



# Sewer Rate Study

**City of Joplin, Missouri**

**Project No. 114532**

**Draft Report**  
**11/1/2019**



# **Sewer Rate Study**

prepared for

**City of Joplin, Missouri**

**Project No. 114532**

**Draft Report  
11/1/2019**

prepared by

**Burns & McDonnell Engineering Company, Inc.  
Kansas City, Missouri**

## TABLE OF CONTENTS

|            |   | <u>Page No.</u> |
|------------|---|-----------------|
| <b>1.0</b> | <b>INTRODUCTION .....</b>                           | <b>1-1</b>      |
| 1.1        | Study Background.....                               | 1-1             |
| 1.2        | Project Approach .....                              | 1-1             |
| 1.3        | Industry Trends in Sewer Rate Increases.....        | 1-2             |
| <b>2.0</b> | <b>FINANCIAL PLANNING ANALYSIS .....</b>            | <b>2-1</b>      |
| 2.1        | Introduction to Financial Planning.....             | 2-1             |
| 2.2        | Sewer Utility Revenues under Existing Rates .....   | 2-1             |
| 2.2.1      | Historical and Projected Customers.....             | 2-1             |
| 2.2.2      | Historical and Projected Volumes .....              | 2-2             |
| 2.2.3      | Existing Sewer Rates .....                          | 2-2             |
| 2.2.4      | User Revenues under Existing Rates .....            | 2-3             |
| 2.2.5      | Proposed Default Use Adjustment.....                | 2-3             |
| 2.3        | Sewer Utility Expenditures .....                    | 2-4             |
| 2.3.1      | Operation and Maintenance Expenses .....            | 2-4             |
| 2.3.2      | Projected Capital Improvement Expenditures .....    | 2-5             |
| 2.3.3      | Projected Debt Service Requirements .....           | 2-7             |
| 2.4        | Sewer Utility Financial Plan Cash Flow .....        | 2-7             |
| <b>3.0</b> | <b>PROPOSED RATE DESIGN.....</b>                    | <b>3-11</b>     |
| 3.1        | Introduction.....                                   | 3-11            |
| 3.2        | Existing and Proposed Wastewater Rates.....         | 3-11            |
| 3.3        | Typical Bills and Residential Bill Comparison ..... | 3-12            |
| 3.4        | Statement of Limitations.....                       | 3-14            |

**LIST OF TABLES**

|   | <b><u>Page No.</u></b> |
|---|------------------------|
| Table 2-1: Historical and Projected Accounts and Volume.....                | 2-2                    |
| Table 2-2: Existing Sewer Rates.....  | 2-2                    |
| Table 2-3: Historical and Projected Sewer User Charge Revenues.....         | 2-3                    |
| Table 2-4: Historical and Projected Operation and Maintenance Expenses..... | 2-5                    |
| Table 2-5: Capital Improvement Program.....                                 | 2-6                    |
| Table 2-6: Existing and Proposed Debt Service.....                          | 2-7                    |
| Table 2-7: Projected Sewer Utility Cash Flow.....                           | 2-9                    |
| Table 3-1: Proposed Wastewater Rates.....                                   | 3-12                   |
| Table 3-2: Proposed Monthly Wastewater Bills.....                           | 3-13                   |

**LIST OF FIGURES**

**PAGE NO.**

|   |      |
|---|------|
| Figure 1-1: Study Methodology.....                                      | 1-1  |
| Figure 1-2: Changes in General Inflation vs. Water and Sewer Rates..... | 1-2  |
| Figure 3-1: Residential Monthly Bill Comparison.....                    | 3-13 |

**LIST OF ABBREVIATIONS**

| <b><u>Abbreviation</u></b> | <b><u>Term/Phrase/Name</u></b>                   |
|----------------------------|--|
| AWWA                       | American Water Works Association                 |
| BLS                        | United States Bureau of Labor Statistics         |
| Burns & McDonnell          | Burns & McDonnell Engineering Company, Inc.      |
| CIP                        | Capital Improvement Program                      |
| CPI-U                      | Consumer Price Index for all Urban Consumers     |
| EPA                        | Environmental Protection Agency                  |
| Kgal                       | Thousand Gallons                                 |
| FY                         | Fiscal Year                                      |
| MHI                        | Median Household Income                          |
| NACWA                      | The National Association of Clean Water Agencies |
| O&M                        | Operation and Maintenance                        |
| The City                   | The City of Joplin, Missouri                     |
| The Study                  | Financial Plan and Rate Analysis                 |

## 1.0 INTRODUCTION

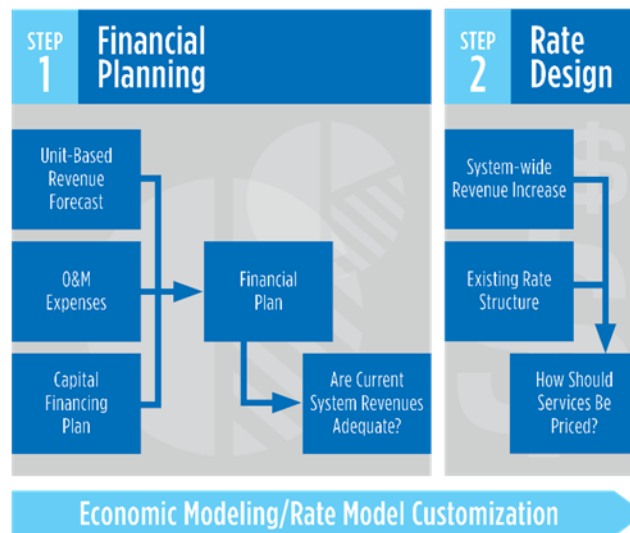
### 1.1 Study Background

The City of Joplin, Missouri (the City) retained Burns & McDonnell to perform a wastewater rate study (Study) including financial planning and rate analysis for the City's wastewater system. The Study provides a five-year financial plan that evaluates the sufficiency of revenues under existing rates to meet future operating and capital costs of the utility. If revenues are insufficient to meet funding requirements, recommendations are made to increase rates sufficiently to meet the utility's revenue requirements. Throughout this report various years are referenced regarding the City's financial plan. The years referenced are the City's fiscal years (FY), which are November 1<sup>st</sup> through October 31<sup>st</sup>.

### 1.2 Project Approach

To meet the Study objectives, Burns & McDonnell conducted the analysis in a two-step approach. This approach is depicted in Figure 1-1.

**Figure 1-1: Study Methodology**



**Step 1: Financial Planning** provides an indication of the adequacy of the revenue generated by current rates. The results of the financial forecast analysis answer the questions "Are the existing rates adequate?" and "If not, what level of overall revenue increase is needed?" The Financial Planning Analysis is presented in Section 2 of this report.

**Step 2: Rate Design** provides for the required revenue recovery. Once the overall level of revenue required is identified, a schedule of proposed rates is developed using the existing rate structure and

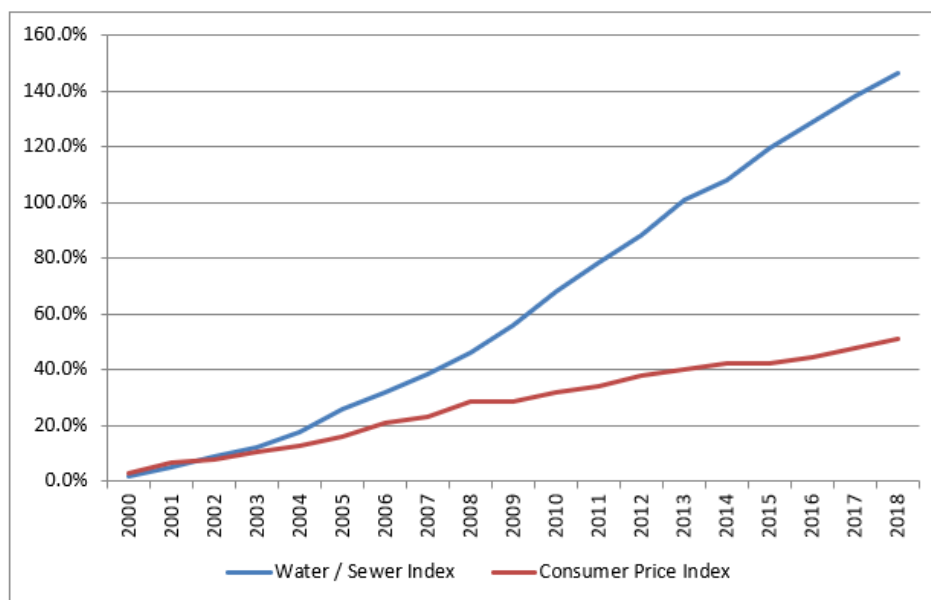
revenue increases from the financial plan. The development of proposed rates is discussed in Section 3.0 of this report.

### 1.3 Industry Trends in Sewer Rate Increases

Nationally, the cost of residential water and sewer service is rising faster than many other household costs. Replacement of aging infrastructure is one of several dynamics impacting utility rates. Other dynamics generally include increasing regulatory requirements, inflation on operating and capital costs, and a trend in declining consumption most often associated with more efficient fixtures and appliances and greater awareness of water conservation.

Every utility is different, and the relative importance of these dynamics will vary by utility. However, there is no doubt that water and sewer rate increases have substantially outpaced general inflation in the United States. The United States Bureau of Labor Statistics (BLS) tracks many facets of inflation. The most commonly referenced measure is the Consumer Price Index for all Urban Consumers (CPI-U) which measures inflation at the consumer level for a representative basket of goods. The BLS also tracks a combined inflation index for consumer water and sewer costs. Figure 1-2 compares changes in the BLS' consumer price index to changes in the BLS' water and sewer cost index.

**Figure 1-2: Changes in General Inflation vs. Water and Sewer Rates**



**Source: Bureau of Labor Statistics, Consumer Price Index & Water & Sewer Maintenance Series**

Annually, the water and sewer index has been increasing at approximately 5.0 percent per year, while CPI's annual rate of change is about 2.0 percent per year.

Other industry surveys reach similar conclusions regarding water and/or sewer rates. The National Association of Clean Water (NACWA) annually updates its *Cost of Clean Water Index*, which specifically surveys sewer utilities across the nation regarding the cost of residential sewer service. From 1985 through 2018, the annual increase according to this survey has been 5.0 percent per year. American Water Works Association (AWWA) also conducts a broad, annual water and sewer rate survey with comparable results regarding increases in water and sewer rates.

Despite these increasing costs for water and sewer service, many utilities continue to be challenged to adequately fund renewal and replacement of existing infrastructure. Understanding the reality of increasing costs within the sewer industry provides helpful context in evaluating proposed financial plans and rates for the City's sewer service.



## 2.0 FINANCIAL PLANNING ANALYSIS

### 2.1 Introduction to Financial Planning

The primary issue addressed in Financial Planning Analysis is revenue sufficiency. The results of Financial Planning Analysis answer the questions:

- "Are the existing rates adequate to meet future funding needs?"
- "If not, what level of overall revenue increase is needed?"

To determine if the existing schedule of rates can be expected to generate enough revenue to meet the City's operating and capital costs, Burns & McDonnell prepared a five-year financial projection of revenues and expenditures for the utility. A comparison of projected revenues and expenditures provides insight into the adequacy of overall revenue levels.

Our approach to Financial Planning involves the following basic steps:

1. Project revenues under existing rates.
2. Project utility expenditures.
3. Develop a multi-year financial plan
4. Evaluate financial sufficiency based on key performance indicators such as reserve balances.

The planning period includes the current fiscal year (FY) 2019 and a five-year forecast period, 2020 – 2024. The City utilizes a twelve-month fiscal year beginning November 1. The Financial Plan Analysis recognizes and references the same fiscal year in the forecast period.

The remainder of this section of the report discusses how the sewer utility financial plan was developed and identifies the sufficiency of existing rates to adequately meet future costs.

### 2.2 Sewer Utility Revenues under Existing Rates

The first step in Financial Planning Analysis was to project revenues under the existing schedule of rates. To support this effort an analysis of customer billing determinants and revenues was performed.

#### 2.2.1 Historical and Projected Customers

Table 2-1 presents the historical sewer customers served by the City from 2016 to 2018 and the projection of customers for the 2020 to 2024 planning period. In recent years, the City has experienced a slight increase in the number of accounts. For the purpose of this Study, forecasted accounts are anticipated to remain consistent with 2018 historical levels.

## 2.2.2 Historical and Projected Volumes

Table 2-1 also presents the historical and projected billed sewer volume, which has also been relatively stable. Projected volumes are anticipated to remain consistent with recent history throughout the Study period.

**Table 2-1: Historical and Projected Accounts and Volume**

| Line No.                            |                                 | Historical |           |           | Budget    | Projected |           |           |           |           |
|-------------------------------------|---------------------------------|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|                                     |                                 | 2016       | 2017      | 2018      | 2019      | 2020      | 2021      | 2022      | 2023      | 2024      |
| <b>Accounts</b>                     |                                 |            |           |           |           |           |           |           |           |           |
| 1                                   | Residential - Inside            | 18,462     | 19,047    | 19,118    | 19,118    | 19,118    | 19,118    | 19,118    | 19,118    | 19,118    |
| 2                                   | Residential - Outside           | 348        | 365       | 356       | 356       | 356       | 356       | 356       | 356       | 356       |
| 3                                   | Commercial - Inside             | 1,947      | 1,951     | 1,938     | 1,938     | 1,938     | 1,938     | 1,938     | 1,938     | 1,938     |
| 4                                   | Commercial - Outside            | 30         | 30        | 30        | 30        | 30        | 30        | 30        | 30        | 30        |
| 5                                   | Industrial - Inside             | 37         | 37        | 35        | 35        | 35        | 35        | 35        | 35        | 35        |
| 6                                   | Inside Meter-Related Residence  | 102        | 104       | 103       | 103       | 103       | 103       | 103       | 103       | 103       |
| 7                                   | Other Public Authority - Inside | 90         | 94        | 95        | 95        | 95        | 95        | 95        | 95        | 95        |
| 8                                   | Outside Meter-Related Residence | -          | 3         | 3         | 3         | 3         | 3         | 3         | 3         | 3         |
| 9                                   | Total Accounts                  | 21,015     | 21,631    | 21,679    | 21,678    | 21,678    | 21,678    | 21,678    | 21,678    | 21,678    |
| <b>Billed Volume (1000 Gallons)</b> |                                 |            |           |           |           |           |           |           |           |           |
| 10                                  | Residential - Inside            | 917,414    | 940,764   | 958,283   | 958,270   | 958,270   | 958,270   | 958,270   | 958,270   | 958,270   |
| 11                                  | Residential - Outside           | 7,679      | 8,137     | 8,043     | 8,030     | 8,030     | 8,030     | 8,030     | 8,030     | 8,030     |
| 12                                  | Commercial - Inside             | 597,465    | 594,907   | 599,146   | 599,300   | 599,300   | 599,300   | 599,300   | 599,300   | 599,300   |
| 13                                  | Commercial - Outside            | 40,734     | 49,080    | 45,332    | 45,460    | 45,460    | 45,460    | 45,460    | 45,460    | 45,460    |
| 14                                  | Industrial - Inside             | 715,889    | 854,444   | 794,009   | 794,010   | 794,010   | 794,010   | 794,010   | 794,010   | 794,010   |
| 15                                  | Inside Meter-Related Residence  | 27,739     | 29,064    | 31,623    | 31,500    | 31,500    | 31,500    | 31,500    | 31,500    | 31,500    |
| 16                                  | Other Public Authority - Inside | 36,056     | 81,150    | 39,994    | 39,820    | 39,820    | 39,820    | 39,820    | 39,820    | 39,820    |
| 17                                  | Outside Meter-Related Residence | -          | 1,739     | 2,113     | 2,110     | 2,110     | 2,110     | 2,110     | 2,110     | 2,110     |
| 18                                  | Total Billed Volume             | 2,342,975  | 2,559,284 | 2,478,543 | 2,478,500 | 2,478,500 | 2,478,500 | 2,478,500 | 2,478,500 | 2,478,500 |

## 2.2.3 Existing Sewer Rates

The current sewer rate schedule is shown in Table 2-2 and features a fixed monthly base fee that varies by meter size, and a uniform volumetric rate applicable to all domestic strength customers. High strength industrial customers pay surcharge rates based on sampled wastewater strength. Outside City rates reflect a multiplier of 1.3x the Inside City rates.

**Table 2-2: Existing Sewer Rates**

| Line No.                   | Service Charge:   | In City   | Out of City |
|----------------------------|-------------------|-----------|-------------|
| 1                          | 3/4" or smaller   | \$ 31.56  | \$ 41.03    |
| 2                          | 1"                | \$ 40.51  | \$ 52.66    |
| 3                          | 1.5"              | \$ 62.94  | \$ 81.82    |
| 4                          | 2"                | \$ 89.82  | \$ 116.77   |
| 5                          | 3"                | \$ 152.56 | \$ 198.33   |
| 6                          | 4"                | \$ 242.13 | \$ 314.77   |
| 7                          | 6"                | \$ 466.20 | \$ 606.06   |
| <b>Volume Charge:</b>      |                   |           |             |
| 8                          | per 1,000 gallons | \$ 2.07   | \$ 2.69     |
| <b>Surcharges (\$/lb):</b> |                   |           |             |
| 9                          | BOD               | \$ 0.87   | \$ 1.13     |
| 10                         | SS                | \$ 0.53   | \$ 0.69     |

## 2.2.4 User Revenues under Existing Rates

Table 2-3 presents historical user revenues for 2016 to 2018 and a projection of user revenues under existing rates for the planning period. The projection of user revenues was estimated based on the forecasted accounts, estimated volumes, and existing rates.

Historical sewer user revenues ranged from approximately \$11.2 million in 2016 to \$14.1 million in 2018. Increases in historical revenues are associated primarily with rate increases adopted in the last rate study. Overall, sewer user charge revenues under existing 2019 rates are projected to remain consistent with 2019 through the end of the Study period.

**Table 2-3: Historical and Projected Sewer User Charge Revenues**

| Line No. |   | Historical    |               |               | Budget        | Projected     |               |               |               |               |
|----------|---|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
|          |   | 2016          | 2017          | 2018          | 2019          | 2020          | 2021          | 2022          | 2023          | 2024          |
|          | <b>User Revenues Under Existing Rates</b> |               |               |               |               |               |               |               |               |               |
| 1        | Residential - Inside                      | \$ 6,714,703  | \$ 7,603,229  | \$ 8,471,456  | \$ 9,318,500  | \$ 9,318,500  | \$ 9,318,500  | \$ 9,318,500  | \$ 9,318,500  | \$ 9,318,500  |
| 2        | Residential - Outside                     | 397,761       | 449,387       | 456,341       | 501,200       | 501,200       | 501,200       | 501,200       | 501,200       | 501,200       |
| 3        | Commercial - Inside                       | 1,738,392     | 1,911,881     | 2,145,499     | 2,360,700     | 2,360,700     | 2,360,700     | 2,360,700     | 2,360,700     | 2,360,700     |
| 4        | Commercial - Outside                      | 109,151       | 114,383       | 141,868       | 156,500       | 156,500       | 156,500       | 156,500       | 156,500       | 156,500       |
| 5        | Industrial - Inside [1]                   | 2,074,325     | 2,715,921     | 2,744,802     | 3,019,300     | 3,019,300     | 3,019,300     | 3,019,300     | 3,019,300     | 3,019,300     |
| 6        | Inside Meter-Related Residence            | 81,875        | 90,239        | 105,512       | 115,600       | 115,600       | 115,600       | 115,600       | 115,600       | 115,600       |
| 7        | Other Public Authority - Inside           | 123,446       | 214,430       | 91,278        | 100,000       | 100,000       | 100,000       | 100,000       | 100,000       | 100,000       |
| 8        | Outside Meter-Related Residence           | -             | 6,234         | 8,034         | 8,800         | 8,800         | 8,800         | 8,800         | 8,800         | 8,800         |
| 9        | Total User Revenues                       | \$ 11,239,653 | \$ 13,105,705 | \$ 14,164,790 | \$ 15,580,600 | \$ 15,580,600 | \$ 15,580,600 | \$ 15,580,600 | \$ 15,580,600 | \$ 15,580,600 |
| 10       | Adjustment for Change in Default Use      | \$ -          | \$ -          | \$ -          | \$ -          | \$ (104,300)  | \$ (104,300)  | \$ (104,300)  | \$ (104,300)  | \$ (104,300)  |
| 11       | Total Net User Revenues                   | \$ 11,239,653 | \$ 13,105,705 | \$ 14,164,790 | \$ 15,580,600 | \$ 15,476,300 | \$ 15,476,300 | \$ 15,476,300 | \$ 15,476,300 | \$ 15,476,300 |

[1] Includes BOD and SS charges

## 2.2.5 Proposed Default Use Adjustment

For residential billing purposes, the City uses average water use over a winter quarter for determining billable sewer flow for its wastewater residential customers. Use of average water use during a winter period as a basis for sewer billing is a common approach, since sewer flow is not metered, and winter use generally reflects indoor water use that is most likely to be conveyed through the sewer system. This winter quarter billable flow is calculated on the most recent history for each residential account. When a new sewer account is created that does not have enough water use history to establish an average winter quarter, the City uses a proxy or default usage level of 6 thousand gallons per month. Based on analysis performed by the City, the default usage level is recommended to be lowered to 5 thousand gallons beginning in 2020. The City estimates 4,200 accounts are typically billed on a default usage basis. As such, reducing the default usage by 1 thousand gallons per month is projected to reduce revenues by about \$104,000. This adjustment is shown on Line 10 of Table 2-3.

## 2.3 Sewer Utility Expenditures

The Sewer Utility's primary cash expenditures include the following operating and capital costs:

- Operation and Maintenance (O&M) Expenses
- Revenue-Financed Capital Improvement Program (CIP) Expenditures
- Existing Debt Service Expenditures

### 2.3.1 Operation and Maintenance Expenses

Table 2-4 presents the recent historical and projected sewer system operation and maintenance (O&M) expenses through the 2024 planning period. The sewer O&M expenses include the collection, treatment, and administrative operating costs incurred by the utility in providing sewer service to the City. Costs related to major capital projects are excluded from Table 2-4 and will be discussed later in this report.

O&M costs for 2019 reflect the approved budget. Projected O&M expenses are escalated from the 2019 budget amounts based on 2.0 percent annual inflation applied uniformly to all existing O&M costs from 2020 through 2024.

Lines 15 through 21 of Table 2-4 include allowances for incremental personnel costs over the five-year projection period. Over the course of the five-year forecast, these incremental costs are phased-in to mitigate the impact to each year's operating cost.

**Table 2-4: Historical and Projected Operation and Maintenance Expenses**

| Line No.                        | Historical                      |           |           | Budgeted  | Projected |           |           |           |           |           |
|---------------------------------|---------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|                                 | 2016                            | 2017      | 2018      | 2019      | 2020      | 2021      | 2022      | 2023      | 2024      |           |
| <b>Billing &amp; Collection</b> |                                 |           |           |           |           |           |           |           |           |           |
| 1                               | Personnel Services              | 132,200   | 153,300   | 190,800   | 183,000   | 186,700   | 190,400   | 194,200   | 198,100   | 202,100   |
| 2                               | Supplies                        | 194,800   | 149,800   | 202,700   | 178,900   | 182,500   | 186,200   | 189,900   | 193,700   | 197,600   |
| 3                               | Other Purchases                 | 317,300   | 363,100   | 388,500   | 394,400   | 402,300   | 410,300   | 418,500   | 426,900   | 435,400   |
| 4                               | Total Billing & Collection      | 644,300   | 666,200   | 782,000   | 756,300   | 771,500   | 786,900   | 802,600   | 818,700   | 835,100   |
|                                 |                                 |           | 3.4%      | 17.4%     | -3.3%     | 2.0%      | 2.0%      | 2.0%      | 2.0%      | 2.0%      |
| <b>Sewer Treatment</b>          |                                 |           |           |           |           |           |           |           |           |           |
| 5                               | Personnel Services              | 1,695,900 | 1,812,300 | 1,876,300 | 1,911,300 | 1,949,500 | 1,988,500 | 2,028,300 | 2,068,900 | 2,110,300 |
| 6                               | Supplies                        | 1,831,000 | 1,805,200 | 1,846,500 | 2,138,600 | 2,181,400 | 2,225,000 | 2,269,500 | 2,314,900 | 2,361,200 |
| 7                               | Other Purchases                 | 94,200    | 110,700   | 96,500    | 107,500   | 109,700   | 111,900   | 114,100   | 116,400   | 118,700   |
| 8                               | Other Financing Uses            | 249,300   | 2,600     | 2,600     | 2,600     | 2,600     | 2,600     | 2,600     | 2,600     | 2,600     |
| 9                               | Total Sewer Treatment Expense   | 3,870,400 | 3,730,800 | 3,821,900 | 4,160,000 | 4,243,200 | 4,328,000 | 4,414,500 | 4,502,800 | 4,592,800 |
|                                 |                                 |           | -3.6%     | 2.4%      | 8.8%      | 2.0%      | 2.0%      | 2.0%      | 2.0%      | 2.0%      |
| <b>Sewer Maintenance</b>        |                                 |           |           |           |           |           |           |           |           |           |
| 10                              | Personnel Services              | 365,300   | 389,000   | 532,700   | 538,500   | 549,200   | 560,200   | 571,400   | 582,800   | 594,500   |
| 11                              | Supplies                        | 309,000   | 463,700   | 306,400   | 340,400   | 347,200   | 354,100   | 361,200   | 368,400   | 375,800   |
| 12                              | Other Purchases                 | 29,600    | 36,400    | 31,300    | 34,500    | 35,200    | 35,900    | 36,600    | 37,300    | 38,000    |
| 13                              | Other Financing Uses            | 38,700    | 1,300     | 51,300    | 1,300     | 1,300     | 1,300     | 1,300     | 1,300     | 1,300     |
| 14                              | Total Sewer Maintenance Expense | 742,600   | 890,400   | 921,700   | 914,700   | 932,900   | 951,500   | 970,500   | 989,800   | 1,009,600 |
|                                 |                                 |           | 19.9%     | 3.5%      | -0.8%     | 2.0%      | 2.0%      | 2.0%      | 2.0%      | 2.0%      |
| <b>Incremental O&amp;M</b>      |                                 |           |           |           |           |           |           |           |           |           |
| 15                              | Heavy Equipment Operator        | -         | -         | -         | -         | 57,300    | 58,500    | 59,700    | 60,900    | 62,100    |
| 16                              | Laborer I                       | -         | -         | -         | -         | -         | 47,300    | 48,300    | 49,300    | 50,300    |
| 17                              | WW Maintenance Electrician      | -         | -         | -         | -         | 69,600    | 71,000    | 72,400    | 73,800    | 75,300    |
| 18                              | Chief Operator to WWTP Manager  | -         | -         | -         | -         | 25,500    | 26,000    | 26,500    | 27,000    | 27,500    |
| 19                              | WWTP Maintenance Personnel      | -         | -         | -         | -         | -         | -         | 64,000    | 65,300    | 66,600    |
| 20                              | Maintenance Plant Technician    | -         | -         | -         | -         | -         | -         | -         | 60,600    | 61,800    |
| 21                              | Total Incremental O&M           | -         | -         | -         | -         | 152,400   | 202,800   | 270,900   | 336,900   | 343,600   |
|                                 |                                 |           |           |           |           |           | 33.1%     | 33.6%     | 24.4%     | 2.0%      |
| 22                              | Total O&M                       | 5,257,300 | 5,287,400 | 5,525,600 | 5,831,000 | 6,100,000 | 6,269,200 | 6,458,500 | 6,648,200 | 6,781,100 |
|                                 |                                 |           | 0.6%      | 4.5%      | 5.5%      | 4.6%      | 2.8%      | 3.0%      | 2.9%      | 2.0%      |

[1] All projected costs are assumed to inflate at 2%

### 2.3.2 Projected Capital Improvement Expenditures

Table 2-5 presents the projected capital improvement (CIP) expenditures anticipated for the planning period. The CIP used for this Study is based on the five-year capital planning estimates developed by the City. Overall, the total CIP through 2024 amounts to \$46.7 million and includes projects ranging from truck and pump replacement to sewer interceptor replacement. Improvements are anticipated throughout the system, including projects at the treatment plant, lift stations, interceptors, force mains and other components of the collection system. Improvements will enable the rehabilitation of existing critical infrastructure, help mitigate infiltration and inflow into the collection system, and help manage peak flow during wet weather events.

**Table 2-5: Capital Improvement Program**

| Line No. | Budgeted   | Projected |           |           |           |           | Total     |            |
|----------|--|-----------|-----------|-----------|-----------|-----------|-----------|------------|
|          |  | 2019      | 2020      | 2021      | 2022      | 2023      |           | 2024       |
| 1        | Replacement Computer                                       | 850       | -         | -         | -         | -         | -         | 850        |
| 2        | Rehabilitate Able Body Lift Station                        | 15,000    | -         | -         | -         | -         | -         | 15,000     |
| 3        | Twin Equalization Basin Rehabilitation - Phase 2           | 175,000   | -         | -         | -         | -         | -         | 175,000    |
| 4        | Digester Rehabilitation - Turkey Creek                     | 200,000   | -         | -         | -         | -         | -         | 200,000    |
| 5        | Replacement Boiler - Turkey Creek                          | 225,000   | -         | -         | -         | -         | -         | 225,000    |
| 6        | Control Panels SCADA - Remaining Lift Stations             | 65,000    | -         | -         | -         | -         | -         | 65,000     |
| 7        | Replacement 1 1/2 - Ton Truck with Crane Body              | 95,000    | -         | -         | -         | -         | -         | 95,000     |
| 8        | Replacement Truck with Utility Vehicle                     | 12,000    | -         | -         | -         | -         | -         | 12,000     |
| 9        | Replacement Generator - Filmore Bridge Lift Station        | 65,000    | -         | -         | -         | -         | -         | 65,000     |
| 10       | Portable Compressor  | 3,000     | -         | -         | -         | -         | -         | 3,000      |
| 11       | Replacement High-End Computer                              | 1,750     | -         | -         | -         | -         | -         | 1,750      |
| 12       | Replacement Ruggedized Laptop Computer (4)                 | 17,600    | -         | -         | -         | -         | -         | 17,600     |
| 13       | 7th Street East Annexation Sanitary Sewer Extension        | 400,000   | -         | -         | -         | -         | -         | 400,000    |
| 14       | I / I Rehabilitation                                       | 1,750,000 | -         | -         | -         | -         | -         | 1,750,000  |
| 15       | Parallel Line from Fillmore Bridge                         | 2,500,000 | -         | -         | -         | -         | -         | 2,500,000  |
| 16       | Peak Flow Storage Study - Phase 2                          | 300,000   | -         | -         | -         | -         | -         | 300,000    |
| 17       | Replacement Pressure Main - 44th & Virginia                | 500,000   | -         | -         | -         | -         | -         | 500,000    |
| 18       | Parallel Line Tin Cup to Filmore Bridge Lift Station Desig | 500,000   | -         | -         | -         | -         | -         | 500,000    |
| 19       | Water's Edge Project                                       | -         | -         | 931,100   | -         | -         | -         | 931,100    |
| 20       | Replace Rodder Truck                                       | -         | 300,000   | -         | -         | -         | -         | 300,000    |
| 21       | Lone Elm Interceptor Project                               | -         | -         | 500,000   | 1,000,000 | 1,500,000 | -         | 3,000,000  |
| 22       | Inflow & Infiltration (Part of Plan w/DNR)                 | -         | 1,750,000 | 1,500,000 | 1,500,000 | 1,500,000 | 1,500,000 | 7,750,000  |
| 23       | Tertiary Filter Replacement                                | 1,800,000 | -         | -         | -         | -         | -         | 1,800,000  |
| 24       | Replace Junction Box Soccer Field                          | -         | 200,000   | -         | -         | -         | -         | 200,000    |
| 25       | Install Parallel Gravity from Junction box to Lone Elm     | -         | 1,200,000 | -         | -         | -         | -         | 1,200,000  |
| 26       | Replace WEMCO Pump   | -         | -         | -         | -         | -         | -         | -          |
| 27       | Freightliner   | -         | 225,000   | -         | -         | -         | -         | 225,000    |
| 28       | Phase I Planning Installation of Offline Storage Basin     | -         | 350,000   | -         | -         | -         | -         | 350,000    |
| 29       | Parallel Force Main Tin Cup to Filmore Bridge              | -         | 2,000,000 | 1,000,000 | -         | -         | -         | 3,000,000  |
| 30       | Roof Replacement for 3 Digereters                          | -         | 775,000   | -         | -         | -         | -         | 775,000    |
| 31       | Replace P/U 4x4 Sampler Truck                              | -         | -         | -         | -         | -         | -         | -          |
| 32       | Replace/Rehab Lift Station                                 | -         | -         | 80,000    | -         | -         | -         | 80,000     |
| 33       | Rehab 60" Main Sewer line                                  | -         | -         | -         | 1,500,000 | -         | -         | 1,500,000  |
| 34       | Replace Media Trickling Filter (TC)                        | -         | -         | -         | -         | -         | 1,100,000 | 1,100,000  |
| 35       | Replace WEMCO Pump   | -         | -         | -         | -         | -         | -         | -          |
| 36       | Dump Truck   | -         | -         | -         | 200,000   | -         | -         | 200,000    |
| 37       | Mower  | -         | -         | -         | -         | -         | -         | -          |
| 38       | Replace P/U  | -         | -         | -         | -         | -         | -         | -          |
| 39       | Rehab Digestors  | -         | -         | 300,000   | -         | -         | -         | 300,000    |
| 40       | Install Equipment Building TC WWTP                         | -         | -         | -         | 700,000   | -         | -         | 700,000    |
| 41       | Rehab 44th Street & Virginia Lift Station                  | -         | -         | 300,000   | -         | -         | -         | 300,000    |
| 42       | Glendale Interceptor Sewer Replacement Phase 1             | -         | -         | 842,700   | -         | -         | -         | 842,700    |
| 43       | Glendale Interceptor Sewer Replacement Phase 2             | -         | -         | -         | 837,300   | -         | -         | 837,300    |
| 44       | Replace/Rehab Lift Station                                 | -         | -         | -         | 85,000    | -         | -         | 85,000     |
| 45       | Replace Pressure Main                                      | -         | -         | -         | 500,000   | -         | -         | 500,000    |
| 46       | Replace WEMCO Pump   | -         | -         | -         | -         | -         | -         | -          |
| 47       | Replace Generators & Pumps at Misc. Lift Stations          | -         | -         | -         | 185,000   | -         | -         | 185,000    |
| 48       | Replace P/U Truck  | -         | -         | -         | -         | -         | -         | -          |
| 49       | Equalization Basin Rehab TC WWTP                           | -         | -         | -         | -         | -         | 250,000   | 250,000    |
| 50       | Install Equipment Building SC WWTP                         | -         | -         | -         | -         | 700,000   | -         | 700,000    |
| 51       | VACTOR Truck   | -         | -         | -         | 350,000   | -         | -         | 350,000    |
| 52       | Install Offline Storage Detention Basin                    | -         | -         | -         | 1,500,000 | 2,000,000 | -         | 3,500,000  |
| 53       | Glendale Interceptor Sewer Replacement Phase 3             | -         | -         | -         | -         | 823,100   | -         | 823,100    |
| 54       | I-44 Interceptor Sewer Replacement                         | -         | -         | -         | -         | -         | 2,000,000 | 2,000,000  |
| 55       | RODDER TRUCK   | -         | -         | -         | -         | -         | 350,000   | 350,000    |
| 56       | Replace/Rehab Lift Station                                 | -         | -         | -         | -         | 85,000    | -         | 85,000     |
| 57       | Buy new Jetter Truck                                       | -         | -         | -         | -         | 250,000   | -         | 250,000    |
| 58       | Replace/Rehab Lift Station                                 | -         | -         | -         | -         | 250,000   | -         | 250,000    |
| 59       | Replace Pressure   | -         | -         | -         | -         | 150,000   | -         | 150,000    |
| 60       | Rehab Trickling Filter (TC)                                | -         | -         | -         | -         | -         | -         | -          |
| 61       | Pumps for in plant operations                              | -         | -         | -         | -         | -         | 320,000   | 320,000    |
| 62       | Scrubbers for Bio Gas (Two)                                | -         | -         | -         | -         | 150,000   | -         | 150,000    |
| 63       | Piston Pump  | -         | -         | -         | -         | 300,000   | -         | 300,000    |
| 64       | Peterbilt Press VAC  | -         | -         | -         | -         | 225,000   | -         | 225,000    |
| 65       | I-44 Interceptor Sewer Replacement                         | -         | -         | -         | -         | -         | -         | -          |
| 66       | Rehab Clarifier  | -         | -         | -         | -         | -         | 125,000   | 125,000    |
| 67       | Replace Pumps  | -         | -         | -         | -         | -         | 55,000    | 55,000     |
| 68       | Replace Media in Digester                                  | -         | -         | -         | -         | -         | 80,000    | 80,000     |
| 69       | Clean-out of Digester                                      | -         | -         | -         | -         | -         | -         | -          |
| 70       | Replace Pressure Main                                      | -         | -         | -         | -         | -         | 1,000,000 | 1,000,000  |
| 71       | Replace Control Boxes                                      | -         | -         | -         | -         | -         | 150,000   | 150,000    |
| 72       | Replace P/U Truck  | -         | -         | -         | -         | -         | -         | -          |
| 73       | Replace SS Main Trunk Line                                 | -         | -         | -         | -         | -         | 1,000,000 | 1,000,000  |
| 74       | New Development Project                                    | -         | 320,000   | 320,000   | 320,000   | 320,000   | 320,000   | 1,600,000  |
| 75       | Total  | 8,625,200 | 7,120,000 | 5,773,800 | 8,677,300 | 8,253,100 | 8,250,000 | 46,699,400 |

### 2.3.3 Projected Debt Service Requirements

The City currently has four outstanding sewer system debt issues, summarized in Table 2-6. The Series 2009 and 2010 debt will be fully amortized in 2031, the Series 2011 debt will be fully amortized in 2033, and the Series 2014 debt will be fully amortized in 2035.

All proposed CIP will be funded on a pay-as-you-go basis, with no new debt issuance anticipated during the Study period.

**Table 2-6: Existing and Proposed Debt Service**

| Line No. |                                    | Budgeted       | Projected      |                |                |                |                |
|----------|------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|
|          |                                    | 2019           | 2020           | 2021           | 2022           | 2023           | 2024           |
|          | <b><u>Existing Debt Issues</u></b> |                |                |                |                |                |                |
| 1        | Series 2009                        | 82,515         | 83,993         | 84,353         | 84,793         | 85,110         | 85,606         |
| 2        | Series 2010                        | 378,733        | 400,674        | 400,687        | 398,863        | 400,828        | 400,848        |
| 3        | Series 2011                        | 1,600,522      | 1,713,001      | 1,716,685      | 1,720,674      | 1,723,946      | 1,728,479      |
| 4        | Series 2014                        | <u>150,625</u> | <u>162,685</u> | <u>162,831</u> | <u>164,815</u> | <u>165,837</u> | <u>166,695</u> |
| 5        | Total Existing Debt Service        | 2,212,400      | 2,360,400      | 2,364,600      | 2,369,100      | 2,375,700      | 2,381,600      |
|          | <b><u>Proposed Debt [1]</u></b>    |                |                |                |                |                |                |
| 6        | N/A                                | -              | -              | -              | -              | -              | -              |

[1] No new issuance included in the plan

[2] Does not include the debt administrative fee

Sewer administrative fees are included in the cashflow in Table 2-7.

## 2.4 Sewer Utility Financial Plan Cash Flow

Table 2-7 presents a cash flow that evaluates the sufficiency of revenues under existing rates to meet future cash requirements of the system.

Line 1 of Table 2-7 shows net user revenues under existing rates as shown previously on Table 2-1. Lines 2 through 6 of Table 2-7 present proposed revenue increases needed to finance the City's operating and capital costs for the planning period and sustain reserves. Beginning in 2020, a levelized plan of 5.0 percent increases are proposed to be implemented annually through 2024.

The first proposed increase is anticipated to take effect in April of 2020. All other proposed increases are anticipated to take effect in January of their respective years. With input from City Finance, the incremental revenue associated with the proposed increases has been adjusted to prudently reflect price elasticity associated with the proposed increases.

Other revenues are shown on Lines 9 through 14 of Table 2-7. These revenue streams are based on the 2019 Budget and are estimated to remain constant over the forecast period. Line 15 summarizes the total operating revenues forecasted over the study period. Including proposed revenue adjustments, total Sewer Utility operating revenues are projected to range from \$15.8 million in 2019 to \$19.0 million in 2024.

Operating revenue requirements are shown on Lines 16 through 23 of Table 2-7 and include O&M expenses, transfers to the General Fund, and existing debt service payments and associated debt administrative fees. O&M expenses, identified previously on Line 22 of Table 2-4, are shown on Line 16 of Table 2-7. Transfers to the General Fund are based on the 2019 Budget and inflated at 2.0 percent annually, consistent with all other O&M. Total Debt Service on Line 22 of Table 2-7 includes existing debt shown previously in Table 2-6, and the Missouri Department of Natural Resources debt administrative fee shown on Line 20. Line 23 summarizes total operating revenue requirements for each year of the Study period.

Annual operating balance is shown on Line 24 and is determined by deducting total revenue requirements, Line 23, from the grand total sewer revenue found on Line 15.

Lines 25 through 29 projects the operating fund balance. The 2018 audit indicates an ending unrestricted net position of \$10.7 million and represents the beginning balance shown on Line 25 of Table 2-7. Note that this amount excludes restricted reserves of \$3.7 million for capital replacement and \$0.4 million for debt service. The annual operating cash projected to be generated by each fiscal year, shown previously on Line 24, is added to the operating balance on Line 26. As a matter of policy, the utility is targeting a minimum operating reserve of \$5.0 million. After taking into consideration the beginning balance and annual cash flow, any monies in excess of the minimum reserve target are considered available for capital projects and are transferred to the capital flow of funds as represented on Line 27.



**Table 2-7: Projected Sewer Utility Cash Flow**

| Line No.                                     | Budget   |                   | Projected         |                   |                   |                   |
|--|--|-------------------|-------------------|-------------------|-------------------|-------------------|
|  | 2019   | 2020              | 2021              | 2022              | 2023              | 2024              |
| <b>Sewer Utility Operating Flow of Funds</b> |  |                   |                   |                   |                   |                   |
| 1  | Net Revenue [1]                                  | 15,580,600        | 15,476,300        | 15,476,300        | 15,476,300        | 15,476,300        |
| <b>Proposed Revenue Adjustments [2]</b>      |  |                   |                   |                   |                   |                   |
|  | Year   | Month             | Increase          |                   |                   |                   |
| 2  | 2020   | 5                 | 5.0%              | 412,700           | 619,100           | 619,100           |
| 3  | 2021   | 2                 | 5.0%              | 590,200           | 643,800           | 643,800           |
| 4  | 2022   | 2                 | 5.0%              |                   | 613,800           | 669,600           |
| 5  | 2023   | 2                 | 5.0%              |                   | 638,300           | 696,400           |
| 6  | 2024   | 2                 | 5.0%              |                   |                   | 663,900           |
| 7  | Total Proposed Additional Revenue                | -                 | 412,700           | 1,209,300         | 1,876,700         | 2,570,800         |
| 8  | Total Sewer User Charge Revenue                  | 15,580,600        | 15,889,000        | 16,685,600        | 17,353,000        | 18,047,100        |
| <b>Other Revenue</b>                         |  |                   |                   |                   |                   |                   |
| 9  | Charges and Assessments                          | 160,600           | 160,600           | 160,600           | 160,600           | 160,600           |
| 10   | Other Income and Donations                       | 22,100            | 22,100            | 22,100            | 22,100            | 22,100            |
| 11   | Federal Grants                                   | -                 | -                 | -                 | -                 | -                 |
| 12   | State Grants                                     | -                 | -                 | -                 | -                 | -                 |
| 13   | Local Grants                                     | -                 | -                 | -                 | -                 | -                 |
| 14   | Total Other Revenue                              | 182,700           | 182,700           | 182,700           | 182,700           | 182,700           |
| 15   | <b>Grand Total Sewer Revenue</b>                 | <b>15,763,300</b> | <b>16,071,700</b> | <b>16,868,300</b> | <b>17,535,700</b> | <b>18,229,800</b> |
| <b>Revenue Requirements</b>                  |  |                   |                   |                   |                   |                   |
| 16   | Operation and Maintenance Expense                | 5,831,000         | 6,100,000         | 6,269,200         | 6,458,500         | 6,648,200         |
| 17   | Transfers Out                                    | 1,447,800         | 1,476,800         | 1,506,300         | 1,536,400         | 1,567,100         |
| 18   | Total O&M  | 7,278,800         | 7,576,800         | 7,775,500         | 7,994,900         | 8,215,300         |
| <b>Debt Service</b>                          |  |                   |                   |                   |                   |                   |
| 19   | Existing Debt                                    | 2,212,400         | 2,360,400         | 2,364,600         | 2,369,100         | 2,375,700         |
| 20   | Debt Admin Fee                                   | 143,600           | 135,200           | 126,600           | 116,100           | 108,900           |
| 21   | Proposed Debt                                    | -                 | -                 | -                 | -                 | -                 |
| 22   | Total Debt Service                               | 2,356,000         | 2,495,600         | 2,491,200         | 2,485,200         | 2,484,600         |
| 23   | <b>Total Revenue Requirements</b>                | <b>9,634,800</b>  | <b>10,072,400</b> | <b>10,266,700</b> | <b>10,480,100</b> | <b>10,699,900</b> |
| 24   | <b>Annual Operating Balance</b>                  | <b>6,128,500</b>  | <b>5,999,300</b>  | <b>6,601,600</b>  | <b>7,055,600</b>  | <b>8,091,000</b>  |
| 25   | Beginning Balance                                | 10,672,900        | 5,000,000         | 5,000,000         | 5,000,000         | 5,000,000         |
| 26   | Annual Operating Balance                         | 6,128,500         | 5,999,300         | 6,601,600         | 7,055,600         | 7,529,900         |
| 27   | Transfers to Capital                             | (11,801,400)      | (5,999,300)       | (6,601,600)       | (7,055,600)       | (7,529,900)       |
| 28   | <b>Ending Balance</b>                            | <b>5,000,000</b>  | <b>5,000,000</b>  | <b>5,000,000</b>  | <b>5,000,000</b>  | <b>5,000,000</b>  |
| 29   | Op. Reserve Target [3]                           | 5,000,000         | 5,000,000         | 5,000,000         | 5,000,000         | 5,000,000         |
| <b>Sewer Utility Capital Flow of Funds</b>   |  |                   |                   |                   |                   |                   |
| <b>Sources</b>                               |  |                   |                   |                   |                   |                   |
| 30   | Beginning Balance Capital Funds                  | -                 | 3,176,200         | 2,055,500         | 2,883,400         | 1,261,700         |
| 31   | Transfer from Operations                         | 11,801,400        | 5,999,300         | 6,601,600         | 7,055,600         | 7,529,900         |
| 32   | Anticipated Grants                               | -                 | -                 | -                 | -                 | -                 |
| 33   | Debt Issuance                                    | -                 | -                 | -                 | -                 | -                 |
| 34   | <b>Total Capital Sources</b>                     | <b>11,801,400</b> | <b>9,175,500</b>  | <b>8,657,100</b>  | <b>9,939,000</b>  | <b>8,629,500</b>  |
| <b>Uses</b>                                  |  |                   |                   |                   |                   |                   |
| 35   | Capital Improvement Projects                     | 8,625,200         | 7,120,000         | 5,773,700         | 8,677,300         | 8,253,100         |
| 36   | Bond Issuance Expense                            | -                 | -                 | -                 | -                 | -                 |
| 37   | <b>Total Capital Uses</b>                        | <b>8,625,200</b>  | <b>7,120,000</b>  | <b>5,773,700</b>  | <b>8,677,300</b>  | <b>8,253,100</b>  |
| 38   | <b>Annual Capital Balance</b>                    | <b>3,176,200</b>  | <b>2,055,500</b>  | <b>2,883,400</b>  | <b>1,261,700</b>  | <b>538,500</b>    |
| <b>Debt Service Coverage</b>                 |  |                   |                   |                   |                   |                   |
| 39   | Net Operating Revenue Available for Debt Service | 9,932,300         | 9,971,700         | 10,599,100        | 11,077,200        | 11,581,600        |
| 40   | Annual Debt Service                              | 2,356,000         | 2,495,600         | 2,491,200         | 2,485,200         | 2,484,600         |
| 41   | Debt Service Coverage                            | 4.22              | 4.00              | 4.25              | 4.46              | 4.66              |
| <b>Affordability Projection</b>              |  |                   |                   |                   |                   |                   |
| 42   | Typical Monthly Wastewater Bill [4]              | 41.91             | 43.99             | 46.20             | 48.49             | 50.92             |
| 43   | Median Household Income [5]                      | 42,565            | 43,337            | 44,122            | 44,922            | 45,736            |
| 44   | Annual Average Bill/ MHI [6]                     | 1.18%             | 1.22%             | 1.26%             | 1.30%             | 1.34%             |

[1] Assumes default use is reduced from 6 kgal to 5 kgal beginning in 2020

[2] Effectiveness of proposed revenue increases is reduced 20%

[3] Operating Reserve Target is roughly 70% of annual O&M

[4] The typical bill calculation reflects average use of 5 kgal per month. Future bills reflect proposed increases of 5% per year in FY 2020 through 2024

[5] MHI based on 5-Year American Community Survey 2017 estimate. Forecasted MHI assumes 1.81% annual increases based on historical rate of change since 2009.

[6] (Monthly Bill x 12) / MHI

Capital sources and uses of funds are shown on Lines 30 through 38 of Table 2-7. The primary source of funds for capital projects are the transfers from operations shown on Line 31. There are no proposed debt issuances with the financial plan for the funding of capital projects, as shown on Line 33. Uses of funds are shown on Line 35 and match the total CIP shown on Line 75 of Table 2-5. Line 38 shows a positive annual capital balance for all the years of the forecast.

Lines 39 through 41 evaluate the debt service coverage requirements for the City. Debt service coverage is shown on Line 41. Debt service coverage is a frequent requirement in bond covenants associated with utility revenue bonds. This coverage ratio is calculated as follows:

$$\left( \frac{\text{Grand Total Sewer Revenue} - \text{O\&M Expense}}{\text{Total Debt Service}} \right)$$

Debt service coverage represents a degree of security to bondholders that the utility could encounter lower revenues or higher O&M and still have the financial capacity to pay annual debt service. The City has an internal debt service coverage target of 1.5x. As shown on Line 41 the City is above this internal target throughout the Study period.

Lines 42 through 44 provide some context regarding the affordability of wastewater bills. One of the measures utilized by the Environmental Protection Agency (EPA) in considering the burden associated with Consent Decrees is the “residential indicator.” This indicator compares the annual wastewater bill of a residential user to median household income (MHI). For the purpose of this analysis, 5 thousand gallons a month has been used to calculate the annual wastewater bill. Dividing the 2019 annual wastewater bill by the City of Joplin’s MHI indicates that wastewater bills generally represent about 1.18 percent of MHI. Generally speaking, the EPA considers this ratio to be “high burden” when it exceeds 2.0 percent.

This ratio has been projected out through the Study period by inflating MHI based on growth in the City’s MHI since 2009, as shown on Line 43. The cost for annual wastewater service is increasing by 5.0 percent annually as has been proposed in the financial plan, as shown on Line 42. At the end of the Study period, it is estimated that wastewater bills will represent approximately 1.38 percent of MHI, well below a high burden designation.

### **3.0 PROPOSED RATE DESIGN**

#### **3.1 Introduction**

The primary focus of Step 2, Rate Design is the development of proposed rates. The objective of rate design is to design rates for the utility that generate adequate revenues to meet the projected operating and capital costs, while sustaining the utility's sound financial performance.

#### **3.2 Existing and Proposed Wastewater Rates**

The existing schedule of wastewater rates, which was shown previously in Table 2-2, became effective January 1, 2019. The existing rates feature a monthly facility charge based on meter size and a volume charge per 1,000 gallons. Outside City rates are based on a 30 percent differential over Inside City rates. Industrial customers with high strength discharge are monitored and assessed a surcharge based on pounds in excess of domestic strength.

Existing and proposed wastewater rates are shown in Table 3-1. Proposed wastewater rates were designed using the existing rate structure, adjusted proportionately in accordance with the system adjustments summarized in Table 2-7. Proposed rates for 2020 are assumed to be effective in April 2020, while all subsequent rates are assumed to be effective on January 1 of each fiscal year.

**Table 3-1: Proposed Wastewater Rates**

| Line No.                                 | Description                         | Existing  | Proposed  |           |           |           |           |
|--|-------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|
|  |                                     | 2019      | 2020      | 2021      | 2022      | 2023      | 2024      |
| <b>INSIDE CITY</b>                       |                                     |           |           |           |           |           |           |
| <b>Monthly Facility Charge - \$/bill</b> |                                     |           |           |           |           |           |           |
| 1  | 3/4" or smaller                     | \$ 31.56  | \$ 33.14  | \$ 34.80  | \$ 36.54  | \$ 38.37  | \$ 40.29  |
| 2  | 1"                                  | \$ 40.51  | \$ 42.54  | \$ 44.67  | \$ 46.90  | \$ 49.25  | \$ 51.71  |
| 3  | 1.5"                                | \$ 62.94  | \$ 66.09  | \$ 69.39  | \$ 72.86  | \$ 76.50  | \$ 80.33  |
| 4  | 2"                                  | \$ 89.82  | \$ 94.31  | \$ 99.03  | \$ 103.98 | \$ 109.18 | \$ 114.64 |
| 5  | 3"                                  | \$ 152.56 | \$ 160.19 | \$ 168.20 | \$ 176.61 | \$ 185.44 | \$ 194.71 |
| 6  | 4"                                  | \$ 242.13 | \$ 254.24 | \$ 266.95 | \$ 280.30 | \$ 294.32 | \$ 309.04 |
| 7  | 6"                                  | \$ 466.20 | \$ 489.51 | \$ 513.99 | \$ 539.69 | \$ 566.67 | \$ 595.00 |
| 8  | <b>Volume Charge - \$/1,000 gal</b> | \$ 2.07   | \$ 2.17   | \$ 2.28   | \$ 2.39   | \$ 2.51   | \$ 2.64   |
| 9  | <b>BOD Surcharge - \$/lb</b>        | \$ 0.87   | \$ 0.91   | \$ 0.96   | \$ 1.01   | \$ 1.06   | \$ 1.11   |
| 10                                       | <b>SS Surcharge - \$/lb</b>         | \$ 0.53   | \$ 0.56   | \$ 0.59   | \$ 0.62   | \$ 0.65   | \$ 0.68   |
| <b>OUTSIDE CITY</b>                      |                                     |           |           |           |           |           |           |
| <b>Monthly Facility Charge - \$/bill</b> |                                     |           |           |           |           |           |           |
| 11                                       | 3/4" or smaller                     | \$ 41.03  | \$ 43.08  | \$ 45.24  | \$ 47.50  | \$ 49.88  | \$ 52.38  |
| 12                                       | 1"                                  | \$ 52.66  | \$ 55.30  | \$ 58.07  | \$ 60.97  | \$ 64.03  | \$ 67.22  |
| 13                                       | 1.5"                                | \$ 81.82  | \$ 85.92  | \$ 90.21  | \$ 94.72  | \$ 99.45  | \$ 104.43 |
| 14                                       | 2"                                  | \$ 116.77 | \$ 122.60 | \$ 128.74 | \$ 135.17 | \$ 141.93 | \$ 149.03 |
| 15                                       | 3"                                  | \$ 198.33 | \$ 208.25 | \$ 218.66 | \$ 229.59 | \$ 241.07 | \$ 253.12 |
| 16                                       | 4"                                  | \$ 314.77 | \$ 330.51 | \$ 347.04 | \$ 364.39 | \$ 382.62 | \$ 401.75 |
| 17                                       | 6"                                  | \$ 606.06 | \$ 636.36 | \$ 668.19 | \$ 701.60 | \$ 736.67 | \$ 773.50 |
| 18                                       | <b>Volume Charge - \$/1,000 gal</b> | \$ 2.69   | \$ 2.82   | \$ 2.96   | \$ 3.11   | \$ 3.26   | \$ 3.43   |
| 19                                       | <b>BOD Surcharge - \$/lb</b>        | \$ 1.13   | \$ 1.18   | \$ 1.25   | \$ 1.31   | \$ 1.38   | \$ 1.44   |
| 20                                       | <b>SS Surcharge - \$/lb</b>         | \$ 0.69   | \$ 0.73   | \$ 0.77   | \$ 0.81   | \$ 0.85   | \$ 0.88   |

### 3.3 Typical Bills and Residential Bill Comparison

A comparison of a typical monthly wastewater bill for a residential customer with 5 thousand gallons of billable flow has been calculated under existing and proposed rates in Table 3-2. In 2020, the monthly wastewater bill for an average residential customer under proposed rates will be \$2.08 more per month. The percentage adjustment of the residential typical bill is shown on Line 3 and correlates to the overall system revenue increase for each fiscal year.

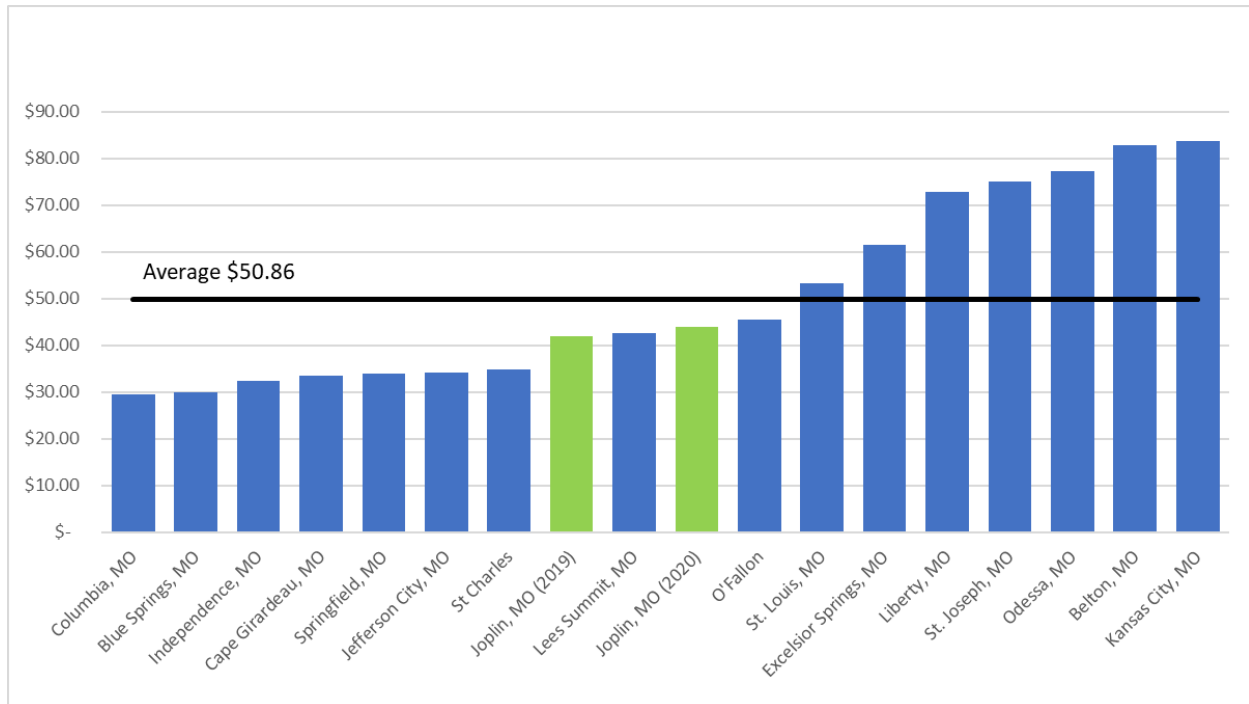
**Table 3-2: Proposed Monthly Wastewater Bills**

| Line No.                             | Description              | Billable Flow Kgal | Existing 2019 | Proposed Monthly Bill |          |          |          |          |
|--------------------------------------|--------------------------|--------------------|---------------|-----------------------|----------|----------|----------|----------|
|                                      |                          |                    |               | 2020                  | 2021     | 2022     | 2023     | 2024     |
| 1                                    | Typical Residential Bill | 5.0                | \$ 41.91      | \$ 43.99              | \$ 46.20 | \$ 48.49 | \$ 50.92 | \$ 53.49 |
| Incremental Increase in Typical Bill |                          |                    |               |                       |          |          |          |          |
| 2                                    | Dollars                  |                    |               | \$ 2.08               | \$ 2.21  | \$ 2.29  | \$ 2.43  | \$ 2.57  |
| 3                                    | Percentage               |                    |               | 5.0%                  | 5.0%     | 5.0%     | 5.0%     | 5.0%     |

A comparison of monthly Residential typical bills from other regional wastewater utilities was also completed and is shown in Figure 3-1. Under existing rates, the typical Joplin residential bill is indicated to be in the middle within this regional comparison. Under proposed rates, the position of Joplin’s typical residential bill remains in the middle when compared to other regional and state wastewater utilities. It should also be noted that it is likely that surrounding community’s sewer rates will increase in the future as well.

Overall, the comparison shown in Figure 3-1 indicates that the typical residential wastewater bill under proposed rates is competitively positioned among regional wastewater utilities.

**Figure 3-1: Residential Monthly Bill Comparison**



### **3.4 Statement of Limitations**

In preparation of the City of Joplin Sewer Rate Study (Study), Burns & McDonnell relied upon information provided by the City. The information included various analyses, computer-generated information and reports, audited financial reports, and other financial and statistical information, as well as other documents such as operating budgets and current retail water rate schedules. In addition, input to key assumptions regarding expected future levels of revenue, sales, and expenditures was provided by City staff to Burns & McDonnell. While Burns & McDonnell has no reason to believe that the information provided, and upon which Burns & McDonnell has relied, is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee its accuracy or completeness.

Estimates and projections prepared by Burns & McDonnell relating to financial forecasting and costs are based on Burns & McDonnell's experience, qualifications, and judgment as a professional consultant. Since Burns & McDonnell has no control over weather, cost and availability of labor, material and equipment, labor productivity, contractors' procedures and methods, unavoidable delays, economic conditions, government regulations and laws (including interpretation thereof), competitive bidding, and market conditions or other factors affecting such estimates or projections, Burns & McDonnell does not guarantee the accuracy of its estimates or predictions.



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