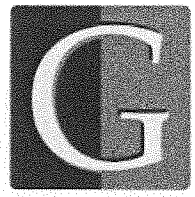

Aronow Consulting
ECONOMICS & PUBLIC FINANCE

# DRAFT WASTEWATER RATE STUDY

*Prepared for*
**City of Jackson**

*In Conjunction with*
**Stantec**

**August 2014**

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# City of Jackson Wastewater Rate Study



## Tables

Section 1

# Introduction and Summary of Findings

## 1.1 BACKGROUND

The City of Jackson (the City) is a full service City that provides sewer service to approximately 1,724 accounts, of which, approximately 85 percent are residential and 15 percent are non-residential customers.

The City is currently in the planning and design phase of improvements to the Wastewater Treatment Facility (WWTF) as required by the current wastewater discharge permit. This rate analysis evaluates the revenue capacity of the wastewater fund to fund the Project as well as projected operating and maintenance costs going forward. Sewer rates have been calculated for a five year period.

## 1.2 PURPOSE OF THE REPORT

The purpose of the report is to provide an explanation and justification of the calculated sewer rates for the City. Rates have been calculated for the fiscal years 2014-15 through 2018-19. The rates have been calculated in accordance with the requirements of XIIID et. seq. of the California Constitution, commonly known as Proposition 218, which mandates that the fee or charge imposed is commensurate with the benefit received by those paying the fee.

## 1.3 SUMMARY OF FINDINGS

It is recommended that the City consider revising the monthly sewer user rates based on the analysis provided in this report. Revised user rates are summarized in Table 1. Some of the major assumptions of the analysis are highlighted below:

- ***Full Funding of Operation and Maintenance Cost Projections*** – This rates analysis assumes full funding of the projected operation and maintenance expenses including existing debt service. No funding offsets are assumed, such as the $80,000 in mitigation funding that the City has used towards the sewer fund over the past three years, as this funding is not projected to be available in future years.
- ***CIP and Capital Set-Asides (Depreciation)*** – The City has had significant capital expenses over the past several years given the required improvements to the Wastewater Treatment Facility. The analysis assumes a baseline funding for CIP and Capital Set-Asides of $200,000. These revenues would be targeted towards capital improvement projects as needed and/or depreciation.

- ***Funding for the Wastewater Treatment Facility (WWTF) Capital Improvement Project*** – The WWTF Improvement project will provide necessary upgrades to improve wastewater discharge quality to Jackson Creek and Lake Amador. These requirements are driven by the Waste Discharge Requirements adopted by the Regional Water Board in 2013 in Order No. R5-2013-0146 (hereinafter, Order) that the City must comply with or risk incurring fines. The project cost is currently estimated at $12 million and is anticipated to be completed in FY 2016-17. The City plans to borrow monies from State and Federal lenders that offer low interest loans for wastewater capital improvement projects. The rates calculated in this analysis assume full funding of the debt service related to the project.

- ***Proposed Changes to Rate Structure to allow for both Wastewater Flow and Strength*** – Currently the rate structure employed by the City focuses only on wastewater flow and does not take into consideration strength (as measured by biochemical oxygen demand (BOD) and suspended solids (SS)). While this is not uncommon for small cities, rates are generally more equitable when both flow and influent strength are considered. In addition, over 50% of the WWTF Improvement project focuses on elements that enhance the treatment of solids (influent strength). Therefore it is recommended that the City account for both flow and strength in allocating costs via rates. To simplify the methodology but still allow for both flow and strength, it is proposed that the City consolidate commercial categories into 7 groups (residential categories remain unchanged) as follows:

  Group 1: Low Strength/Low Flow
  Group 2: Medium Strength/Low Flow
  Group 3: Medium Strength/High Flow
  Group 4: High Strength/Low Flow
  Group 5: High Strength/Medium Flow
  Group 6: High Strength/High Flow
  Group 7: Schools

  Commercial accounts have been aggregated into groups based on similarity of wastewater characteristics. For example, Group 1 which is low strength and flow, is generally the type of business with no food, perhaps just a toilet or washing facility, such as stores and offices.

## 1.4 ORGANIZATION OF THE REPORT

This report is divided into five sections. Following this introduction, Section 2 provides an overview of the City's sewer system and the current customer base. Section 3 details the projected annual revenue requirements in a five-year financial plan, which serves as the basis for the rate calculations. Section 4 provides the rate analysis and rate calculations for the City. Section 5 includes the findings and recommendations of the analysis.

# Table 1
## Summary of Current and Calculated Residential and Commercial Sewer Rates

| | Existing | Calculated | | | | | |
|---|---|---|---|---|---|---|---|
| | Rate Charge [1] | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 | |
| **Residential** | | | | | | | |
| Step 1: Baseline O&M | | $31.07 | $31.92 | $32.79 | $33.69 | $34.61 | per unit |
| Step 2: Capital & Reserves | | $5.54 | $5.69 | $5.84 | $5.99 | $6.15 | per unit |
| Step 3: WTF Construction Project | | $0.00 | $4.56 | $9.65 | $16.26 | $16.28 | per unit |
| **Subtotal** | **$29.35** | **$36.61** | **$42.17** | **$48.28** | **$55.94** | **$57.05** | |
| **Commercial [2]** | | | | | | | |
| **Group 1 - Fixed, Monthly Charge** | | | | | | | |
| Step 1: Baseline O&M | | $21.68 | $22.27 | $22.88 | $23.50 | $24.15 | per Account |
| Step 2: Capital & Reserves | | $3.90 | $4.01 | $4.11 | $4.22 | $4.33 | per Account |
| Step 3: WTF Construction Project | | $0.00 | $3.22 | $6.80 | $11.45 | $11.47 | per Account |
| **Subtotal** | | **$25.58** | **$29.49** | **$33.79** | **$39.18** | **$39.96** | |
| Variable Charge per HCF | | $2.93 | $3.37 | $3.87 | $4.48 | $4.57 | per HCF |
| **Group 2 - Fixed, Monthly Charge** | | | | | | | |
| Step 1: Baseline O&M | | $39.84 | $40.93 | $42.05 | $43.20 | $44.39 | per Account |
| Step 2: Capital & Reserves | | $7.40 | $7.59 | $7.79 | $8.00 | $8.21 | per Account |
| Step 3: WTF Construction Project | | $0.00 | $6.09 | $12.88 | $21.70 | $21.74 | per Account |
| **Subtotal** | | **$47.24** | **$54.62** | **$62.73** | **$72.90** | **$74.34** | |
| Variable Charge per HCF | | $2.57 | $2.97 | $3.41 | $3.96 | $4.04 | per HCF |
| **Group 3 - Fixed, Monthly Charge** | | | | | | | |
| Step 1: Baseline O&M | | $130.81 | $134.39 | $138.07 | $141.85 | $145.74 | per Account |
| Step 2: Capital & Reserves | | $24.58 | $25.23 | $25.89 | $26.58 | $27.29 | per Account |
| Step 3: WTF Construction Project | | $0.00 | $20.24 | $42.80 | $72.10 | $72.22 | per Account |
| **Subtotal** | | **$155.39** | **$179.85** | **$206.76** | **$240.53** | **$245.24** | |
| Variable Charge per HCF | | $2.72 | $3.15 | $3.62 | $4.21 | $4.29 | per HCF |
| **Group 4 - Fixed, Monthly Charge** | | | | | | | |
| Step 1: Baseline O&M | | $38.22 | $39.27 | $40.34 | $41.45 | $42.58 | per Account |
| Step 2: Capital & Reserves | | $7.72 | $7.92 | $8.13 | $8.35 | $8.57 | per Account |
| Step 3: WTF Construction Project | | $0.00 | $6.36 | $13.44 | $22.64 | $22.68 | per Account |
| **Subtotal** | | **$45.94** | **$53.55** | **$61.92** | **$72.44** | **$73.83** | |
| Variable Charge per HCF | | $5.62 | $6.55 | $7.58 | $8.86 | $9.03 | per HCF |
| **Group 5 - Fixed, Monthly Charge** | | | | | | | |
| Step 1: Baseline O&M | | $404.16 | $415.21 | $426.56 | $438.25 | $450.26 | per Account |
| Step 2: Capital & Reserves | | $82.18 | $84.35 | $86.58 | $88.87 | $91.23 | per Account |
| Step 3: WTF Construction Project | | $0.00 | $67.67 | $143.09 | $241.07 | $241.46 | per Account |
| **Subtotal** | | **$486.34** | **$567.23** | **$656.24** | **$768.19** | **$782.95** | |
| Variable Charge per HCF | | $6.88 | $8.02 | $9.28 | $10.87 | $11.08 | per HCF |
| **Group 6 - Fixed, Monthly Charge** | | | | | | | |
| Step 1: Baseline O&M | | $755.39 | $776.04 | $797.27 | $819.11 | $841.57 | per Account |
| Step 2: Capital & Reserves | | $149.93 | $153.89 | $157.96 | $162.15 | $166.45 | per Account |
| Step 3: WTF Construction Project | | $0.00 | $123.46 | $261.07 | $439.83 | $440.54 | per Account |
| **Subtotal** | | **$905.33** | **$1,053.39** | **$1,216.30** | **$1,421.08** | **$1,448.55** | |
| Variable Charge per HCF | | $3.78 | $4.40 | $5.08 | $5.93 | $6.05 | per HCF |
| **Group 7 - Fixed, Monthly Charge** | | | | | | | |
| Step 1: Baseline O&M | | $39.51 | $40.59 | $41.71 | $42.85 | $44.02 | per Account |
| Step 2: Capital & Reserves | | $7.05 | $7.23 | $7.43 | $7.62 | $7.82 | per Account |
| Step 3: WTF Construction Project | | $0.00 | $5.80 | $12.27 | $20.68 | $20.71 | per Account |
| **Subtotal** | | **$46.56** | **$53.63** | **$61.40** | **$71.15** | **$72.56** | |
| Variable Charge per HCF | | $2.16 | $2.49 | $2.85 | $3.30 | $3.37 | per HCF |

[1] Commercial charge reflects rate per hcf per month. The charge based on bi-monthly water use is $2.94/hcf. At minimum an account pays $29.35. If the average bi-monthly water use exceeds 10 hcf. The charge would be calculated at $2.94 times the bi-monthly winter use hcf.

[2] Groups are defined as follows:

Group 1: Low Strength/Low Flow
Group 2: Medium Strength/Low Flow
Group 3: Medium Strength/High Flow
Group 4: High Strength/Low Flow
Group 5: High Strength/Medium Flow
Group 6: High Strength/High Flow
Group 7: Schools

Section 2

# The City and the Sewer Enterprise Fund

This section provides a brief description of the City's sewer system and an overview of the City's customer base and current billing structure.

## 2.1 THE CITY DEMOGRAPHIC TRENDS

Incorporated as a City in 1905, the City of Jackson is a full service City with a residential population of approximately 4,545 and weekend populations of approximately 12-15,000. Jackson is located in the heart of California's historic Mother Lode, approximately 45 miles east of Sacramento. Based on California Department of Finance data, residential population has been decreasing over the last 5 years by approximately 0.6 percent annually as shown in **Table 2**. Housing units have increased by approximately 0.1 percent annually since 2010.

Table 2
**Summary of Historical Population Growth**

| Year (as of Jan. 1) | | Population | Annual Change | Percent Increase | Housing Units | Annual Change | Percent Increase |
|---|---|---|---|---|---|---|---|
| 2010 | | 4,651 | | | 2,309 | | |
| 2011 | | 4,618 | (33) | -0.7% | 2,310 | 1 | 0.0% |
| 2012 | [1] | 4,600 | (18) | -0.4% | 2,312 | 2 | 0.1% |
| 2013 | | 4,592 | (8) | -0.2% | 2,312 | - | 0.0% |
| 2014 | | 4,545 | (47) | -1.0% | 2,317 | 5 | 0.2% |
| **Average Annual** | | | **(27)** | **-0.6%** | | **2** | **0.1%** |

Source: State Department of Finance
[1] Reflects 2010 Census data

## 2.2 SEWER SYSTEM INFRASTRUCTURE

The City of Jackson owns and operates its own sewer collection system and wastewater treatment plant. The collection system consists of three primary sewer branches known as Branch 1 and Branches 2A and 2B, covering the City from west to east, respectively. Branch 1 serves the Martell area and includes three pump stations that discharge to 6-inch and 8-inch trunks. The 8-inch sewer connects to the City wastewater treatment plant, south of the basin. Branch 2A serves the North Main Street part of the City and does not have any pump stations. It includes 8-inch to 16-inch sewers with the 16-inch sewer connecting to the City's wastewater treatment plant to the southwest of the basin. Basin 2B serves the City area along New York Ranch Road, Highway 49

and Highway 88 to the east and includes 6-inch and 8-inch sewers that connect to the Basin 2A 16-inch trunk sewer to the plant. Basin 2A does not include any pump stations.

The overall collection system consists of approximately 12 miles of primary trunk sewers and almost 20 miles of sewer, including the smaller collector segments. Many of these sewer date back to the City's mining heritage of the 1900s and as a result are a source of inflow and infiltration to the City's wastewater facilities, requiring on-going monitoring and maintenance.

The City's existing wastewater treatment plant was built in 1985 and includes a headworks, two oxidation ditches, two secondary clarifiers, and a return activated sludge (RAS) pump station, followed by four sand filters and chlorine disinfection. Treated effluent is dechlorinated and discharged to Jackson Creek. Solids are stored, dewatered and disposed of at a local landfill. The treatment plant can accommodate approximately 3.5 Mgal/d (million gallons per day) of flow and treat approximately 1400 lbs/d of BOD (pounds per day of organic waste). The proposed project for which costs are included in this rate study will allow the treatment plant to achieve a higher level of wastewater treatment, as required to meet its new Waste Discharge Requirements, but not increase its hydraulic or treatment capacity.

## 2.3 CUSTOMER SUMMARY AND RATE STRUCTURE

The City currently charges residential customers $29.35 per unit per month. There are approximately 1,460 residential accounts and 2,195 residential units including single family multi-family units.

There are currently approximately 264 commercial accounts in the City. They pay a minimum of $29.35 per month and $2.94 for every hundred cubic feet (hcf) of water over 10 hcf. Water use is determined based on winter water use for the months of November, December, January, February, March, and April for the prior year. The City calculates a bi-monthly average for the six month period and then uses that to determine the fixed rate for each month (12 month period).

## 2.4 WASTEWATER CUSTOMER CHARACTERISTICS

Historically, the rate structure has not accounted for strength as it was focused primarily on flow, which is not uncommon in small cities. However, strength is a significant component of the treatment of wastewater and is a major factor of the proposed wastewater treatment improvement project, accounting for approximately 40% to 50% of the project cost. Therefore, it is recommended that the City include both flow and strength in the rate structure.

Table 3 summarizes the wastewater customers, the number of units or accounts in each category, and their respective assumed wastewater characteristics in terms of flow and strength (BOD and SS). These characteristics are translated into estimated daily wastewater flow and strength contributions and then annual wastewater flow and strength contributions. This capacity is

reflective of existing average flows and loadings. Total annual flow is estimated at approximately 170.9 million gallons.

Residential customers are all assumed to have the same wastewater flow and strength characteristics. Commercial customers have been separated into seven groups as defined, in general, below and are shown on Table 4:

Group 1: Low Strength/Low Flow

Group 2: Medium Strength/Low Flow

Group 3: Medium Strength/High Flow

Group 4: Low Flow/High Strength/ Low Flow

Group 5: High Strength/ Medium Flow

Group 6: High Strength/High Flow

Group 7: Schools

These groups reflect groups of customers with similar sewer flows and loads (based on City water data and industry averages for influent strength). Commercial users will continue to be charged a fixed rate plus a variable rate as is currently the practice; however, the rates vary by group. It is assumed that the variable rate will be charged based on winter water use by each account for the previous year. Ultimately, this should provide greater rate equity. For example, restaurants, with their heavy influent concentrations, are more costly to treat than business/retail, which typically have wastewater characteristics similar to single-family units.

For purposes of the rate model and calculating rates, some adjustments were assumed for commercial water flow that should be noted and which are detailed in Table 5. Fiscal Year 2013-14 winter water use (November through April) was used as the basis for the wastewater use assumptions. However, the amount of wastewater flow assumed varies for each group. In the case of groups where there is very low flow (Groups 1 and 4), all of it was generally assumed as wastewater flow. In the case of high water volume users, 50 percent of the water use was assumed as wastewater flow, shown in Table 5.

However, since commercial customers will actually be paying charges based on actual water use, the rate calculations in Table 15 reflect higher flow numbers. They reflect the average winter water use reduced by 35 percent per group. The 35 percent reduction allows for the fact that averages were used in the calculations as well as the potential for customers to reduce their water consumption given higher charges in future years.

# Table 3
## Wastewater Customer Characteristics

| Customer Category | Basis of Charge | Accounts | Units/ EDUs | Wastewater Characteristics [1] ADWF/EDU GPD | BOD MG/L | SS MG/L | Existing Treatment Capacity Flow MGD | BOD Lbs/Day | SS Lbs/Day | Total Annual Capacity Flow MG | BOD Lbs/Year | SS Lbs/Year |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (A) | (B) | (C) | (D) | (E)=(A)x(B) | (F)= (C)x(E)x8.34 | (G)= (D)x(E)x8.34 | (K)=(E)x365 | (L)=(F)x(K)x8.34 | (M)=(G)x(K)x8.34 |
| Residential | | | | | | | | | | | | |
| SFD | per Unit | 1375 | 1,375 | 160 | 200 | 200 | 0.2200 | 367 | 367 | 80.30 | 133,940 | 133,940 |
| Duplex | per Unit | 46 | 92 | 160 | 200 | 200 | 0.0147 | 25 | 25 | 5.37 | 8,962 | 8,962 |
| MFD | per Unit | 20 | 65 | 160 | 200 | 200 | 0.0104 | 17 | 17 | 3.80 | 6,332 | 6,332 |
| Apartments/Mobile Homes | per Unit | 19 | 663 | 160 | 200 | 200 | 0.1061 | 177 | 177 | 38.72 | 64,584 | 64,584 |
| **Subtotal** | | **1,460** | **2,195** | | | | **0.1312** | **586** | **586** | **128.19** | **213,818** | **213,818** |
| Commercial [1] | | | | | | | | | | | | |
| Group 1 | per Account | 190 | | 215 | 221 | 221 | 0.0409 | 75 | 75 | 14.91 | 27,535 | 27,535 |
| Group 2 | per Account | 16 | | 348 | 300 | 300 | 0.0056 | 14 | 14 | 2.03 | 5,085 | 5,085 |
| Group 3 | per Account | 39 | | 1,081 | 338 | 338 | 0.0422 | 119 | 119 | 15.39 | 43,313 | 43,313 |
| Group 4 | per Account | 3 | | 201 | 735 | 735 | 0.0006 | 4 | 4 | 0.22 | 1,349 | 1,349 |
| Group 5 | per Account | 3 | | 2,006 | 800 | 800 | 0.0060 | 40 | 40 | 2.20 | 14,656 | 14,656 |
| Group 6 | per Account | 4 | | 4,532 | 600 | 600 | 0.0181 | 91 | 91 | 6.62 | 33,110 | 33,110 |
| Group 7 | per Account | 9 | | 407 | 200 | 200 | 0.0037 | 6 | 6 | 1.34 | 2,230 | 2,230 |
| **Subtotal** | | **264** | | | | | **0.1170** | **349** | **349** | **42.70** | **127,278** | **127,278** |
| Infiltration/Inflow | | | | | | | | | | | | |
| TOTAL | | **1,724** | **2,195** | | | | **0.4682** | **935** | **935** | **170.89** | **341,096** | **341,096** |

*"user_characteristics"*

[1] Groups are defined as follows:

Group 1: Low Strength/Low Flow
Group 2: Medium Strength/Low Flow
Group 3: Medium Strength/High Flow
Group 4: High Strength/Low Flow
Group 5: High Strength/Medium Flow
Group 6: High Strength/High Flow
Group 7: Schools

# Table 4
## Commercial Customer Wastewater Characteristic Assumptions & Summary

| | Sewer Code | Accounts | Average Winter Water Flow [1] HCF/Mo | Average Winter Water Flow [1] GPD [2] | Strength [3] BOD - MG/L | Strength [3] SS - MG/L |
|---|---|---|---|---|---|---|
| Group 1 - Low Strength/Low Flow | | | | | | |
| Stores | 26 | 65 | 6 | 150 | 200 | 200 |
| Offices | 27 | 98 | 7 | 176 | 200 | 200 |
| Beauty/Barber Shop | 30 | 7 | 7 | 176 | 250 | 250 |
| Churches | 38 | 8 | 4 | 100 | 200 | 200 |
| Library/Museum | 42 | 1 | 28 | 702 | 200 | 200 |
| Lt. Industrial/Warehouse/Storage | 52 | 4 | 3 | 75 | 250 | 250 |
| Auto Repair | A | 7 | 5 | 125 | 250 | 250 |
| **Average** | | | **9** | **215** | **221** | **221** |
| **Total** | | **190** | | | | |
| Group 2 - Medium Strength/Low Flow | | | | | | |
| Senior Citizen Center | 43 | 1 | 36 | 903 | 300 | 300 |
| Gas Stations/Mini-Mart | 28 | 8 | 6 | 150 | 300 | 300 |
| Medical Offices/Surgery Center/Lab | B | 3 | 29 | 727 | 300 | 300 |
| Community Center/Lodges | C | 4 | 40 | 1003 | 300 | 300 |
| **Average** | | | **28** | **696** | **300** | **300** |
| **Total** | | **16** | | | | |
| Group 3 - Medium Strength/Medium Flow | | | | | | |
| Hotel - Motel | 25 | 7 | 80 | 2006 | 300 | 300 |
| Restaurants & Bars | 29 | 21 | 46 | 1153 | 500 | 500 |
| Car Wash | 32 | 2 | 66 | 1655 | 300 | 300 |
| Laundromat | 33 | 2 | 194 | 4864 | 450 | 450 |
| Health Club | 36 | 2 | 104 | 2608 | 300 | 300 |
| Bed & Breakfast | 40 | 1 | 32 | 802 | 300 | 300 |
| Theatre | 48 | 1 | 65 | 1630 | 250 | 250 |
| Retirement Home | 50 | 3 | 103 | 2583 | 300 | 300 |
| **Average** | | | **86** | **2163** | **338** | **338** |
| **Total** | | **39** | | | | |
| Group 4 - High Strength/Low Flow | | | | | | |
| Commercial Cleaners/Dry Cleaners | D | 2 | 10 | 251 | 670 | 670 |
| Mortuary | 37 | 1 | 6 | 150 | 800 | 800 |
| **Average** | | | **8** | **201** | **735** | **735** |
| **Total** | | **3** | | | | |
| Group 5 -High Strength/Medium Flow | | | | | | |
| Full Service Grocery/Supermarkets | 46 | 3 | 160 | 4012 | 800 | 800 |
| **Average** | | | **160** | **4012** | **800** | **800** |
| **Total** | | **3** | | | | |
| Group 6 - High Strength/High Flow | | | | | | |
| Hospitals | 34 | 3 | 344 | 8626 | 600 | 600 |
| Detention Center | 41 | 1 | 379 | 9503 | 600 | 600 |
| **Average** | | | **362** | **9064** | **600** | **600** |
| **Total** | | **4** | | | | |
| Group 7 - Schools [4] | 35 | 9 | 33 | 815 | 200 | 200 |
| **Total** | | **264** | | | | |

[1] Based on water use during months of November through April 2013.

[2] Conversion from hundred cubic feet per month to Gallons Per Day Assumptions:

| | |
|---|---|
| Cubic Feet | 100 |
| Gallons | 748.052 |
| Total Months | 6 |
| Total Days | 179 |

[3] Based on industry standards where available and past rate study experience of Stantec/G Aronow Consulting.

[4] School water use was reduced by 50% to account for the installation of irrigation meters.

## Table 5
## Commercial Water Use Assumed in Rate Calculations

| | Accounts | Average Winter Water Use | | Water Use Assumed in Model | | % Assumed | Assumed for Rate |
|---|---|---|---|---|---|---|---|
| | | GPD per Account | Total - MG/Y | GPD per Account | Total - MG/Y | in Model | Calculation - MG/Y |
| Commercial | | | | | | | |
| Group 1 | 190 | 214.9 | 14.90 | 215.00 | 14.91 | 100% | 14.91 |
| Group 2 | 16 | 695.8 | 4.06 | 348.00 | 2.03 | 50% | 2.64 |
| Group 3 | 39 | 2162.7 | 30.79 | 1,081.00 | 15.39 | 50% | 20.01 |
| Group 4 | 3 | 200.6 | 0.22 | 201.00 | 0.22 | 100% | 0.22 |
| Group 5 | 2 | 4011.9 | 2.93 | 2,006.00 | 1.46 | 50% | 1.90 |
| Group 6 | 4 | 9064.4 | 13.23 | 4,532.00 | 6.62 | 50% | 8.60 |
| Group 7 | 9 | 814.9 | 2.68 | 407.00 | 1.34 | 50% | 1.74 |
| **Subtotal** | **263.0** | | **68.81** | | **41.97** | | **50.03** |
| Adjustment Factor for Calculating Rates - Reduction to Avg Winter Water Use - MG | | | | | | | -35% |
| *Excluding Group 1 and Group 4 | | | | | | | |

Section 3

# Revenue Requirements and Financial Plan

A review of the City's revenue requirements is a key first step in the rate analysis process. The review involves an analysis of current and historical operating revenues and expenses. This section of the report also provides a discussion of projected revenues and expenses.

## 3.1 HISTORICAL REVENUE AND EXPENSES

Table 6 provides a summary of the City's historical and budgeted revenues and expenses. Revenues include sewer sales, property tax, interest income and miscellaneous revenues. On average, the City's revenues have increased by approximately 1.5 percent over the past seven years.

Operating expenses include operation and maintenance (O&M) costs, capital costs including debt service, depreciation and transfers. Total expenses have increased by approximately 1.7 percent over the same period.

## 3.2 PROJECTED EXPENSES

The projected annual revenue requirements and corresponding rate calculations are directly related to the projected expenses of the City. Table 7 shows the projected expenses for fiscal years 2014-15 through 2018-19. The annual cost adjustment factors are also shown and vary from 2.5% to 5% by cost category. The cost factors were determined in part based on historical increases in costs over time as well as the expected increases in costs based on discussions with City of Jackson staff. In general, cost adjustment factors vary by public agency, but do tend to fall in the range of 2.5 to 7.0 percent based on G Aronow Consulting's experience with other utility rate studies.

The projected expenses are broken out into the following categories:

- ***Step 1- Baseline O&M***: Step 1 is intended to reflect the existing operations and maintenance expenses and debt service obligations of the sewer fund. The fiscal year 2013-14 budget serves as the basis for the expense projections for FY 14-15 through FY 18-19. For FY 14-15, these costs total approximately $1.2 million.

  The 2013-14 budget includes an $80,000 expense offset from mitigation fees. This offset is not expected to continue in future years and so is not included in the expense projections.

## Table 6
## Comparison of Historical and Budgeted Revenues and Expenses

| | Actual 2007/08 | Actual 2008/09 | Actual 2009/10 | Actual 2010/11 | Actual 2011/12 | Estimated 2012/13 | Budget 2013/14 | Avg Annual % Change 07/08 to 13/14 |
|---|---|---|---|---|---|---|---|---|
| **Revenues** | | | | | | | | |
| Sewer Sales | $1,136,622 | $1,207,061 | $1,296,453 | $1,250,335 | $1,212,059 | $1,251,826 | $1,260,000 | 1.73% |
| Property Tax | $591 | $573 | $590 | $590 | $590 | $590 | $590 | -0.03% |
| Interest Earned | $14,213 | $5,256 | $1,600 | $1,500 | $1,500 | $1,500 | $1,500 | -31.26% |
| Misc. Revenue | $0 | $0 | $327 | $0 | $0 | $0 | $0 | |
| **Total Revenues** | **$1,151,426** | **$1,212,890** | **$1,298,970** | **$1,252,425** | **$1,214,149** | **$1,253,916** | **$1,262,090** | **1.54%** |
| **Expenditures** | | | | | | | | |
| Personnel Services & Benefit | $396,149 | $397,731 | $317,487 | $367,403 | $378,484 | $368,918 | $392,447 | -0.16% |
| Contract & Professional Serv | $326,600 | $428,091 | $348,363 | $506,126 | $610,450 | $308,375 | $347,485 | 1.04% |
| Repairs & Maintenance | $29,814 | $39,901 | $50,050 | $65,280 | $51,445 | $44,740 | $43,500 | 6.50% |
| Materials & Supplies | $104,896 | $181,808 | $164,950 | $86,578 | $69,655 | $58,253 | $63,800 | -7.95% |
| Other Services & Charges | $245,534 | $244,000 | $250,332 | $270,338 | $269,290 | $241,515 | $263,680 | 1.20% |
| Capital Purchases | $0 | $0 | $2,000 | $14,758 | $5,196 | $1,291 | $18,150 | |
| CIP Projects | $32,608 | $0 | $0 | $770 | $244,631 | $16,205 | $194,200 | 34.63% |
| Debt Service | $101,584 | $101,234 | $11,000 | $10,549 | $10,125 | $9,775 | $9,775 | -32.31% |
| Depreciation [1] | $168,991 | $170,499 | $160,000 | $162,187 | $154,033 | $116,838 | $116,838 | -5.97% |
| Transfers In/Out (Gen. Fund) | $0 | ($401,119) | $0 | $0 | ($80,000) | ($80,000) | ($80,000) | |
| **Total Expenditures** | **$1,406,176** | **$1,162,145** | **$1,304,182** | **$1,483,989** | **$1,713,309** | **$1,085,910** | **$1,369,875** | **-0.43%** |
| **Net Revenue** | ($254,750) | $50,745 | ($5,212) | ($231,564) | ($499,160) | $168,006 | ($107,785) | |

[1] Depreciation for 13/14 assumed based on 2012/13

## Table 7
## Projected Expenses

| | Budget 2013-14 | *Cost Adj. Factors* | Projected 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 |
|---|---|---|---|---|---|---|---|
| **Step 1: Baseline O&M** | | | | | | | |
| Personnel Services & Benefits | $392,447 | *2.5%* | $402,258 | $412,315 | $422,622 | $433,188 | $444,018 |
| Contract & Professional Services | $347,485 | *3.0%* | $357,910 | $368,647 | $379,706 | $391,097 | $402,830 |
| Repairs & Maintenance | $43,500 | *5.0%* | $45,675 | $47,959 | $50,357 | $52,875 | $55,518 |
| Materials & Supplies | $63,800 | *2.5%* | $65,395 | $67,030 | $68,706 | $70,423 | $72,184 |
| Other Services & Charges | $263,680 | *2.5%* | $270,272 | $277,029 | $283,955 | $291,053 | $298,330 |
| Capital Purchases | $18,150 | *2.5%* | $18,604 | $19,069 | $19,546 | $20,034 | $20,535 |
| **Subtotal** | **$1,129,062** | | **$1,160,113** | **$1,192,048** | **$1,224,891** | **$1,258,671** | **$1,293,415** |
| Existing Debt Service | $9,775 | *0.0%* | $9,775 | $9,775 | $9,775 | $9,775 | $9,775 |
| Transfers In/Out (Gen. Fund) | ($80,000) | | $0 | $0 | $0 | $0 | $0 |
| **Subtotal** | ($70,225) | | **$9,775** | **$9,775** | **$9,775** | **$9,775** | **$9,775** |
| **Subtotal** | **$1,058,837** | | **$1,169,888** | **$1,201,823** | **$1,234,666** | **$1,268,446** | **$1,303,190** |
| **Step 2: Capital & Reserves** | | | | | | | |
| Capital Set-Aside/CIP Projects | $194,200 | *2.5%* | $200,000 | $205,000 | $210,125 | $215,378 | $220,763 |
| General Operating Reserve | $0 | *5.0%* | $12,000 | $12,600 | $13,230 | $13,892 | $14,586 |
| **Subtotal** | **$194,200** | | **$212,000** | **$217,600** | **$223,355** | **$229,270** | **$235,349** |
| **Step 3: WTF Construction Project** | | | | | | | |
| Additional O&M due to Project | $0 | *2.5%* | $0 | $0 | $20,000 | $40,000 | $41,000 |
| Construction Loan - Debt Service | $0 | *n/a* | $0 | $158,700 | $317,400 | $529,000 | $529,000 |
| Debt Service Coverage | $0 | *n/a* | $0 | $15,870 | $31,740 | $52,900 | $52,900 |
| **Subtotal** | **$0** | | **$0** | **$174,570** | **$369,140** | **$621,900** | **$622,900** |
| **Total** | **$1,253,037** | | **$1,381,888** | **$1,593,993** | **$1,827,161** | **$2,119,615** | **$2,161,439** |
| Percent Increase | | | 10.3% | 15.3% | 14.6% | 16.0% | 2.0% |

- ***Step 2 –Capital & Reserves***: Step 2 capital improvement costs are also shown in Table 7. These costs are intended to reflect annual CIP expenditures and in years where projects are minimal, would be applied toward depreciation. It also includes approximately $12,000 to $14,500 in an allowance for general operating reserve. This would be the net revenue expected to be earned each year.

- ***Step 3- Construction Project:*** Step 3 costs are those costs associated with the WWTF Improvement Project. Table 8 shows the engineer's preliminary project cost estimate ($12 million). It is anticipated that the City will finance the project through either the State Clean Water Revolving Loan Fund (SRF) or a combination of SRF and USDA financing. Table 9 shows the estimated debt service for the project, which ranges from approximately $513,000 to $529,000 per year. The rate analysis phases in the debt service over three years and assumes the higher debt service allocation ($529,000). Step 3 costs also include additional operation and maintenance costs due to the project, which are estimated at approximately $40,000 in FY 2017-18. A ten percent debt service reserve is also included in Step 3.

Table 8
**Preliminary Project Cost Estimate**

| Item | Amount, 2014$ [1] |
|---|---|
| Denitrification Facility | $1,117,000 |
| Existing Aeration System Improvements | $305,000 |
| RAS Pump Improvements | $102,000 |
| Floculation/Coagulation Improvements (1) | $482,000 |
| Filtration Improvements | $883,000 |
| Solids Handling Improvements (2) | $386,000 |
| UV Disinfection | $1,685,000 |
| **Subtotal 1** | **$4,960,000** |
| Electrical & Instrumentation @ 25% of Subtotal 1 | $1,240,000 |
| Sitework @ 5% of Subtotal 1 | $248,000 |
| Site Piping @ 10% of Subtotal 1 | $496,000 |
| **Subtotal 2** | **$6,944,000** |
| General Conditions, Overhead & Profit @ 20% of Subtotal 2 | $1,389,000 |
| **Construction Cost** | **$8,333,000** |
| Construction Contingency @ 20% of Construction Costs | $1,666,600 |
| Total Construction Costs | $9,999,600 |
| Engineering, Administration @ 20% | $2,000,000 |
| **Total Project Cost (rounded)** | **$12,000,000** |

Source: Stantec

(1) Improvement costs assume ACL/TSO improvements are built separately. The ACL/TSO improvements referenced include a rapid mixer and concrete basin where coagulant may be added to enhance flocculation ahead of the tertiary filters. These improvements are currently under construction. The remainder of the costs here reflect a flocculation basin, paddle mixers and associated improvements (such electrical and controls), yet to be designed.

(2) Specific improvements TBD.

## Table 9
## Financing Assumptions & Debt Service Calculations

| | | Option A | | Option B | | |
|---|---|---|---|---|---|---|
| **Item** | **Assumption** | **CWSRF Loan** | **USDA Loan** | **CWSRF Loan** | **USDA Loan** | **Total** |
| **Bond/Loan Proceeds** | | **$12,000,000** | **$0** | **$7,000,000** | **$5,000,000** | **$12,000,000** |
| **Net Amount Financed** | | | | | | |
| Issuance Costs | 0.0% | $0 | $0 | $0 | $0 | |
| Capitalized Interest | 0 | $0 | $0 | $0 | $0 | |
| **Total Bond/Loan Amount** | | **$12,000,000** | **$0** | **$7,000,000** | **$5,000,000** | **$12,000,000** |
| ***Assumptions*** | | | | | | |
| Interest Rate | | 1.90% | 2.63% | 1.90% | 2.63% | |
| Term | | 30 years | 40 years | 30 years | 40 years | |
| Bond/Loan Factor | | 1.000 | 1.000 | 1.000 | 1.000 | |
| Calculated Debt Service | | $528,460 | $0 | $308,268 | $203,397 | |
| **Debt Service - Rounded** | | **$529,000** | **$0** | **$309,000** | **$204,000** | **$513,000** |
| Total Estimated EDUS* | | 3,566 | | 3,566 | 3,566 | |
| Annual Cost per EDU | | $148.35 | | $86.65 | $57.21 | $143.86 |
| Monthly Cost per EDU | | $12.36 | | $7.22 | $4.77 | $11.99 |

*Estimated based on the current rate structure. EDU estimates will likely change if the rate structure is updated.

## 3.3 PROJECTED REVENUE REQUIREMENT

Table 10 shows the projected revenue requirement from sewer sales for the same fiscal years as the projected expenses. The revenue requirement adjusts projected expenses for other non-sewer sales related revenues (other revenue sources), such as property tax income and interest. The annual revenue requirement for all Steps in FY 2014-15 is approximately $1.4 million and is projected to increase to $2.2 million by FY 2018-19.

Table 10
**Revenue Requirement Allocated to Sewer Sales**

| | Projected | | | | |
|---|---|---|---|---|---|
| | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 |
| | *1* | *2* | *3* | *4* | *5* |
| **Revenue Requirement** | | | | | |
| **Step 1: Baseline O&M** | | | | | |
| Personnel Services & Benefits | $402,258 | $412,315 | $422,622 | $433,188 | $444,018 |
| Contract & Professional Services | $357,910 | $368,647 | $379,706 | $391,097 | $402,830 |
| Repairs & Maintenance | $45,675 | $47,959 | $50,357 | $52,875 | $55,518 |
| Materials & Supplies | $65,395 | $67,030 | $68,706 | $70,423 | $72,184 |
| Other Services & Charges | $270,272 | $277,029 | $283,955 | $291,053 | $298,330 |
| Capital Purchases | $18,604 | $19,069 | $19,546 | $20,034 | $20,535 |
| **Subtotal** | **$1,160,113** | **$1,192,048** | **$1,224,891** | **$1,258,671** | **$1,293,415** |
| Existing Debt Service | $9,775 | $9,775 | $9,775 | $9,775 | $9,775 |
| Transfers In/Out (Gen. Fund) | $0 | $0 | $0 | $0 | $0 |
| **Subtotal** | **$9,775** | **$9,775** | **$9,775** | **$9,775** | **$9,775** |
| **Subtotal Step 1** | **$1,169,888** | **$1,201,823** | **$1,234,666** | **$1,268,446** | **$1,303,190** |
| **Step 2: Capital & Reserves** | | | | | |
| Capital Set-Aside/CIP Projects | $200,000 | $205,000 | $210,125 | $215,378 | $220,763 |
| General Operating Reserve | $12,000 | $12,600 | $13,230 | $13,892 | $14,586 |
| **Subtotal Step 2** | **$212,000** | **$217,600** | **$223,355** | **$229,270** | **$235,349** |
| **Step 3: CIP & Construction Project** | | | | | |
| Additional O&M due to Project | $0 | $0 | $20,000 | $40,000 | $41,000 |
| Construction Loan - Debt Service | $0 | $158,700 | $317,400 | $529,000 | $529,000 |
| Debt Service Coverage | $0 | $15,870 | $31,740 | $52,900 | $52,900 |
| **Subtotal Step 3** | **$0** | **$174,570** | **$369,140** | **$621,900** | **$622,900** |
| **Total** | **$1,381,888** | **$1,593,993** | **$1,827,161** | **$2,119,615** | **$2,161,439** |
| ***Less Other Revenue Sources*** | | | | | |
| Property Tax | ($590) | ($590) | ($590) | ($590) | ($590) |
| Interest Earned | ($1,500) | ($1,500) | ($1,500) | ($1,500) | ($1,500) |
| Misc. Revenue | $0 | $0 | $0 | $0 | $0 |
| **Subtotal** | **($2,090)** | **($2,090)** | **($2,090)** | **($2,090)** | **($2,090)** |
| **Net Revenue Requirement** | **$1,379,798** | **$1,591,903** | **$1,825,071** | **$2,117,525** | **$2,159,349** |

## 3.4 FIVE-YEAR FINANCIAL PLAN

Table 11 shows the five-year financial plan. The existing revenue from sewer sales (per the FY 2013-14 budget) is shown and then the additional revenue required (based on Table 10) that is needed for each subsequent fiscal year.

FY 2014-15 net revenues are projected to be negative, as it is anticipated that projected rates would be in effect for less than 12 months. However, annual net revenues after FY 2014-15 are projected to be $12,600 and increase by 5% annually. These funds will allow the City to maintain an operating fund balance over time. The operating fund balance projected in FY 2018-19 is $1.0 million, representing approximately 6 months of operating expenses.

# Table 11
## Operating Financial Plan

| | Inflation Assumption | Budget 2013-14 | Projected 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 |
|---|---|---|---|---|---|---|---|
| **Revenues** | | | | | | | |
| Current Budgeted Sewer Sales | | **$1,260,000** | $1,260,000 | $1,260,000 | $1,260,000 | $1,260,000 | $1,260,000 |
| Additional Revenue Required: | | | | | | | |
| Year | Effective Months | | | | | | |
| 2014-15 | 9 | | $89,849 | $119,798 | $119,798 | $119,798 | $119,798 |
| 2015-16 | 12 | | | $212,104 | $212,104 | $212,104 | $212,104 |
| 2016-17 | 12 | | | | $233,168 | $233,168 | $233,168 |
| 2017-18 | 12 | | | | | $292,454 | $292,454 |
| 2018-19 | 12 | | | | | | $41,823 |
| **Sutotal** | | | **$1,349,849** | **$1,591,903** | **$1,825,071** | **$2,117,525** | **$2,159,349** |
| Other Revenues | | | | | | | |
| Property Tax | | $590 | $590 | $590 | $590 | $590 | $590 |
| Interest Earned | | $1,500 | $1,500 | $1,500 | $1,500 | $1,500 | $1,500 |
| Misc. Revenue | | $0 | $0 | $0 | $0 | $0 | $0 |
| **Subtotal** | | **$2,090** | **$2,090** | **$2,090** | **$2,090** | **$2,090** | **$2,090** |
| **Subtotal Revenues** | | **$1,262,090** | **$1,351,939** | **$1,593,993** | **$1,827,161** | **$2,119,615** | **$2,161,439** |
| **Expenses** | | | | | | | |
| ***Step 1: Baseline O&M*** | | | | | | | |
| Personnel Services & Benefits | 2.5% | $392,447 | $402,258 | $412,315 | $422,622 | $433,188 | $444,018 |
| Contract & Professional Services | 3.0% | $347,485 | $357,910 | $368,647 | $379,706 | $391,097 | $402,830 |
| Repairs & Maintenance | 5.0% | $43,500 | $45,675 | $47,959 | $50,357 | $52,875 | $55,518 |
| Materials & Supplies | 2.5% | $63,800 | $65,395 | $67,030 | $68,706 | $70,423 | $72,184 |
| Other Services & Charges | 2.5% | $263,680 | $270,272 | $277,029 | $283,955 | $291,053 | $298,330 |
| Capital Purchases | 2.5% | $18,150 | $18,604 | $19,069 | $19,546 | $20,034 | $20,535 |
| Existing Debt Service | 0.0% | $9,775 | $9,775 | $9,775 | $9,775 | $9,775 | $9,775 |
| Transfers In/Out (Gen. Fund) | 0.0% | ($80,000) | $0 | $0 | $0 | $0 | $0 |
| **Subtotal Expenses** | | **$1,058,837** | **$1,169,888** | **$1,201,823** | **$1,234,666** | **$1,268,446** | **$1,303,190** |
| ***Step 2: Capital & Reserves [1]*** | | | | | | | |
| Capital Set-Aside/CIP Projects | | $194,200 | $200,000 | $205,000 | $210,125 | $215,378 | $220,763 |
| **Subtotal Step 2** | | **$194,200** | **$200,000** | **$205,000** | **$210,125** | **$215,378** | **$220,763** |
| ***Step 3: CIP & Construction Project*** | | | | | | | |
| Additional O&M due to Project | | $0 | $0 | $0 | $20,000 | $40,000 | $41,000 |
| Construction Loan - Debt Service [2] | | | $0 | $158,700 | $317,400 | $529,000 | $529,000 |
| Debt Service Coverage | | | $0 | $15,870 | $31,740 | $52,900 | $52,900 |
| **Subtotal Step 3** | | **$0** | **$0** | **$174,570** | **$369,140** | **$621,900** | **$622,900** |
| **Total Expenses** | | **$1,253,037** | **$1,369,888** | **$1,581,393** | **$1,813,931** | **$2,105,724** | **$2,146,853** |
| **Net Revenue After D/S** | | **$9,053** | **($17,950)** | **$12,600** | **$13,230** | **$13,892** | **$14,586** |
| *Net Revenue as % of Total Expenses* | | | | *0.8%* | *0.7%* | *0.7%* | *0.7%* |
| **Beginning Operating Balance [3]** | | **$1,017,685** | **$1,026,738** | **$1,008,788** | **$1,021,388** | **$1,034,618** | **$1,048,510** |
| Net Revenues | | $9,053 | ($17,950) | $12,600 | $13,230 | $13,892 | $14,586 |
| Transfers Out | | | | | | | |
| **Ending Operating Balance** | | **$1,026,738** | **$1,008,788** | **$1,021,388** | **$1,034,618** | **$1,048,510** | **$1,063,096** |
| *Target Operating Balance [4]* | | *$626,519* | *$684,944* | *$790,696* | *$906,966* | *$1,052,862* | *$1,073,426* |

[1] General reserves are not shown in Step 2 in this table as they show up as Net Revenue After D/S.
[2] The City will likely need to fund a debt service reserve fund equal to one year's annual debt service payment.
[3] FY 13-14 beginning balance based on cash and investments as of June 30, 2013 in audit.
[4] The target operating balance represents 6 months of operating expenses, excluding debt service.

Section 4

# Wastewater Rates Analysis

This section of the report describes the development of sewer rate calculations for the City of Jackson. The City's user classifications as described in Section 2 of this report and the revenue requirements reviewed and finalized through the operating cash flow analysis discussed in Section 3 of the report provide the basis for performing the cost of service analysis and rate calculations.

## 4.1 COST OF SERVICE ANALYSIS

Cost allocation is the method by which the annual sewer rate revenue requirement is recovered from each customer class based on the cost of providing sewer service. The total revenue requirements, net of revenue credits from other sources, shown in Table 10, is by definition the cost of providing service. These costs must then be allocated to each customer class. This is done in a three step process as follows:

1. ***Allocate the Annual O&M Costs to Either Treatment or Collection*** – The operating and maintenance costs are first allocated to either treatment or collection. Capital costs continue to be classified as capital costs.

2. ***Determine the Unit Cost per Flow, BOD, or SS*** – Once the costs are allocated to collection, treatment, or capital expenditures they are then distributed to either flow or strength categories. The flow category is simply referred to as flow. There are two strength categories – biochemical oxygen demand (BOD) and suspended solids (SS). The annual revenue requirement is distributed to flow, BOD and SS depending on a percentage distribution of O&M operations (or project capital expenditures) attributed to flow, BOD, and SS. The unit cost is then determined by dividing the allocated cost per flow or strength category by the total system demand for that category.

3. ***Determine the Annual Cost per Customer Type*** – The unit costs (for flow, BOD, and SS by cost category) are then multiplied by the number of units/accounts to determine the annual cost per customer category.

Once the costs are allocated to each customer category, the sewer rates can be calculated. By determining a unit cost to allocate customer costs, it ensures that each user is paying the same "unit cost" only then to vary by the use or impact of each user on the system and therefore meets the requirements of Proposition 218.

The tables used to illustrate the sewer rate calculations in the discussion below are for FY 2014-15. These same calculations are performed for each year of the rate study projection period.

### Cost Allocation to Collection and Treatment Categories

The operating and maintenance costs are allocated to collection and treatment function categories based on percentage allocation or distribution factors as shown in Table 12. These percentage allocation factors are based on the estimated distribution of City costs between the two system functions and based on G Aronow Consulting experience with other sewer rate studies. Capital costs remain segregated as capital costs.

The costs shown in Table 12 correspond to the projected costs in Table 7, prior to any offsetting revenue adjustments.

### Cost Allocation to Flow and Strength & Unit Cost Determination

Once the costs are allocated to a function category, the costs are then further allocated to flow, BOD, and SS, as shown in Table 13. The costs are allocated to flow, BOD, and SS based on percent allocation factors. Collection costs are strictly related to flow and therefore, 100 percent of the collection costs are allocated to flow. For all other costs it is assumed that the distribution is 50% to flow, 25% to BOD, and 25% to SS. These distribution factors were determined based on discussions with the City's wastewater engineers.

The allocated costs are then divided by the total influent to determine the unit cost per flow, BOD, and SS. These unit costs are then used to determine the cost allocated to each customer type and ultimately the calculated rates for each customer.

### Cost Allocation by Customer Category

Table 14 shows the cost allocated to flow, BOD, and SS by customer category for 2014-15. The unit costs determined in Table 13 are multiplied by the flow, BOD, or SS for each customer type. These costs are then summed to determine the total cost allocation by customer type.

### Calculated Rates

Based on the costs allocated to each customer type, rates are calculated. Table 15 shows the calculated rates for FY 2014-15 for residential and commercial customers. The rates for residential customers are charged on a per unit basis.

The commercial users are charged both a fixed monthly rate plus a flow charge that would be based on actual winter water consumption for the previous year (flow rate times the winter water consumption averaged over the six month period, November through April). The cost allocated to commercial users is split between the fixed cost at 50% and the variable cost at 50%. This allows the City some reliability in the collection of sewer charges, i.e., that 50% of the charges

are not based upon potentially fluctuating water use. The majority of the wastewater expenses are fixed expenses and do not vary by water use.

The variable portion of the commercial rate calculation assumes annual winter water flow as described in Table 5 above.

# Table 12
## Projected Costs and Distribution between Collection and Treatment System, FY 2014-15

| | Inflation Adjustment | Budget 2013-14 | Projected 2014-15 | Allocation | | Collection System | | | Treatment System | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Collection | Treatment | Cost | Fixed | Variable | Cost | Fixed | Variable |
| | | Years Inflated: | 1 | | | | | | | | |
| **Expenditures** | | | | | | | | | | | |
| **Step 1: Baseline O&M** | | | | | | | | | | | |
| Personnel Services & Benefits | 2.5% | $392,447 | $402,258 | 20% | 80% | $80,452 | $80,452 | | $321,807 | $321,807 | |
| Contract & Professional Services | 3.0% | $347,485 | $357,910 | 20% | 80% | $71,582 | $71,582 | | $286,328 | $286,328 | |
| Repairs & Maintenance | 5.0% | $43,500 | $45,675 | 20% | 80% | $9,135 | $9,135 | | $36,540 | $36,540 | |
| Materials & Supplies | 2.5% | $63,800 | $65,395 | 20% | 80% | $13,079 | $13,079 | | $52,316 | $52,316 | |
| Other Services & Charges | 2.5% | $263,680 | $270,272 | 20% | 80% | $54,054 | $54,054 | | $216,218 | $216,218 | |
| Capital Purchases | 2.5% | $18,150 | $18,604 | 20% | 80% | $3,721 | $3,721 | | $14,883 | $14,883 | |
| **Subtotal** | | **$1,129,062** | **$1,160,113** | | | **$232,023** | **$232,023** | **$0** | **$928,091** | **$928,091** | **$0** |
| Existing Debt Service | 0.0% | $9,775 | $9,775 | 0% | 100% | $0 | $0 | | $9,775 | $9,775 | |
| Transfers In/Out (Gen. Fund) | | ($80,000) | | 20% | 80% | $0 | $0 | | $0 | $0 | $0 |
| **Subtotal** | | **($70,225)** | **$9,775** | | | **$0** | **$0** | **$0** | **$9,775** | **$9,775** | **$0** |
| **Subtotal Step 1** | | **$1,058,837** | **$1,169,888** | | | **$232,023** | **$232,023** | **$0** | **$937,866** | **$937,866** | **$0** |
| **Step 2: Capital & Reserves** | | | | | | | | | | | |
| Capital Set-Aside/CIP Projects | 2.5% | $194,200 | $200,000 | 20% | 80% | $40,000 | $40,000 | | $160,000 | $160,000 | |
| General Operating Reserve | 5.0% | | $12,000 | 20% | 80% | $2,400 | $2,400 | | $9,600 | $9,600 | |
| **Subtotal Step 2** | | | **$212,000** | | | **$42,400** | **$42,400** | | **$169,600** | **$169,600** | |
| **Step 3: WTF Construction Project** | | | | | | | | | | | |
| Additional O&M due to Project | 2.5% | $0 | $0 | 20% | 80% | $0 | $0 | | $0 | $0 | |
| Construction Loan - Debt Service | n/a | $0 | $0 | 0% | 100% | $0 | $0 | | $0 | $0 | |
| Debt Service Coverage | n/a | | $0 | | 100% | $0 | $0 | | $0 | $0 | |
| **Subtotal Step 3** | | | **$0** | | | **$0** | **$0** | | **$0** | **$0** | |
| **Total** | | **$1,253,037** | **$1,381,888** | | | **$274,423** | **$274,423** | **$0** | **$1,107,466** | **$1,107,466** | **$0** |

*"proj_costs"*

## Table 13
## Unit Cost Determination, FY 2014-15

| Cost Category | Allocated Operating Costs | Percent Allocation | | | Cost | | | Total Influent | | | Unit Cost Per: | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Flow | BOD | SS | Flow | BOD | SS | Flow MG | BOD Klbs | SS Klbs | Mgal of Flow ($/Mgal) | Klb of BOD ($/Klb) | Klb of SS ($/Klb) |
| **Collection System O&M Costs** | | | | | | | | | | | | | |
| Fixed | $232,023 | 100% | | | $232,023 | $0 | $0 | 170.89 | 341.10 | 341.10 | $1,357.74 | $0.00 | $0.00 |
| Variable | $0 | 100% | | | $0 | $0 | $0 | 170.89 | 341.10 | 341.10 | $0.00 | $0.00 | $0.00 |
| **Total Collection** | **$232,023** | | | | **$232,023** | **$0** | **$0** | | | | **$1,357.74** | **$0.00** | **$0.00** |
| **Treatment O&M Costs** | | | | | | | | | | | | | |
| Fixed | $937,866 | 50% | 25.00% | 25.00% | $468,933 | $234,466 | $234,466 | 170.89 | 341.10 | 341.10 | $2,744.08 | $687.39 | $687.39 |
| Variable | $0 | 50% | 25.00% | 25.00% | $0 | $0 | $0 | 170.89 | 341.10 | 341.10 | $0.00 | $0.00 | $0.00 |
| **Total Treatment** | **$937,866** | | | | **$468,933** | **$234,466** | **$234,466** | | | | **$2,744.08** | **$687.39** | **$687.39** |
| **Step 2: Capital & Reserves** | $212,000 | 50% | 25.00% | 25.00% | $106,000 | $53,000 | $53,000 | 170.89 | 341.10 | 341.10 | $620.29 | $155.38 | $155.38 |
| **Step 3: CIP & Construction Loan** | $0 | 50% | 25.00% | 25.00% | $0 | $0 | $0 | 170.89 | 341.10 | 341.10 | $0.00 | $0.00 | $0.00 |
| SUBTOTAL | **$1,381,888** | | | | | | | | | | **$4,722.10** | **$842.77** | **$842.77** |
| Less Other Revenue Sources | ($2,090) | 50% | 25.00% | 25.00% | ($1,045) | ($523) | ($523) | 170.89 | 341.10 | 341.10 | ($6.12) | ($1.53) | ($1.53) |
| TOTAL | **$1,379,798** | | | | **$805,911** | **$286,944** | **$286,944** | | | | **$4,715.99** | **$841.24** | **$841.24** |

# Table 14
## Allocation of Costs to Flow, BOD, and SS by Customer Category, FY 2014-15

| | | | | Step 1: Baseline O&M | | | | | | | | Step 2 | | | | Step 3 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Collection | Treatment | | | Other Revenue Impacts | | | | Capital & Reserves | | | | CIP & Construction Loan | | | | |
| Unit Cost/Customer Category | Flow MG/Yr | BOD Klb/Yr | SS Klb/Yr | Flow ($/Mgal) | Flow ($/Mgal) | BOD ($/Klb) | SS ($/Klb) | Flow ($/Mgal) | BOD ($/Klb) | SS ($/Klb) | SUBTOTAL Step 1 | Flow ($/Mgal) | BOD ($/Klb) | SS ($/Klb) | SUBTOTAL Step 2 | Flow ($/Mgal) | BOD ($/Klb) | SS ($/Klb) | SUBTOTAL Step 3 | Total |
| **Unit Cost** | | | | **$1,357.74** | **$2,744.08** | **$687.39** | **$687.39** | **($6.12)** | **($1.53)** | **($1.53)** | **$5,467** | **$620.29** | **$155.38** | **$155.38** | **$931** | **$0.00** | **$0.00** | **$0.00** | **$0** | **$6,398** |
| **Residential** | | | | | | | | | | | | | | | | | | | | |
| SFD | 80.30 | 133.94 | 133.94 | $109,026 | $220,350 | $92,070 | $92,070 | ($491) | ($205) | ($205) | **$512,614** | $49,809 | $20,812 | $20,812 | **$91,433** | $0 | $0 | $0 | **$0** | **$604,046** |
| Duplex | 5.37 | 8.96 | 8.96 | $7,295 | $14,743 | $6,160 | $6,160 | ($33) | ($14) | ($14) | **$34,299** | $3,333 | $1,393 | $1,393 | **$6,118** | $0 | $0 | $0 | **$0** | **$40,416** |
| MFD | 3.80 | 6.33 | 6.33 | $5,154 | $10,417 | $4,352 | $4,352 | ($23) | ($10) | ($10) | **$24,233** | $2,355 | $984 | $984 | **$4,322** | $0 | $0 | $0 | **$0** | **$28,555** |
| Apartments/M. Homes | 38.72 | 64.58 | 64.58 | $52,571 | $106,249 | $44,394 | $44,394 | ($237) | ($99) | ($99) | **$247,173** | $24,017 | $10,035 | $10,035 | **$44,087** | $0 | $0 | $0 | **$0** | **$291,260** |
| **Subtotal** | **128.19** | **213.82** | **213.82** | **$174,046** | **$351,758** | **$146,976** | **$146,976** | **($784)** | **($328)** | **($328)** | **$818,318** | **$79,513** | **$33,223** | **$33,223** | **$145,960** | **$0** | **$0** | **$0** | **$0** | **$964,278** |
| **Commercial** | | | | | | | | | | | | | | | | | | | | |
| Group 1 | 14.91 | 27.53 | 27.53 | $20,244 | $40,915 | $18,927 | $18,927 | ($91) | ($42) | ($42) | **$98,838** | $9,249 | $4,278 | $4,278 | **$17,805** | $0 | $0 | $0 | **$0** | **$116,644** |
| Group 2 | 2.03 | 5.08 | 5.08 | $2,759 | $5,577 | $3,495 | $3,495 | ($12) | ($8) | ($8) | **$15,299** | $1,261 | $790 | $790 | **$2,841** | $0 | $0 | $0 | **$0** | **$18,140** |
| Group 3 | 15.39 | 43.31 | 43.31 | $20,893 | $42,226 | $29,773 | $29,773 | ($94) | ($66) | ($66) | **$122,439** | $9,545 | $6,730 | $6,730 | **$23,005** | $0 | $0 | $0 | **$0** | **$145,444** |
| Group 4 | 0.22 | 1.35 | 1.35 | $299 | $604 | $927 | $927 | ($1) | ($2) | ($2) | **$2,752** | $137 | $210 | $210 | **$556** | $0 | $0 | $0 | **$0** | **$3,308** |
| Group 5 | 2.20 | 14.66 | 14.66 | $2,982 | $6,028 | $10,074 | $10,074 | ($13) | ($22) | ($22) | **$29,100** | $1,363 | $2,277 | $2,277 | **$5,917** | $0 | $0 | $0 | **$0** | **$35,017** |
| Group 6 | 6.62 | 33.11 | 33.11 | $8,984 | $18,157 | $22,760 | $22,760 | ($40) | ($51) | ($51) | **$72,518** | $4,104 | $5,145 | $5,145 | **$14,394** | $0 | $0 | $0 | **$0** | **$86,912** |
| Group 7 | 1.34 | 2.23 | 2.23 | $1,815 | $3,669 | $1,533 | $1,533 | ($8) | ($3) | ($3) | **$8,535** | $829 | $347 | $347 | **$1,522** | $0 | $0 | $0 | **$0** | **$10,057** |
| **Subtotal** | **42.70** | **127.28** | **127.28** | **$44,195** | **$89,322** | **$53,123** | **$53,123** | **($199)** | **($118)** | **($118)** | **$349,481** | **$20,191** | **$12,008** | **$12,008** | **$66,040** | **$0** | **$0** | **$0** | **$0** | **$415,521** |
| TOTAL | **170.89** | **341.10** | **341.10** | **$232,023** | **$468,933** | **$234,466** | **$234,466** | **($1,045)** | **($523)** | **($523)** | **$1,167,798** | **$106,000** | **$53,000** | **$53,000** | **$212,000** | **$0** | **$0** | **$0** | **$0** | **$1,379,798** |

# Table 15
## Calculation of Sewer User Charges, FY 2014-15

| Customer Category | Accounts/ Customers | Units | Allocated Cost | Annual Cost Allocated to Flat Rate | Annual Cost Allocated to Fixed Rate Metered | Monthly Cost Flat Mo. Charge | Monthly Cost Metered Base Charge | Consumption Charge Ann.Flow-Wint. Water [1] | Consumption Charge Cost/ Gallons | Consumption Charge Cost/1000 Gallons | Consumption Charge Cost per 100 CF [2] | Basis of Charge |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Step 1: Baseline O&M** | | | | | | | | | | | | |
| Residential | | | | | | | | | | | | |
| SFD | 1,375 | 1,375 | $512,614 | $372.81 | | $31.07 | | | | | | per Unit |
| Duplex | 46 | 92 | $34,299 | $372.81 | | $31.07 | | | | | | per Unit |
| MFD | 20 | 65 | $24,233 | $372.81 | | $31.07 | | | | | | per Unit |
| Apartments/M. Homes | 19 | 663 | $247,173 | $372.81 | | | | | | | | |
| **Residential Total** | **1,460** | | **$818,318** | | | | | | | | | |
| Commercial | | | | | *(at 50%)* | | | | | | | |
| Group 1 | 190 | | $98,838 | | $260.10 | | $21.68 | 14.91 | $0.0033 | $3.31 | $2.48 | per Account |
| Group 2 | 16 | | $15,299 | | $478.09 | | $39.84 | 2.64 | $0.0029 | $2.90 | $2.17 | per Account |
| Group 3 | 39 | | $122,439 | | $1,569.73 | | $130.81 | 20.01 | $0.0031 | $3.06 | $2.29 | per Account |
| Group 4 | 3 | | $2,752 | | $458.69 | | $38.22 | 0.22 | $0.0063 | $6.25 | $4.68 | per Account |
| Group 5 | 3 | | $29,100 | | $4,849.96 | | $404.16 | 1.90 | $0.0076 | $7.64 | $5.72 | per Account |
| Group 6 | 4 | | $72,518 | | $9,064.73 | | $755.39 | 8.60 | $0.0042 | $4.22 | $3.15 | per Account |
| Group 7 | 9 | | $8,535 | | $474.17 | | $39.51 | 1.74 | $0.0025 | $2.45 | $1.83 | per Account |
| **Commercial Total** | **245** | | **$236,576** | | | | | | | | | |
| **Subtotal Step 1** | | | **$1,054,894** | | | | | | | | | |
| **Step 2: Capital & Reserves** | | | | | | | | | | | | |
| Residential | | | | | | | | | | | | |
| SFD | 1,375 | 1,375 | $91,433 | $66.50 | | $5.54 | | | | | | per Unit |
| Duplex | 46 | 92 | $6,118 | $66.50 | | $5.54 | | | | | | per Unit |
| MFD | 20 | 65 | $4,322 | $66.50 | | $5.54 | | | | | | per Unit |
| Apartments/M. Homes | 19 | 663 | $44,087 | $66.50 | | | | | | | | |
| **Residential Total** | **1,460** | | **$145,960** | | | | | | | | | |
| Commercial | | | | | *(at 50%)* | | | | | | | |
| Group 1 | 190 | | $17,805 | | $46.86 | | $3.90 | 14.91 | $0.0006 | $0.60 | $0.45 | per Account |
| Group 2 | 16 | | $2,841 | | $88.78 | | $7.40 | 2.64 | $0.0005 | $0.54 | $0.40 | per Account |
| Group 3 | 39 | | $23,005 | | $294.94 | | $24.58 | 20.01 | $0.0006 | $0.57 | $0.43 | per Account |
| Group 4 | 3 | | $556 | | $92.63 | | $7.72 | 0.22 | $0.0013 | $1.26 | $0.94 | per Account |
| Group 5 | 3 | | $5,917 | | $986.15 | | $82.18 | 1.90 | $0.0016 | $1.55 | $1.16 | per Account |
| Group 6 | 4 | | $14,394 | | $1,799.21 | | $149.93 | 8.60 | $0.0008 | $0.84 | $0.63 | per Account |
| Group 7 | 9 | | $1,522 | | $84.58 | | $7.05 | 1.74 | $0.0004 | $0.44 | $0.33 | per Account |
| **Commercial Total** | **264** | | **$43,651** | | | | | | | | | |
| **Subtotal Step 2** | | | **$189,611** | | | | | | | | | |
| **Step 3: CIP & Capital Project** | | | | | | | | | | | | |
| Residential | | | | | | | | | | | | |
| SFD | 1,375 | 1,375 | $0 | $0.00 | | $0.00 | | | | | | per Unit |
| Duplex | 46 | 92 | $0 | $0.00 | | $0.00 | | | | | | per Unit |
| MFD | 20 | 65 | $0 | $0.00 | | $0.00 | | | | | | per Unit |
| Apartments/M. Homes | 19 | 663 | $0 | $0.00 | | | | | | | | |
| **Residential Total** | **1,460** | | **$0** | | | | | | | | | |
| Commercial | | | | | *(at 50%)* | | | | | | | |
| Group 1 | 190 | | $0 | | $0.00 | | $0.00 | 14.91 | $0.0000 | $0.00 | $0.00 | per Account |
| Group 2 | 16 | | $0 | | $0.00 | | $0.00 | 2.64 | $0.0000 | $0.00 | $0.00 | per Account |
| Group 3 | 39 | | $0 | | $0.00 | | $0.00 | 20.01 | $0.0000 | $0.00 | $0.00 | per Account |
| Group 4 | 3 | | $0 | | $0.00 | | $0.00 | 0.22 | $0.0000 | $0.00 | $0.00 | per Account |
| Group 5 | 3 | | $0 | | $0.00 | | $0.00 | 1.90 | $0.0000 | $0.00 | $0.00 | per Account |
| Group 6 | 4 | | $0 | | $0.00 | | $0.00 | 8.60 | $0.0000 | $0.00 | $0.00 | |
| Group 7 | 9 | | $0 | | $0.00 | | $0.00 | 1.74 | $0.0000 | $0.00 | $0.00 | |
| **Commercial Total** | **264** | | **$0** | | | | | | | | | |
| **Subtotal Step 3** | | | **$0** | | | | | | | | | |
| **TOTAL** | | | | | | | | | | | | |
| Residential | | | | | | | | | | | | |
| SFD | 1,375 | 1,375 | $604,046 | $439.31 | | $36.61 | | | | | | per Unit |
| Duplex | 46 | 92 | $40,416 | $439.31 | | $36.61 | | | | | | per Unit |
| MFD | 20 | 65 | $28,555 | $439.31 | | $36.61 | | | | | | per Unit |
| Apartments/M. Homes | 19 | 663 | $291,260 | $439.31 | | | | | | | | |
| **Residential Total** | **1,460** | | **$964,278** | | | | | | | | | |
| Commercial | | | | | *(at 50%)* | | | | | | | |
| Group 1 | 190 | | $116,644 | | $306.96 | | $25.58 | 14.91 | $0.0039 | $3.91 | $2.93 | per Account |
| Group 2 | 16 | | $18,140 | | $566.86 | | $47.24 | 2.64 | $0.0034 | $3.43 | $2.57 | per Account |
| Group 3 | 39 | | $145,444 | | $1,864.67 | | $155.39 | 20.01 | $0.0036 | $3.63 | $2.72 | per Account |
| Group 4 | 3 | | $3,308 | | $551.32 | | $45.94 | 0.22 | $0.0075 | $7.51 | $5.62 | per Account |
| Group 5 | 3 | | $35,017 | | $5,836.11 | | $486.34 | 1.90 | $0.0092 | $9.20 | $6.88 | per Account |
| Group 6 | 4 | | $86,912 | | $10,863.94 | | $905.33 | 8.60 | $0.0051 | $5.05 | $3.78 | per Account |
| Group 7 | 9 | | $10,057 | | $558.74 | | $46.56 | 1.74 | $0.0029 | $2.89 | $2.16 | per Account |
| **Commercial Total** | **264** | | **$415,521** | | | | | | | | | |
| **Total all Steps** | | | **$1,379,798** | | | | | | | | | |

[1] See Table 5.
[2] Conversion factor from gallons to cubic feet is —— 7.48 gallons/ 1 cubic ft.

Section 5

# Findings and Recommendations

Through this rate analysis it was determined that current sewer rates are insufficient to fund the on-going operating and maintenance expenses as well as provide funding for the Wastewater Treatment Facility Capital Improvement Project.

It is recommended that the City increase sewer user charges to provide revenues that are adequate to fund on-going operating and maintenance expenses, and to support existing and future debt service from the proposed project. The recommended rates per equivalent dwelling unit are shown in Table 16 below as well as summarized projected revenues and expenses for the sewer enterprise fund through fiscal year 2018-19.

Table 16
**Summary of Calculated Rate per EDU and Projected Revenues and Expenses**

| | Projected | | | | |
|---|---|---|---|---|---|
| | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 |
| **Projected Revenues** | | | | | |
| Rate per EDU [1] | $36.61 | $42.17 | $48.28 | $55.94 | $57.05 |
| Sewer Sales Revenues | $1,379,798 | $1,591,903 | $1,825,071 | $2,117,525 | $2,159,349 |
| Other Revenues | $2,090 | $2,090 | $2,090 | $2,090 | $2,090 |
| **Total Projected Revenues** | **$1,381,888** | **$1,593,993** | **$1,827,161** | **$2,119,615** | **$2,161,439** |
| **Projected Expenses** | | | | | |
| Total O&M & Existing Debt Service | $1,169,888 | $1,201,823 | $1,234,666 | $1,268,446 | $1,303,190 |
| CIP & Capital Set-Aside | $200,000 | $205,000 | $210,125 | $215,378 | $220,763 |
| Project Related Debt Service & Related Costs | $0 | $174,570 | $369,140 | $621,900 | $622,900 |
| **Total Projected Expenses** | **$1,369,888** | **$1,581,393** | **$1,813,931** | **$2,105,724** | **$2,146,853** |
| **Net Revenue** | **$12,000** | **$12,600** | **$13,230** | **$13,892** | **$14,586** |

[1] EDU is an equivalent dwelling unit or equal to a single family unit