater system. Eligible low-income disabled, elderly (LID/LIE) customers receive 30 percent off of the residential wastewater rates. Commercial customers are categorized by the strength of the wastewater and charged a monthly fixed charge and a variable rate based on water usage and categories since different commercial customers discharge different strength wastewater into the system. The examples of commercial establishments included in each category are shown in **Table 1-2**.

Table 1-1
Current Wastewater Rates

| Current Wastewater Rates | 2016 |
|-------------------------------------|-------------|
| Single Family Residential | |
| Monthly Fixed Charge | \$22.79 |
| Flow Charge (\$/hcf) | \$4.30 |
| Commercial | |
| Monthly Fixed Charge | \$10.84 |
| Flow Charge (\$/hcf of water usage) | |
| Category 1 | \$5.73 |
| Category 2 | \$6.07 |
| Category 3 | \$7.64 |
| Category 4 | \$9.39 |
| Category 5 | \$9.39 |
| Category 6 | \$11.15 |
| Category 7 | \$12.66 |
| Category 8 | \$13.10 |
| Various | \$3.65 |

**Table 1-2
Commercial Customers Classification**

| Category | Business Type | BOD (mg/L) | TSS (mg/L) |
|----------|--|------------|------------|
| 1 | Nursing Homes Photo Finish Labs Taverns- No Food Preparation Commercial Printers Business Form Printers Laundromats Photo Studios Car Washes Lime Manufacturers | 200 | 150 |
| 2 | Domestic Strength (1) Hotels & Motels - No Restaurant Hospitals Auto Dealers Top & Body Repair Shops Repair & Paint Shops Auto Repair Shops Asphalt Felts & Coating | 200 | 225 |
| 3 | Canned and Cured Fish Fresh or Frozen Fish Grocery Stores - Others Bowling Alleys - No Restaurant | 400 | 300 |
| 4 | Hotels & Motels - With Restaurant Correctional Institutions | 500 | 450 |
| 5 | Commercial Laundries Bakeries (Manufacturers) | 600 | 400 |
| 6 | Bakery Stores - On-Site Baking Restaurants Category I (2) Taverns- Food Preparation Cat. I (2) Bowling Alleys - With Restaurant Cat. I (2) | 800 | 400 |
| 7 | Grocery Stores - Full Service Funeral Services - With Embalming | 800 | 700 |
| 8 | Restaurants Category II (3) Taverns- Food Preparation Cat. II (3) Bowling Alleys - With Restaurant Cat. II (3) | 950 | 600 |

(1) Applies to all other business types not listed.

(2) Category I - Customers with approved grease retention devices.

(3) Category II - Customers without approved grease retention devices.

Customer Accounts

Customer accounts and water usage information for 2015 are used as the basis for projecting wastewater revenues. The Department does not expect any growth to occur during the six-year period as the Department is essentially built out. As shown in **Table 1-3**, the Department also provides wastewater services to neighboring agencies, including Pierce County, Fife, Ruston, and Fircrest, on a contract basis. The flows from these contract agencies are based on either rate agreements, which specify a residential equivalent flow, or actual metered water consumption. Within the Department, residential customers account for 95.8 percent of the total customer accounts and 71.8 percent of the total billable water usage or wastewater generation.

Table 1-3
Wastewater Accounts and Water Usage

| | Accounts | Water Usage |
|--------------------------------|---------------|------------------|
| Residential | | |
| Single Family | 52,373 | 3,470,377 |
| Multi Family | 28,717 | 1,436,772 |
| Total Residential | 81,090 | 4,907,149 |
| Commercial | | |
| Category 1 | 49 | 54,959 |
| Category 2 | 2,352 | 1,567,384 |
| Category 3 | 68 | 29,617 |
| Category 4 | 9 | 125,067 |
| Category 5 | 6 | 1,816 |
| Category 6 | 32 | 28,009 |
| Category 7 | 21 | 37,898 |
| Category 8 | 279 | 250,572 |
| Monitored | 4 | 4,079 |
| Total Commercial | 2,820 | 2,099,401 |
| Contract Agencies | | |
| Pierce County | 6,537 | 569,927 |
| Fife | 3,971 | 485,175 |
| Fircrest | 2,953 | 223,734 |
| Ruston | 352 | 24,953 |
| Total Contract Agencies | 13,813 | 1,303,789 |

FINANCIAL PLAN

A review of a utility's revenue requirements is a key first step in the rate development process. The review involves an analysis of annual operating revenues under the current rates, non-operating revenues, operation and maintenance (O&M) expenses, capital expenditures, transfers between funds, and reserve requirements. This subsection of the report provides a discussion of the projected

revenues, O&M and capital expenditures, capital improvement financing plan, debt service requirements, and the revenue adjustments required to ensure the financial stability of the wastewater utility.

Wastewater System Revenues

The Department's wastewater utility derives its required annual operating and non-operating revenues from a number of sources. The principal source of operating revenues from rates are the wastewater service charges from the Department's users, which are expected to remain at approximately \$67 million per year; while the Department is not expecting any growth to occur, it is projected to see about a 0.6 percent decrease per year in water used due to conservation. Other operating revenue includes service revenues, Tagro sales, and customer fee revenues. Non-operating revenue sources include investment earnings, rental income, other miscellaneous non-operating income, etc.

Table 1-4 presents the details of the operating revenues at existing rates and non-operating revenues.

Table 1-4
Wastewater Revenue at Existing Rates

| Revenue at Existing Rates | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|--|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Operating Revenues | | | | | | |
| ENV-4270 Customer Fee Revenue | \$80,000 | \$80,000 | \$82,000 | \$84,050 | \$86,151 | \$88,305 |
| ENV-4550 Sales Revenue | \$587,000 | \$599,000 | \$613,975 | \$629,324 | \$645,057 | \$661,184 |
| ENV-4560 Service Revenue | \$1,000,000 | \$1,000,000 | \$1,025,000 | \$1,050,625 | \$1,076,891 | \$1,103,813 |
| ENV-4660 Wastewater Revenue-Commercial | \$21,511,618 | \$21,424,557 | \$21,338,032 | \$21,252,010 | \$21,166,484 | \$21,081,497 |
| ENV-4670 Wastewater Revenue-Residential | \$45,691,462 | \$45,560,501 | \$45,430,321 | \$45,300,928 | \$45,172,314 | \$45,044,468 |
| ENV-4695 Discount-Aid to Families in Need | (\$75,000) | (\$75,000) | (\$76,875) | (\$78,797) | (\$80,767) | (\$82,786) |
| Total Operating Revenues | \$68,795,080 | \$68,589,058 | \$68,412,452 | \$68,238,141 | \$68,066,131 | \$67,896,481 |
| Non-Operating Revenues/(Expenses) | | | | | | |
| ENV-6100 Investment Income | \$781,425 | \$608,205 | \$741,417 | \$872,016 | \$786,513 | \$632,237 |
| ENV-6300 Rental and Lease Income | \$1,789,200 | \$1,796,400 | \$1,796,400 | \$1,796,400 | \$1,796,400 | \$1,796,400 |
| ENV-6560 Other Debt Service Costs | \$0 | \$0 | (\$175,000) | \$0 | \$0 | \$0 |
| ENV-6700 Capitalized Interest Expense | \$577,582 | \$487,769 | \$502,743 | \$495,398 | \$507,376 | \$534,642 |
| ENV-7800 Misc Nonoperating Inc and Expense | \$156,137 | \$60,000 | \$61,500 | \$63,038 | \$64,613 | \$66,229 |
| Total Non-Operating Revenues/(Expenses) | \$3,304,344 | \$2,952,374 | \$2,927,060 | \$3,226,852 | \$3,154,903 | \$3,029,508 |
| TOTAL REVENUES | \$72,099,425 | \$71,541,432 | \$71,339,512 | \$71,464,992 | \$71,221,034 | \$70,925,988 |

Wastewater System Expenditures

For sound financial operation of the Department's wastewater system, revenues generated must be sufficient to meet the revenue requirements or cash obligations of the system. Revenue requirements include O&M expenses, capital improvement program (CIP) expenditures, principal and interest payments on existing debt, and other obligations.

Operations and Maintenance Expenses

O&M expenditures include the cost of operating and maintaining treatment, collection, and disposal facilities. O&M expenses also include the costs of providing technical services such as laboratory services, and other administrative costs of the wastewater system such as customer service and billing.

These costs are a normal obligation of the system, and are met from operating revenues as they are incurred. The comprehensive forecasted annual O&M expenditures for the Study are based upon the Department's budgeted 2017 and 2018 expenditures and the effect of inflation in future years. The Department uses the estimated Consumer Price Index (CPI) for the Puget Sound area as the standard inflation factor to project all future O&M expenditures, except benefits, construction, assessments, and utilities, starting in 2019. Benefits expenses are projected to increase at a higher rate than standard inflation factors, estimated at seven percent per year. Construction and utilities expenses are projected to increase at four percent per year during the Study period. Assessments expenses are projected to increase at five percent per year. Projected O&M expenditures for the study period are summarized by functions in **Table 1-5**.

The rate model provides for segregation between cash and non-cash expenses such as depreciation, which is excluded when revenue requirements are calculated to determine wastewater rates.

Table 1-5
Wastewater O&M Expenses

| O&M Expenses by Cost Center | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| 522300 ES Wastewater Rate Stabilization | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| 522400 ES Wastewater Conservation Loan | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| 523200 ES Wastewater Pumping | \$1,603,173 | \$1,645,100 | \$1,700,900 | \$1,758,993 | \$1,819,494 | \$1,882,524 |
| 523400 ES Wastewater Engineering | \$3,392,187 | \$3,588,953 | \$3,690,805 | \$3,796,564 | \$3,906,445 | \$4,020,674 |
| 523410 ES Wastewater Construction Support | \$1,064,099 | \$1,096,934 | \$1,128,842 | \$1,162,262 | \$1,197,299 | \$1,234,064 |
| 523500 ES Wastewater Laboratory | \$1,470,179 | \$1,522,656 | \$1,575,696 | \$1,631,110 | \$1,689,030 | \$1,749,599 |
| 523600 ES Wastewater Environmental Compliance | \$1,220,359 | \$1,250,250 | \$1,292,378 | \$1,336,320 | \$1,382,175 | \$1,430,047 |
| 523700 ES Wastewater Customer Service | \$798,201 | \$825,767 | \$853,236 | \$881,870 | \$911,731 | \$942,886 |
| 523900 ES Wastewater Revenues and Accounting | \$18,262,483 | \$18,780,963 | \$19,377,805 | \$20,010,748 | \$20,612,125 | \$21,170,963 |
| 523905 ES Wastewater Public Info-Comm Rel | \$162,030 | \$168,399 | \$172,828 | \$177,383 | \$182,067 | \$186,885 |
| 523915 ES Wastewater Assessments | \$7,231,691 | \$7,245,317 | \$7,607,583 | \$7,987,962 | \$8,387,360 | \$8,806,729 |
| 523925 ES Wastewater Business Operations | \$1,296,263 | \$1,491,268 | \$1,531,964 | \$1,573,916 | \$1,617,170 | \$1,661,778 |
| 524200 ES Wastewater Transmission | \$6,287,676 | \$6,477,353 | \$6,687,521 | \$6,906,313 | \$7,134,180 | \$7,371,601 |
| 524600 ES Wastewater 2006 Bond Construction | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| 524700 ES Wastewater Construction | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| 524800 ES Wastewater Expense Construct Proj | \$237,500 | \$237,500 | \$243,438 | \$249,523 | \$255,762 | \$262,156 |
| 525100 ES Wastewater Plant #1 Oper | \$8,035,396 | \$8,288,025 | \$8,603,337 | \$8,932,579 | \$9,276,451 | \$9,635,691 |
| 525200 ES Wastewater Treatment by Other | \$2,761,463 | \$2,874,175 | \$2,946,040 | \$3,019,702 | \$3,095,207 | \$3,172,599 |
| 525300 ES Wastewater Plant #3 Oper | \$1,034,131 | \$1,068,919 | \$1,101,708 | \$1,135,679 | \$1,170,883 | \$1,207,376 |
| 526100 ES Wastewater Plant #1 Maint | \$5,948,955 | \$6,020,038 | \$6,214,167 | \$6,416,450 | \$6,627,331 | \$6,847,284 |
| 526101 ES Wastewater Maintenance Parts Room | \$270,631 | \$279,170 | \$287,275 | \$295,751 | \$304,619 | \$313,901 |
| 526102 ES Wastewater Maintenance Administration | \$502,509 | \$531,432 | \$549,616 | \$568,597 | \$588,420 | \$609,131 |
| 526300 ES Wastewater Plant #3 Maint | \$608,181 | \$631,420 | \$648,852 | \$666,834 | \$685,389 | \$704,540 |
| 527000 ES Wastewater Biosolids Oper | \$587,000 | \$599,000 | \$573,298 | \$545,184 | \$514,528 | \$481,193 |
| 527500 ES Wastewater Biosolids Maint | \$101,624 | \$105,774 | \$108,418 | \$111,129 | \$113,907 | \$116,755 |
| 527901 ES Wastewater SRF Loan Reserve | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| 527902 ES Wastewater TES Bonds Reserve | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| 527904 ES Wastewater 2011 Ref Bonds Reserve | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| 523420 ES WW Site Development | \$453,207 | \$472,664 | \$488,256 | \$504,501 | \$521,435 | \$539,096 |
| 523430 ES WW Asset Management | \$1,970,087 | \$1,979,208 | \$2,042,323 | \$2,107,970 | \$2,176,280 | \$2,247,390 |
| 523740 ES Wastewater Business Administration | \$745,300 | \$767,895 | \$795,603 | \$824,601 | \$854,960 | \$886,761 |
| 523930 ES Wastewater Environ Policy and Sustain | \$231,910 | \$238,670 | \$246,892 | \$255,478 | \$264,447 | \$273,821 |
| TOTAL O&M EXPENSES | \$66,276,233 | \$68,186,848 | \$70,468,780 | \$72,857,419 | \$75,288,693 | \$77,755,442 |

Taxes

The wastewater utility pays three types of taxes on the revenues for wastewater services: a municipal gross earnings (MGE) tax of 8 percent, assessed by the City of Tacoma; a public utility tax of 3.852 percent on revenues received for wastewater collection; a business and occupation (B&O) tax of 1.5 percent on revenues received for wastewater transmission and treatment and a manufacturing B&O tax of 0.484 percent on Tagro sales assessed by the State of Washington. Expenses for wastewater collection and transmission and treatment have been adjusted for a combined tax rate of 11.852 percent and 9.5 percent, respectively.

Capital Improvement Program

The Department has developed a comprehensive wastewater CIP to address current wastewater system needs. As **Table 1-6** indicates, the total estimated wastewater construction improvement plan (CIP) from 2015 to 2020 is \$141.4 million. These projected costs include a four percent annual inflation factor for projects after 2018 due to anticipated increases in construction costs over time. This inflation rate is based on the Engineering News Record (ENR) and ensures that the Department has adequate resources reserved to complete the necessary projects.

Table 1-6
Wastewater Capital Improvement Program

| Capital Improvement Program | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|-----------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Collections Systems | \$8,842,310 | \$9,787,259 | \$10,848,761 | \$10,410,332 | \$10,799,877 | \$11,480,843 |
| CTP Facility Improvements | \$8,270,377 | \$3,450,000 | \$2,756,000 | \$2,866,240 | \$2,812,160 | \$2,924,646 |
| NETP Facility Improvements | \$475,000 | \$600,000 | \$624,000 | \$540,800 | \$562,432 | \$584,929 |
| Pump Stations Improvements | \$325,000 | \$825,000 | \$858,000 | \$892,320 | \$843,648 | \$877,394 |
| Equipment | \$2,626,000 | \$2,956,000 | \$2,324,400 | \$3,340,305 | \$3,262,106 | \$3,234,659 |
| Special Projects (SC) | \$363,610 | \$152,460 | \$124,800 | \$129,792 | \$134,984 | \$140,383 |
| Capital Labor Credit | \$2,715,238 | \$2,758,045 | \$2,868,367 | \$2,983,101 | \$3,102,426 | \$3,226,523 |
| Capitalized A&G | \$1,574,073 | \$1,346,819 | \$1,365,527 | \$1,377,276 | \$1,405,867 | \$1,475,279 |
| Capitalized Interest | \$577,582 | \$487,769 | \$502,743 | \$495,398 | \$507,376 | \$534,642 |
| TOTAL CIP - INFLATED | \$25,769,190 | \$22,363,352 | \$22,272,598 | \$23,035,564 | \$23,430,874 | \$24,479,299 |

Major Capital Improvement Financing Plan

Typical CIP funding sources include the following:

System Revenues

Pay-as-you-go revenues
Interest earnings

Capital Financing

Bond proceeds
Grant receipts
State revolving loans

Table 1-6 presents the proposed capital financing plan to finance major CIP projects over the six-year period from 2017 to 2022. In addition to a \$6 million SRF loan in 2017, the Department will issue \$50 million in bonds in 2019 to adequately fund the capital improvement program since revenues from rates are insufficient to cover the costs. When bonds or loans are issued, it is assumed that debt proceeds are

used up first before revenues from rates and other sources are considered for financing the capital expenses.

Table 1-7
Wastewater Capital Financing Plan

| Capital Financing Plan | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|--|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Total Capital Projects | \$25,769,190 | \$22,363,352 | \$22,272,598 | \$23,035,564 | \$23,430,874 | \$24,479,299 |
| Total Capital Projects - PAYGO only | \$2,989,610 | \$3,108,460 | \$2,449,200 | \$3,470,097 | \$3,397,089 | \$3,375,042 |
| Total Capital Projects - Other funding sources | \$22,779,580 | \$19,254,892 | \$19,823,398 | \$19,565,467 | \$20,033,785 | \$21,104,257 |
| Sources of Funding: | | | | | | |
| Debt | \$16,528,789 | \$0 | \$18,823,398 | \$19,565,467 | \$11,611,135 | \$0 |
| SRF Loans | \$5,250,791 | \$349,209 | \$0 | \$0 | \$0 | \$0 |
| Grants | \$1,000,000 | \$1,350,000 | \$1,000,000 | \$0 | \$0 | \$0 |
| Other | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Total Sources | \$22,779,580 | \$1,699,209 | \$19,823,398 | \$19,565,467 | \$11,611,135 | \$0 |
| Projects Funded by Rates | \$2,989,610 | \$20,664,143 | \$2,449,200 | \$3,470,097 | \$11,819,740 | \$24,479,299 |

Debt Service Requirements

Debt service requirements consist of principal and interest payments on existing debt. The required debt service coverage on outstanding bonds is 130 percent. The Department currently has debt service obligations associated with its outstanding 2006, 2011, 2015, and 2016 Revenue and Refunding Bonds, and two SRF loans. Existing and proposed debt service consists of annual payments in the range of \$12.1 million to \$15.0 million. **Table 1-8** shows the existing and proposed debt service of the wastewater utility; the existing debt includes a \$6 million SRF ESCO loan in 2017 and \$50 million in bonds in 2019.

Table 1-8
Wastewater Debt Service

| | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| 2006 ORIG BONDS | \$108 | \$108 | \$108 | \$108 | \$108 | \$108 |
| 2011 REV & REF BONDS | \$330,710 | \$330,710 | \$330,710 | \$330,710 | \$330,710 | \$883,710 |
| Wastewater Loan #1 | \$3,195,493 | \$3,195,493 | \$3,195,493 | \$3,195,493 | \$3,195,493 | \$3,195,493 |
| Wastewater Loan #2 | \$1,442,301 | \$1,442,301 | \$1,442,301 | \$1,442,301 | \$1,442,301 | \$1,442,301 |
| Wastewater ESCO Loan | \$625,884 | \$625,884 | \$625,884 | \$625,884 | \$625,884 | \$625,883 |
| 2015 REVENUE BONDS | \$2,395,444 | \$2,395,575 | \$2,395,740 | \$2,396,108 | \$2,395,688 | \$2,396,057 |
| 2015 REF 06 BONDS | \$889,025 | \$892,049 | \$888,479 | \$888,731 | \$888,626 | \$871,322 |
| 2016 A REVENUE BONDS | \$2,092,775 | \$2,098,525 | \$2,093,125 | \$2,090,875 | \$2,097,075 | \$2,097,038 |
| 2016 B REF 06 BONDS | \$1,149,372 | \$1,148,700 | \$1,147,650 | \$1,150,590 | \$1,148,805 | \$0 |
| 2019 REVENUE BONDS | \$0 | \$0 | \$1,618,522 | \$2,864,889 | \$2,868,602 | \$2,868,281 |
| TOTAL EXISTING DEBT SERVICE | \$12,121,111 | \$12,129,344 | \$13,738,011 | \$14,985,688 | \$14,993,291 | \$14,380,191 |
| Proposed Debt | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| TOTAL PROPOSED DEBT SERVICE | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| TOTAL DEBT SERVICE | \$12,121,111 | \$12,129,344 | \$13,738,011 | \$14,985,688 | \$14,993,291 | \$14,380,191 |

Reserves

The Department requires adequate cash reserves to meet operating, capital, and debt service requirements. Operating reserves may be used to meet ongoing cash flow requirements as well as emergency requirements. Typically, a balance in the range of 10 to 50 percent of annual operating expenses is considered appropriate. This represents one to six months of working capital. The Department target is to maintain a minimum 60-day operating reserve and a maximum of 120-day operating reserve. The operating reserve balances and the minimum and maximum operating reserve targets are shown in **Table 1-9**. The Department's desired operating reserve level is 90 days of operating expenses.

In addition to the operating reserve, the Department also maintains a rate stabilization fund (RSF), which is used to mitigate spikes in rate increases by better matching revenues and expenses. The Department target balance for the RSF, which is funded when there are excess revenues, is 10% of annual operating revenues. Interest from reserve funds may be used to finance operations. The total reserve levels are projected to meet the minimum required level in all six years, as shown in **Figure 1-1**.

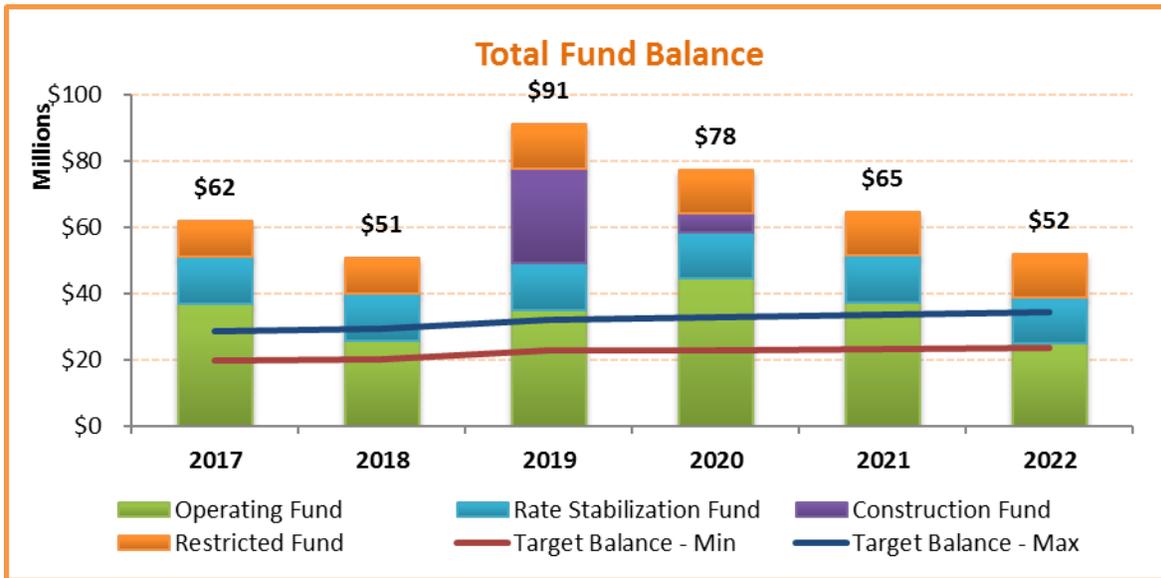
Based on the terms of the debt issued, debt reserves provide protection to bond buyers in the event that revenues are unable to cover debt service. These are restricted reserves used only for meeting debt service payments. The parity bond reserve is the least of 10 percent of the original par value of the bond issue, the maximum annual debt service, or 125 percent of the average annual debt service. Each time the Department issues bonds, either insurance is purchased or additional proceeds as required are to be added to the debt reserves, as shown in the Restricted Fund in **Table 1-9**.

Table 1-9
Wastewater Funds/Reserves Balance

| Wastewater Funds/Reserves Balance | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|--|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Operating Fund | | | | | | |
| Beginning Balance | \$43,583,032 | \$37,065,680 | \$25,928,826 | \$35,124,608 | \$44,488,242 | \$37,457,620 |
| Net Cash Flow | \$6,071,594 | (\$10,808,357) | \$6,745,070 | \$5,891,925 | (\$1,481,720) | (\$12,691,677) |
| Transfer from/(to) Rate Stabilization Fund | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Transfer from Construction Fund | (\$12,596,142) | (\$331,292) | \$2,449,200 | \$3,470,097 | (\$5,602,036) | \$30,045 |
| Transfer From/(To) Restricted Fund | \$7,196 | \$2,795 | \$1,512 | \$1,611 | \$53,134 | \$2,362 |
| Ending Balance | \$37,065,680 | \$25,928,826 | \$35,124,608 | \$44,488,242 | \$37,457,620 | \$24,798,350 |
| <i>Interest Income</i> | <i>\$514,666</i> | <i>\$359,323</i> | <i>\$337,475</i> | <i>\$426,659</i> | <i>\$484,918</i> | <i>\$360,814</i> |
| Target Balance - Min - 60 days of O&M | \$8,873,315 | \$9,187,477 | \$9,512,231 | \$9,853,290 | \$10,200,067 | \$10,551,354 |
| Target Balance - Max - 120 days of O&M | \$17,746,630 | \$18,374,955 | \$19,024,462 | \$19,706,580 | \$20,400,135 | \$21,102,708 |
| Days of O&M - Calculated | 356 | 306 | 222 | 271 | 323 | 280 |
| Rate Stabilization Fund | | | | | | |
| Beginning Balance | \$14,000,000 | \$14,000,000 | \$14,000,000 | \$14,000,000 | \$14,000,000 | \$14,000,000 |
| Transfer From/(To) Operating Fund | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Ending Balance | \$14,000,000 | \$14,000,000 | \$14,000,000 | \$14,000,000 | \$14,000,000 | \$14,000,000 |
| <i>Interest Income</i> | <i>\$140,000</i> | <i>\$140,000</i> | <i>\$140,000</i> | <i>\$140,000</i> | <i>\$140,000</i> | <i>\$140,000</i> |
| Target Balance - 10% of revenue | \$7,028,322 | \$7,331,933 | \$7,637,083 | \$7,955,004 | \$8,252,953 | \$8,555,534 |
| Construction Fund | | | | | | |
| Beginning Balance | \$3,583,438 | \$17,917 | \$90 | \$28,871,129 | \$6,009,098 | \$30,045 |
| Total Bonds Proceeds | \$0 | \$0 | \$50,000,000 | \$0 | \$0 | \$0 |
| SRF Loan Proceeds | \$5,600,000 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Other Sources of Funding | \$1,000,000 | \$1,350,000 | \$1,000,000 | \$0 | \$0 | \$0 |
| Bonds Used for Capital Projects | (\$16,528,789) | \$0 | (\$18,823,398) | (\$19,565,467) | (\$11,611,135) | \$0 |
| SRF Loan Used for Capital Projects | (\$5,250,791) | (\$349,209) | \$0 | \$0 | \$0 | \$0 |
| Other Sources Used for Capital Projects | (\$1,000,000) | (\$1,350,000) | (\$1,000,000) | \$0 | \$0 | \$0 |
| Transfer to fund PAYGO | \$12,596,142 | \$331,292 | (\$2,449,200) | (\$3,470,097) | \$5,602,036 | (\$30,045) |
| Transfer From/(To) Restricted Fund | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Ending Balance | \$0 | \$0 | \$28,727,491 | \$5,835,565 | \$0 | \$0 |
| <i>Interest Income</i> | <i>\$17,917</i> | <i>\$90</i> | <i>\$143,638</i> | <i>\$173,533</i> | <i>\$30,045</i> | <i>\$150</i> |
| Restricted Fund | | | | | | |
| Beginning Balance | \$10,887,808 | \$10,880,612 | \$10,877,817 | \$13,183,117 | \$13,181,506 | \$13,128,372 |
| Reserves from New Bonds | \$0 | \$0 | \$2,306,812 | \$0 | \$0 | \$0 |
| Transfer From/(To) Operating Fund | (\$7,196) | (\$2,795) | (\$1,512) | (\$1,611) | (\$53,134) | (\$2,362) |
| Transfer From/(To) Construction Fund | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Ending Balance | \$10,880,612 | \$10,877,817 | \$13,183,117 | \$13,181,506 | \$13,128,372 | \$13,126,010 |
| <i>Interest Income</i> | <i>\$108,842</i> | <i>\$108,792</i> | <i>\$120,305</i> | <i>\$131,823</i> | <i>\$131,549</i> | <i>\$131,272</i> |

Figure 1-1 shows the total funds balance and total targets in a graphical format. The blue line represents the maximum target balance, defined as 120 days of O&M expenses for the Operating fund, 10 percent of revenue for the Rate Stabilization fund, and the entirety of the Restricted reserves. The red line represents the minimum target balance, defined as 60 days of O&M expenses for the Operating fund, 10 percent of revenue for the Rate Stabilization fund, and the entirety of the Restricted reserves.

Figure 1-1
Projected Total Wastewater Funds Balance



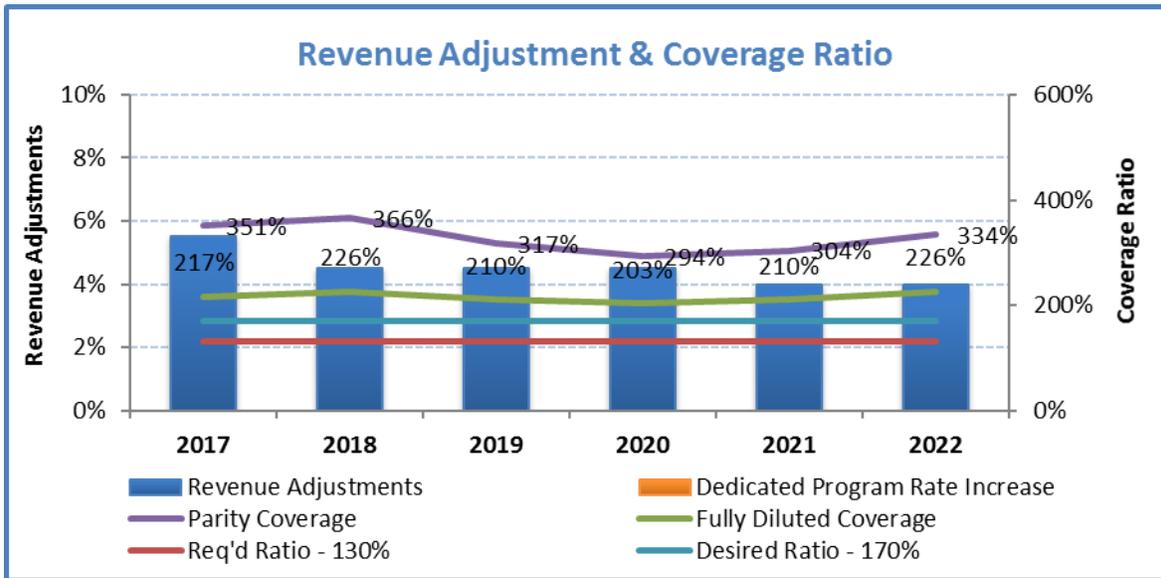
Proposed Revenue Adjustments

In order to meet projected revenue requirements, to achieve desired operating and capital reserve fund balances, and to minimize customer impacts, the following revenue adjustments are proposed to meet long-term rate stability:

| Effective Date | Increases |
|-----------------|-------------|
| January 1, 2017 | 5.5 percent |
| January 1, 2018 | 4.5 percent |

Figure 1-2 shows the projected revenue adjustments for the wastewater utility over the next six years. However, only the first two years are implemented in this rate cycle.

**Figure 1-2
Proposed Wastewater Revenue Adjustments and Debt Coverage**



The operating financial plan presented in **Table 1-10** shows the revenues projected from rates based on the proposed revenue adjustment schedule shown above. The financial plan shows that the Wastewater utility will need to generate additional revenues, estimated to be 4.5 percent per year from 2019 to 2020 and 4.0 percent per year from 2021 to 2022 as shown in **Figure 1-2**, to meet revenue requirements in those years.

Table 1-10
Wastewater Operating Financial Plan

| Operating Financial Plan | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---------------------------------------|----------------------|-----------------------|----------------------|----------------------|----------------------|-----------------------|
| Revenue at Existing Rates | \$67,203,080 | \$66,985,058 | \$66,768,352 | \$66,552,938 | \$66,338,798 | \$66,125,965 |
| Total Additional Revenue | \$3,080,141 | \$6,334,275 | \$9,602,478 | \$12,997,098 | \$16,190,731 | \$19,429,377 |
| Total Rate Revenue | \$70,283,222 | \$73,319,332 | \$76,370,831 | \$79,550,036 | \$82,529,530 | \$85,555,342 |
| Other Operating Revenue | \$1,592,000 | \$1,604,000 | \$1,644,100 | \$1,685,202 | \$1,727,333 | \$1,770,516 |
| Adj to Actual Cash Flow - Non-op | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Investment Earnings | \$763,508 | \$608,116 | \$597,779 | \$698,482 | \$756,468 | \$632,086 |
| Other Non-Operating Revenue | \$2,522,919 | \$2,344,169 | \$2,185,643 | \$2,354,836 | \$2,368,390 | \$2,397,271 |
| TOTAL REVENUES | \$145,444,870 | \$151,194,949 | \$157,169,184 | \$163,838,592 | \$169,911,250 | \$175,910,557 |
| EXPENDITURES | | | | | | |
| O&M Expenses | \$53,979,333 | \$55,890,487 | \$57,866,072 | \$59,940,846 | \$62,050,409 | \$64,187,403 |
| O&M Cash Flow Adj and Tax Expense Adj | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Dedicated Program Cost | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Existing Debt Service | \$12,121,111 | \$12,129,344 | \$13,738,011 | \$14,985,688 | \$14,993,291 | \$14,380,191 |
| Proposed Debt Service | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Proposed SRF Loan | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Capital PAYGO (funded by rates) | \$2,989,610 | \$20,664,143 | \$2,449,200 | \$3,470,097 | \$11,819,740 | \$24,479,299 |
| TOTAL EXPENDITURES | \$69,090,054 | \$88,683,974 | \$74,053,283 | \$78,396,631 | \$88,863,440 | \$103,046,892 |
| NET CASH FLOW | \$6,071,594 | (\$10,808,357) | \$6,745,070 | \$5,891,925 | (\$1,481,720) | (\$12,691,677) |

*All revenues and expenses shown exclude non-cash items

Debt Service Coverage

The Department must meet debt service coverage requirements on its outstanding bond issues. Coverage requirements typically vary between 100 percent and 160 percent or higher. The Department's required debt coverage is 130 percent, which means that the Department's adjusted net system revenues shall amount to at least 130 percent of the annual debt service. However, the Department's debt coverage policy requires that the debt service coverage be 170 percent. The system revenues include funds derived from the ownership and operation of the system including wastewater service charges from the Department's users, miscellaneous service charges, revenue received from contracts, interest income, and other non-operating revenues. Annual debt service includes annual principal and interest payments on outstanding debt. With the proposed revenue adjustments, the Department exceeds the coverage requirement during all six years for both the parity debt service, which excludes debt service for SRF loans, and the fully diluted debt service, which includes all debt service expenses, as shown in **Table 1-11**, and in **Figure 1-2** above.

Table 1-11
Wastewater Coverage Ratio Calculation

| Coverage Ratio Calculation | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Revenues | | | | | | |
| Operating Revenue | \$71,875,222 | \$74,923,332 | \$78,014,931 | \$81,235,238 | \$84,256,862 | \$87,325,858 |
| Non-Operating Revenue | \$2,726,762 | \$2,464,605 | \$2,599,317 | \$2,731,453 | \$2,647,527 | \$2,494,865 |
| Transfer from/(to) Rate Stabilization | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Total Revenues | \$74,601,984 | \$77,387,937 | \$80,614,248 | \$83,966,691 | \$86,904,389 | \$89,820,723 |
| Expenses | | | | | | |
| O&M Expenses | \$48,311,608 | \$50,000,459 | \$51,735,673 | \$53,551,050 | \$55,420,684 | \$57,328,710 |
| Dedicated Program Cost | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Non-Operating Expenses | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Total Expenses | \$48,311,608 | \$50,000,459 | \$51,735,673 | \$53,551,050 | \$55,420,684 | \$57,328,710 |
| Net Revenue | \$26,290,376 | \$27,387,478 | \$28,878,575 | \$30,415,642 | \$31,483,705 | \$32,492,013 |
| Parity Debt Service | \$7,483,317 | \$7,491,550 | \$9,100,217 | \$10,347,894 | \$10,355,497 | \$9,742,397 |
| Fully Diluted Debt Service | \$12,121,111 | \$12,129,344 | \$13,738,011 | \$14,985,688 | \$14,993,291 | \$14,380,191 |
| Coverage Ratio | | | | | | |
| Parity Debt Service | 351% | 366% | 317% | 294% | 304% | 334% |
| Fully Diluted Debt Service | 217% | 226% | 210% | 203% | 210% | 226% |
| Parity Debt Service After GET | 351% | 366% | 317% | 294% | 304% | 334% |
| Required Coverage Ratio | 130% | 130% | 130% | 130% | 130% | 130% |
| Desired Coverage Ratio | 170% | 170% | 170% | 170% | 170% | 170% |

COST OF SERVICE ANALYSIS

The determination of the Department's user-class flows and loadings and the revenue requirements reviewed and finalized through the operating and capital cash flow analysis provide the basis for performing the cost of service analysis. This section of the report discusses the allocation of operating costs and the determination of unit rates, and the calculation of user class cost responsibility.

The total revenue requirement net of miscellaneous revenue credits, by definition, is the net cost of providing service. This cost of service is then used as the basis to develop unit rates for the wastewater parameters and to allocate costs to the various user classes in proportion to the wastewater services rendered. The wastewater rates were based on the cost of service performed in 2015, and updated for 2017 and 2018 budgeted costs.

Costs of Service to be Allocated

The annual revenue requirement or cost of service to be recovered from wastewater charges includes operation and maintenance expenses and other non-operating costs. O&M expenses include costs directly related to the collection, treatment, and disposal of wastewater and maintenance of system facilities.

The total net cost of service to be recovered from the Department's wastewater users, as shown in **Table 1-12**, is estimated at approximately \$70.9 million, of which approximately \$52.3 million is

operating costs and the remaining \$18.6 million is capital costs, which consists of existing debt service and capital projects funded by rates. The cost of service analysis is based upon the need to generate annual revenues adequate to meet the estimated annual revenue requirement. As part of the cost of service analysis, revenues from other sources except wastewater rates and charges are deducted from the appropriate cost elements. Additional deductions are made to reflect interest income and other non-operating income during the year. Adjustments are also made to account for cash balances to ensure adequate collection of revenue and to determine annual revenues needed from rates.

Table 1-12
Wastewater Revenue Requirements from Rates

| | 2017 | | |
|---|---------------------|----------------------|----------------------|
| | Operating | Capital | Total |
| Revenue Requirements | | | |
| O&M Expenses | \$53,979,333 | | \$53,979,333 |
| Existing Debt Service | | \$12,121,111 | \$12,121,111 |
| Proposed Debt Service | | \$0 | \$0 |
| Proposed SRF Loan | | \$0 | \$0 |
| Capital PAYGO | | \$2,989,610 | \$2,989,610 |
| Total Revenue Requirements | \$53,979,333 | \$15,110,721 | \$69,090,054 |
| Revenue from Other Sources | | | |
| Other Operating Revenue | \$1,592,000 | | \$1,592,000 |
| Investment Earnings | \$763,508 | | \$763,508 |
| Other Non-Operating Revenue | | \$2,522,919 | \$2,522,919 |
| Interfund Transfers | \$0 | | \$0 |
| Total Revenue from Other Sources | \$2,355,508 | \$2,522,919 | \$4,878,427 |
| Adjustments | | | |
| Adjustments for Cash Balance | | (\$6,071,594) | (\$6,071,594) |
| Adjustments to Annualize Rate Increase | (\$616,028) | | (\$616,028) |
| Total Adjustments | (\$616,028) | (\$6,071,594) | (\$6,687,623) |
| Revenue to be Collected from Rates | \$52,239,854 | \$18,659,396 | \$70,899,250 |

Mass Balance

Cost of service analysis requires that costs be assigned to customers in proportion to their loadings. Customers are divided into classes based on their strength. Since measurement of wastewater flow is expensive and prone to errors, most customers' wastewater flows are not metered. The flow from customers can be estimated based on their water usage; for residential customers, average winter water use provides a good proxy for the amount of wastewater generated, and for commercial customers, actual water use serves as the proxy for wastewater generated. Commercial customers'

strengths are defined in **Table 1-2**. Contract agencies' flows are based either on agreements or on actual metered usage. These agencies are assigned the same strengths as other Department customers.

A significant quantity of wastewater results from infiltration and inflow (I&I), which is water that enters the collection system during rain-related events, run-off, or through other ways. To determine this, a mass balance analysis is done by taking the total flow and strength of the wastewater influent into the plant and reducing that by the wastewater loadings of all the Department's customers. Based on this analysis, the calculated infiltration and inflow, is estimated to be approximately 33.1 percent of the total flow entering the treatment plant. Discussions with the Department's wastewater staff show that this number is reasonable given the amount of rain the Department receives during the year. The strength of the I&I is higher than would be expected. Since the anomaly cannot be explained, the costs related to I&I are allocated to loadings as well as accounts to ensure equitable recovery of I&I related costs.

Table 1-13 shows the total annual units of flow and strength for each customer class based on the result of the mass balance analysis.

Table 1-13
Wastewater Mass Balance

| 2015 | Flow | BOD | TSS |
|--------------------------------|--------------|---------------|---------------|
| | (MG) | (klbs/yr) | (klbs/yr) |
| Total Plant | 9,437 | 23,887 | 23,761 |
| Contract Agencies | | | |
| Pierce County | 408 | 1,011 | 986 |
| Fife | 208 | 488 | 482 |
| Fircrest | 125 | 199 | 229 |
| Ruston | 13 | 31 | 31 |
| Total Contract Agencies | 753 | 1,729 | 1,727 |
| Commercial | | | |
| Commercial Category 1 | 55 | 92 | 69 |
| Commercial Category 2 | 1,057 | 1,764 | 1,985 |
| Commercial Category 3 | 55 | 185 | 138 |
| Commercial Category 4 | 105 | 436 | 393 |
| Commercial Category 5 | 1 | 6 | 4 |
| Commercial Category 6 | 25 | 164 | 82 |
| Commercial Category 7 | 23 | 156 | 137 |
| Commercial Category 8 | 165 | 1,310 | 827 |
| Commercial, Various | 32 | 79 | 79 |
| Total Commercial | 1,518 | 4,193 | 3,715 |
| Residential | 4,043 | 11,449 | 11,804 |
| Estimated I&I - | 33.1% | 3,123 | 6,516 |

Unit Cost of Service

In order to allocate costs of service to the different user classes, unit costs of service are developed consistent with the guidelines for allocating costs detailed in the Manual of Practice titled Financing and Charges for Wastewater Systems published by the Water Environment Federation (WEF). Operating and capital costs are functionalized as collection, treatment, billing, administrative, etc. These costs are then allocated to the flow, biochemical oxygen demand (BOD) and suspended solids (SS) parameters based on the design of each facility. Collection costs are allocated entirely to flow. Since treatment plants are designed to treat flow, BOD and SS, treatment costs are allocated to those three parameters based on the design of each component of the treatment system. For example, the equipment in the primary clarifiers is designed to remove suspended solids. Along with suspended solids there is also some removal of BOD, therefore the equipment is allocated to SS and BOD based on the removal of those two parameters. Additionally, the primary tank structure is designed for flow; therefore, the structure is allocated to flow. Similarly, other components of the treatment plant are analyzed to determine the appropriate allocation to flow, BOD and SS. The allocation of the operating treatment costs is estimated

to be 56 percent to flow, 24 percent to BOD, 19 percent to SS, and 2 percent to customer billing. Administrative costs are assigned to general and then spread amongst the other costs centers proportionately. Capital costs are assigned on the basis of the asset values as described above. The unit costs of service are developed by dividing the total annual costs by the appropriate service units, such as flow, BOD and SS generated in the system and accounts for billing costs, as shown in **Table 1-14**.

Table 1-14
Wastewater Units of Service

| Customer Class | Flow (hcf/yr) | BOD (lbs/yr) | TSS (lbs/yr) | Accounts |
|--------------------------------|--------------------------|-------------------------|-------------------------|-----------------|
| Residential | | | | |
| Single Family | 3,635,991 | 7,701,731 | 7,940,079 | 55,397 |
| Multi Family | 1,485,850 | 3,147,317 | 3,244,718 | 32,554 |
| Subtotal Residential | 5,121,841 | 10,849,049 | 11,184,797 | 87,951 |
| Commercial | | | | |
| Commercial Category 1 | 72,789 | 90,875 | 68,156 | 66 |
| Commercial Category 2 | 1,396,151 | 1,743,056 | 1,960,938 | 3,284 |
| Commercial Category 3 | 73,063 | 182,434 | 136,826 | 96 |
| Commercial Category 4 | 138,127 | 431,119 | 388,007 | 11 |
| Commercial Category 5 | 1,682 | 6,300 | 4,200 | 7 |
| Commercial Category 6 | 32,513 | 162,366 | 81,183 | 45 |
| Commercial Category 7 | 30,884 | 154,231 | 134,952 | 22 |
| Commercial Category 8 | 218,269 | 1,294,389 | 817,509 | 301 |
| Commercial, Monitored | 41,833 | 78,341 | 78,341 | 8 |
| Subtotal Commercial | 2,005,311 | 4,143,112 | 3,670,113 | 3,840 |
| Contract Agencies | | | | |
| Pierce County | 545,201 | 1,010,855 | 985,501 | 6,537 |
| Fife | 277,507 | 488,113 | 481,690 | 3,971 |
| Fircrest | 166,620 | 198,660 | 228,823 | 2,953 |
| Ruston | 17,081 | 31,494 | 30,893 | 352 |
| Total Contract Agencies | 1,006,409 | 1,729,123 | 1,726,907 | 13,813 |
| TOTAL | 8,133,561 | 16,721,284 | 16,581,816 | 105,604 |

Table 1-15 shows the development of the unit costs for each of the wastewater expense categories using the revenue requirements from rates (**Table 1-12**). Each cost category is divided by the total number of service units in that category. The total number of bills per year excludes contract agencies since the Department does not bill individual customers within the contract agencies. After the total system unit cost is calculated, the I&I costs are calculated. I&I costs may be entirely assigned to customers equally or be spread in proportion to the loadings from each customer. It may not be fair to

charge all of the I&I costs to loadings and therefore a portion of the I&I costs are allocated to billing to be shared equally by all customers, and the remainder to the loadings from customers.

Table 1-15
Wastewater Unit Cost Calculation

| | Flow | BOD | TSS | Billing | General | Total |
|-------------------------------|---------------------|---------------------|---------------------|--------------------|---------------------|---------------------|
| Operating Cost | \$16,774,791 | \$7,121,270 | \$5,699,142 | \$629,133 | \$22,015,519 | \$52,239,854 |
| Capital Cost | \$8,217,505 | \$4,678,244 | \$3,138,266 | \$627,914 | \$1,997,467 | \$18,659,396 |
| Total Cost of Service | \$24,992,296 | \$11,799,514 | \$8,837,407 | \$1,257,047 | \$24,012,985 | \$70,899,250 |
| Allocation of General Cost | \$12,799,903 | \$6,043,168 | \$4,526,113 | \$643,802 | (\$24,012,985) | |
| True Cost of Service | \$37,792,199 | \$17,842,682 | \$13,363,520 | \$1,900,849 | \$0 | \$70,899,250 |
| Unit of Service (Total plant) | 12,616,310 | 23,887,321 | 23,760,706 | 1,101,492 | | |
| Unit Cost | \$3.00 | \$0.75 | \$0.56 | | | |
| I&I Cost | \$13,428,090 | \$5,352,686 | \$4,037,558 | | | |
| Allocation of I&I Cost | \$10,742,472 | \$4,282,149 | \$3,230,047 | \$4,563,667 | | |
| Allocated I&I Unit Cost | \$1.32 | \$0.26 | \$0.19 | \$4.14 | | |
| Total Unit Cost | \$4.32 | \$1.00 | \$0.76 | \$5.87 | | |
| Unit | hcf | lbs/yr | lbs/yr | billings/mo | | |

Allocations of Cost to Customer Class

After the unit costs are determined, they are allocated to each customer class based on the respective units of service from each customer class (shown in **Table 1-14**) to determine the total revenue required from each customer class. Cost of service principles require that the rates be designed so that there are no subsidies among customer classes. **Table 1-16** shows the total revenue required from each customer class by cost category.

Table 1-16
Wastewater Costs by Customer Class

| Customer Class | Flow (hcf/yr) | BOD (lbs/yr) | TSS (lbs/yr) | Accounts |
|--------------------------------|--------------------------|-------------------------|-------------------------|-----------------|
| Residential | | | | |
| Single Family | 3,635,991 | 7,701,731 | 7,940,079 | 55,397 |
| Multi Family | 1,485,850 | 3,147,317 | 3,244,718 | 32,554 |
| Subtotal Residential | 5,121,841 | 10,849,049 | 11,184,797 | 87,951 |
| Commercial | | | | |
| Commercial Category 1 | 72,789 | 90,875 | 68,156 | 66 |
| Commercial Category 2 | 1,396,151 | 1,743,056 | 1,960,938 | 3,284 |
| Commercial Category 3 | 73,063 | 182,434 | 136,826 | 96 |
| Commercial Category 4 | 138,127 | 431,119 | 388,007 | 11 |
| Commercial Category 5 | 1,682 | 6,300 | 4,200 | 7 |
| Commercial Category 6 | 32,513 | 162,366 | 81,183 | 45 |
| Commercial Category 7 | 30,884 | 154,231 | 134,952 | 22 |
| Commercial Category 8 | 218,269 | 1,294,389 | 817,509 | 301 |
| Commercial, Monitored | 41,833 | 78,341 | 78,341 | 8 |
| Subtotal Commercial | 2,005,311 | 4,143,112 | 3,670,113 | 3,840 |
| Contract Agencies | | | | |
| Pierce County | 545,201 | 1,010,855 | 985,501 | 6,537 |
| Fife | 277,507 | 488,113 | 481,690 | 3,971 |
| Fircrest | 166,620 | 198,660 | 228,823 | 2,953 |
| Ruston | 17,081 | 31,494 | 30,893 | 352 |
| Total Contract Agencies | 1,006,409 | 1,729,123 | 1,726,907 | 13,813 |
| TOTAL | 8,133,561 | 16,721,284 | 16,581,816 | 105,604 |

RATE DESIGN

The revenue requirements and cost of service analyses described in the preceding sections of this report provide a basis for the design of wastewater rates. Rate design involves the development of a rate schedule for each user class so as to recover the annual cost of service determined for each user class, shown in **Table 1-16**. This subsection of the report presents a schedule of rates for the Department's user classes and analyzes the impact of the proposed changes in cost allocation and rate design on the user classes.

Proposed Wastewater Rates

The Department will retain the current wastewater rate structure as it has a fixed charge component that ensures revenue stability to the utility and a variable rate component that is equitable and encourages conservation. **Table 1-17** shows the proposed wastewater rates for 2017 and 2018. The fixed charge for residential customers was developed to recover approximately 52 percent of the revenue requirements allocated to the residential customer class so as to provide revenue stability and reduce customer impacts. Similarly, the fixed charge for commercial customers was developed to recover approximately 3 percent of the total revenue requirements allocated to the commercial class, in keeping with the current rate structure. The residential rates also reflect the LIE/LID discount costs since only residential customers benefit from the assistance program.

Table 1-17
Proposed Wastewater Rates

| | 2017 | 2018 |
|--|---------|---------|
| Residential | | |
| Monthly Fixed Charge | \$23.88 | \$24.96 |
| Flow Charge (\$/hcf) | \$4.47 | \$4.68 |
| LID/LIE customers receive 30% discount | | |
| Commercial | | |
| Monthly Fixed Charge | \$11.40 | \$11.92 |
| Flow Charge (\$/hcf of water usage) | | |
| Category 1 | \$6.22 | \$6.50 |
| Category 2 | \$6.48 | \$6.78 |
| Category 3 | \$8.16 | \$8.53 |
| Category 4 | \$9.57 | \$10.01 |
| Category 5 | \$9.69 | \$10.13 |
| Category 6 | \$11.13 | \$11.64 |
| Category 7 | \$12.59 | \$13.16 |
| Category 8 | \$13.01 | \$13.60 |
| Commercial, Various | | |
| Flow (\$/hcf) | \$4.32 | \$4.52 |
| BOD (\$/lb) | \$1.01 | \$1.06 |
| SS (\$/lb) | \$0.76 | \$0.80 |
| Septic Tank Wastes (\$/100 gal) | \$13.47 | \$14.08 |

Customer Impacts

Since there are changes in the cost allocations to different parameters, it is expected that individual customers as well as customer classes will experience different impacts based on their water usage and their strength categories. This realigns the rates with the cost of service analysis. **Table 1-18** below shows the difference between the proposed bills in 2017 and 2018 and the current bill for residential

customers at varying levels of water usage. Most residential customers will experience an increase of 4.1 to 4.7 percent in their wastewater bill in 2017 and in 2018.

Table 1-18
Residential Customers Impacts

| Residential Customers | Winter Usage | Current Bill | 2017 Bill | 2018 Bill | Δ from Prior Year | Δ from Prior Year |
|-----------------------|--------------|--------------|-----------|-----------|-------------------|-------------------|
| Very low volume | 2 | \$31.39 | \$32.82 | \$34.32 | 4.56% | 4.57% |
| Low volume | 4 | \$39.99 | \$41.76 | \$43.68 | 4.43% | 4.60% |
| Average volume | 6 | \$48.59 | \$50.70 | \$53.04 | 4.34% | 4.62% |
| High volume | 9 | \$61.49 | \$64.11 | \$67.08 | 4.26% | 4.63% |
| Very high volume | 18 | \$100.19 | \$104.34 | \$109.20 | 4.14% | 4.66% |

Table 1-19 shows the difference between the proposed bills in 2017 and 2018 and the current bill for the average commercial customer in each category. On average, commercial customers will experience a 3.2 percent and 4.6 percent increase in their wastewater bill in 2017 and 2018, respectively. However, each customer will experience different impacts based on their water usage.

Table 1-19
Commercial Customers Impacts

| Commercial Customer | Average Water Usage | Current Bill | 2017 Bill | 2018 Bill | Δ from Prior Year | Δ from Prior Year |
|---------------------|---------------------|--------------|-------------|-------------|-------------------|-------------------|
| Category 1 | 92 | \$538.00 | \$583.64 | \$609.92 | 8.5% | 4.5% |
| Category 2 | 36 | \$229.36 | \$244.68 | \$256.00 | 6.7% | 4.6% |
| Category 3 | 64 | \$499.80 | \$533.64 | \$557.84 | 6.8% | 4.5% |
| Category 4 | 1,047 | \$9,842.17 | \$10,031.19 | \$10,492.39 | 1.9% | 4.6% |
| Category 5 | 21 | \$208.03 | \$214.89 | \$224.65 | 3.3% | 4.5% |
| Category 6 | 61 | \$690.99 | \$690.33 | \$721.96 | -0.1% | 4.6% |
| Category 7 | 117 | \$1,492.06 | \$1,484.43 | \$1,551.64 | -0.5% | 4.5% |
| Category 8 | 61 | \$809.94 | \$805.01 | \$841.52 | -0.6% | 4.5% |

SECTION 2 – SURFACE WATER MANAGEMENT

SURFACE WATER SYSTEM

The Department’s surface water system consists of over 500 miles of pipelines, 22,000-plus catch basins, four pump stations and numerous detention ponds/structures. The catch basin is the storm water’s first stop past the storm drains designed to “catch” the big pieces of debris such as garbage and leaves that wash into the storm drain. Once through a catch basin, the water is carried by miles of pipelines, sometimes with the help of pump stations to move water in lower areas, to the local waterways. To help prevent flooding, the Department has holding basins, or detention ponds, that collect and hold water during heavy rain episodes. Four main areas with holding basins include the Northshore Golf Course in Northeast Tacoma, Flett Creek, Hosmer, and Leach Creek.

Current Surface Water Rates

The Department currently charges surface water customers a monthly fixed charge and variable rate per 500 square footage of area or fraction thereof. The area charge, as shown in **Table 2-1**, varies based on the development categories of each parcel. The development categories are defined as follows:

- » Undeveloped (undeveloped land that soaks up much of the rainfall)
- » Light development (land with very limited impervious surface)
- » Moderate development (single-family homes with yards to soak up some of the runoff)
- » Heavy development (most commercial property with parking and some vegetation)
- » Very heavy development (industrial with mostly impervious surface and lots of runoff)

In addition, waterfront parcels, defined as properties abutting the Puget Sound with at least 50 feet of frontage or discharging all or most of their surface water directly into the Puget Sound, are charged lower rates than non-waterfront parcels since they are direct dischargers. Residential customers are considered within the moderate development category. Eligible LID/LIE customers receive 30 percent off the surface water rates.

**Table 2-1
Current Surface Water Rates**

| Development Categories | Monthly Fixed | Area Charge per 500 sq ft |
|--------------------------------------|----------------------|----------------------------------|
| Undeveloped area <= than 1 acre | \$6.73 | \$0.27 |
| Undeveloped area in excess of 1 acre | \$6.73 | \$0.06 |
| Light development | \$6.73 | \$0.81 |
| Moderate development | \$6.73 | \$1.11 |
| Heavy development | \$6.73 | \$1.63 |
| Very heavy development | \$6.73 | \$2.17 |
| Waterfront Properties | | |
| Undeveloped area <= than 1 acre | \$6.73 | \$0.13 |
| Undeveloped area in excess of 1 acre | \$6.73 | \$0.06 |
| Light development | \$6.73 | \$0.40 |
| Moderate development | \$6.73 | \$0.55 |
| Heavy development | \$6.73 | \$0.79 |
| Very heavy development | \$6.73 | \$1.06 |

Customer Accounts

Information regarding surface water customer accounts and billable units for 2016 is used as the basis for projecting surface water revenues during the Study period. The Department does not expect any growth to occur during the six-year period as the Department is essentially built out. As shown in **Table 2-2**, approximately 76 percent of the surface water accounts are non-waterfront parcels in the moderate development category, which represents most of the residential customers as they are considered to be in the moderate development category. Waterfront properties account for less than one percent of the total surface water accounts.

**Table 2-2
Current Surface Water Customer Accounts**

| Development Categories | Accounts | Billing Units |
|--------------------------------------|-----------------|----------------------|
| Undeveloped area <= than 1 acre | 4,843 | 218,451 |
| Undeveloped area in excess of 1 acre | 327 | 143,117 |
| Light development | 1,107 | 94,335 |
| Moderate development | 53,348 | 868,393 |
| Heavy development | 6,101 | 241,029 |
| Very heavy development | 4,378 | 285,098 |
| Waterfront Properties | | |
| Undeveloped area <= than 1 acre | 27 | 11,273 |
| Undeveloped area in excess of 1 acre | 8 | 3,602 |
| Light development | 9 | 10,948 |
| Moderate development | 36 | 1,304 |
| Heavy development | 29 | 15,647 |
| Very heavy development | 150 | 110,339 |
| TOTAL | 70,363 | 2,003,536 |

FINANCIAL PLAN

A review of a utility's revenue requirements is a key first step in the rate design process. The review involves an analysis of annual operating revenues under the current rates, capital revenues, O&M expenses, capital expenditures, transfers between funds, and reserve requirements. This subsection of the report provides a discussion of the projected revenues, O&M and capital expenditures, capital improvement financing plan, debt service requirements, and the revenue adjustments required to ensure the financial stability of the surface water utility.

Surface Water System Revenues

The Department's surface water utility derives its required annual operating and non-operating revenues from a number of sources. The principal source of operating revenues is the surface water service charges from the Department's users, which are expected to remain at \$32.2 million per year as the Department is not expecting any growth to occur. Another source of operating revenue is service revenues. Non-operating revenue sources include investment earnings, rental income, etc.

RFC reviewed the various sources of operating and non-operating revenues and the Department's financing plan. **Table 2-3** presents the details of the operating and non-operating revenues.

Table 2-3
Surface Water Revenue at Existing Rates

| Revenue at Existing Rates | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|--|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Operating Revenues | | | | | | |
| ENV-4100 Cost Recovery Revenue | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| ENV-4270 Customer Fee Revenue | \$7,000 | \$7,000 | \$7,175 | \$7,354 | \$7,538 | \$7,727 |
| ENV-4411 Other Misc Oper Rev | \$60,000 | \$60,000 | \$61,500 | \$63,038 | \$64,613 | \$66,229 |
| ENV-4550 Sales Revenue | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| ENV-4560 Service Revenue | \$150,000 | \$150,000 | \$153,750 | \$157,594 | \$161,534 | \$165,572 |
| ENV-4640 Surface Water Revenue-Residential | \$15,459,968 | \$15,459,968 | \$15,459,968 | \$15,459,968 | \$15,459,968 | \$15,459,968 |
| ENV-4645 Surface Water Revenue-Commercial | \$16,738,273 | \$16,738,273 | \$16,738,273 | \$16,738,273 | \$16,738,273 | \$16,738,273 |
| ENV-4695 Discount-Aid to Families in Need | (\$35,000) | (\$35,000) | (\$35,875) | (\$36,772) | (\$37,691) | (\$38,633) |
| ENV-4700 Salvage Revenue | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Total Operating Revenues | \$32,380,241 | \$32,380,241 | \$32,384,791 | \$32,389,455 | \$32,394,235 | \$32,399,135 |
| Non-Operating Revenues/(Expenses) | | | | | | |
| ENV-6100 Investment Income | \$322,483 | \$294,499 | \$327,587 | \$376,527 | \$322,280 | \$271,128 |
| ENV-6300 Rental and Lease Income | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| ENV-6400 Operating Grant Revenue | \$25,000 | \$0 | \$0 | \$0 | \$0 | \$0 |
| ENV-6510 Bond Interest Expense | | | | | | |
| ENV-6520 Amortization of Bond Discount | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| ENV-6540 Amortization of Bond Premium | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| ENV-6550 Amortization of Bond Refunding Costs | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| ENV-6560 Other Debt Service Costs | \$0 | \$0 | (\$210,000) | \$0 | \$0 | \$0 |
| ENV-6617 Amort of Bond Insurance | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| ENV-6600 SRF Loan Interest Expense | | | | | | |
| ENV-6700 Capitalized Interest Expense | \$467,611 | \$391,193 | \$481,324 | \$374,968 | \$408,138 | \$426,823 |
| ENV-6800 Reclass Noncap Bond Interest Expense | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| ENV-6900 Reclass Noncap Bond Principal Paymts | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| ENV-7000 Noncapital Debt Service - Environmental | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| ENV-7100 Capital Lease Interest Expense | | | | | | |
| ENV-7200 Other Interest Expense | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| ENV-7300 Gain/Loss on Bond Defeasance (Cash) | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| ENV-7400 Cash Proceeds from Sale of Cap Assets | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| ENV-7500 Gain/Loss on Disposal of Cap Assets | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| ENV-7600 Low Inc Assistance Expense | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| ENV-7700 Capital Related Nonop Rev and Exp | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| ENV-7750 Insurance Recoveries | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| ENV-7800 Misc Nonoperating Inc and Expense | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| ENV-8220 CIAC - Cash | | | | | | |
| ENV-8230 Donated Capital | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| ENV-8280 Contributions and Donations - Cash | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| ENV-8300 Debt Related Proceeds and Payments | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| ENV-8420 Transfers In / Out - Capital - Cash | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| ENV-8430 Transfers In / Out - Capital - Non-Cash | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| ENV-8440 Transfers In / Out - Operating Related | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| ENV-8240 Contributions - Cash | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Total Non-Operating Revenues/(Expenses) | \$815,094 | \$685,692 | \$598,911 | \$751,495 | \$730,419 | \$697,951 |
| TOTAL REVENUES | \$33,195,335 | \$33,065,933 | \$32,983,701 | \$33,140,949 | \$33,124,654 | \$33,097,085 |

Surface Water System Expenditures

For sound financial operation of the Department's surface water system, revenues generated must be sufficient to meet the revenue requirements or cash obligations of the system. Revenue requirements include O&M expenses, CIP expenditures, principal and interest payments on existing debt, and other obligations.

Operations and Maintenance Expenses

O&M expenditures include the cost of operating and maintaining treatment, collection, and disposal facilities. O&M expenses also include the costs of providing technical services such as laboratory services and other administrative costs of the surface water system such as customer service and billing. These costs are a normal obligation of the system, and are met from operating revenues as they are incurred. The comprehensive forecasted annual O&M expenditures for the study are based upon the Department's budgeted 2017 and 2018 expenditures and adjusted for anticipated changes in operations and the effect of inflation in future years. The Department uses the estimated CPI for the Puget Sound area as the standard inflation factor to project all future O&M expenditures, except benefits, construction, assessments, and utilities, starting in 2019. Benefits expenses are projected to increase at a higher rate than standard inflation factors, estimated at seven percent per year. Construction and utilities expenses are projected to increase at four percent per year. Assessments expenses are projected to increase at 5 percent per year. Projected O&M expenditures are summarized by functions in **Table 2-4**.

The rate model provides for segregation between cash and non-cash expenses, such as depreciation, which is excluded when revenue requirements are calculated to determine surface water rates.

Table 2-4
Surface Water O&M Expenses

| O&M Expenses by Cost Center | | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|-------------------------------|---|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| 521100 | ES Surface Water Transmission | \$3,584,979 | \$3,672,631 | \$3,787,981 | \$3,907,851 | \$4,032,470 | \$4,162,079 |
| 521200 | ES Surface Water Pumping | \$216,973 | \$226,339 | \$233,907 | \$241,741 | \$249,850 | \$258,244 |
| 521300 | ES Surface Water Hold Basins | \$226,501 | \$235,641 | \$242,028 | \$248,608 | \$255,389 | \$262,378 |
| 521400 | ES Surface Water Environmental Compl | \$1,246,127 | \$1,283,523 | \$1,326,503 | \$1,371,320 | \$1,418,074 | \$1,466,869 |
| 521500 | ES Surface Water Contingency Reserve | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| 521600 | ES Surface Water Environmental Programs | \$3,241,572 | \$3,241,471 | \$3,341,164 | \$3,444,719 | \$3,552,331 | \$3,664,207 |
| 521610 | ES Surface Water Construction Support | \$686,909 | \$708,096 | \$729,864 | \$752,633 | \$776,466 | \$801,431 |
| 521620 | ES Surface Water Private Development | \$1,825,717 | \$1,960,277 | \$2,032,859 | \$2,108,907 | \$2,188,622 | \$2,272,219 |
| 521900 | ES Surface Water Revenues and Accounting | \$6,540,906 | \$6,863,847 | \$6,982,901 | \$7,443,758 | \$7,663,613 | \$7,921,005 |
| 521905 | ES Surface Water Public InfoComRelations | \$104,295 | \$109,635 | \$113,079 | \$116,659 | \$120,381 | \$124,252 |
| 521915 | ES Surface Water Assessments | \$4,910,846 | \$4,959,990 | \$5,207,989 | \$5,468,389 | \$5,741,808 | \$6,028,898 |
| 521920 | ES Surface Water ES Customer Service | \$274,733 | \$282,320 | \$292,293 | \$302,719 | \$313,625 | \$325,037 |
| 521925 | ES Surface Water Business Operations | \$1,725,224 | \$1,865,807 | \$1,917,240 | \$1,970,292 | \$2,025,029 | \$2,081,516 |
| 522100 | ES Surface Water Detention Pond Reserve | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| 522110 | ES Surface Water Rate Stabilization | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| 529500 | ES Surface Water Laboratory | \$574,402 | \$601,474 | \$622,605 | \$644,688 | \$667,778 | \$691,930 |
| 529600 | ES Surface Water NRD | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| 529700 | ES Surface Water Construction | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| 529800 | ES Surface Water 2006 Bond Construction | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| 529805 | ES Surface Water TES Bond Reserve | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| 529900 | ES Surface Water Expense Construct Proj | \$910,000 | \$250,000 | \$256,250 | \$262,656 | \$269,223 | \$275,953 |
| 521700 | ES Surface Water Open Space | \$574,500 | \$649,515 | \$665,918 | \$682,737 | \$699,984 | \$717,670 |
| 521630 | ES Surface Water Asset Management | \$1,097,964 | \$1,139,226 | \$1,176,535 | \$1,215,395 | \$1,255,887 | \$1,298,100 |
| 521640 | ES Surface Water Project Delivery | \$619,245 | \$633,209 | \$651,538 | \$670,744 | \$690,885 | \$712,028 |
| 521930 | ES Surface Water Environ Policy and Sustain | \$487,382 | \$502,127 | \$517,583 | \$533,629 | \$550,294 | \$567,608 |
| TOTAL O&M EXPENSES | | \$28,848,275 | \$29,185,126 | \$30,098,237 | \$31,387,447 | \$32,471,708 | \$33,631,423 |

Taxes

The surface water utility is subject to two taxes: an MGE tax of 8 percent assessed by the City of Tacoma and a B&O tax of 1.5 percent assessed by the State of Washington. The MGE tax is assessed on all revenues collected and the B&O tax is assessed on all operating revenues. Surface water expenses have been adjusted for both taxes.

Capital Improvement Program

The Department has developed a comprehensive surface-water CIP to address current surface-water system needs. As **Table 2-5** indicates, the total estimated surface water CIP from 2017 to 2022 is \$78.7 million. These projected costs include a four percent annual inflation factor for projects after 2018 due to anticipated increases in construction costs over time. This inflation rate is a conservative estimate and ensures that the Department has adequate resources reserved to complete the necessary projects.

Table 2-5
Surface Water Capital Improvement Program

| Capital Improvement Program | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|--------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Collection Systems | \$5,944,733 | \$8,025,913 | \$8,727,178 | \$5,446,259 | \$8,392,051 | \$8,789,826 |
| Equipment | \$468,500 | \$428,500 | \$676,000 | \$665,184 | \$736,786 | \$520,587 |
| Facilities Improvements | \$94,543 | \$0 | \$1,768,000 | \$2,163,200 | \$0 | \$0 |
| Treatment and Low Impact Development | \$5,207,547 | \$1,180,880 | \$1,040,000 | \$1,081,600 | \$1,124,864 | \$1,169,859 |
| Special Projects (SC) | \$389,005 | \$154,463 | \$156,000 | \$162,240 | \$168,730 | \$175,479 |
| Capital Labor Credit | \$1,058,740 | \$1,087,747 | \$1,131,257 | \$1,176,507 | \$1,223,567 | \$1,272,510 |
| Capitalized A&G | \$792,115 | \$658,633 | \$813,826 | \$639,375 | \$696,083 | \$720,423 |
| Capitalized Interest | \$467,611 | \$391,193 | \$481,324 | \$374,968 | \$408,138 | \$426,823 |
| TOTAL CIP - INFLATED | \$14,422,794 | \$11,927,329 | \$14,793,585 | \$11,709,333 | \$12,750,219 | \$13,075,507 |

Major Capital Improvement Financing Plan

Typical CIP funding sources include the following:

System Revenues

Pay-as-you-go revenues

Interest earnings

Capital Financing

Bond proceeds

Grant receipts

State revolving loans

Table 2-6 presents the proposed capital financing plan to finance major CIP projects over the six-year period from 2017 to 2022. As of 2016, the Department expects to receive \$8.6 million in grants over the next six years to surface water projects. It is projected that the Department will issue debt of \$20 million in 2019 to adequately fund the capital improvement program since revenues from rates are insufficient to cover the costs. When bonds are issued, it is assumed that bond proceeds are used up first before revenues from rates and other sources are considered.

**Table 2-6
Surface Water Capital Financing Plan**

| Capital Financing Plan | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|--|--------------------|---------------------|---------------------|--------------------|---------------------|---------------------|
| Total Capital Projects | \$14,422,794 | \$11,927,329 | \$14,793,585 | \$11,709,333 | \$12,750,219 | \$13,075,507 |
| Total Capital Projects - PAYGO only | \$857,505 | \$582,963 | \$832,000 | \$827,424 | \$905,516 | \$696,066 |
| Total Capital Projects - Other funding sources | \$13,565,289 | \$11,344,366 | \$13,961,585 | \$10,881,909 | \$11,844,703 | \$12,379,441 |
| Sources of Funding: | | | | | | |
| Debt | \$1,045,732 | \$0 | \$12,961,585 | \$7,038,415 | \$0 | \$0 |
| SRF Loans | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Grants | \$3,711,944 | \$927,986 | \$1,000,000 | \$1,000,000 | \$1,000,000 | \$1,000,000 |
| Other | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Total Sources | \$4,757,676 | \$927,986 | \$13,961,585 | \$8,038,415 | \$1,000,000 | \$1,000,000 |
| Projects Funded by Rates | \$9,665,118 | \$10,999,343 | \$832,000 | \$3,670,918 | \$11,750,219 | \$12,075,507 |

Debt Service Requirements

Debt service requirements consist of principal and interest payments on existing debt. The Department currently has debt service obligations associated with its outstanding 2006, 2011, 2015, and 2016 Revenue and Refunding Bonds, and an SRF loan. Existing and proposed debt service consists of annual payments in the range of \$5.8 to \$7.6 million over the six years. **Table 2-7** shows the existing and proposed debt service of the surface water utility. The proposed debt issues are included in existing debt.

Table 2-7
Surface Water Existing and Proposed Debt Service

| | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|------------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| 2006 ORIG BONDS | \$149 | \$149 | \$149 | \$149 | \$149 | \$149 |
| 2011 REV & REF BONDS | \$1,322,840 | \$1,322,840 | \$1,322,840 | \$1,322,840 | \$1,322,840 | \$3,534,840 |
| Surface Water Loan #1 | \$32,034 | \$32,034 | \$32,034 | \$32,034 | \$32,034 | \$32,034 |
| 44.1% TES BONDS | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| 2015 REVENUE BONDS | \$1,693,731 | \$1,693,800 | \$1,693,885 | \$1,694,118 | \$1,693,787 | \$1,694,018 |
| 2015 REF 06 BONDS | \$1,227,701 | \$1,231,877 | \$1,226,947 | \$1,227,295 | \$1,227,150 | \$1,203,254 |
| 2016 A REF TES BONDS | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| 2016 B REF 06 BONDS | \$1,587,228 | \$1,586,300 | \$1,584,850 | \$1,588,910 | \$1,586,445 | \$0 |
| 2019 REVENUE BONDS | \$0 | \$0 | \$648,316 | \$1,147,561 | \$1,149,048 | \$1,148,919 |
| TOTAL EXISTING DEBT SERVICE | \$5,863,682 | \$5,866,998 | \$6,509,019 | \$7,012,905 | \$7,011,451 | \$7,613,213 |
| Proposed Bonds | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| TOTAL PROPOSED DEBT SERVICE | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| TOTAL DEBT SERVICE | \$5,863,682 | \$5,866,998 | \$6,509,019 | \$7,012,905 | \$7,011,451 | \$7,613,213 |

Reserves

The Department requires adequate cash reserves to meet operating, capital, and debt service requirements. Operating reserves may be used to meet ongoing cash flow requirements, as well as emergency requirements. Typically, a balance in the range of 10 to 50 percent of annual operating expenses is considered appropriate. This represents one to six months of working capital. The Department has chosen to maintain a minimum 60-day operating reserve and a maximum of 120-day operating reserve. The operating reserve balances and the minimum and maximum operating reserve targets are shown in **Table 2-8**. The Department's desired operating reserve level is 90 days of operating expenses.

In addition to the operating reserves, the Department also maintains an RSF, which is used to mitigate spikes in rate increases and better match revenues and expenses. The Department has a target reserve level equal to 10 percent of the total annual rate revenue for the RSF. Interest from reserve funds may be used to finance operations. The reserve levels are projected to meet the minimum required level in all six years of the study period, as shown in **Figure 2-1**.

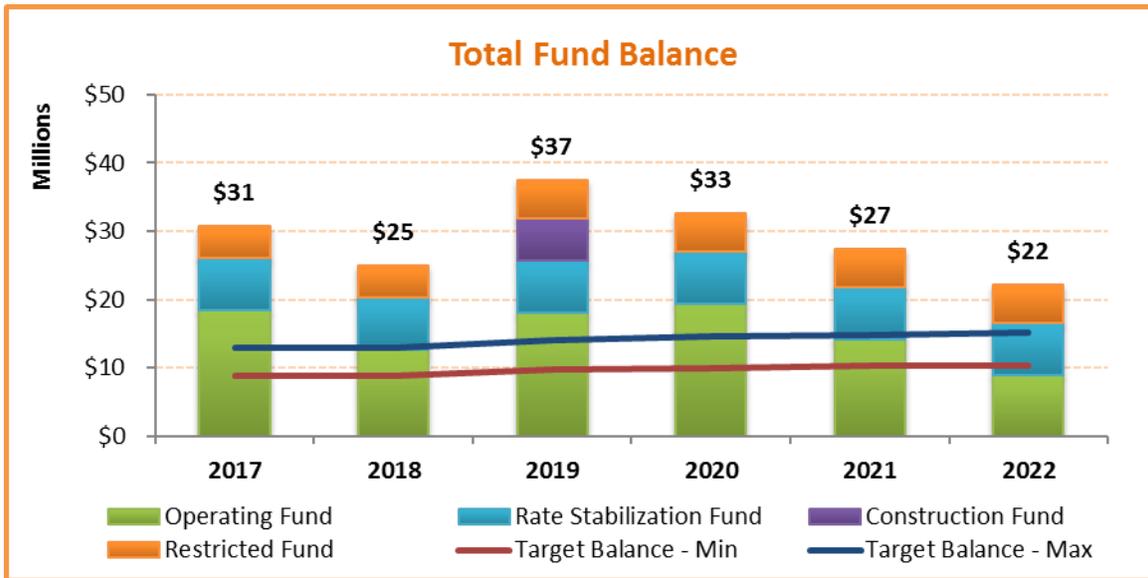
Based on the terms of the debt issued, debt reserves provide protection to bond buyers for one year of debt service payments in times of financial difficulty. These are restricted reserves used only for meeting debt service payments. Each time the Department issues a new bond, either bond insurance or additional proceeds are required to be added to the debt reserves, as shown in the Restricted Fund in **Table 2-8**.

Table 2-8
Surface Water Fund/Reserves Balance

| Surface Water Fund/Reserves Balance | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|--|---------------------|---------------------|---------------------|---------------------|---------------------|--------------------|
| Operating Fund | | | | | | |
| Beginning Balance | \$15,428,036 | \$18,381,565 | \$12,629,782 | \$18,060,486 | \$19,348,709 | \$14,169,397 |
| Net Cash Flow | (\$5,602,550) | (\$5,807,945) | \$4,592,094 | \$2,082,364 | (\$5,168,653) | (\$5,334,520) |
| Transfer from/(to) Rate Stabilization Fund | \$300,000 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Transfer from Construction Fund | \$8,266,865 | \$46,563 | \$832,000 | (\$800,733) | \$31,188 | \$156 |
| Transfer From/(To) Restricted Fund | (\$10,786) | \$9,598 | \$6,611 | \$6,591 | (\$41,847) | \$8,997 |
| Ending Balance | \$18,381,565 | \$12,629,782 | \$18,060,486 | \$19,348,709 | \$14,169,397 | \$8,844,030 |
| <i>Interest Income</i> | <i>\$151,253</i> | <i>\$171,094</i> | <i>\$168,847</i> | <i>\$213,086</i> | <i>\$189,695</i> | <i>\$138,534</i> |
| Target Balance - min - 60 days of O&M | \$4,109,305 | \$4,164,678 | \$4,298,957 | \$4,494,664 | \$4,656,276 | \$4,829,876 |
| Target Balance - max - 120 days of O&M | \$8,218,611 | \$8,329,357 | \$8,597,914 | \$8,989,328 | \$9,312,552 | \$9,659,751 |
| Days of O&M - Calculated | 289 | 340 | 252 | 318 | 334 | 260 |
| Rate Stabilization Fund | | | | | | |
| Beginning Balance | \$8,000,000 | \$7,700,000 | \$7,700,000 | \$7,700,000 | \$7,700,000 | \$7,700,000 |
| Transfer From/(To) Operating Fund | (\$300,000) | \$0 | \$0 | \$0 | \$0 | \$0 |
| Ending Balance | \$7,700,000 | \$7,700,000 | \$7,700,000 | \$7,700,000 | \$7,700,000 | \$7,700,000 |
| <i>Interest Income</i> | <i>\$78,500</i> | <i>\$77,000</i> | <i>\$77,000</i> | <i>\$77,000</i> | <i>\$77,000</i> | <i>\$77,000</i> |
| Target Balance - 10% of revenue | \$3,367,399 | \$3,552,606 | \$3,733,067 | \$3,919,721 | \$4,099,244 | \$4,283,710 |
| Construction Fund | | | | | | |
| Beginning Balance | \$9,312,597 | \$46,563 | \$233 | \$6,237,682 | \$31,188 | \$156 |
| Bonds Proceeds | \$0 | \$0 | \$20,000,000 | \$0 | \$0 | \$0 |
| SRF Loan Proceeds | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Other Sources of Funding | \$3,711,944 | \$927,986 | \$1,000,000 | \$1,000,000 | \$1,000,000 | \$1,000,000 |
| Bonds Used for Capital Projects | (\$1,045,732) | \$0 | (\$12,961,585) | (\$7,038,415) | \$0 | \$0 |
| SRF Loan Used for Capital Projects | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Other Sources Used for Capital Projects | (\$3,711,944) | (\$927,986) | (\$1,000,000) | (\$1,000,000) | (\$1,000,000) | (\$1,000,000) |
| Transfer to fund PAYGO | (\$8,266,865) | (\$46,563) | (\$832,000) | \$800,733 | (\$31,188) | (\$156) |
| Transfer From/(To) Restricted Fund | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Ending Balance | \$0 | \$0 | \$6,206,648 | \$0 | \$0 | \$0 |
| <i>Interest Income</i> | <i>\$46,563</i> | <i>\$233</i> | <i>\$31,034</i> | <i>\$31,188</i> | <i>\$156</i> | <i>\$1</i> |
| Restricted Fund | | | | | | |
| Beginning Balance | \$4,611,275 | \$4,622,061 | \$4,612,463 | \$5,528,577 | \$5,521,986 | \$5,563,833 |
| Reserves from New Bonds | \$0 | \$0 | \$922,725 | \$0 | \$0 | \$0 |
| Transfer From/(To) Operating Fund | \$10,786 | (\$9,598) | (\$6,611) | (\$6,591) | \$41,847 | (\$8,997) |
| Transfer From/(To) Construction Fund | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Ending Balance | \$4,622,061 | \$4,612,463 | \$5,528,577 | \$5,521,986 | \$5,563,833 | \$5,554,836 |
| <i>Interest Income</i> | <i>\$46,167</i> | <i>\$46,173</i> | <i>\$50,705</i> | <i>\$55,253</i> | <i>\$55,429</i> | <i>\$55,593</i> |

Figure 2-1 shows the total funds balance and total targets in a graphical format. The blue line represents the maximum target balance, defined as 120 days of O&M expenses for the Operating fund, 10 percent of revenue for the Rate Stabilization fund, and the entirety of the Restricted reserves. The red line represents the minimum target balance, defined as 60 days of O&M expenses for the Operating fund, 10 percent of revenue for the Rate Stabilization fund, and the entirety of the Restricted reserves.

Figure 2-1
Projected Total Surface Water Funds Balance



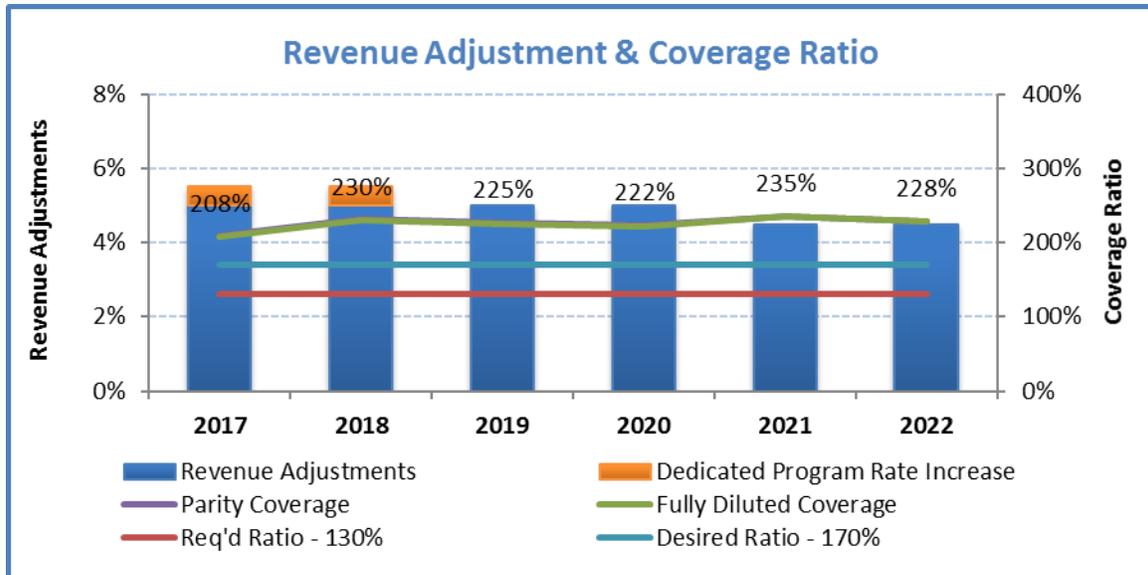
Proposed Revenue Adjustments

In order to meet projected revenue requirements, to achieve desired operating and capital reserve fund balances, and to minimize customer impacts, the following revenue adjustments are proposed to meet long-term rate stability:

| Effective Date | Increases |
|-----------------|-------------|
| January 1, 2017 | 5.0 percent |
| January 1, 2018 | 5.0 percent |

Figure 2-2 shows the projected revenue adjustments for the surface water utility over the next six years. However, only the first two years are implemented in this rate cycle.

**Figure 2-2
Proposed Surface Water Revenue Adjustments and Debt Coverage**



The operating financial plan presented in **Table 2-9** shows the revenues projected from rates based on the proposed revenue adjustment schedule shown above. The financial plan shows that the surface water utility will need to generate additional revenues, estimated to be 5.0 percent in years 2019 to 2020 and 4.5 percent in years 2021 to 2022, as shown in **Figure 2-2**, to meet its revenue requirements in those years.

Table 2-9
Surface Water Operating Financial Plan

| Operating Financial Plan | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|--|----------------------|----------------------|---------------------|---------------------|----------------------|----------------------|
| Revenue at Existing Rates | \$32,198,241 | \$32,198,241 | \$32,198,241 | \$32,198,241 | \$32,198,241 | \$32,198,241 |
| Total Additional Revenue | \$1,475,753 | \$3,327,822 | \$5,132,433 | \$6,998,967 | \$8,794,199 | \$10,638,859 |
| Total Rate Revenue | \$33,673,993 | \$35,526,063 | \$37,330,674 | \$39,197,208 | \$40,992,440 | \$42,837,100 |
| Other Operating Revenue | \$182,000 | \$182,000 | \$186,550 | \$191,214 | \$195,994 | \$200,894 |
| Investment Earnings | \$275,920 | \$294,267 | \$296,552 | \$345,339 | \$322,125 | \$271,127 |
| Adj to Actual Cash Flow - Non-op | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Other Non-Operating Revenue | \$492,611 | \$391,193 | \$271,324 | \$374,968 | \$408,138 | \$426,823 |
| TOTAL REVENUES | \$68,298,518 | \$71,919,586 | \$75,415,774 | \$79,305,935 | \$82,911,136 | \$86,573,043 |
| EXPENDITURES | | | | | | |
| O&M Expenses | \$24,998,275 | \$25,335,126 | \$26,151,987 | \$27,342,540 | \$28,325,679 | \$29,381,744 |
| <i>O&M Cash Flow Adj and Tax Expense Adj</i> | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Open Space Program Cost | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Existing Debt Service | \$5,863,682 | \$5,866,998 | \$6,509,019 | \$7,012,905 | \$7,011,451 | \$7,613,213 |
| Proposed Debt Service | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Proposed SRF Loan | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Capital PAYGO (funded by rates) | \$9,665,118 | \$10,999,343 | \$832,000 | \$3,670,918 | \$11,750,219 | \$12,075,507 |
| TOTAL EXPENDITURES | \$40,527,074 | \$42,201,467 | \$33,493,006 | \$38,026,364 | \$47,087,349 | \$49,070,464 |
| Transfer (To) / From Rate Stabilization | \$300,000 | \$0 | \$0 | \$0 | \$0 | \$0 |
| NET CASH FLOW | (\$5,602,550) | (\$5,807,945) | \$4,592,094 | \$2,082,364 | (\$5,168,653) | (\$5,334,520) |

*All revenues and expenses shown exclude non-cash items

Debt Service Coverage

The Department must meet debt service coverage requirements on its outstanding bond issues. Coverage requirements typically vary between 100 percent and 160 percent or higher. The Department's required debt coverage is 130 percent, which means that the Department's adjusted net system revenues shall amount to at least 130 percent of the annual debt service. However, the Department financial policy requires debt service coverage of 170 percent. The system revenues include funds derived from the ownership and operation of the system including surface water service charges from the Department's users, miscellaneous service charges, revenue received from contracts, interest income, and other non-operating revenues. Annual debt service includes annual principal and interest payments on outstanding debt. With the proposed revenue adjustments, the Department exceeds the coverage requirement during all six years of the study for both the parity debt service, which excludes debt service for SRF loans, and the fully diluted debt service, which includes all debt service expenses, as shown in **Table 2-10**, and in **Figure 2-2** above.

Table 2-10
Surface Water Debt Coverage Calculation

| Debt Coverage Calculation | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Revenues | | | | | | |
| Operating Revenue | \$33,855,993 | \$35,708,063 | \$37,517,224 | \$39,388,421 | \$41,188,434 | \$43,037,993 |
| Non-Operating Revenue | \$347,483 | \$294,499 | \$327,587 | \$376,527 | \$322,280 | \$271,128 |
| Transfer from/(to) Rate Stabilization | \$300,000 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Total Revenues | \$34,503,476 | \$36,002,563 | \$37,844,811 | \$39,764,948 | \$41,510,714 | \$43,309,121 |
| Expenses | | | | | | |
| O&M Expenses | \$22,317,722 | \$22,504,940 | \$23,178,135 | \$24,216,371 | \$25,058,679 | \$25,972,205 |
| Dedicated Program Cost | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Non-Operating Expenses | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Total Expenses | \$22,317,722 | \$22,504,940 | \$23,178,135 | \$24,216,371 | \$25,058,679 | \$25,972,205 |
| Net Revenue | \$12,185,755 | \$13,497,623 | \$14,666,676 | \$15,548,578 | \$16,452,035 | \$17,336,916 |
| Parity Debt Service | \$5,831,648 | \$5,834,965 | \$6,476,985 | \$6,980,871 | \$6,979,418 | \$7,581,180 |
| Fully Diluted Debt Service | \$5,863,682 | \$5,866,998 | \$6,509,019 | \$7,012,905 | \$7,011,451 | \$7,613,213 |
| Coverage Ratio | | | | | | |
| Parity Debt Service | 209% | 231% | 226% | 223% | 236% | 229% |
| Fully Diluted Debt Service | 208% | 230% | 225% | 222% | 235% | 228% |
| Parity Debt Service After GET | 209% | 231% | 226% | 223% | 236% | 229% |
| Required Coverage Ratio | 130% | 130% | 130% | 130% | 130% | 130% |
| Desired Coverage Ratio | 170% | 170% | 170% | 170% | 170% | 170% |

COST OF SERVICE ANALYSIS

The Department's parcels, quantity, and quality units for each user class, and the revenue requirements reviewed and finalized through the operating and capital cash flow analysis provide the basis for performing the cost of service analysis. This section of the report discusses the allocation of operating costs and the determination of unit rates, and the calculation of user class cost responsibility.

The total revenue requirement net of miscellaneous revenue credits, by definition, is the net cost of providing service. This cost of service is then used as the basis to develop unit rates for the surface water parameters and to allocate costs to the various user classes in proportion to the surface water services rendered. The surface water rates were based on the cost of service performed in 2015, and updated for 2017 and 2018 budgeted costs. After a review of individual rates, the Department chose to implement changes over time to smooth changes in rates.

Costs of Service to be Allocated

The annual revenue requirement or cost of service to be recovered from surface water charges includes operation and maintenance expenses and other non-operating expenses and capital costs. O&M expenses include costs directly related to the collection and disposal of surface water and maintenance of system facilities.

The total 2017 net cost of service to be recovered from the Department's surface water users, as shown in **Table 2-11**, is estimated at approximately \$34.0 million, of which approximately \$18.9 million is operating costs and the remaining \$15.0 million is capital costs, which consists of existing debt service and capital projects funded through rates. The cost of service analysis is based upon the need to generate annual revenues adequate to meet the estimated annual revenue requirement. As part of the cost of service analysis, revenues from other sources except surface water rates and charges are deducted from the appropriate cost elements. Additional deductions are made to reflect interest income and other non-operating income during 2017. Adjustments are also made to account for cash balances to ensure adequate collection of revenue and to determine annual revenues needed from rates.

Table 2-11
Surface Water Revenue Requirements from Rates

| | 2017 | | |
|---|---------------------|---------------------|---------------------|
| | Operating | Capital | Total |
| Revenue Requirements | | | |
| O&M Expenses | \$24,998,275 | | \$24,998,275 |
| Open Space Program Cost | \$0 | | \$0 |
| Existing Debt Service | | \$5,863,682 | \$5,863,682 |
| Proposed Debt Service | | \$0 | \$0 |
| Proposed SRF Loan | | \$0 | \$0 |
| Capital PAYGO | | \$9,665,118 | \$9,665,118 |
| Total Revenue Requirements | \$24,998,275 | \$15,528,800 | \$40,527,074 |
| Revenue from Other Sources | | | |
| Other Operating Revenue | \$182,000 | | \$182,000 |
| Investment Earnings | \$275,920 | | \$275,920 |
| Other Non-Operating Revenue | | \$492,611 | \$492,611 |
| Interfund Transfers | \$300,000 | | \$300,000 |
| Total Revenue from Other Sources | \$757,920 | \$492,611 | \$1,250,531 |
| Adjustments | | | |
| Adjustments for Cash Balance | \$5,602,550 | | \$5,602,550 |
| Adjustments to Annualize Rate Increase | (\$295,151) | | (\$295,151) |
| Total Adjustments | \$5,307,400 | \$0 | \$5,307,400 |
| Revenue to be Collected from Rates | \$18,932,955 | \$15,036,189 | \$33,969,144 |

Unit Cost of Service

In order to allocate costs of service to the different user classes, unit costs of service are developed consistent with industry guidelines. Operating and capital costs are functionalized as collection, pumping, billing, administrative, etc. These costs are then allocated to the quantity, quality, parcel, and streets parameters based on the design of each facility. Transmission costs are allocated to quantity,

quality, and streets. Pumping costs are allocated solely to quantity as pump stations are designed to move water. Environmental compliance costs are allocated mainly to quality. Administrative costs are assigned to general and then spread amongst the other costs centers proportionately. The unit costs of service are developed by dividing the total annual costs by the appropriate service units generated in the system and accounts for billing costs. **Table 2-12** shows the units of service in each cost category and for each development category.

Table 2-12
Surface Water Unit of Service

| Development Categories | Billable Units | Runoff Units | Quantity RU | Quality RU | Streets RU |
|--------------------------------------|------------------|------------------|------------------|------------------|------------------|
| Non-waterfront Parcels | | | | | |
| Undeveloped area <= than 1 acre | 175,291 | 38,954 | 38,954 | 38,954 | 38,954 |
| Undeveloped area in excess of 1 acre | 146,896 | 32,644 | 0 | 0 | 32,644 |
| Light development | 90,355 | 66,260 | 66,260 | 66,260 | 66,260 |
| Moderate development | 841,906 | 841,906 | 841,906 | 841,906 | 841,906 |
| Heavy development | 248,969 | 370,687 | 370,687 | 370,687 | 370,687 |
| Very heavy development | 285,033 | 570,066 | 570,066 | 570,066 | 570,066 |
| Waterfront Parcels | | | | | |
| Undeveloped area <= than 1 acre | 10,504 | 2,334 | 0 | 2,334 | 2,334 |
| Undeveloped area in excess of 1 acre | 3,606 | 801 | 0 | 0 | 801 |
| Light development | 9,693 | 7,108 | 0 | 7,108 | 7,108 |
| Moderate development | 2,224 | 2,224 | 0 | 2,224 | 2,224 |
| Heavy development | 15,158 | 22,569 | 0 | 22,569 | 22,569 |
| Very heavy development | 112,597 | 225,194 | 0 | 225,194 | 225,194 |
| Streets | 237,600 | 517,440 | 517,440 | 517,440 | 517,440 |
| TOTAL | 2,179,832 | 2,698,187 | 2,405,313 | 2,664,742 | 2,698,187 |

Table 2-13 shows the development of the 2017 surface water unit costs for each of the surface water cost categories by dividing the total revenue requirements from **Table 2-11** by the number of service units in **Table 2-12**. Streets costs are reallocated to each development category as it is a cost that is shared by all customers.

Table 2-13
Surface Water Unit Cost Calculation

| | Quantity | Quality | Parcel | Streets | General | Total |
|------------------------------|---------------------|---------------------|--------------------|------------------|--------------------|---------------------|
| Operating Cost | \$3,993,950 | \$4,812,465 | \$4,632,962 | \$315,741 | \$5,177,837 | \$18,932,955 |
| Capital Cost | \$8,926,788 | \$4,539,838 | \$632,198 | \$68,282 | \$869,083 | \$15,036,189 |
| Total Cost of Service | \$12,920,738 | \$9,352,302 | \$5,265,159 | \$384,023 | \$6,046,921 | \$33,969,144 |
| Allocation of General Cost | \$2,798,154 | \$2,025,363 | \$1,140,239 | \$83,165 | (\$6,046,921) | \$0 |
| Cost of Service | \$15,718,892 | \$11,377,665 | \$6,405,398 | \$467,189 | \$0 | \$33,969,144 |
| Unit of Service | 2,405,313 | 2,664,742 | 70,572 | 2,698,187 | | |
| Unit | quantity units | quality units | parcels | street units | | |
| Unit Cost | \$0.5446 | \$0.3558 | \$7.5637 | \$0.0144 | | |
| | per unit | per unit | per month | per unit | | |

Allocations of Cost to Customer Class

After the unit costs are determined, these costs are then allocated to each customer class based on the respective units of service from each customer class (shown in **Table 2-12**) to determine the total revenue required from each customer class. Cost of service principles require that the rates be designed so that there are no subsidies between customer classes. **Table 2-14** shows the total revenue required from each customer class by cost category.

Table 2-14
Surface Water Costs by Customer Class

| Development Categories | Quantity | Quality | Streets | Parcel | Total | Streets | |
|--------------------------------------|---------------------|---------------------|------------------|--------------------|---------------------|---------------|---------------------|
| | | | | | | Reallocated | Final Total |
| Non-waterfront Parcels | | | | | | | |
| Undeveloped area <= than 1 acre | \$254,564 | \$166,320 | \$6,745 | \$392,645 | \$820,274 | \$101,466 | \$921,741 |
| Undeveloped area in excess of 1 acre | \$0 | \$0 | \$5,652 | \$160,108 | \$165,760 | \$85,030 | \$250,790 |
| Light development | \$433,016 | \$282,912 | \$11,473 | \$63,989 | \$791,390 | \$172,595 | \$963,985 |
| Moderate development | \$5,501,916 | \$3,594,691 | \$145,775 | \$4,894,450 | \$14,136,832 | \$2,193,000 | \$16,329,832 |
| Heavy development | \$2,422,467 | \$1,582,725 | \$64,184 | \$520,713 | \$4,590,090 | \$965,567 | \$5,555,657 |
| Very heavy development | \$3,725,422 | \$2,434,014 | \$98,706 | \$342,453 | \$6,600,595 | \$1,484,910 | \$8,085,505 |
| Waterfront Parcels | | | | | | | |
| Undeveloped area <= than 1 acre | \$0 | \$9,966 | \$404 | \$1,634 | \$12,004 | \$6,080 | \$18,085 |
| Undeveloped area in excess of 1 acre | \$0 | \$0 | \$139 | \$12,798 | \$12,936 | \$2,087 | \$15,024 |
| Light development | \$0 | \$30,350 | \$1,231 | \$0 | \$31,581 | \$18,515 | \$50,096 |
| Moderate development | \$0 | \$9,496 | \$385 | \$2,995 | \$12,876 | \$5,793 | \$18,669 |
| Heavy development | \$0 | \$96,361 | \$3,908 | \$8,623 | \$108,892 | \$58,787 | \$167,678 |
| Very heavy development | \$0 | \$961,512 | \$38,992 | \$4,992 | \$1,005,496 | \$586,586 | \$1,592,083 |
| Streets | \$3,381,507 | \$2,209,317 | \$89,594 | \$0 | \$5,680,418 | (\$5,680,418) | \$0 |
| TOTAL | \$15,718,892 | \$11,377,665 | \$467,189 | \$6,405,398 | \$33,969,144 | \$0 | \$33,969,144 |

RATE DESIGN

The revenue requirements and cost of service analyses described in the preceding sections of this report provide a basis for the design of surface water rates. Rate design involves the development of a rate schedule for each user class so as to recover the annual cost of service determined for each user class. This subsection of the report presents a schedule of rates for the Department's user classes, and analyzes the impact of the proposed changes in cost allocation and rate design on the user classes.

Proposed Surface Water Rates

Table 2-15 shows the proposed surface water rates for 2017 and 2018. Cost of service rates will be phased in over time. The area charge for the moderate development category includes the LIE/LID discount costs since only residential customers benefit from the assistance program.

Table 2-15
Proposed Surface Water Rates

| Development Categories | 2017 | | 2018 | |
|--------------------------------------|---------------|--------------------------|---------------|--------------------------|
| | Monthly Fixed | Area Charge per 500 sqft | Monthly Fixed | Area Charge per 500 sqft |
| Undeveloped area <= than 1 acre | \$7.17 | \$0.2793 | \$7.65 | \$0.2865 |
| Undeveloped area in excess of 1 acre | \$7.17 | \$0.0608 | \$7.65 | \$0.0616 |
| Light development | \$7.17 | \$0.8441 | \$7.65 | \$0.8812 |
| Moderate development | \$7.17 | \$1.1506 | \$7.65 | \$1.2054 |
| Heavy development | \$7.17 | \$1.6890 | \$7.65 | \$1.7684 |
| Very heavy development | \$7.17 | \$2.2526 | \$7.65 | \$2.3619 |
| Waterfront Properties | | | | |
| Undeveloped area <= than 1 acre | \$7.17 | \$0.1371 | \$7.65 | \$0.1422 |
| Undeveloped area in excess of 1 acre | \$7.17 | \$0.0608 | \$7.65 | \$0.0616 |
| Light development | \$7.17 | \$0.4150 | \$7.65 | \$0.4350 |
| Moderate development | \$7.17 | \$0.5786 | \$7.65 | \$0.6071 |
| Heavy development | \$7.17 | \$0.8312 | \$7.65 | \$0.8724 |
| Very heavy development | \$7.17 | \$1.1091 | \$7.65 | \$1.1650 |

Customer Impacts

Consistent with the cost of service analysis, there are changes in the cost allocations to different parameters, and it is expected that individual customers as well as customer classes will experience different impacts based on their water usage and their strength categories. **Table 2-16** below shows the difference between the proposed bills in 2017 and 2018 with the current bills for the average residential customer with an average parcel size of 7,000 square feet for both non-waterfront and waterfront properties. The table also shows the impacts at various parcel sizes and development categories to

illustrate the range of impacts of the proposed surface water rates. As **Table 2-16** illustrates, the impacts for 2017 and 2018 range from 3.9 percent to 5.8 percent.

Table 2-16
Customer Impacts

| | Billable Area | Current Bill | 2017 Bill | 2018 Bill | Δ from Prior Year | Δ from Prior Year |
|---------------------------------|------------------|--------------|-----------|-----------|----------------------|----------------------|
| Residential Average Lot | 7,000 | \$22.25 | \$23.28 | \$24.53 | 4.6% | 5.4% |
| Residential Waterfront (WF) Lot | 7,000 | \$14.45 | \$15.27 | \$16.15 | 5.7% | 5.8% |
| Light development | 10,000 | \$23.01 | \$24.05 | \$25.27 | 4.5% | 5.1% |
| Heavy development | 25,000 | \$88.11 | \$91.62 | \$96.07 | 4.0% | 4.9% |
| Very heavy development | 50,000 | \$223.73 | \$232.43 | \$243.84 | 3.9% | 4.9% |
| Light development - WF | 10,000 | \$14.65 | \$15.47 | \$16.35 | 5.6% | 5.7% |
| Heavy development - WF | 25,000 | \$46.34 | \$48.73 | \$51.27 | 5.2% | 5.2% |
| Very heavy development - WF | 50,000 | \$112.33 | \$118.08 | \$124.15 | 5.1% | 5.1% |

SECTION 3 – SOLID WASTE MANAGEMENT

SOLID WASTE SYSTEM

The solid waste utility provides garbage, recycling, and yard waste services for residential and commercial customers, as well as a recycling center, a hazardous waste facility and a Call-2-Haul program for bulk item collection service.

Current Solid Waste Rates

Residential customers are currently charged a monthly fixed charge for all garbage, recycling, and yard waste services, depending on the size of the garbage containers. The Department offers four container sizes: 30 gallons, 60 gallons and 90 gallons in addition to combinations of can sizes: 60x2 gallons 60+90 gallons, and 90x2 gallons. The monthly rate includes EOW pickups; additional pickups are charged a \$10 fee per pickup. Eligible LID/LIE customers receive 30 percent off the residential solid waste rates. Commercial customers are charged either a monthly rate or a per haul rate, depending on the size of the containers. Additionally, large containers are charged a monthly rental fee. Commercial customers with a monthly charge include weekly pickups. Fees for additional pickups vary based on the size of the container. Additional services such as Call-2-Haul, yard waste and food recycling are charged additional fees. **Table 3-1** shows the current solid waste rates for residential and commercial customers.

Table 3-1
Current Solid Waste Rates

| Current Solid Waste Rates | 2016 |
|--|----------|
| Residential Monthly Rate | |
| 30 gallons | \$20.38 |
| 45 gallons | \$30.57 |
| 60 gallons | \$40.75 |
| 90 gallons | \$61.14 |
| 2X60 gallons | \$81.50 |
| 60+90 gallons | \$101.89 |
| 2X90 gallons | \$122.28 |
| Additional Pickup | \$10.00 |
| Commercial | |
| <u>Barrel containers: Monthly Rate</u> | |
| 20 gallons | \$27.49 |
| 30 gallons | \$36.47 |
| 60 gallons | \$54.45 |
| 90 gallons | \$73.90 |
| 300 gallons | \$166.05 |

Table 3-1
Current Solid Waste Rates (continued)

| Current Solid Waste Rates | 2016 |
|---|-------------|
| <u>Barrel containers: Rental Fee</u> | |
| 300 gallons | \$3.55 |
| <u>Front-load containers: Monthly Rate</u> | |
| 1-cubic yard box | \$167.65 |
| 2-cubic yard box | \$218.90 |
| 3-cubic yard box | \$281.55 |
| 4-cubic yard box | \$344.25 |
| 6-cubic yard box | \$469.60 |
| 8-cubic yard box | \$594.95 |
| <u>Front-load containers: Rental Fee</u> | |
| 1-cubic yard box | \$4.85 |
| 2-cubic yard box | \$7.80 |
| 3-cubic yard box | \$8.90 |
| 4-cubic yard box | \$10.60 |
| 6-cubic yard box | \$13.85 |
| 8-cubic yard box | \$15.30 |
| <u>Front-load containers: Additional Pickup</u> | |
| 1-cubic yard box | \$38.26 |
| 2-cubic yard box | \$50.52 |
| 3-cubic yard box | \$64.97 |
| 4-cubic yard box | \$79.44 |
| 6-cubic yard box | \$108.37 |
| 8-cubic yard box | \$137.30 |
| <u>Drop-off box containers: Rental Fee</u> | |
| 15-cubic yard box | \$36.80 |
| 20-cubic yard box | \$39.45 |
| 25-cubic yard box | \$39.55 |
| 30-cubic yard box | \$43.50 |
| 40-cubic yard box | \$44.00 |
| <u>Drop-off box containers: Per Haul Rate</u> | |
| 15-cubic yard box | \$504.95 |
| 20-cubic yard box | \$594.60 |
| 25-cubic yard box | \$683.95 |
| 30-cubic yard box | \$773.05 |
| 40-cubic yard box | \$951.10 |

**Table 3-1
Current Solid Waste Rates (continued)**

| Current Solid Waste Rates | 2016 |
|---|------------|
| <u>Front-load compactor containers: Per Haul Rate</u> | |
| 2-cubic yard box | \$99.40 |
| 3-cubic yard box | \$161.91 |
| 4-cubic yard box | \$208.39 |
| 5-cubic yard box | \$254.69 |
| <u>Drop-off box compactor containers: Per Haul Rate</u> | |
| 10-cubic yard box | \$719.75 |
| 12-cubic yard box | \$831.06 |
| 15-cubic yard box | \$1,082.94 |
| 16-cubic yard box | \$1,134.60 |
| 17-cubic yard box | \$1,163.97 |
| 18-cubic yard box | \$1,216.67 |
| 20-cubic yard box | \$1,355.28 |
| 24-cubic yard box | \$1,573.81 |
| 25-cubic yard box | \$1,628.29 |
| 26-cubic yard box | \$1,683.02 |
| 27-cubic yard box | \$1,736.20 |
| 30-cubic yard box | \$1,903.01 |
| 33-cubic yard box | \$2,071.46 |
| 34-cubic yard box | \$2,121.53 |
| 40-cubic yard box | \$2,451.18 |
| Commercial Recycling - Monthly Rate | |
| Mixed (up to 90-gal) | |
| Bi-weekly | \$5.00 |
| Weekly | \$10.00 |
| 2 hauls/week | \$20.00 |
| 3 hauls/week | \$30.00 |
| 4 hauls/week | \$40.00 |
| Daily | \$50.00 |
| Mixed 2-yard rear load | |
| Bi-weekly | \$30.00 |
| Weekly | \$50.00 |
| 2 hauls/week | \$100.00 |
| Glass | |
| Bi-weekly | \$25.00 |
| Weekly | \$45.00 |
| 2 hauls/week | \$90.00 |
| 3 hauls/week | \$135.00 |

**Table 3-1
Current Solid Waste Rates (continued)**

| Current Solid Waste Rates | 2016 |
|---|----------|
| Commercial Recycling - Monthly Rate | |
| Cardboard | |
| Bi-weekly | \$20.00 |
| Weekly | \$40.00 |
| 2 hauls/week | \$80.00 |
| 3 hauls/week | \$120.00 |
| 4 hauls/week | \$160.00 |
| Yard Waste | |
| Hauls/Pick ups | \$50.00 |
| Landfill Fees | |
| <u>Garbage Disposal Fees - per 100 lbs</u> | |
| Tacoma Residents | \$6.50 |
| Non-Residents | \$7.50 |
| Commercial | \$6.50 |
| Non-Profit | \$3.25 |
| <u>First 400 lbs for Residents or Minimum Fee</u> | |
| Tacoma Residents | \$20.00 |
| Non-Residents | \$20.00 |
| Commercial | \$20.00 |
| Non-Profit | \$20.00 |

Customer Information

Solid waste customer accounts and pickups information for 2015 are used as the basis for projecting revenues. The Department does not expect any growth to occur during the six-year period as the Department is essentially built out. As shown in **Table 3-2**, approximate 79.3 percent of the customer accounts are residential customers, accounting for approximately 81.8 percent of the total pickups during the year. Within the commercial accounts, barrel containers account for 7.2 percent of the total accounts and 9.1 percent of the total pickups.

Table 3-2
Current Solid Waste Customer Accounts and Pickups

| Customer Class | Accounts | Annual Pickups |
|-----------------------------------|----------|----------------|
| Residential | 53,775 | 2,796,300 |
| Commercial | | |
| Barrel Containers | 4,852 | 309,267 |
| Front-load containers | 910 | 54,482 |
| Drop-off box containers | 429 | 4,768 |
| Front-load compactor containers | 56 | 3,410 |
| Drop-off box compactor containers | 234 | 4,426 |
| Commercial Recycling | 7,588 | 244,160 |

FINANCIAL PLAN

A review of a utility's revenue requirements is a key first step in the rate design process. The review involves an analysis of annual operating revenues under the current rates, capital revenues, operation and maintenance (O&M) expenses, capital expenditures, transfers between funds, and reserve requirements. This subsection of the report provides a discussion of the projected revenues, O&M and capital expenditures, capital improvement financing plan, debt service requirements, and the revenue adjustments required to ensure the financial stability of the solid waste utility.

Solid Waste System Revenues

The Department's solid waste utility derives its required annual operating and non-operating revenues from a number of sources. The principal source of operating revenues is the solid waste service charges from the Department's users. Other operating revenue includes service revenues. Non-operating revenue sources include investment earnings, rental income, etc.

Table 3-3 presents the details of the operating and non-operating revenues.

Table 3-3
Solid Waste Revenue at Existing Rates

| Revenue at Existing Rates | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Operating Revenues | | | | | | |
| ENV-4270 Customer Fee Revenue | \$36,000 | \$36,000 | \$36,900 | \$37,823 | \$38,768 | \$39,737 |
| ENV-4411 Other Misc Oper Rev | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| ENV-4560 Service Revenue | \$180,000 | \$180,000 | \$184,500 | \$189,113 | \$193,840 | \$198,686 |
| ENV-4590 Solid Wst Commercial Recycl Revenue | \$1,381,929 | \$1,381,929 | \$1,381,929 | \$1,381,929 | \$1,381,929 | \$1,381,929 |
| ENV-4600 Solid Wst Container Rental Revenue | \$650,660 | \$650,660 | \$650,660 | \$650,660 | \$650,660 | \$650,660 |
| ENV-4610 Solid Waste Disposal Revenue | \$7,191,518 | \$7,191,518 | \$7,191,518 | \$7,191,518 | \$7,191,518 | \$7,191,518 |
| ENV-4621 Solid Wst Commercial Collection | \$24,580,062 | \$24,580,062 | \$24,580,062 | \$24,580,062 | \$24,580,062 | \$24,580,062 |
| ENV-4630 Solid Waste Residential Collec Revenue | \$26,819,580 | \$26,819,580 | \$26,819,580 | \$26,819,580 | \$26,819,580 | \$26,819,580 |
| ENV-4695 Discount-Aid to Families in Need | (\$95,000) | (\$95,000) | (\$97,375) | (\$99,809) | (\$102,305) | (\$104,862) |
| ENV-4700 Salvage Revenue | \$425,000 | \$375,000 | \$384,375 | \$393,984 | \$403,834 | \$413,930 |
| Total Operating Revenues | \$61,169,749 | \$61,119,749 | \$61,132,149 | \$61,144,859 | \$61,157,887 | \$61,171,240 |
| Non-Operating Revenues/(Expenses) | | | | | | |
| ENV-6100 Investment Income | \$442,172 | \$385,158 | \$372,753 | \$366,666 | \$373,622 | \$380,873 |
| ENV-6300 Rental and Lease Income | \$55,000 | \$55,000 | \$55,000 | \$55,000 | \$55,000 | \$55,000 |
| ENV-6400 Operating Grant Revenue | \$63,600 | \$0 | \$0 | \$0 | \$0 | \$0 |
| ENV-6560 Other Debt Service Costs | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| ENV-6700 Capitalized Interest Expense | \$53,000 | \$40,000 | \$147,680 | \$23,795 | \$24,747 | \$25,737 |
| Total Non-Operating Revenues/(Expenses) | \$613,772 | \$480,158 | \$575,433 | \$445,461 | \$453,369 | \$461,610 |
| TOTAL REVENUES | \$61,783,522 | \$61,599,907 | \$61,707,583 | \$61,590,320 | \$61,611,256 | \$61,632,850 |

Solid Waste System Expenditures

For sound financial operation of the Department's solid waste system, revenues generated must be sufficient to meet the revenue requirements or cash obligations of the system. Revenue requirements include O&M expenses, CIP expenditures, principal and interest payments on existing debt, and other obligations.

Operations and Maintenance Expenses

O&M expenditures include the cost of operating and maintaining treatment, collection, and disposal facilities. O&M expenses also include the costs of providing technical services such as laboratory services and other administrative costs of the solid waste system such as customer service and billing. These costs are a normal obligation of the system, and are met from operating revenues as they are incurred. The comprehensive forecasted annual O&M expenditures are based upon the Department's budgeted 2017 and 2018 expenditures, adjusted for anticipated changes in operations and the effect of inflation in future years. The Department uses the estimated CPI for the Puget Sound area as the standard inflation factor to project all future O&M expenditures, except benefits, construction, assessments, and utilities, starting in 2019. Benefits expenses are projected to increase at a higher rate than standard inflation factors, estimated at seven percent per year. Construction and utilities expenses are projected to increase at four percent per year. Assessments expenses are projected to increase at five percent per year. Projected O&M expenditures for the study period are summarized by functions in **Table 3-4**.

The rate model provides for segregation between cash and non-cash expenses, such as depreciation, which is excluded when revenue requirements are calculated to determine solid waste rates.

**Table 3-4
Solid Waste O&M Expenses**

| O&M Expenses by Cost Center | | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|-------------------------------|--|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| 512000 | ES Solid Waste Revenues and Accounting | \$12,544,729 | \$12,828,979 | \$12,926,187 | \$13,620,613 | \$13,964,113 | \$14,340,225 |
| 512005 | ES Solid Waste Public Information | \$318,262 | \$330,316 | \$339,290 | \$348,539 | \$358,073 | \$367,902 |
| 512007 | ES Solid Waste Engineering Svcs | \$226,664 | \$240,772 | \$247,701 | \$254,934 | \$262,490 | \$270,391 |
| 512010 | ES Solid Waste Customer Service | \$1,144,034 | \$1,176,705 | \$1,219,067 | \$1,263,393 | \$1,309,798 | \$1,358,400 |
| 512015 | ES Solid Waste Assessments | \$5,146,446 | \$5,173,012 | \$5,431,662 | \$5,703,245 | \$5,988,408 | \$6,287,828 |
| 512020 | ES Solid Waste Facility Maintenance | \$1,626,215 | \$1,668,523 | \$1,723,478 | \$1,780,726 | \$1,840,389 | \$1,902,596 |
| 512025 | ES Solid Waste Business Operations | \$3,113,399 | \$3,208,722 | \$3,311,257 | \$3,417,853 | \$3,528,713 | \$3,644,055 |
| 513000 | ES Solid Waste Residential Waste | \$2,686,403 | \$2,726,729 | \$2,810,873 | \$2,898,240 | \$2,988,987 | \$3,083,283 |
| 513010 | ES Solid Waste Commercial Barrel | \$1,182,702 | \$1,205,680 | \$1,244,952 | \$1,285,762 | \$1,328,185 | \$1,372,299 |
| 513020 | ES Solid Waste Commercial Front Load | \$1,067,935 | \$1,085,965 | \$1,118,305 | \$1,151,817 | \$1,186,556 | \$1,222,579 |
| 513030 | ES Solid Waste Commercial DOB | \$1,752,656 | \$1,783,013 | \$1,837,614 | \$1,894,281 | \$1,953,115 | \$2,014,222 |
| 514010 | ES Solid Waste Public Receiving | \$4,058,516 | \$4,164,899 | \$4,304,516 | \$4,449,949 | \$4,601,500 | \$4,759,488 |
| 514050 | ES Solid Waste Environmental Systems | \$764,956 | \$789,216 | \$813,499 | \$838,691 | \$864,835 | \$891,977 |
| 514300 | ES Solid Waste Res Commingle Recycle | \$3,244,217 | \$3,304,288 | \$3,409,237 | \$3,518,373 | \$3,631,911 | \$3,750,079 |
| 514310 | ES Solid Waste Commercial Recycle | \$1,147,555 | \$1,169,768 | \$1,207,704 | \$1,247,196 | \$1,288,327 | \$1,331,183 |
| 514340 | ES Solid Waste Recycling Center | \$591,661 | \$611,831 | \$633,608 | \$656,378 | \$680,197 | \$705,125 |
| 514350 | ES Solid Waste Yard Waste Diversion | \$3,656,175 | \$3,723,930 | \$3,829,419 | \$3,938,413 | \$4,051,059 | \$4,167,514 |
| 514360 | ES Solid Waste Misc Recycling Programs | \$700,901 | \$665,317 | \$683,068 | \$701,341 | \$720,155 | \$739,529 |
| 514380 | ES Sol Waste Comm Food Waste Recycling | \$159,596 | \$163,608 | \$169,320 | \$175,289 | \$181,529 | \$188,054 |
| 514500 | ES Solid Waste Call-2-Haul | \$514,007 | \$528,424 | \$546,776 | \$565,946 | \$585,981 | \$606,928 |
| 514510 | ES Solid Waste Tacoma CARES | \$598,661 | \$613,415 | \$636,982 | \$661,638 | \$687,436 | \$714,435 |
| 514520 | ES Solid Waste Hazardous Waste | \$867,753 | \$895,902 | \$925,167 | \$955,641 | \$987,387 | \$1,020,473 |
| 515010 | ES Solid Waste Off-site Transport | \$9,266,815 | \$9,424,877 | \$9,676,335 | \$9,935,188 | \$10,201,699 | \$10,476,141 |
| 516200 | ES Solid Waste Nuisance Code Abatement | \$1,567,000 | \$1,567,000 | \$1,606,175 | \$1,646,329 | \$1,687,488 | \$1,729,675 |
| 516210 | ES Solid Waste NCE Neighborhood Cleanups | \$97,800 | \$98,300 | \$100,949 | \$103,671 | \$106,470 | \$109,347 |
| 519000 | ES Solid Waste Collection Clearing | \$1,129,333 | \$1,150,671 | \$1,186,035 | \$1,222,741 | \$1,260,854 | \$1,300,443 |
| 519010 | ES Solid Waste Container Svcs Clearing | \$1,148,939 | \$1,176,119 | \$1,217,828 | \$1,261,441 | \$1,307,066 | \$1,354,818 |
| TOTAL O&M EXPENSES | | \$60,957,094 | \$62,124,915 | \$63,828,028 | \$66,191,706 | \$68,270,863 | \$70,452,269 |

Taxes

The solid waste utility is subject to three main types of taxes: an MGE tax assessed by the City of Tacoma, B&O taxes and a collection tax assessed by the State of Washington. The MGE tax of 8 percent is assessed on all revenues collected. The B&O wholesale tax of 0.484 percent is assessed on any wholesale revenues. The B&O retail tax of 0.471 percent is assessed on rental revenues. The B&O service tax of 1.5 percent is assessed on all service revenues. The collection tax of 3.6 percent is assessed on all collection and disposal revenues. In addition, there is a retail sales tax of 9.5 percent on all container rentals. However, the customer pays this tax separately so it is not included as an expense of the solid waste utility. Solid waste expenses have been adjusted for the MGE and B&O taxes expenses since the collection and retail sales taxes are collected and passed through to the State.

Capital Improvement Program

The Department has developed a comprehensive solid waste CIP to address current solid waste system needs. As **Table 3-5** indicates, the total estimated solid waste CIP from 2017 to 2022 is \$53.4 million. These projected costs include a four percent annual inflation factor for projects after 2018 due to anticipated increases in construction costs over time. This inflation rate is based on the ENR and ensures that the Department has adequate resources reserved to complete the necessary projects.

Table 3-5
Solid Waste Capital Improvement Program

| Capital Improvement Plan | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|-----------------------------|--------------------|--------------------|---------------------|--------------------|--------------------|--------------------|
| Environmental Remediation | \$125,000 | \$55,000 | \$26,000 | \$86,528 | \$89,989 | \$93,589 |
| Equipment | \$4,281,000 | \$3,531,000 | \$2,084,368 | \$2,167,743 | \$3,461,488 | \$3,599,947 |
| Containers | \$1,526,971 | \$1,526,971 | \$1,588,050 | \$1,651,572 | \$1,717,635 | \$1,786,340 |
| Facilities Improvements | \$1,910,000 | \$1,487,500 | \$5,665,400 | \$811,200 | \$843,648 | \$877,394 |
| Special Projects (SC) | \$268,523 | \$53,275 | \$119,600 | \$124,384 | \$129,359 | \$134,534 |
| Capital Labor Credit | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Capitalized A&G | \$264,000 | \$210,000 | \$474,240 | \$141,690 | \$170,979 | \$177,819 |
| Capitalized Interest | \$53,000 | \$40,000 | \$147,680 | \$23,795 | \$24,747 | \$25,737 |
| TOTAL CIP - INFLATED | \$8,428,494 | \$6,903,746 | \$10,105,338 | \$5,006,911 | \$6,437,845 | \$6,695,359 |

Major Capital Improvement Financing Plan

Typical CIP funding sources include the following:

System Revenues

Pay-as-you-go revenues

Interest earnings

Capital Financing

Bond proceeds

Grant receipts and contributions

Table 3-6 presents the proposed capital financing plan to finance the CIP projects over the six-year period from 2017 to 2022.

Table 3-6
Solid Waste Capital Financing Plan

| Capital Financing Plan | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|--|--------------------|--------------------|---------------------|--------------------|--------------------|--------------------|
| Total Capital Projects | \$8,428,494 | \$6,903,746 | \$10,105,338 | \$5,006,911 | \$6,437,845 | \$6,695,359 |
| Total Capital Projects - PAYGO only | \$1,795,494 | \$1,580,246 | \$1,707,650 | \$1,775,956 | \$1,846,994 | \$1,920,874 |
| Total Capital Projects - Other funding sources | \$6,633,000 | \$5,323,500 | \$8,397,688 | \$3,230,956 | \$4,590,851 | \$4,774,485 |
| Sources of Funding: | | | | | | |
| Debt | \$2,867,550 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Total Sources | \$2,867,550 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Projects Funded by Rates | \$5,560,944 | \$6,903,746 | \$10,105,338 | \$5,006,911 | \$6,437,845 | \$6,695,359 |

Debt Service Requirements

Debt service requirements consist of principal and interest payments on existing debt. The Department currently has debt service obligations associated with its outstanding 2008, 2015, and 2016 Revenue and Refunding Bonds. **Table 3-7** shows the existing debt service of the solid waste utility.

Table 3-7
Solid Waste Debt Service Schedule

| | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|------------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| 2008 REV & REF BONDS | \$2,839,388 | \$0 | \$0 | \$0 | \$0 | \$0 |
| 2015 BONDS | \$2,898,200 | \$2,900,200 | \$2,897,200 | \$2,899,200 | \$2,898,800 | \$2,901,200 |
| 2016 A REF BONDS | \$1,070,700 | \$1,070,700 | \$1,070,700 | \$1,070,700 | \$1,070,700 | \$1,070,700 |
| 2016 B REF BONDS | \$751,250 | \$751,250 | \$751,250 | \$751,250 | \$751,250 | \$751,250 |
| TOTAL EXISTING DEBT SERVICE | \$7,559,538 | \$4,722,150 | \$4,719,150 | \$4,721,150 | \$4,720,750 | \$4,723,150 |
| Proposed Debt | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| TOTAL PROPOSED DEBT SERVICE | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| TOTAL DEBT SERVICE | \$7,559,538 | \$4,722,150 | \$4,719,150 | \$4,721,150 | \$4,720,750 | \$4,723,150 |

Reserves

The Department requires adequate cash reserves to meet operating, capital, and debt service requirements. Operating reserves may be used to meet ongoing cash flow requirements as well as emergency requirements. Typically, a balance in the range of 10 to 50 percent of annual operating expenses is considered appropriate. This represents one to six months of working capital. The Department has chosen to maintain a minimum 60-day operating reserve and a maximum of 120-day operating reserve. The operating reserve balances and the minimum and maximum operating reserve targets are shown in **Table 3-8**. The Department's desired operating reserve level is 90 days of operating expenses.

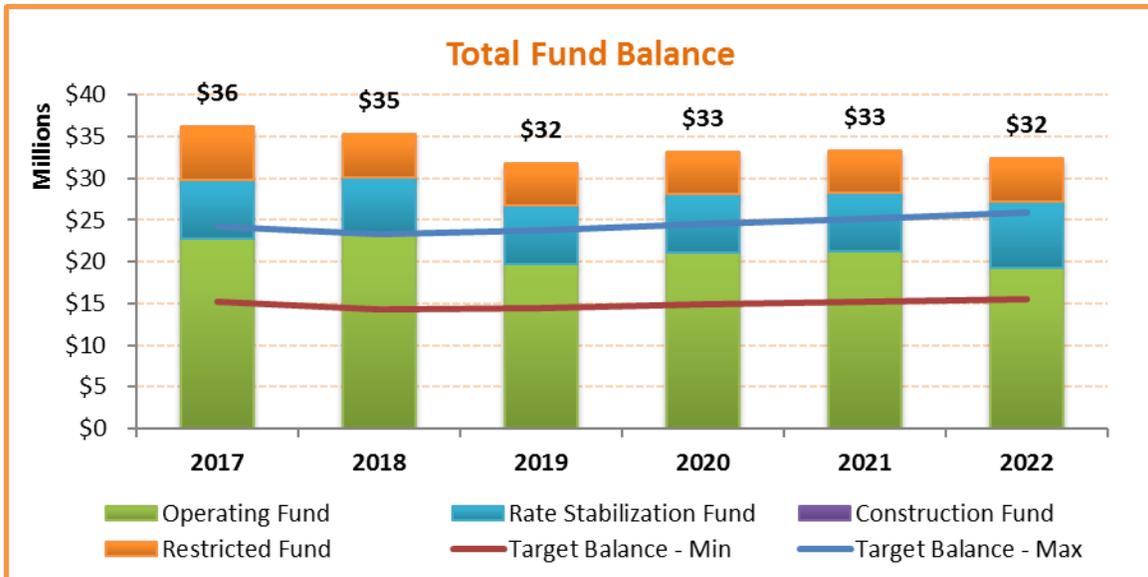
In addition to the operating reserves, the Department also maintains an RSF, which is used to mitigate spikes in rate increases and better match revenues and expenses. The Department has a target reserve level equal to 10 percent of the total annual rate revenue for the RSF. Interest from reserve funds may be used to finance operations. The reserve levels are projected to meet the minimum required level in all six years of the Study period, as shown in **Figure 3-1**.

Table 3-8
Solid Waste Fund/Reserves Balance

| | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|--|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Operating Fund | | | | | | |
| Beginning Balance | \$27,590,276 | \$22,816,692 | \$23,167,236 | \$19,727,080 | \$21,091,846 | \$21,221,703 |
| Net Cash Flow | (\$3,529,231) | (\$874,361) | (\$3,440,019) | \$1,364,733 | \$130,057 | (\$968,853) |
| Transfer from/(to) Rate Stabilization Fund | \$0 | \$0 | \$0 | \$0 | \$0 | (\$1,000,000) |
| Transfer from Construction Fund | (\$1,673,855) | \$5,968 | \$30 | \$0 | \$0 | \$0 |
| Transfer From/(To) Restricted Fund | \$429,501 | \$1,218,936 | (\$166) | \$33 | (\$200) | \$42 |
| Ending Balance | \$22,816,692 | \$23,167,236 | \$19,727,080 | \$21,091,846 | \$21,221,703 | \$19,252,892 |
| <i>Interest Income</i> | <i>\$300,703</i> | <i>\$257,869</i> | <i>\$251,588</i> | <i>\$245,500</i> | <i>\$252,455</i> | <i>\$254,706</i> |
| Target Balance - Min - 60 days of O&M | \$8,910,755 | \$9,102,726 | \$9,354,950 | \$9,715,066 | \$10,027,702 | \$10,356,416 |
| Target Balance - Max - 120 days of O&M | \$17,821,510 | \$18,205,452 | \$18,709,900 | \$19,430,133 | \$20,055,403 | \$20,712,833 |
| Days of O&M | 202 | 198 | 191 | 161 | 165 | 150 |
| Rate Stabilization Fund | | | | | | |
| Beginning Balance | \$7,000,000 | \$7,000,000 | \$7,000,000 | \$7,000,000 | \$7,000,000 | \$7,000,000 |
| Transfer From/(To) Operating Fund | \$0 | \$0 | \$0 | \$0 | \$0 | \$1,000,000 |
| Ending Balance | \$7,000,000 | \$7,000,000 | \$7,000,000 | \$7,000,000 | \$7,000,000 | \$8,000,000 |
| <i>Interest Income</i> | <i>\$70,000</i> | <i>\$70,000</i> | <i>\$70,000</i> | <i>\$70,000</i> | <i>\$70,000</i> | <i>\$75,000</i> |
| Target Balance - 10% of revenue | \$6,264,454 | \$6,515,032 | \$6,720,991 | \$6,922,621 | \$7,130,300 | \$7,344,209 |
| Construction Fund | | | | | | |
| Beginning Balance | \$1,193,696 | \$5,968 | \$30 | \$0 | \$0 | \$0 |
| Bonds Proceeds | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| SRF Loan Proceeds | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Other Sources of Funding | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Bonds Used for Capital Projects | (\$2,867,550) | \$0 | \$0 | \$0 | \$0 | \$0 |
| SRF Loan Used for Capital Projects | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Other Sources Used for Capital Projects | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Transfer to fund PAYGO | \$1,673,855 | (\$5,968) | (\$30) | (\$0) | (\$0) | (\$0) |
| Transfer From/(To) Restricted Fund | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Ending Balance | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| <i>Interest Income</i> | <i>\$5,968</i> | <i>\$30</i> | <i>\$0</i> | <i>\$0</i> | <i>\$0</i> | <i>\$0</i> |
| Restricted Fund | | | | | | |
| Beginning Balance | \$6,764,849 | \$6,335,348 | \$5,116,412 | \$5,116,578 | \$5,116,545 | \$5,116,745 |
| Reserves from New Bonds | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Transfer From/(To) Operating Fund | (\$429,501) | (\$1,218,936) | \$166 | (\$33) | \$200 | (\$42) |
| Transfer From/(To) Construction Fund | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Ending Balance | \$6,335,348 | \$5,116,412 | \$5,116,578 | \$5,116,545 | \$5,116,745 | \$5,116,703 |
| <i>Interest Income</i> | <i>\$65,501</i> | <i>\$57,259</i> | <i>\$51,165</i> | <i>\$51,166</i> | <i>\$51,166</i> | <i>\$51,167</i> |

Figure 3-1 shows the total funds balance and total targets in a graphical format. The blue line represents the maximum target balance, defined as 120 days of O&M expenses for the Operating fund, 10 percent of revenue for the Rate Stabilization fund, and the entirety of the Restricted reserves. The red line represents the minimum target balance, defined as 60 days of O&M expenses for the Operating fund, 10 percent of revenue for the Rate Stabilization fund, and the entirety of the Restricted reserves.

**Figure 3-1
Projected Total Solid Waste Funds Balance**

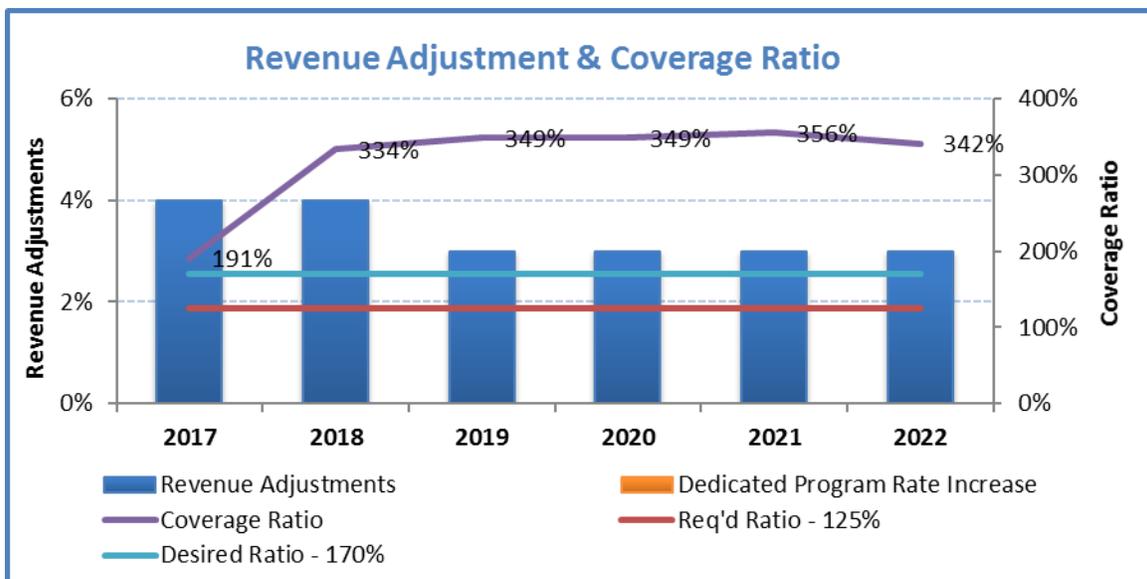


Proposed Revenue Adjustments

In order to meet projected revenue requirements, to achieve desired operating and capital reserve fund balances, and to minimize customer impacts, the following revenue adjustments are proposed to meet long-term rate stability:

| Effective Date | Increases |
|-----------------|-------------|
| January 1, 2017 | 4.0 percent |
| January 1, 2018 | 4.0 percent |

**Figure 3-2
Proposed Solid Waste Revenue Adjustments and Debt Coverage**



The operating financial plan presented in **Table 3-9** shows the revenues from rates projected over the next six years. The financial plan shows that the solid waste utility will need 3.0 percent per year in additional revenues in years 2019 through 2022 as shown in **Figure 3-2**, to meet its revenue requirements in those years.

Table 3-9
Solid Waste Operating Financial Plan

| Operating Financial Plan | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|--|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Revenue at Existing Rates | \$60,623,749 | \$60,623,749 | \$60,623,749 | \$60,623,749 | \$60,623,749 | \$60,623,749 |
| Total Additional Revenue | \$2,020,792 | \$4,526,573 | \$6,586,164 | \$8,602,462 | \$10,679,248 | \$12,818,338 |
| Total Rate Revenue | \$62,644,541 | \$65,150,322 | \$67,209,913 | \$69,226,211 | \$71,302,997 | \$73,442,087 |
| Other Operating Revenue | \$546,000 | \$496,000 | \$508,400 | \$521,110 | \$534,138 | \$547,491 |
| Investment Earnings | \$436,204 | \$385,128 | \$372,753 | \$366,666 | \$373,622 | \$380,873 |
| Other Non-Operating Revenue | \$171,600 | \$95,000 | \$202,680 | \$78,795 | \$79,747 | \$80,737 |
| TOTAL REVENUES BF Rate Stabilization Transf | \$126,442,886 | \$131,276,773 | \$135,503,660 | \$139,418,993 | \$143,593,501 | \$147,893,275 |
| EXPENDITURES | | | | | | |
| O&M Expenses | \$54,207,094 | \$55,374,915 | \$56,909,278 | \$59,099,988 | \$61,001,851 | \$63,001,532 |
| Dedicated Program Cost | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Existing Debt Service | \$7,559,538 | \$4,722,150 | \$4,719,150 | \$4,721,150 | \$4,720,750 | \$4,723,150 |
| Proposed Debt Service | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Proposed SRF Loan | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Capital PAYGO (funded by rates) | \$5,560,944 | \$6,903,746 | \$10,105,338 | \$5,006,911 | \$6,437,845 | \$6,695,359 |
| TOTAL EXPENDITURES | \$67,327,575 | \$67,000,811 | \$71,733,766 | \$68,828,049 | \$72,160,447 | \$74,420,041 |
| Transfer from/(to) Rate Stabilization Fund | \$0 | \$0 | \$0 | \$0 | \$0 | (\$1,000,000) |
| NET CASH FLOW | (\$3,529,231) | (\$874,361) | (\$3,440,019) | \$1,364,733 | \$130,057 | (\$968,853) |

Debt Service Coverage

The Department must meet debt service coverage requirements on its outstanding bond issues which is 1.25. Coverage requirements typically vary between 100 percent and 160 percent or higher. However, the Department financial policy advocates debt coverage at 170 percent, which means that the Department's adjusted net system revenues shall amount to at least 170 percent of the annual debt service. The system revenues include funds derived from the ownership and operation of the system including solid waste service charges from the Department's users, miscellaneous service charges, revenue received from contracts, interest income, and other non-operating revenues. Annual debt service includes annual principal and interest payments on outstanding debt. With the proposed revenue adjustments and proposed refunding schedule, the Department expects to meet the coverage requirement during all six years, as shown in **Table 3-10**, and in **Figure 3-2** above.

Table 3-10
Solid Waste Debt Service Coverage Calculation

| Debt Coverage Calculation | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Revenues | | | | | | |
| Operating Revenue | \$63,190,541 | \$65,646,322 | \$67,718,313 | \$69,747,321 | \$71,837,135 | \$73,989,578 |
| Non-Operating Revenue (Excl. Cash Flow Adj) | \$560,772 | \$440,158 | \$427,753 | \$421,666 | \$428,622 | \$435,873 |
| Transfer from/(to) Rate Stabilization | \$0 | \$0 | \$0 | \$0 | \$0 | (\$1,000,000) |
| Total Revenues | \$63,751,313 | \$66,086,480 | \$68,146,067 | \$70,168,987 | \$72,265,757 | \$73,425,451 |
| Expenses | | | | | | |
| O&M Expenses | \$49,322,554 | \$50,297,999 | \$51,673,843 | \$53,709,125 | \$55,449,814 | \$57,283,449 |
| Dedicated Program Cost | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Non-Operating Expenses | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Total Expenses | \$49,322,554 | \$50,297,999 | \$51,673,843 | \$53,709,125 | \$55,449,814 | \$57,283,449 |
| Net Revenue | \$14,428,759 | \$15,788,481 | \$16,472,224 | \$16,459,862 | \$16,815,943 | \$16,142,002 |
| Total Debt Service | \$7,559,538 | \$4,722,150 | \$4,719,150 | \$4,721,150 | \$4,720,750 | \$4,723,150 |
| Coverage Ratio After Rate Stabilization | 191% | 334% | 349% | 349% | 356% | 342% |
| Required Coverage | 125% | 125% | 125% | 125% | 125% | 125% |
| Desired Coverage Ratio | 170% | 170% | 170% | 170% | 170% | 170% |

COST OF SERVICE ANALYSIS

The process for cost of service analysis for solid waste is similar to that for wastewater and surface water. First, the revenue requirements from rates are determined. Expenses are then allocated to different cost functions such as collection, disposal, recycling and yard waste, user, and general. After conducting the cost of service analysis, the department found that the results would cause a significant change to the allocation of costs among customer classes. After a thorough review of the cost allocation process, the Department determined that rate adjustments would be implemented over time to smooth changes in rates.

RATE DESIGN

Proposed Solid Waste Rates

The Department has completed both the move to residential volume based garbage collection rates and the EOW collection schedule. Cost of service rate adjustments will be implemented over time. **Table 3-11** on the next page shows the proposed rates.

**Table 3-11
Proposed Solid Waste Rates**

| Container Size | 2017 | 2018 |
|-----------------------------------|-------------|-------------|
| Residential Monthly Charge | | |
| 30 gal | \$21.14 | \$21.93 |
| 45 gal | \$31.71 | \$32.89 |
| 60 gal | \$42.27 | \$43.85 |
| 90 gal | \$63.42 | \$65.78 |
| 2X60 gal | \$84.54 | \$87.69 |
| 60+90 gal | \$105.69 | \$109.63 |
| 2X90 gal | \$126.84 | \$131.57 |
| LIE/LID Customers | | |
| 30 gal | \$14.80 | \$15.36 |
| 45 gal | \$22.20 | \$23.03 |
| 60 gal | \$29.59 | \$30.70 |
| 90 gal | \$44.40 | \$46.05 |
| 2X60 gal | \$59.18 | \$61.39 |
| 60+90 gal | \$73.99 | \$76.75 |
| 2X90 gal | \$88.79 | \$92.10 |
| COMMERCIAL RATES | | |
| Barrel Containers | 2017 | 2018 |
| Monthly Charge | | |
| 20 gal | \$27.92 | \$28.36 |
| 30 gal | \$36.91 | \$37.35 |
| 60 gal | \$55.66 | \$56.90 |
| 90 gal | \$75.78 | \$77.70 |
| 300 gal | \$166.05 | \$166.05 |
| Charge per pickup | | |
| 20 gal | \$15.00 | \$15.00 |
| 30 gal | \$15.00 | \$15.00 |
| 60 gal | \$15.00 | \$15.00 |
| 90 gal | \$15.00 | \$15.00 |
| 300 gal | \$38.35 | \$38.35 |
| Rental Fee (\$/mo) | | |
| 300 gal | \$4.00 | \$4.00 |

**Table 3-11
Proposed Solid Waste Rates (continued)**

| Front-load Containers | | 2017 | 2018 |
|--------------------------------|--------|-------------|-------------|
| Monthly Charge | | | |
| 1 YD | | \$169.08 | \$170.52 |
| 2 YD | | \$223.52 | \$228.24 |
| 3 YD | | \$285.83 | \$290.17 |
| 4 YD | | \$348.36 | \$352.52 |
| 6 YD | | \$472.68 | \$475.78 |
| 8 YD | | \$597.60 | \$600.26 |
| Charge per Pickup | | | |
| | 4.3333 | | |
| 1 YD | | \$38.26 | \$38.26 |
| 2 YD | | \$51.16 | \$51.81 |
| 3 YD | | \$65.27 | \$65.58 |
| 4 YD | | \$79.44 | \$79.44 |
| 6 YD | | \$108.37 | \$108.37 |
| 8 YD | | \$137.30 | \$137.30 |
| Rental Fee (\$/mo) | | | |
| 1 YD | | \$4.85 | \$4.85 |
| 2 YD | | \$7.80 | \$7.80 |
| 3 YD | | \$8.90 | \$8.90 |
| 4 YD | | \$10.60 | \$10.60 |
| 6 YD | | \$13.85 | \$13.85 |
| 8 YD | | \$15.30 | \$15.30 |
| Drop-off Box Containers | | 2017 | 2018 |
| Charge per pickup | | | |
| 15 YD | | \$525.59 | \$547.08 |
| 20 YD | | \$616.29 | \$638.77 |
| 25 YD | | \$707.25 | \$731.34 |
| 30 YD | | \$799.28 | \$826.40 |
| 40 YD | | \$981.46 | \$1,012.79 |
| Rental Fee (\$/mo) | | | |
| 15 YD | | \$38.90 | \$38.90 |
| 20 YD | | \$42.45 | \$42.45 |
| 25 YD | | \$43.25 | \$43.25 |
| 30 YD | | \$46.05 | \$46.05 |
| 40 YD | | \$52.15 | \$52.15 |

**Table 3-11
Proposed Solid Waste Rates (continued)**

| Front-load Compactor Containers | 2017 | 2018 |
|--|-------------|-------------|
| Charge per pickup | | |
| 2 YD | \$100.91 | \$102.45 |
| 3 YD | \$172.66 | \$184.13 |
| 4 YD | \$222.38 | \$237.31 |
| 5 YD | \$271.82 | \$290.11 |
| Drop-off Box Compactor Containers | 2017 | 2018 |
| Charge per pickup | | |
| 10 YD | \$728.45 | \$737.25 |
| 12 YD | \$884.56 | \$941.50 |
| 15 YD | \$1,140.01 | \$1,200.09 |
| 16 YD | \$1,194.14 | \$1,256.81 |
| 17 YD | \$1,241.62 | \$1,324.45 |
| 18 YD | \$1,298.23 | \$1,385.26 |
| 20 YD | \$1,427.55 | \$1,503.67 |
| 24 YD | \$1,658.40 | \$1,747.54 |
| 25 YD | \$1,715.82 | \$1,808.05 |
| 26 YD | \$1,773.55 | \$1,868.94 |
| 27 YD | \$1,829.36 | \$1,927.52 |
| 30 YD | \$2,005.93 | \$2,114.42 |
| 33 YD | \$2,184.26 | \$2,303.20 |
| 34 YD | \$2,236.46 | \$2,357.62 |
| 40 YD | \$2,584.96 | \$2,726.05 |
| Self-Haul Garbage Services | 2017 | 2018 |
| Up to 400 lbs/Minimum | | |
| Tacoma Residents | \$20.00 | \$20.00 |
| Non-Residents | \$20.00 | \$20.00 |
| Commercial | \$20.00 | \$20.00 |
| Non-Profit | \$20.00 | \$20.00 |
| Charge per 100-lbs | | |
| Tacoma Residents | \$7.25 | \$7.25 |
| Non-Residents | \$7.25 | \$7.25 |
| Commercial | \$7.25 | \$7.25 |
| Non-Profit | \$3.63 | \$3.63 |

**Table 3-11
Proposed Solid Waste Rates (continued)**

| Service Category | 2017 | 2018 |
|-----------------------------|-------------|-------------|
| Commercial Recycling | | |
| Mixed - up to 90gal | | |
| Bi-weekly | \$6.25 | \$6.50 |
| Weekly | \$12.50 | \$13.00 |
| 2 hauls/week | \$25.00 | \$26.00 |
| 3 hauls/week | \$37.50 | \$39.00 |
| 4 hauls/week | \$50.00 | \$52.00 |
| Daily | \$62.50 | \$65.00 |
| Mixed - 2 YD | | |
| Bi-weekly | \$37.50 | \$39.00 |
| Weekly | \$62.50 | \$65.00 |
| 2 hauls/week | \$125.00 | \$130.00 |
| Glass | | |
| Bi-weekly | \$25.00 | \$25.00 |
| Weekly | \$45.00 | \$45.00 |
| 2 hauls/week | \$90.00 | \$90.00 |
| 3 hauls/week | \$135.00 | \$135.00 |
| Cardboard | | |
| Bi-weekly | \$20.00 | \$20.00 |
| Weekly | \$40.00 | \$40.00 |
| 2 hauls/week | \$80.00 | \$80.00 |
| 3 hauls/week | \$120.00 | \$120.00 |
| 4 hauls/week | \$160.00 | \$160.00 |
| Yard Waste - 90 gal | | |
| Bi-weekly | \$8.00 | \$8.00 |
| Weekly | \$16.00 | \$16.00 |
| Food Waste - 90 gal | | |
| Weekly | \$16.00 | \$16.00 |
| 2 hauls/week | \$32.00 | \$32.00 |
| Food Waste - 2 YD | | |
| Weekly | \$71.82 | \$71.82 |
| 2 hauls/week | \$143.64 | \$143.64 |
| Yard Waste | | |
| Hauls/Pick ups | \$50.00 | \$50.00 |

Customer Impacts

Table 3-12 shows the impacts of the 3.7 percent annual increase on residential customers with different bin sizes within the Department's service area.

**Table 3-12
Residential Customer Impacts**

| Container Size | Current Bill | 2017 Bill | 2018 Bill | Δ from Prior Year | Δ from Prior Year |
|----------------|--------------|-----------|-----------|--------------------------|--------------------------|
| 30 gal | \$20.38 | \$21.14 | \$21.93 | 3.7% | 3.7% |
| 45 gal | \$30.57 | \$31.71 | \$32.89 | 3.7% | 3.7% |
| 60 gal | \$40.75 | \$42.27 | \$43.85 | 3.7% | 3.7% |
| 90 gal | \$61.14 | \$63.42 | \$65.78 | 3.7% | 3.7% |
| 2X60 gal | \$81.50 | \$84.54 | \$87.69 | 3.7% | 3.7% |
| 60+90 gal | \$101.89 | \$105.69 | \$109.63 | 3.7% | 3.7% |
| 2X90 gal | \$122.28 | \$126.84 | \$131.57 | 3.7% | 3.7% |