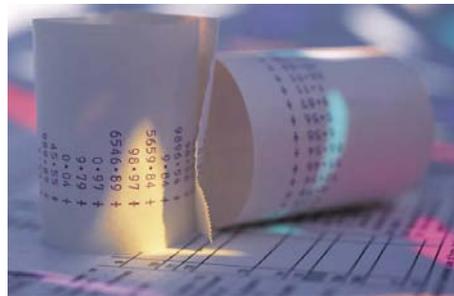


Draft Report

City of Bozeman

Comprehensive Wastewater Rate Study

April 2007



HDR *Prepared by:*
HDR Engineering, Inc.



May 8, 2007

DRAFT

Ms. Anna Rosenberry, CPA
Finance Director
City of Bozeman
411 E Main Street
P.O. Box 1230
Bozeman, Montana 59771-1230

Dear Ms. Rosenberry:

HDR Engineering Inc. (HDR) is pleased to provide the draft final report on the comprehensive wastewater rate study recently completed for the City of Bozeman (City). This report contains a discussion of the process used to develop the wastewater rate study. In addition, contained in the Technical Appendix of this report is a complete set of the exhibits used to develop the study.

This study has been developed based upon data and information supplied by the City to HDR. In addition, this report was prepared using generally accepted wastewater rate setting techniques and methodologies. The accounting, budgeting, billing records, and current revenue requirement analysis for the City were the primary sources for the data contained within the report.

We appreciate your assistance, along with that of the City's management team and staff in the development of this report. We look forward to the opportunity to provide other technical assistance in the future.

Sincerely yours,
HDR Engineering, Inc.

Tom Gould
Vice President

Contents

Executive Summary

Introduction.....	ES-1
Key Wastewater Rate Study Results.....	ES-1
Overview of the Rate Study Process.....	ES-2
Prudent Financial Planning.....	ES-2
Wastewater Rate Study.....	ES-3
Summary.....	ES-10

1 Introduction

1.1 Introduction.....	1-1
1.2 Overview of the Rate Study Process.....	1-1
1.3 Organization of the Study.....	1-2
1.4 Summary.....	1-2

2 Overview of Utility Rate Setting Principles

2.1 Introduction.....	2-1
2.2 Global Principles in Which Rates Should Be Set.....	2-1
2.3 Methods of Accumulating Costs for Wastewater Revenue Requirements.....	2-2
2.4 Economic Theory and Rate Design.....	2-3
2.5 Prudent Financial Planning.....	2-3
2.6 City Financial/Rate Setting Policies.....	2-5
2.7 Summary.....	2-6

3 Development of the Wastewater Utility Rate Study

3.1 Introduction.....	3-1
3.2 Development of the Wastewater Revenue Requirements.....	3-1
3.3 Wastewater Cost of Service Analysis.....	3-9
3.4 Wastewater Rate Designs.....	3-15
3.5 Summary of the Wastewater Rate Study.....	3-20

Technical Appendix

Executive Summary

Introduction

HDR Engineering (HDR) was retained by the City of Bozeman (City) to conduct a comprehensive wastewater rate study. A comprehensive rate study reviews both the adequacy of the City's current rates, as well as the fairness and equity of the rates. This study provides the decision framework for any needed future adjustments.

In developing this study the City's planned capital improvement projects were major cost drivers for the study. The major capital improvement to occur during the time period is the Phase 1 expansion of the City's wastewater treatment plant. Funding for this project will be provided from a combination of rates, bond issuance and impact fees. The amount and timing of this expansion project, along with other capital improvements projects, were key in establishing the financial revenue requirements for the wastewater utility.

Key Wastewater Rate Study Results

Based upon the technical analysis undertaken as a part of this study, the following findings, conclusions and recommendations were noted.

- Minimum wastewater reserve levels are recommended to increase financial stability.
- Wastewater capital funding from rates, equal to or greater than annual depreciation expense, is recommended to ensure adequate funding for replacement of existing infrastructure.
- Phase 1 of the expansion of the wastewater treatment is planned to occur and be operational in 2010. Construction of the treatment plant needs to occur during this time period to meet operational permitting requirements.
- Revenue requirements were developed for the wastewater utility for the period of fiscal year 2007 through 2012. The findings of this study indicate that rate adjustments of 5%, 9%, 9%, 2% and 2% are needed for the respective five years of 2008, 2009, 2010, 2011 and 2012.
- Based upon the findings of the wastewater cost-of-service analyses conducted, there are some interclass differences. A slow ramping in of interclass changes or adjustments is recommended for the wastewater utility.
- The Country Classic Dairy flows to the wastewater plant are at exceptionally high (strength) loading levels. At the same time, the City's treatment plant requires expansion and upgrades, in part, to meet permitting requirements. As such, it is recommended that this customer, due to their high biochemical oxygen demand (BOD) loading levels, should be separated into a separate class of service to provide an equitable and cost-based rate, or until such time that the dairy constructs pretreatment facilities.
- It is recommended that the City establish a new class of service for industrial customers which would include commercial/industrial customers with consistently high loading levels, and do not have pretreatment facilities.

- The City’s overall level of wastewater rates should be adjusted to reflect the above recommendations, but no change in the wastewater rate structure is recommended.

Provided below is the executive summary of the analyses undertaken for the City and the findings, conclusions and recommendations reached as a result of this study.

A comprehensive review of the City’s wastewater rates was undertaken. The wastewater utility was financially evaluated on a “stand-alone” basis. That is, no subsidies between the any other City utilities should occur. By viewing the utility on a stand-alone basis, the need to adequately fund both O&M and capital infrastructure must be balanced against the rate impacts to customers.

Prudent Financial Planning

In developing revenue requirements, the City’s budget documents were used as the initial starting point. However, within the development of the revenue requirements, the analysis should also consider prudent financial planning criteria. The prudent financial planning criteria considered during the development of this study were as follows:

- **ESTABLISHING A MINIMUM FUNDING LEVEL FOR CAPITAL PROJECTS FUNDED FROM RATES** – Prudent financial planning dictates that a utility should fund a certain portion of capital improvement projects from rates on an on-going basis. The general financial guideline used is that at a minimum, a utility should fund an amount equal to or greater than annual depreciation expense.
- **ESTABLISHING A MINIMUM DEBT SERVICE COVERAGE RATIO** – The debt service coverage ratio is an important financial measure that is reviewed by bond rating agencies and banks to evaluate a utility’s ability to make debt service payments. While the City will have a legal obligation to meet a specified minimum DSC, for financial planning purposes it is prudent to plan around meeting a debt service coverage ratio that is above the minimum (e.g. 1.50 – 1.75).
- **ESTABLISHING MINIMUM RESERVE LEVELS** – The City should strive to maintain a cash balance sufficient to meet the total operating expenses for the wastewater utility in order to provide sufficient cash flow to meet daily operating expenses.

These prudent financial planning practices were used within the City’s study.

Wastewater Rate Study

In conducting the wastewater rate study, the three analyses of a comprehensive rate study were conducted; a revenue requirement analysis, a cost of service analysis and the design of rates. Provided below is a summary of each analysis.

Wastewater Revenue Requirement Analysis – The development of the wastewater revenue requirements was the first analysis undertaken. A revenue requirement analysis is used to determine the overall adequacy of the wastewater utility rates.

For this particular analysis, the revenue requirements were developed for the six-year time period of 2007 – 2012. The City’s analysis utilized the “cash-basis” approach to accumulate costs. The cash basis approach sums the wastewater utility’s O&M expenses, debt service and capital improvements from rates to determine the overall funding requirements needed from rates. This approach is the most commonly used methodology to set revenue requirements for municipal utilities.

An important aspect of the wastewater revenue requirements was the proper and adequate funding of capital improvements. The City’s capital improvement plan was used as a starting point. The capital improvement projects were designated by the City as either wastewater fund or impact fee (growth) related projects. The City has planned on approximately \$36.5 million in wastewater fund capital improvements and \$14 million in growth related capital improvements, during the six-year time period. The majority of funding for the planned wastewater fund capital improvements is from rates and \$17.7 million dollar State Revolving Fund loan. The funding for the wastewater growth related capital improvements is from wastewater impact fees.

“An important aspect of the wastewater revenue requirements was the proper and adequate funding of capital improvements.”

A general financial guideline that can be used to determine proper funding levels for capital improvements from rates is that, at a minimum, a utility should fund an amount equal to or greater than annual depreciation expense. The City has historically funded at least 100% or more of annual depreciation expense within their rates for renewal and replacement capital projects. The City should be commended for maintaining this level of funding from rates. This level of funding attempts to close the gap between depreciation expense (original cost) and replacement cost.

A summary of the wastewater revenue requirement analysis is provided below in Table ES-1.

Table ES-1 Summary of the Wastewater Revenue Requirement Analysis (000's)						
	2007	2008	2009	2010	2011	2012
Revenues						
Retail Sales	\$3,999	\$4,454	\$4,676	\$4,909	\$5,154	\$5,412
Other Revenue	161	161	168	162	151	152
Total Revenues	\$4,161	\$4,615	\$4,844	\$5,071	\$5,305	\$5,564
Expenses						
O&M Expenses	\$2,658	\$2,965	\$3,237	\$3,643	\$3,738	\$3,911
Rate Revenues Dedicated to CIP	1,591	1,791	2,510	2,750	2,600	2,700
Current Debt Service	0	0	0	0	0	0
New Debt (Net of Impact Fees)	0	0	42	254	314	274
Total Revenue Requirements	\$4,249	\$4,756	\$5,789	\$6,647	\$6,653	\$6,885
Balance/(Deficiency) of Funds	(\$88)	(\$141)	(\$945)	(\$1,576)	(\$1,347)	(\$1,321)
Bal./(Def.) as a % of Rates (Cumulative)	2.2%	3.2%	20.2%	32.1%	26.1%	24.4%
Proposed Annual Rate Adjustments	0.0%	5.0%	9.0%	9.0%	2.0%	2.0%
Add'l Revenue From Rate Adj.	\$0	\$223	\$655	\$1,129	\$1,289	\$1,461
Bal./(Def.) of Funds After Rate Adj.	(\$88)	\$82	(\$290)	(\$447)	(\$59)	\$140

It should be noted that the balance or deficiencies in any single year are cumulative. That is, any adjustments in the initial years will reduce the deficiency in the following years. Over the six-year period, rates need to be adjusted by approximately 24.4% in order to adequately and properly fund the City's wastewater utility O&M and capital infrastructure needs.

To implement the needed adjustments, a wastewater transition plan was developed. Provided in Table ES-2 is the proposed wastewater utility rate transition plan for the six year period.

Table ES-2 Wastewater Utility – Six Year Rate Transition Plan						
	2007	2008	2009	2010	2011	2012
Present Average Monthly Residential Wastewater Bill [1]	\$21.67					
Proposed Wastewater Rate Adjustments		5.0%	9.0%	9.0%	2.0%	2.0%
Projected Average Monthly Residential Wastewater Bill		\$22.75	\$24.80	\$27.03	\$27.57	\$28.13
\$ Change Per Month		\$1.08	\$2.05	\$2.23	\$0.54	\$0.55
Cumulative \$ Change Per Month		\$1.08	\$3.13	\$5.36	\$5.90	\$6.45

[1] Average bill was assumed a ¾" meter with 6 CCF

Wastewater Cost of Service Analysis – A wastewater cost of service analysis is concerned with the equitable allocation of the total wastewater revenue requirements to the various customer classes of service of the utility. The objectives of the wastewater cost of service analysis are different from determining revenue requirements. A revenue requirement analysis determines the utility's overall financial needs, while the cost of service study determines the "fair and equitable" manner to collect those revenue requirements. A summary of the wastewater utility cost of service analysis is shown within Table ES-3.

Table ES-3
Summary of the Wastewater Utility Cost of Service Analysis for 2008 (\$000's)

Classes of Service	Present Rate Revenues	Allocated Costs	\$ Difference	% Difference
Residential	\$1,690	\$1,543	(\$147)	-8.7%
Low-Income	3	7	4	135.2%
Multi-Family	974	1,007	33	3.4%
Commercial	1,162	1,252	90	7.7%
Commercial – Special	13	13	(0)	-0.8%
Classic Country Dairy [1]	26	103	77	296.1%
Government	55	60	5	8.7%
Government – Special	0	0	0	2.3%
Montana State University	521	601	80	15.3%
Unmetered	9	9	(1)	-7.2%
Total	\$4,454	\$4,595	\$141	3.2%

[1] This table does not include surcharge revenues paid by the Dairy. Currently they pay approximately an additional \$27,000 annually in surcharges. That would increase substantially if this rate structure were maintained and appropriate cost-based surcharges applied.

The cost of service results indicate that cost differences do exist between the major customer classes of service. A simple rule is that a customer class is considered to be paying their fair allocation of costs if the costs of service results are within +/- 5% of the overall adjustment. Therefore, it was determined that a slow ramping in of interclass cost of service adjustments should be made over time. As a result of this decision, each class of service will be adjusted in the design of the proposed rates to reflect the cost of service results.

Classic County Dairy (the “dairy”) currently is in the commercial class of service. For purposes of the cost of service study, the dairy was separated out as an individual customer based on the dairy’s exceptionally high biochemical oxygen demand (BOD) loadings. This study has recommended to the City an approach to work with the Dairy in a positive manner which should allow the dairy to make a business decision as to whether they will invest in pretreatment to reduce their loadings to the City, or alternatively, continue to have the City treat their high BOD wastewater and charge the dairy the appropriate and cost-based rates indicated by this study. A more detailed discussion of this aspect of the study is included within the rate design discussion of the study.

Wastewater Rate Design – The revenue requirement and cost of service results indicate the priority of the City should be to generate an adequate level of funding for the wastewater utility. Therefore, the revenue requirement results were the basis for establishing cost-based rates for the utility. The City currently has seven wastewater classes of service. They are residential, low-

income, multi-family, commercial, government, Montana State University, and unmetered. All of the classes of service are under the same rate schedule. The present rate structure is composed of a service charge and a volume charge. Presented below in Table ES-4 is a summary of the present (2007) wastewater rate schedules.

Table ES-4
Summary of the 2007 Present Wastewater Rates

Rate Components	Current Rate
Service Charge (Monthly) (Low-Income no charge)	\$10.67/Month
Volume Charge (\$/ccf) [1]	
Residential	\$1.80
Low-Income	\$1.80
Multi-Family	\$1.80
Commercial	\$1.80
Government	\$1.80
Montana State University	\$1.80

[1] – CCF of wastewater = One hundred cubic feet of wastewater. 1 CCF of wastewater = 748 gallons

Presented below in Table ES-5 is a summary of the proposed wastewater rates. The multi-family, commercial, government and Montana State University were combined into Non-Residential class of service. The rates collect the proposed overall increase of 5% in rate revenues.

Table ES-5
Summary of the Proposed 2007 Wastewater Rates

	2007	2008	2009	2010	2011	2012
Service Charge (Monthly)						
Residential	\$10.87	\$11.17	\$12.17	\$13.27	\$13.54	\$13.81
Low-Income	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Non-Residential	\$10.87	\$11.41	\$12.44	\$13.56	\$13.83	\$14.11
Industrial (Country Classic)	\$10.87	\$27.36	\$29.82	\$32.50	\$33.15	\$33.81
Volume Charge (\$/ccf)						
Residential	\$1.80	\$1.85	\$2.02	\$2.20	\$2.24	\$2.28
Low-Income	\$1.80	\$1.80	\$1.96	\$2.14	\$2.18	\$2.22
Non-Residential	\$1.80	\$1.89	\$2.06	\$2.25	\$2.30	\$2.35
Industrial (Country Classic)	\$1.80	\$4.53	\$4.94	\$5.38	\$5.49	\$5.60

As can be seen, the dairy was separated from the commercial class into an industrial class of service for customers with high wastewater loadings, and that do not pre-treat their wastewater. The proposed rate for the dairy assumes no change in the operation of the dairy and continued high BOD loadings. This report has recommended an approach for the City to work with the dairy in a positive manner to allow the dairy sufficient time to determine the best approach for the dairy to address this problem. For that reason, this report is not recommending an immediate increase in the dairy's rates, to the levels shown in Table ES-5. Rather, the City should work with the dairy to allow them sufficient time to make a reasoned business decision on the

construction of pretreatment facilities. If the dairy determines that it will build a pretreatment facility, the City should reward them for this decision and hold their rates at the proposed commercial level. This assumes that the City will provide the dairy with a reasonable date for the final completion and start-up of the facility. Failure to meet this completion date could, at the City's discretion, trigger the implementation of the rates as shown in Table ES-5. Finally, if the dairy determines that they will forego building a pretreatment facility, then the City should implement the rates as shown in Table ES-5, since these are cost-based and reflect the impacts to the City's wastewater facility from the high BOD loadings by the dairy.

A full and complete discussion of the development of the comprehensive wastewater rate study and the proposed rate designs can be found in Section 3 of this report.

Summary

The previous discussion has provided an executive summary of the rate analyses undertaken for the City's wastewater utility. In summary, it was concluded that the City's wastewater rates appear to be fair and equitable and set at a level that generally meets the City's current overall costs. A detailed discussion of the analyses undertaken for the City's wastewater utility is contained in the following sections of this report. Included within this report are Technical Appendices, which document all the analyses undertaken, along with our findings and conclusions.

Section 1

Introduction

1.1 Introduction

HDR Engineering, Inc. (HDR) was retained by the City of Bozeman (City) to conduct a comprehensive wastewater rate study. The objective of the rate study was to develop financial plans and cost-based rates necessary to meet the City's operation and maintenance (O&M) needs and the capital improvement program for the wastewater utility. This study determined the adequacy of the existing wastewater rates and provides the framework for any needed future adjustments.

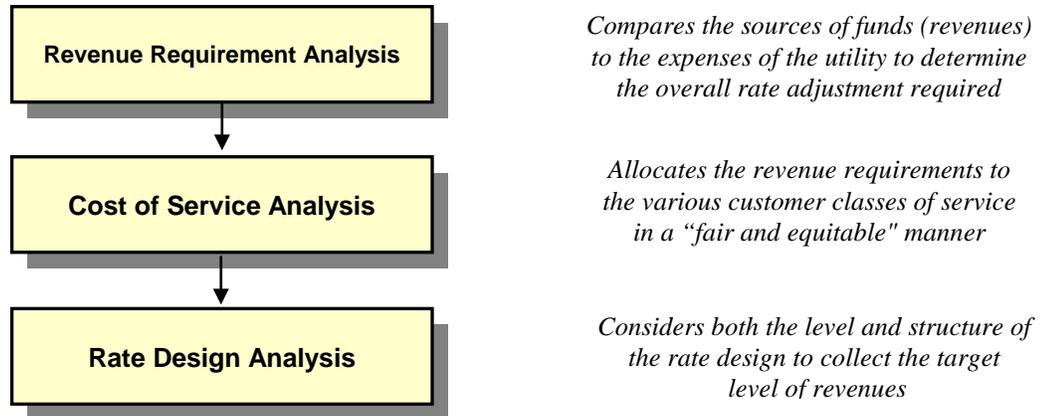
“The objective of the rate study was to develop financial plans and rates necessary to meet the City’s operation and maintenance needs and the capital improvement program for the utility.”

This study is timely in that the City has planned for a significant amount of future improvements to the City's wastewater system. In particular, the expansion of the City's wastewater treatment plant will have a major impact upon the City's wastewater rates. This expansion is required to meet operational permitting requirements and growth-related needs. The City is currently at or exceeding permitting requirements and therefore must complete Phase 1 of the expansion project within this study's projected test (time) period. Given the level of expenditures required, developing a financial plan to fund these projects and to ensure financial and rate stability for the utility was of paramount importance. In developing this study the City's wastewater capital improvement plan was a major cost driver for the study and our findings and recommendations. The amount and timing of these projects were important to the establishment of the overall financial revenue requirements.

1.2 Overview of the Rate Study Process

User rates must be set at a level where a utility's operating and capital expenses are met with the revenues received from customers. This is an important point, as failure to achieve this objective may lead to insufficient funds to maintain system integrity. To evaluate the adequacy of the existing rates, a comprehensive wastewater rate study is often performed. A comprehensive wastewater rate study consists of three interrelated analyses. Figure 1-1 provides an overview of these analyses.

Figure 1-1
Overview of the Comprehensive Rate Analyses



1.3 Organization of the Study

This report is organized in a sequential manner that first provides an overview of utility rate setting principles, followed by sections that detail the specific steps used to review the City's wastewater rates. The following sections comprise the City's wastewater rate study report:

- Section 2 – Overview of Utility Rate Setting Principles
- Section 3 – Development of the Wastewater Rate Analyses

A Technical Appendices is attached at the end of this report, which details the various wastewater rate analyses that were used in the preparation of this report.

1.4 Summary

This report will review the comprehensive wastewater rate analyses prepared for the City of Bozeman. This report has been prepared utilizing "generally accepted" wastewater rate setting techniques. The next section of the report will provide a brief overview of the general rate setting process that was used to analyze and establish the proposed wastewater rates for the City.

Section 2

Overview of Utility Rate Setting Principles

2.1 Introduction

A major objective of conducting a comprehensive wastewater rate study is to determine the adequacy of the existing wastewater rates and provide the basis for any needed adjustments to meet operating and capital needs of the City. At the same time, the study reviewed the fairness and equity of the current wastewater rates.

In developing and establishing utility rates, there are “generally accepted” principles or guidelines around which rates should be set. This section of the report provides a general overview of the methodology and guidelines used for setting cost-based rates for the utility. This should give the reader a better understanding of the general process that is detailed later in this report. In addition, this section of the report discusses the issues of “prudent” financial planning and the use of established financial policies to aid in establishing the City’s rates.

“In developing and establishing utility rates, there are “generally accepted” principles or guidelines around which rates should be set.”

2.2 Global Principles in Which Rates Should Be Set

As a practical matter, there should be a general set of principles around which rates should be set. These guiding principles may be items such as setting rates that are cost-based, equitable, and easy to administer. These types of principles may be referred to as “global principles” since they should be utilized by all utilities in the development of their rates.

Provided below is a brief listing of the global principles around which the City should consider setting its utility rates:

- Rates should be cost-based and equitable, and set at a level able to meet the full revenue requirements of the utility.
- Rates should be easy to understand and administer.
- Rates and the process of allocating costs should conform to generally-accepted rate setting techniques.
- Rates should be stable, in their ability to provide adequate revenues to meet the utility’s financial, operating, and regulatory requirements.
- Rate levels should be stable from year to year from the customer’s perception.

These guiding principles were utilized within this study to help develop utility rates that are cost-based and equitable.

2.3 Methods of Accumulating Costs for Wastewater Revenue Requirements

The convention used by most public utilities to establish their revenue requirements is called the “cash basis” approach of setting rates. As the name implies, a public utility aggregates its cash expenditures for a period of time to determine its required revenues from user rates and other forms of income. This methodology conforms nicely to most public utility budgetary requirements, and is a very straightforward and easily understood calculation. Operation and maintenance expenses are added to any applicable transfer payments to determine total operating expenses. Capital costs are calculated by adding debt service payments (principal and interest) to capital improvements financed with operating rate revenues. Depreciation expense is sometimes included in lieu of this latter item to stabilize annual revenue requirements. Under the “cash basis” of accounting, the sum of the capital and operating expense equals the utility’s revenue requirement during any period of time. It should be noted that the two portions of the capital expense component (debt service and capital improvements financed from rates) are necessary under the “cash basis” approach because utilities generally cannot finance all of their capital facilities with long-term debt. Table 2-1 may be helpful in summarizing the “cash basis” methodology.

Table 2-1
Overview of the “Cash Basis” Methodology

+ O&M Expense
+ Taxes/Transfer Payments
+ Capital Additions Financed with Rate Revenues (\geq Depreciation Exp.)
+ <u>Debt Service (P+I)</u>
= Total Revenue Requirements

2.4 Overview of the Cost Allocation Procedures

After the total revenue requirement has been quantified and determined, it is allocated to the users of the service in a manner that reflects the cost relationships incurred for the delivery of the services. This analytical exercise usually takes the form of a “cost of service” study.

A cost of service study is a three-step approach. First, costs must be functionalized or grouped into the various cost categories related to the providing of service (e.g. for a wastewater utility; collection, pumping, treatment etc.). This step is largely accomplished by the utility’s accounting system. The next step is the classification of the functionalized costs. Classification refers to the arrangement of the functionalized data into cost components. For a wastewater utility, these are typically, volume (flow)-related, strength-related, and customer-related component costs. Each of the cost components are allocated to the various customer classes of service based upon each customer class’ relative contribution to the specific cost component. For example, customer related costs are allocated proportionally to each class of service based upon the total number of customers in that class of service. Once the costs are allocated to each class of service, a measure

of the required level of rate revenues from each class of service to achieve cost-based rates can be determined.

2.5 Economic Theory and Rate Design

The design of the proposed wastewater rates for adoption by the City concludes the rate study process. The rate design process utilizes the results of both the revenue requirement and cost of service analysis to develop rates that achieve the overall goals and objectives of the City. These goals and objectives may include consideration of cost-based rates, but may also consider items such as ability to pay, continuity of past rate philosophy, encouragement of economic development, ease of administration, legal requirements, etc. It is important to understand that cost of service is only one goal or objective in designing final wastewater rates, however, it is an important one.

While the general description of the utility rate setting process discussed in this section of the report is greatly simplified and abbreviated, it does however address the basic elements of contemporary regulatory thinking. One of the major justifications for a comprehensive rate study is founded in economic theory. Economic theory suggests that the price of a commodity must roughly equal its cost, if equity among customers is to be maintained. The implications of this statement on utility rate design are significant. For example, volume-related costs are usually incurred by a wastewater utility to meet flow requirements. Thus, the customers causing peak flows should properly pay for the demand-related facilities in proportion to their contribution to maximum demands. Through refinement of costing and pricing techniques, consumers of a product are given a more accurate price signal of what the costs are for collection and treatment. The above basic thoughts have considerable foundation in economic literature. They also serve as primary guidelines for rate design by most utility regulators and administrative agencies. This “price-equals-cost” concept will provide the basis for much of the subsequent analysis and comment.

2.6 Prudent Financial Planning

In developing revenue requirements, the City’s budget documents are used as the initial starting point. However, within the development of the revenue requirements, the analysis should also consider prudent financial planning criteria. There are three key financial indicators that should be considered in the development of all utility financial plans or revenue requirement analyses. These three financial planning criteria are: establishing minimum funding levels for capital projects funded from rates, establishing a minimum target debt service coverage ratio, and establishing minimum reserve levels. The following discussion provides a brief overview of each of these financial planning indicators.

■ ESTABLISHING A MINIMUM FUNDING LEVEL FOR CAPITAL PROJECTS FUNDED FROM RATES

Prudent financial planning dictates that a utility should fund a certain portion of capital improvement projects from rates on an on-going basis. The general financial guideline used is that at a minimum, a utility should fund an amount equal to or greater than annual depreciation expense. However, there are three reasons for increasing the level of capital

funding through rates. The first is that funding levels over and above depreciation expense better reflect actual replacement cost. Second, increasing the level of capital funding from rates will help provide cash flow to fund the capital plan in future years, and minimize any long-term borrowing needs. Finally, an increased level of capital funding will have the added benefit of strengthening the utility's debt service coverage ratio.

■ **ESTABLISHING A MINIMUM TARGET DEBT SERVICE COVERAGE RATIO**

The debt service coverage ratio is an important financial measure that is reviewed by bond rating agencies and banks to evaluate a utility's ability to make debt service payments. For revenue bonds, there is typically a legal requirement (rate covenant) to meet a minimum debt service coverage ratio. The debt service coverage ratio is calculated by subtracting total O&M and taxes from total revenues. The resulting figure is the balance available for debt service payment. The balance available for debt service is then divided by the annual debt service obligations (payments) to determine the debt service coverage ratio. For a revenue bond, most bond covenants require meeting a minimum coverage ratio of 1.25 – 1.30. While the City would have a legal obligation to meet the minimum, for financial planning purposes it is prudent to plan around meeting a debt service coverage ratio that is above the minimum (e.g. 1.50 – 1.75). In that way, if the utility has any negative financial fluctuations (e.g. low sales/revenues); they will be much more assured of meeting the required minimum. At the same time, by planning around a higher debt service coverage ratio, the City will appear financially stronger to the bond rating agencies, which may translate into an improved bond rating and lower interest rates on borrowing. Bond rating agencies do not want utilities to financially plan around simply meeting the minimum.

■ **ESTABLISHING MINIMUM RESERVE LEVELS**

Reserve levels are a crucial part of a utility's financial picture. Typically utilities maintain several different types of reserve funds. These may include: an operating reserve, a capital (replacement) reserve, an emergency or contingency reserve, and a rate stabilization reserve. Each of these reserves has its own financial, operating or legal requirements which may set an established minimum reserve level (e.g. a bond reserve). A key aspect of reviewing reserve levels was determining target minimum levels for the City's current reserves. It is important to remember that when reserves fall below the targeted minimum level, management should review the cause of the declining reserves and determine what action, if any, should be taken. Maintenance of minimum reserve levels should not, on its own, trigger the need for a rate adjustment. However, after two consecutive years of diminishing reserves as a result of under-recovery of costs, rates should be reviewed.

The above key financial planning criteria are main drivers in the City's wastewater rate study. Other prudent financial planning criteria beyond those cited above were used within the City's study. As the study is discussed in more detail, these other financial planning criteria will be discussed at that time.

2.7 City Financial/Rate Setting Policies

As a part of the comprehensive rate study process, it is important to understand the key objectives the City was striving to achieve and the policy issues that needed to be addressed by the study. By establishing financial/rate setting policies, it provides City management with clear

“By establishing financial/rate setting policies, it provides City management with clear policy direction concerning these key financial measures and parameters.”

policy direction concerning these key financial measures and parameters. At the same time, it should also lead to more stable rates over time as a consistent set of financial policies are used to establish the City’s rates.

Provided below is a brief discussion of each of the key financial/rate setting policy issues addressed as a part of this study. The key policy issues provided a decision framework for key areas of the study.

■ **OPERATING RESERVES – THE CITY SHOULD STRIVE TO MAINTAIN A CASH BALANCE THAT IS SUFFICIENT TO MEET DAILY OPERATING EXPENSES.**

Cash working capital, or operating reserves, is needed to meet daily cash flow needs, and to minimize reliance on short-term borrowing. For the wastewater utility it was determined that minimum operating reserve levels of 45 days of annual operating expenses were needed for that purpose. This financial measure is equivalent to approximately 12% (45 days / 365 days) of operating expenses.

■ **CAPITAL RESERVE – THE CITY SHOULD STRIVE TO MAINTAIN A CAPITAL RESERVE.**

The capital reserve should be set at a minimum level equal to an amount of the utility’s annual depreciation expense.

■ **MINIMUM FUNDING OF CAPITAL OUTLAY FROM RATES – THE CITY SHOULD ANNUALLY BUDGET AND FUND A REASONABLE AMOUNT OF THE COST FOR “DEPRECIATION” OF CAPITAL ASSETS AS AN EXPENSE WITHIN THE UTILITY’S OPERATING BUDGET.**

One of the major financial challenges in the utility industry is the need to properly maintain utility infrastructure. Across the U.S., the wastewater utility industry is seeing more systems that are deteriorating and are inadequately funded. Therefore, this policy is designed to properly fund a capital program that will help to assure system reliability and efficiency. A well thought out and fully funded replacement program will extend the life of the City’s utility system and in turn reduce infrastructure costs over the long-term. A utility should fund a certain portion of capital improvement projects from rates on an on-going basis. A general financial guideline that can be used to determine minimum funding levels for capital improvements funded from rates is an amount equal to or greater than annual depreciation expense.

“One of the major financial challenges in the utility industry is the need to properly maintain utility infrastructure. Across the U.S., the wastewater utility industry is seeing more systems that are deteriorating and are inadequately funded.”

■ **MINIMUM DEBT SERVICE COVERAGE RATIO – THE CITY SHOULD STRIVE FOR A MINIMUM DEBT SERVICE “COVERAGE” RATIO NECESSARY TO SATISFY ITS OUTSTANDING REVENUE BOND COVENANTS**

The debt service coverage (DSC) ratio is a financial measure of the utility’s ability to repay outstanding debt. Typically, a utility must maintain a minimum of a 1.25 DSC on outstanding revenue bond debt. Failure to meet the minimum DSC for an outstanding debt obligation is considered to be technical default, making the bonds callable or payable upon demand. It is recommended that the City target a minimum DSC of 1.50 for financial planning purposes.

■ **COMPREHENSIVE UTILITY RATE STUDY – A COMPREHENSIVE UTILITY RATE STUDY SHOULD BE CONDUCTED AT LEAST EVERY FIVE YEARS TO UPDATE ASSUMPTIONS AND ENSURE LONG-TERM SOLVENCY AND VIABILITY OF THE CITY’S UTILITY.**

The City’s system and costs change over time. It is prudent for the City to conduct a comprehensive rate study at least every five (5) years. It should be noted that the use of five years should tie to the comprehensive (master) planning period.

2.8 Summary

This section of the report has provided a brief introduction to the general principles, techniques, and economic theory used to set utility rates. These principles, techniques, and economic theory were the basis for the rate study and the foundation used to meet the City’s key objectives in establishing their wastewater rates.

Section 3

Development of the Wastewater Rate Study

3.1 Introduction

This section of the report will present the comprehensive wastewater rate study undertaken for the City. The objective of a wastewater rate study is to determine the sufficiency of current wastewater rate revenues to cover operating and capital needs along with evaluating the equity of current rates. The City's capital improvement plan was the basis for the major capital improvement projects for the wastewater utility. Specifically, the expansion of the wastewater treatment plant was a major cost driver both for capital improvement timing and funding along with changes in operational costs during construction and implementation.

The comprehensive wastewater rate study is comprised of three interrelated analyses. These are a wastewater revenue requirement analysis, a wastewater cost of service study and the design of proposed wastewater rates. This section of the report will review each of these analytical steps of the comprehensive wastewater rate study and discuss the key assumptions, findings and conclusions of each. At the end of this section of the report, the proposed wastewater rates are provided.

3.2 Development of the Wastewater Revenue Requirements

To be consistent with the basic philosophy used to analyze the City's water revenue requirements, the City's wastewater revenue requirement analysis assumes that the wastewater utility must financially "stand on its own" and not be subsidized by any other City utility. Therefore, the wastewater revenue requirements are developed on a stand-alone basis. In developing the revenue requirements for this utility, all the costs that are necessary to run the wastewater utility in a prudent and financially stable manner were included in the analysis.

“The revenue requirement analysis assumes that the City’s wastewater utility must financially “stand on its own” and not be subsidized by any other utility or City fund.”

3.2.1 Determination of Time Period and Method of Accumulating Costs

The wastewater revenue requirements reviewed a six-year projected period of 2007 – 2012. This time period was reviewed in order to maintain consistency between the wastewater rate study and the recent wastewater capital improvement plan for the City.

The wastewater system billing records, wastewater budget, and the City's wastewater capital improvement plan were the major inputs used to develop the wastewater utility revenue requirements. A more detailed discussion of the key assumptions contained within the wastewater revenue requirement is provided below.

In developing the City’s revenue requirements, a “cash basis” approach was utilized. While Section 2 provided a brief overview of the “cash basis” approach, this method of establishing the City’s wastewater revenue requirements has been “tailored” to follow the City’s system of accounts (budget documents). Table 3-1 provides a summary of the approach that was used to develop the City’s wastewater revenue requirements.

Table 3-1
Overview of the Wastewater Utility Revenue Requirements

+	Operation and Maintenance Expenses
✓	Operations
✓	Utilities Locate
✓	Services
✓	Manholes
✓	Televising
✓	Main Repairs
✓	Plant Operations
✓	Plant Laboratory
✓	Plant Sludge Injection
+	Net Capital Improvements Funded From Rates (calculated below) [1]
+	<u>Debt Service (P+I) Existing and Future</u>
=	Total Wastewater Revenue Requirements

[1] Net Capital Improvements Funded From Rates

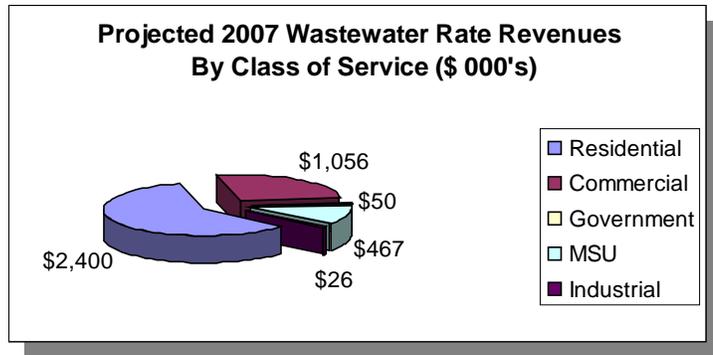
+	Total Wastewater Capital Improvement Projects
–	Funding Sources Other Than Rates
✓	Impact Fees
✓	Grants
✓	Low-Interest State Loans
✓	<u>Long Term Debt Issues</u>
=	Net Capital Improvements Funded From Rates [1]

Given a time period around which to develop the revenue requirements, and a method to accumulate the costs, the focus can shift to the projection of revenues and expenses for the City’s wastewater utility. The primary financial inputs in this process were the City’s historical billing records, the City’s capital improvement plan and the City’s 2006 budgeted expenses.

3.2.2 Wastewater Rate and Other Miscellaneous Revenues

The revenue requirement calculation begins with a projection of rate revenues at present rate levels. This process involved developing projected billing units for each customer class of service (e.g. residential, commercial, etc.) based on historical usage records and an assumed annual growth rate. The billing units are then applied (multiplied) against the current rates to calculate the projected revenue. This method of independently calculating revenue ensures consistency in the revenue and consumption figures that are used throughout the rate study process.

The revenue at present rates was calculated using historical data. The present rates were then calculated for each year based on the specific rate schedule for that year. The revenues at present rates were calculated separately for historical FY 2006. FY 2007 was estimated based on historical 2006 customer class loads and an assumed 5.0% customer growth rate. Projected revenues for 2007 thru 2012 were based upon an assumed 5.0% customer growth rate.



The wastewater utility also receives a variety of miscellaneous revenues. These revenues are received from sources such as service charges, and interest income. Miscellaneous revenues vary by year, but are fairly level during the planning period. In 2007, assuming the present (current) rates, the City is projected to receive approximately \$4.1 million in total revenues.

3.2.3 Projection of Wastewater Operation and Maintenance Expenses

In general, operation and maintenance expenses are grouped into functional areas or services (e.g. operations, maintenance, etc.). Escalation factors were developed for the various types of expenses that the City incurs: power, labor, materials and supplies, equipment, miscellaneous, etc. The escalation factors applied range from 2% to 10% per year. The higher escalation factor reflected the significantly higher recent escalation of costs associated with medical benefits. The City's 2006 budgeted expenses were used as a starting point to project future O&M expenses. Future year projections were calculated by applying an applicable escalation factor (e.g. labor-related costs escalated using the labor escalation factor).

Operationally, the expansion of the wastewater treatment plant will have an impact upon the City's O&M expenses, and simply escalating historical O&M levels would not properly reflect these fundamental changes. Given that, several O&M expense items were adjusted to reflect the impact on O&M of the expansion of the wastewater treatment plant. These adjustments to O&M included both increases and decreases in O&M costs. The adjustments to the O&M levels for specific costs related to the wastewater treatment plant were developed based upon extensive discussions between HDR and the City. The adjustments in O&M, which are related to the wastewater treatment plant expansion, were as follows:

- ▶ One full time employee was added in 2008, 2009, and 2010 in water operations to reflect additional operating costs for meeting permit requirements on the wastewater treatment plant.
- ▶ One full time employee was added 2011 in plant operations to account for the completion of the expansion of the wastewater treatment plant.
- ▶ Chemical costs were increased for the three years of 2007, 2008, 2009 to reflect the increase in costs due to the expansion of the wastewater treatment plant not being completed yet, but the City's need to meet the new requirements of the NPDES permit. These costs were reduced in '11 when the expansion of the wastewater treatment plant is completed.

- ▶ Electrical costs in 2011 was increased by 35% to reflect the blowers for the expansion of the wastewater treatment plant.
- ▶ Insurance costs were increased in 2010 to reflect the new expansion of the treatment plant.

In total, the City is projected to have O&M expenses of approximately \$2.7 million in 2007. With the expansion of the treatment plant and the additional expenses associated with that expansion, the City’s O&M expenses are projected to increase to \$3.9 million by 2012.

3.2.4 Projection of Wastewater Capital Improvement Projects and Funding

An important aspect of the wastewater revenue requirements was the funding of capital improvements. The City anticipates approximately \$50.6 million in capital expenditures for the wastewater utility over the planning period. A major component of the City’s capital improvement needs is the Phase 1 expansion of the wastewater treatment plant in the amount of \$32.8 million. The expansion of the wastewater treatment plant is needed to comply with permitting requirements and to meet the demands of customer growth. The City is currently close to exceeding their newly established permitting requirements.

Given the magnitude of the City’s planned capital improvement projects, an important element of this study was the development of a financial (funding) plan. Provided below is a discussion of the funding methods used to finance the City’s wastewater capital improvement plan.

Capital improvements projects are generally comprised of three different types of projects; growth-related projects, regulatory-related projects and renewal/replacement projects. There are a number of different funding methods that may be used for the City’s growth, regulatory and replacement-related capital projects. Among the methods that may be used to finance these capital improvement projects are long-term debt, impact fees, grants, capital reserves and rates. It is through the use of a combination of these financing resources that the City can minimize their rates through time.

A general financial guideline that can be used to determine proper funding levels for capital improvements from rates (replacement projects in particular) is that, at a minimum, a utility should fund an amount equal to or greater than annual depreciation expenses. Annual depreciation expense reflects the current investment in plant that is being depreciated or “losing” its useful life. Therefore, this portion of plant investment needs to be replaced (funded) to maintain the existing level of infrastructure. It must be kept in mind that, in theory, annual depreciation expense reflects an investment in infrastructure an average of fifteen (15) years ago, assuming a 30-year useful (depreciable) life. Simply funding an amount equal to annual depreciation expense will not be sufficient to replace the existing or depreciated facility. Therefore, consideration should be given to funding within rates some amount greater than annual depreciation expense for renewals and replacements.

“A general financial guideline that can be used to determine proper funding levels for capital improvements from rates is that, at a minimum, a utility should fund an amount equal to or greater than annual depreciation expense.”

“One very good financial indicator for the City is that historically, the City has funded 100% or more of depreciation expense for renewal and replacement funding.”

One very good financial indicator for the City is that historically, the City has funded 100% or more of depreciation expense for renewal and replacement funding. Failure to fund at level this level will either require the use of long-term borrowing to fund the difference between replacement cost and rate funding, or unfortunately, the deferral of maintenance projects due to a lack of adequate funding. For purposes of this study, the City’s current level of funding has been maintained.

As noted previously, a major component of the City’s capital improvement program is the expansion of the wastewater treatment plant. Phase 1 of the expansion of the wastewater treatment plant is approximately \$32.8 million over the test period. Of this amount, \$11.2 million will be paid for this expansion from impact fees. The remaining will be funded through revenue bonds. Provided below in Table 3-2 is a summary of the wastewater utility capital improvement projects.

Table 3-2
Overview of the Wastewater Capital Improvement Plan (000’s)

Description	2007	2008	2009	2010	2011	2012
CIP- Wastewater Fund						
Wastewater Operations	\$0	\$2,348	\$90	\$788	\$135	\$1,013
Wastewater Treatment -						
WWTP BNR Construction	3,040	0	11,485	11,485	0	0
Semi Trucks Replacement	0	200	0	0	0	0
WW Comp Plan - WWTP Phase II	0	60	0	0	0	0
WW Comp Plan - Collections	0	0	0	0	0	0
Unidentified CIP Projects [1]	0	0	2,274	2,500	2,465	1,687
Total CIP for Wastewater Fund	\$3,040	\$2,608	\$13,849	\$14,773	\$2,600	\$2,700
CIP - Impact Fee						
Shop Complex - Phase 1	\$0	\$990	\$0	\$0	\$0	\$0
WWTP BNR Construction	0	0	5,600	5,600	0	0
E8 Hospital Trunk: Haggerty	0	1,062	0	0	0	0
S15 Install 21" WW Interceptor	0	0	0	0	844	0
A* South Rose Trunk E Babcock	0	0	0	0	0	0
R4 Replace Front Street	0	0	0	0	0	0
Total CIP for Impact Fee	\$0	\$2,052	\$5,600	\$5,600	\$844	\$0
Total Capital Outlays	\$3,040	\$4,660	\$19,449	\$20,373	\$3,444	\$2,700
Less: Funding Sources						
From Operating Reserve Fund	\$0	\$0	\$0	\$0	\$0	\$0
From Capital Reserve Fund	1,449	818	104	5,523	0	0
SRF Loan for WTP	0	0	11,235	6,500	0	0
Impact Fees	0	2,052	5,600	5,600	844	0
Total Funding Other than Rates	1,449	2,870	16,939	17,623	0	0
Rate Revenues Dedicated to CIP	\$1,591	\$1,790	\$2,510	\$2,750	\$2,600	\$2,700

[1] – Detail of the wastewater capital improvement projects can be found in the Wastewater Technical Appendices

As noted previously, the City anticipates approximately \$50.6 million in capital expenditures for the wastewater utility over the five-year period of 2008 – 2012. This equates to approximately \$10 million per year in capital improvement projects. Of the \$50.6 million in projects, approximately \$36.5 million is related to wastewater fund improvements and \$14 million in impact fee (growth-related) improvements, during the five-year time period. It is important to note that 100% of the impact fee related projects are funded from impact fees (note for example the \$5.6 million of improvements in 2009 are off-set by \$5.6 million of funding from impact fees). This is an important concept in that no funding from rates has been included for those specific projects, and the City’s existing customers have been sheltered from the rate impacts of growth.

The funding for the planned wastewater fund capital improvements is primarily from a combination of long-term debt, impact fees and rates. The \$32.8 million wastewater treatment expansion will be funded from \$17.7 million dollars in State Revolving Fund loans, \$11.2 million in impact fees and the balance from capital reserves and rates. Approximately \$12.3 million of the total wastewater fund projects is funded from rates. The balance of the wastewater fund projects will be funded from existing reserves.

3.2.6 Projection of Debt Service Payments

Debt service relates to the principal and interest obligations of the wastewater utility when financing capital projects with a long-term debt issue. The City currently has no outstanding

“... annual debt service payments will increase to approximately \$1.35 million in 2010. However, impact fees will be used to off-set a majority of these annual debt payment obligations. In doing so, the City is relying upon annual growth and resulting impact fee revenue to meet this on-going annual debt obligation.”

wastewater revenue bonds outstanding. With the expansion of the wastewater treatment plant, the City will need to incur new long-term debt. The impact of this additional long-term debt will be significant. It is anticipated that annual debt service payments will increase to approximately \$1.35 million in 2010. However, impact fees will be used to off-set a majority of these annual debt payment obligations. In doing so, the City is relying upon annual growth and resulting impact fee revenue to meet this on-going annual debt obligation. Should growth slow down, now or in the future, then the City may need to

increase their rates to off-set the reduction in impact fee revenue coming through the door on an annual basis to pay this portion of debt service.

3.2.7 Summary of the Wastewater Revenue Requirements

The above components came together to develop the overall wastewater revenue requirements for the City. In developing the final revenue requirements, consideration was given to the financial planning criteria of the City. In particular, emphasis was placed on attempting to minimize rates, yet still providing adequate funds to support the City’s O&M activities, along with the planned capital projects throughout the projected time period. A summary of the wastewater revenue requirements is shown below in Table 3-3.

Table 3-3
Summary of the Wastewater Revenue Requirement Analysis (000's)

	2007	2008	2009	2010	2011	2012
Revenues						
Retail Sales	\$3,999	\$4,454	\$4,676	\$4,909	\$5,154	\$5,412
Other Revenue	161	161	168	162	151	152
Total Revenues	\$4,161	\$4,615	\$4,844	\$5,071	\$5,305	\$5,564
Expenses						
O&M Expenses	\$2,658	\$2,965	\$3,237	\$3,643	\$3,738	\$3,911
Rate Revenues Dedicated to CIP	1,591	1,791	2,510	2,750	2,600	2,700
Current Debt Service	0	0	0	0	0	0
New Debt (Net of Impact Fees)	0	0	42	254	314	274
Total Revenue Requirements	\$4,249	\$4,756	\$5,789	\$6,647	\$6,653	\$6,885
Balance/(Deficiency) of Funds	(\$88)	(\$141)	(\$945)	(\$1,576)	(\$1,347)	(\$1,321)
Bal./(Def.) as a % of Rates (Cumulative)	2.2%	3.2%	20.2%	32.1%	26.1%	24.4%
Proposed Annual Rate Adjustments	0.0%	5.0%	9.0%	9.0%	2.0%	2.0%
Add'l Revenue From Rate Adj.	\$0	\$223	\$655	\$1,129	\$1,289	\$1,461
Bal./(Def.) of Funds After Rate Adj.	(\$88)	\$82	(\$290)	(\$447)	(\$59)	\$140

In reviewing Table 3-3, it should be noted that the annual deficiencies are cumulative. That is, any adjustments in the initial years will reduce the deficiency in the latter years. The results of the wastewater revenue requirements indicate a deficiency of funds by the end of the projected six-year time period. Over the six year period, increasing costs will erode the existing balance of funds and by 2012 the deficiency of funding is approximately \$1.3 million or 24.4% of rates.

This level of deficiency is a function of both increasing O&M and capital improvements funded from rates. The expansion of the City's wastewater treatment plant has added significantly to the O&M levels, while the need to fund a significant portion of capital improvements, while attempting to limit long-term borrowing has added to the need to fund a greater amount of capital projects from rates.

Detailed exhibits of the wastewater revenue requirement analysis prepared for the City are provided in Technical Appendices at the end of this report.

3.2.8 Debt Service Coverage

The debt service coverage (DSC) ratio is a financial measure of the utility's ability to repay outstanding debt. A debt service coverage ratio of 1.25 is generally considered the legally acceptable minimum for a revenue bond.¹ Failure to meet this DSC requirement would be considered a "technical default" on the part of the City, making the revenue bonds callable or payable upon demand. Therefore, it is critical that the City meet this legal requirement. The City does not currently have any outstanding wastewater bond issues. New debt issues start in 2009.

Table 3-4 Summary of Revenue Bond Debt Service Coverage Ratios						
	2007	2008	2009	2010	2011	2012
Wastewater Revenue Bond DSC Ratios –						
Before Rate Increase	0.00	0.00	1.87	1.05	1.16	1.22
After Proposed Rate Increase	0.00	0.00	2.64	1.89	2.11	2.30

As can be seen from the above table, the City does not meet the debt service coverage test in 2010 – 2012 without the proposed rate increases. Once the proposed rate adjustments are implemented, then the City would be meeting the debt service coverage test.

3.2.9 Rate Transition Plan

The purpose in developing a rate transition plan was to set the size and timing of the wastewater rate adjustments to meet the City's needs, but also to help minimize impacts to customers. Given the overall magnitude of the projected deficiency, it was desirable to make the needed adjustments over a number of years. The proposed rate transition plan for the wastewater utility is shown in Table 3-5.

Table 3-5 Wastewater Utility – Rate Transition Plan						
	2007	2008	2009	2010	2011	2012
Present Average Monthly Residential Wastewater Bill [1]	\$21.67					
Proposed Wastewater Rate Adjustments		5.0%	9.0%	9.0%	2.0%	2.0%
Projected Average Monthly Residential Wastewater Bill		\$22.75	\$24.80	\$27.03	\$27.57	\$28.13
\$ Change Per Month		\$1.08	\$2.05	\$2.23	\$0.54	\$0.55
Cumulative \$ Change Per Month		\$1.08	\$3.13	\$5.36	\$5.90	\$6.45

[1] Average bill was assumed a ¾" meter with 6 CCF

¹ "Legally" as used herein, refers to the contractual agreement between revenue bondholders and the City to assure repayment of the bonds, and to financially operate the utility in such a manner as to maintain the City's debt service coverage ratio above a specified minimum. This minimum debt service coverage ratio is a specified covenant of the bond resolution for the revenue bond.

As Table 3-5 indicates, the current average residential bill for a City customer is \$21.67/month. The rate adjustments will change the average residential bill to \$28.13 per month by 2012, or a \$6.45/month overall change.

It should be noted that this rate transition plan assumes that the City will need to use reserves in the initial years to meet their revenue requirements. As was noted in Table 3-3, even with the proposed adjustments, there is still a fairly significant deficiency in funding in 2009 and 2010. By the end of the planning period, the City will have a slightly positive cash flow and recover some of the reserves utilized in 2009 and 2010.

3.2.10 Summary and Recommendations of the Revenue Requirements

“In reviewing the results of the wastewater revenue requirement analysis with City management, it was determined that a rate transition plan be implemented.”

Based upon the wastewater revenue requirement analysis developed herein, it is projected that the City’s wastewater utility will operate at a deficit during the six-year period of 2007 – 2012. The total level of deficiency is projected to be approximately \$1.3 million or 24.4% by 2012. In reviewing the results of the wastewater revenue requirement analysis with City management, it was determined that a rate transition plan should be developed and implemented. The first rate proposed adjustment would be in 2008 and equal to 5.0% (Table 3-5). Failure to implement the proposed rate adjustments in the subsequent years will jeopardize the City’s ability to fund/finance their wastewater treatment plant expansion.

This concludes the discussion and review of the wastewater revenue requirement analysis. Given the findings and recommendations from this analysis, the focus now shifts to the wastewater cost of service analysis.

3.3 Wastewater Cost of Service Analysis

A wastewater cost of service analysis is concerned with the equitable allocation of total wastewater revenue requirements to the various customer classes of service of the utility. A cost of service analysis is a “generally accepted” method used to equitably allocate costs between the various types of customers served.

The cost of service functionalizes, classifies, and allocates the wastewater revenue requirements to each of the classes of service in an equitable manner. Provided below is a detailed discussion of the wastewater cost of service study.

3.3.1 Customer Classes of Service

One of the first tasks that must be accomplished in the cost of service analysis is to determine the customer classes of service to be reviewed. The objective of this task is to group customers together into similar or homogeneous groups based upon facility requirements, flow and/or loading characteristics. For this study, the following customer classes of service were utilized:

- Residential
- Low-Income
- Multi-Family
- Commercial
- Country Classic Dairy (Currently billed as Commercial)
- Governmental
- Montana State University
- Unmetered

Country Classic Dairy (the “dairy”) is currently a commercial customer which was separated into a separate class for cost of service purposes. The dairy has exceptionally high wastewater (strength) loadings and as such, is very unique to the City’s system. In addition, the dairy does not have pretreatment facilities and as a result causes exceptionally heavy loadings to the City’s treatment plant, particularly in the fall. The City currently charges the dairy as a commercial customer, with an additional surcharge for these heavy loadings. Given these unique characteristics, it has been proposed within this report that the dairy be placed in a proposed industrial class of service. The industrial class of service would be for those customers that do not have pretreatment facilities and have loadings that far exceed typical commercial loading profiles.

The wastewater cost of service conducted for the City utilized a three-step approach to review costs. These three steps are: functionalization, classification, and allocation. Provided below is a more detailed discussion of each of these analytical steps of the wastewater cost of service study performed for the City.

3.3.2 Functionalization of Costs

The first analytical step in the wastewater cost of service is called functionalization. Functionalization is the arrangement of expenses and asset (plant) data by major operating functions within the utility (e.g. collection, treatment, etc). Within this study, the functionalization of the wastewater cost data was largely accomplished through the City’s system of accounts.

3.3.3 Classification of Costs

The second analytical task performed is the classification of the functionalized expenses to cost components. This task reviews each cost and attempts to determine why the wastewater cost was incurred and what type of need was being met (e.g. volume, strength, customer etc.). The cost classifiers used for the wastewater utility cost of service study are as follows:

- **Volume Related Costs.** Volume-related costs are those that tend to vary according to the quantity of wastewater collected and treated. A majority of collection system costs and a portion of the treatment costs are included in this component. An example of a volume-related cost is chemicals for treatment of wastewater.
- **Strength (Loading) Related Costs.** Strength related costs are those costs associated with the additional handling and treatment of high “strength” wastewater. Strength of wastewater is typically measured in biochemical oxygen demand (BOD) and total suspended solids (SS). However, strength-related costs may also include loadings related to nitrogen or phosphorous. Increased loading levels generally equate to increased treatment costs. Pre-treatment is generally required if the discharge is known to regularly exceed the typical waste strength.
- **Customer Related Costs.** Customer-related costs vary with the addition or deletion of a customer. Customer related costs typically include the costs of billing, collecting, and accounting. Customer-related costs may also be further categorized as actual or weighted.
- **Revenue Related.** Some costs associated with the wastewater utility may vary with the amount of revenue received by the utility.
- **Direct Assignment.** Certain costs associated with operating the utility may be directly traced to a specific customer or class of service. These costs are then “directly assigned” to that specific class of service.

A more detailed discussion of the specific cost of service methodology used for the wastewater utility is provided below.

3.3.4 Functionalization and Classification of Wastewater Plant in Service

The City’s historical plant records were used in performing the functionalization of wastewater plant in service. The classification process included reviewing each group of assets and determining which cost classifiers the assets were related to, or what function the asset (facility) provided. For example, the wastewater utility accounts were classified as related to volume, loading related (BOD, SS, Peak BOD Capacity), customer, revenue or direct assignment. Provided below is a brief discussion of the classification process used for the City’s

Wastewater Cost Classifiers

VOLUME COSTS – Costs that are classified as volume related vary with the total flow of wastewater on the system (e.g. chemical use at the treatment plant).

STRENGTH (LOADING) COSTS – Costs classified as strength (loading) related refer to the wastewater treatment function. Typically, strength-related costs are further defined as biochemical oxygen demand (BOD) and suspended solids (SS), but may include other loading characteristics, such as nitrogen or phosphorous. Different types of customers may have high wastewater strength characteristics, and high strength wastewater costs more to treat.

CUSTOMER COSTS – Costs classified as customer related vary with the number of customers on the system, e.g. billing costs. Customer costs may be actual or weighted. Actual customer costs do not vary based upon the size or wastewater contributions of the customer. A weighted customer cost is disproportionate, and varies due to the size or usage characteristics of the customer.

DIRECT ASSIGNMENT – Costs that can be clearly identified as belonging to a specific customer or group of customers.

wastewater utility.

The City's historical plant records were used in performing the functionalization of wastewater plant in service. The classification process included reviewing each group of assets and determining which cost classifiers the assets were related to, or what function the asset (facility) provided.

The existing treatment plant was based on the overall design of the plant to meet volume (flow), BOD and SS. Based on City and engineering information the plant was classified 50% volume, 25% BOD and 25% SS. This classification reflects a plant operated under "normal" operating conditions. A unique aspect of the City's system is the impact of the exceptionally high loadings, particularly BOD, from the dairy. Given these high loadings, this study explored different methodologies to equitably allocate the costs, particularly as they related to the exceptionally high and wide variations of BOD loading from the dairy. It was concluded that attempting to allocate BOD entirely on average annual loading failed to recognize the impacts of exceptionally high peak loadings from the dairy in relation to their average loadings. To better recognize that operating characteristic of the dairy and its impact on the wastewater treatment plant, this study developed a cost classifier for BOD peak capacity.

The BOD loadings for the dairy were analyzed to determine a classification split that fairly reflected the issues noted above. It appears that the dairy, on an annual average basis, contributes 996 pounds of the 8,580 pounds per day of BOD capacity. This represents 12 percent of the total BOD treatment capacity of Bozeman's existing facility ($996/8,580=12\%$). A lower rate of 10 percent was used in this study to allow some of the peak capacity to flow in to the surcharge revenues. This approach was used to provide an incentive for the Dairy to improve their operations. The BOD per day amount under a 10% scenario would be 830 lbs of BOD per day or approximately 10% of the daily treatment capacity ($830/8,580=10\%$). Therefore, the peak BOD capacity was based on 10% of the BOD from the Dairy which equates to 10% of the classified 25% BOD or 2.5% related to peak BOD capacity.

Table 3-6 shows a summary of the basic functionalization and classification of the City's major wastewater plant items.

Table 3-6
Summary of the Classification of Wastewater Utility Plant in Service

Plant Component	Volume	BOD	SS	Peak BOD Capacity	Actual Customer	Weighted Customer
Treatment	50.0%	22.5%	25.0%	2.5%	–	–
Collection	100.0%	–	–	–	–	–

The above table represents a summary of the classification of major accounts. A more detailed review of the classification of the wastewater plant in service can be found in the Technical Appendices.

3.3.5 Functionalization and Classification of Wastewater Operating Expenses

The City's wastewater revenue requirements for 2008 were used in the wastewater cost of service analysis. Generally, expenses are functionalized based on the City's system of accounts and classified in a manner similar to the corresponding plant account. For example, collection related expenses are classified in the same manner (percentages) as collection plant, etc. This approach to the classification of operating expenses has been used for this analysis. A more detailed review of the classification of revenue requirements can be found in the Technical Appendices.

3.3.6 Allocation of the Revenue Requirements

Once the classes of service have been defined, and the classification process is complete, the various costs are then allocated to each of the classes of service based on equitable allocation factors. The City's classified wastewater costs were allocated to the various classes of service using the following allocation factors.

- **Volume Allocation Factors.** Volume-related costs are generally allocated on the basis of contribution to wastewater flows. In order to develop this allocation factor, some knowledge of the contribution to flows must be determined. Given that wastewater flows are not metered for residential customers, water consumption is generally utilized as the surrogate for wastewater contributions. Residential flows were based upon use of winter water and then annualized to reflect their estimated annual contribution. The use of winter water use is intended to eliminate outdoor irrigation from the allocation factor. For commercial customers, the actual volumetric billings (water usage) was used within this study for the allocation factor. Infiltration and inflow (I&I) is a fairly significant issue on the City's system. I&I was considered to be a function of volumetric flows and the number of customers served (i.e. the network of collection lines is a function of the number of customers served). Within this study, I&I volumes were assigned based upon 50%/50% split between volume contributed and the number of customers serviced.
- **Loading-Related Costs.** Loading-related costs are classified between biochemical oxygen demand (BOD), suspended solids (SS) and peak BOD capacity (CAP). These types of costs are allocated to the various classes of service based upon the relative estimated loadings that

each class of service contributed to the overall flow at the plant. The BOD loadings are based upon average loading characteristics for BOD and SS. Under this methodology, the dairy is not allocated any costs associated with BOD and SS. Rather, Peak BOD capacity is entirely related to Country Classic Dairy. As discussed previously, Peak BOD capacity is a measure of peak day loading, and allocates 10% of the plant's BOD treatment capacity to the dairy. Embedded within the peak BOD capacity allocation to the dairy is the assumption of an average daily loading of 830 lbs/day of BOD. However, the dairy has extreme swings in their BOD loading, which on an average day basis appears manageable. Operationally, when their loadings are viewed from peak loading perspective, the Dairy utilizes significant treatment capacity within the City's plant and as a result may cause operational (loading) issues from time to time. This approach follows basic cost of service principles in that the cost-causer should be the cost-payer.

Some costs were allocated to nitrogen as some of the increased cost in electricity associated with the treatment plant expansion is related to nitrogen removal. In addition, the temporary increase in chemical costs described above under revenue requirements was allocated to phosphorus which is necessary to enable the City to meet the more stringent regulatory standards while the treatment plant upgrade is under construction.

- **Customer-Related Costs.** Customer-related costs within the cost of service study are allocated to the various customer classes of service based upon their respective customer counts. The number of customers, by customer class of service, was developed within the revenue requirement study. Two types of customer allocation factors were developed, actual and weighted. Actual customer costs do not vary by the volume or strength/loading characteristics of the class of service and are based on the actual number of customers for each class of service. A weighting factor was used to develop the weighted customer allocation factor. The weighted customer allocation factor attempts to reflect the disproportionate costs associated with serving larger customers. These customers are assigned a higher per customer cost because they require additional administrative costs and possible monitoring.
- **Revenue-Related Costs.** Revenue-related costs were allocated based upon the revenues at present rates for each class of service. Revenue-related costs are those costs that vary with the amount of revenue received. Revenues at present rates for 2008 were developed within the revenue requirement study previously discussed.

The wastewater utility allocation factors noted above can be found in the Technical Appendices.

3.3.7 Summary of the Wastewater Cost of Service Results

The summary of the allocated costs determine each class's overall cost responsibility. The allocated costs are then compared to the present revenue received from each customer class to determine the cost difference between current rates and the cost of service for each class. This difference in costs is compared to present rate levels to determine the adjustment needed (increase or decrease) to have cost-based rates. A summary of the wastewater cost of service analysis developed for each class of service is shown within Table 3-7.

Table 3-7
Summary of the Wastewater Utility Cost of Service Analysis for 2008 (\$000's)

Classes of Service	Present Rate Revenues	Allocated Costs	\$ Difference	% Difference
Residential	\$1,690	\$1,543	(\$147)	-8.7%
Low-Income	3	7	4	135.2%
Multi-Family	974	1,007	33	3.4%
Commercial	1,162	1,252	90	7.7%
Commercial – Special	13	13	(0)	-0.8%
Classic Country Dairy [1]	26	103	77	296.1%
Government	55	60	5	8.7%
Government - Special	0	0	0	2.3%
Montana State University	521	601	80	15.3%
Unmetered	9	9	(1)	-7.2%
Total	\$4,454	\$4,595	\$141	3.2%

[1] This table does not include surcharge revenues paid by the Dairy. Currently they pay approximately an additional \$27,000 annually in surcharges. That would increase substantially if this rate structure were maintained and appropriate cost-based surcharges applied.

The allocation of costs attempted to assure that the facilities and costs allocated to each customer class reflected their respective benefit. The cost of service results indicate that some cost differences do exist between the major customer classes of service. Generally, plus or minus 5% of the overall average is considered to be within the range of reasonableness and indicate that a class of service is paying their “cost of service.”

As can be seen, within this cost of service, Country Classic Dairy has been allocated costs which greatly exceed their current rate revenues. This cost of service has equitably allocated treatment costs to the dairy, particularly as it relates to their utilization of the BOD loading capacity of the treatment plant and how that affects (impacts) the City’s ability to meet the loading requirements of the NPDES permit requirements. While the cost of service has shown the need for a large increase to the Dairy, the Dairy has the potential to better manage their operations to help limit their wastewater loadings on the City’s system. Alternatively, the Dairy could invest in pretreatment facilities and pretreat their wastewater. The result of an investment by the dairy in pretreatment facilities would be a significantly lower rate from the City because the Dairy would be discharging wastewater at domestic loading levels.

3.3.8 Summary Conclusions and Recommendations of the Cost of Service

The cost of service did note some cost differences associated with serving the City’s different customer groups. Therefore, it was determined that interclass cost of service adjustments should slowly be ramped in over time. As a result of this decision, each class of service will be adjusted in the design of the proposed rates not more than +/-5.0%. Residential will be adjusted +2.7%, Commercial, Government, Multi-Family, MSU and Unmetered by +5.0%. By

“The cost of service did note some cost differences associated with serving the City’s different customer groups.”

definition, low-income should be below cost, and show the need for a large adjustment. For that reason, no cost of service adjustment is made to the low-income customer class of service.

It must be kept in mind that a cost of service analysis reflects costs and usage characteristics of a specific point in time, and as time goes on, customer's consumption patterns and usage requirements change. Only over time, and through continual analysis, can one fully understand the true cost of providing service. Given the results of the wastewater cost of service analysis, the focus will now shift to the development of the proposed wastewater rate designs.

3.4 Wastewater Rate Designs

The final step of the comprehensive wastewater rate study process is the design of wastewater rates to collect the desired level of revenue, based upon the findings and recommendations of the wastewater revenue requirement and cost of service analysis. In reviewing wastewater rate designs, consideration is given to the level of the rates and the structure of the rates. This subsection of the report will review the proposed wastewater rate designs for the City.

3.4.1 Overview of Wastewater Rate Structures

There are several different rate structures used in the wastewater industry. However, the two most common structures are a fixed monthly fee or fixed fee plus a volumetric charge for estimated (assumed) wastewater contributions. Typically residential type customers are charged a flat monthly rate while commercial customers are charged a fixed rate plus a volumetric rate. However, the recent trend in the wastewater industry is to move towards a more volumetric based rate. This typically has to do with both equity issues and conservation efforts².

The rate structure concepts noted above may be combined and used to form various rate design options that meet the City's needs. However, at the same time, the City must understand its overall goals and objectives in designing rates.

3.4.2 Rate Design Criteria and Considerations

Prudent rate administration dictates that several criteria must be considered when setting utility rates. Some of these rate design criteria are listed below:

- Rates which are easy to understand, from the customer's perspective
- Rates which are easy for the utility to administer
- Consideration of the customer's ability to pay
- Continuity, over time, of the rate making philosophy
- Policy considerations (encourage conservation, economic development, etc.)
- Provide revenue stability from month to month and year to year
- Equitable and non-discriminating (cost based)

Many contemporary rate economists and regulatory agencies feel that the last consideration, cost-based rates, should be of paramount importance and provide the primary guidance to utilities on rate structure and policy.

² Some believe that volumetric sewer rates help to achieve water conservation

It is important that the City provide its customers with a proper price signal as to what their usage is costing. This goal may be approached through rate *level* and *structure*. When developing the proposed rate designs, all of the above listed criteria were taken into consideration. However, it should be noted that it is difficult, if not impossible, to design a rate that meets all of the goals and objectives listed above. For example, it may be difficult to design a rate that takes into consideration the customer's ability to pay, and one which is cost-based. In designing final rates for adoption, there are always trade-offs between the various goals and objectives.

3.4.3 Review of Overall Rate Adjustments

As indicated in the revenue requirement analysis and the cost of service analysis, the priority for the wastewater utility was to adjust and transition the overall level of the wastewater rates to meet the City's financial needs and current rate-setting philosophy and policies. Therefore, the results of revenue requirement analysis were the primary basis for establishing the proposed rate adjustments for the wastewater utility. Table 3-9 provides a summary of the proposed wastewater utility adjustments shown within the revenue requirement analysis. In addition, cost of service adjustments were recommended at this time, the proposed 2008 rate adjustment includes the ramping in of the cost of service results for each of the customer classes of service (rate schedules). The overall rate adjustment will collect an additional 5.0% in rate revenues. Excluding the dairy, Residential will be adjusted +2.7%, Commercial, Government, Multi-Family, MSU and Unlettered will be adjusted by +5.0%. As will be noted later, the dairy's rates will be developed based upon the results of the cost of service analysis. However, the City will need to discuss with the dairy their options to address their high BOD loadings. This aspect of the study is discussed later in this section of the report.

Table 3-9
Summary of the Proposed Wastewater Rate Adjustments

	2007	2008	2009	2010	2011	2012
Proposed Annual Rate Adjustments	0.0%	5.0%	9.0%	9.0%	2.0%	2.0%

3.4.4 Present Wastewater Rates

The City currently has a seven wastewater rate schedules. All customers have the same fixed service charge. The consumption charge is a flat charge based on the amount of usage and does not vary in rate amongst the classes of service. The City's present wastewater rates are shown below in Table 3-10.

Table 3-10
Summary of the 2007 Present Wastewater Rates

Rate Components	Current Rate
Service Charge (Monthly) (Low-Income no charge)	\$10.67/Month
Volume Charge (\$/CCF) [1]	
Residential	\$1.80
Low-Income	\$1.80
Multi-Family	\$1.80
Commercial	\$1.80
Government	\$1.80
Montana State University	\$1.80

[1] – CCF of wastewater = One hundred cubic feet of wastewater. 1 CCF of wastewater = 748 gallons

The above summary shows the present wastewater rates, the focus now shifts to the development of the proposed wastewater rates.

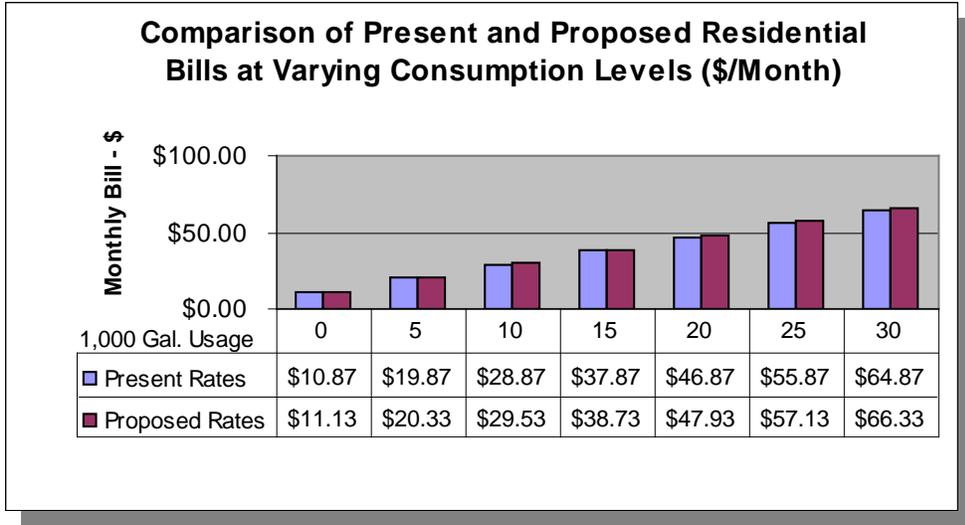
3.4.5 Proposed Wastewater Rates

In developing the proposed wastewater rates, consideration was given to reviewing various rate structures and approaches to adjusting the rates. The proposed wastewater rates are shown below in Table 3-11 have assumed equal adjustments for all components of the rate structure, and has incorporated the cost of service adjustments within it.

Table 3-11
Summary of the Proposed 2007 Wastewater Rates

	2007	2008	2009	2010	2011	2012
Service Charge (Monthly)						
Residential	\$10.87	\$11.17	\$12.17	\$13.27	\$13.54	\$13.81
Low-Income	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Non-Residential	\$10.87	\$11.41	\$12.44	\$13.56	\$13.83	\$14.11
Industrial (Country Classic)	\$10.87	\$27.36	\$29.82	\$32.50	\$33.15	\$33.81
Volume Charge (\$/ccf)						
Residential	\$1.80	\$1.85	\$2.02	\$2.20	\$2.24	\$2.28
Low-Income	\$1.80	\$1.80	\$1.96	\$2.14	\$2.18	\$2.22
Non-Residential	\$1.80	\$1.89	\$2.06	\$2.25	\$2.30	\$2.35
Industrial (Country Classic)	\$1.80	\$4.53	\$4.94	\$5.38	\$5.49	\$5.60

Given the proposed rate structure, a bill comparison was developed which compared the residential bill under the present and proposed rates for varying levels of consumption. Based upon the proposed rate structure, the rates would collect an overall increase of 5% in rate revenues.



3.4.6 Country Classic Dairy (Industrial) Surcharges

The revenue requirement analysis supports the need for overall rate adjustments to the wastewater rates. At the same time, the cost of service indicated that Country Classic Dairy’s rates needed to be adjusted significantly to reflect their wastewater loadings and impacts upon the operation of the City’s wastewater treatment facility. Given the unique characteristics of the dairy, it is recommended that the City establish an industrial customer class of service for the wastewater utility. The purpose of this rate schedule would be to address individual high strength (loading) customers, such as the dairy, who do not have pretreatment facilities.

It appears that the dairy’s current rate is inadequate to fairly reflect the Dairy’s impact upon the system. While the overall level of the rates appear to be insufficient, the rates are structured in a manner that seems appropriate, with certain revisions, to fairly and equitably charge the dairy going forward. The current rates use an approach of a “base rate” and “surcharges” for BOD and SS loadings in excess of the assumed loadings contained within the “base rates.” Going forward, HDR would recommend a similar approach be used for the dairy.

From a treatment perspective, the City needs to assure that they are capable of meeting the load limits for biochemical oxygen demand (BOD), suspended solids (SS), phosphorous (P) and nitrogen (N). The City has a limited treatment capacity for each of these types of wastewater loadings. This particular study has focused on BOD and SS, but phosphorous and nitrogen is a concern and will be even more critical in the years to come. Given that understanding of the issues facing the City and the limitations in their treatment capability, the focus can shift to the method that may be used to create a rate structure for the dairy that is cost-based and fair, yet still provides an incentive for the dairy to manage their operations and loadings. This is accomplished by two separate but interrelated rate (charges) – base rates and surcharges.

Based on recent sampling data (from July 2006 to December 2006) the dairy’s average daily loadings are as follows: 996 lbs of BOD, 208 lbs of SS, and 8.3 lbs of total phosphorus, and a total daily flow of 32,000 gallons/day. These loadings are based on actual sewer flows and monitored data. On average, the dairy contributes 996 pounds of the City’s total treatment

capacity of 8,580 pounds/day. This average daily loading represents 12 percent of the total BOD treatment capacity of Bozeman's existing facility ($996/8,580=12\%$). As discussed in the previous section a lower 10 percent average daily loading was used in this study to allow the remaining capacity to flow into the surcharge revenues. This amount was used to provide an incentive for the Dairy to improve their operations, while maintaining equity with other system customers.

The concept of surcharges is that the customer is charged a "base rate" which includes within that base rate a specified amount of treatment capacity. Any loadings over and above these specified amounts contained within the "base rate: should be charged a surcharge for that amount of loading over and above the amount included within the "base rate." This concept is very similar to the approach currently used by the City. This study has utilized a similar approach for surcharges for suspended solids, phosphorous and nitrogen. However, a slightly different approach has been proposed for BOD loadings.

As has been previously discussed, the City is impacted by BOD loadings in two different ways; on an average daily basis and a peak daily basis. Average daily loadings exceeding the dairy's assumed daily limit of 830 lbs/day has one type of impact upon the system.³ In developing the cost of service analysis for the dairy, they were directly assigned via the peak BOD capacity approach 10% of the BOD treatment capacity or 830 lbs/day, and the base rate for the dairy assumes an average daily loading of 830 lbs.

In contrast to the impact of average daily BOD loading, peak daily BOD loadings is a more important measure for the City's treatment plant in that a very high daily loading can cause significant operational problems for the City. Simply using average daily loading for surcharges, as the City's current approach does, masks the issue. As an example, assuming three daily loadings of 415, 830 and 1,245 produces an average daily loading of 830 and would not be subject to surcharges under the City's current surcharge approach, even though the day with a peak loading of 1,245 lbs may have caused significant operational problems or caused the City to exceed their permit limitations for that day.

To address the above issue, this study has proposed a two part approach for BOD loadings in excess of the loading contained in the base rate. The first part of the surcharge would be similar to the current approach and consider average daily loadings in excess of a specified limit. All average daily use over and above the limitation would be charged a surcharge for average daily loading. In contrast to this, the second part of the surcharge would consider the peak daily loading of the dairy in relation to the assumed limit. Essentially, the dairy would be charged for their peak loading on the system. This concept is somewhat analogous to a demand charge by an electric utility. Using the simple example of the three day loading noted above, the dairy's peak loading for purposes of the peak daily BOD surcharge would be based on a peak loading of 1,245. The base rate for the dairy includes an average loading of 830 lbs/day, and therefore, the dairy would be charged for 415 lbs at the peak BOD surcharge rate.

³ Average daily loading is the simple average of the loadings, or the sum of the daily loadings divided by the number of days.

A detailed example of the calculation of the surcharges, along with loadings contained within the dairy's "base rate" is shown on Exhibit 16 of the Technical Appendices. It should be noted that the dairy has the ability to manage their operations to help minimize these surcharges.

3.4.7 Implementation of the Dairy's Proposed Rates

It is important to understand that this study has developed a cost-based rate design for the dairy, along with associated loading surcharges, based upon their current loading characteristics. At the same time, HDR and the City recognize the financial and rate impacts to the dairy of moving to cost-based rates. Given that, HDR has considered the City's options with regard to the implementation of the proposed rates for the dairy.

HDR and the City understand that immediate implementation of the proposed rate to the dairy would be difficult for both the City and dairy. However, at the same time, the City also recognizes that the current situation of high loadings and significantly below cost rates to the dairy is not acceptable. Ideally, the City and the dairy should work towards a mutually acceptable solution in a positive and business like manner. To do that, the City will need to provide the dairy with a certain amount of time to assess their options. It would appear that the dairy has essentially three options. These options are as follows:

1. Invest in pretreatment facilities and significantly reduce the rates being proposed for the dairy
2. Don't build pretreatment, but review their operations to determine any changes that may help to minimize the impacts of the proposed rates.
3. Don't build pretreatment and don't change operations and continue with high loadings

Under the first option, the dairy would need to make an investment in pretreatment facilities. The impact of this investment would be to significantly lower their BOD loadings and receive from the City a rate commensurate with a commercial customer with domestic level loadings. The second option doesn't change the proposed rates from the City, but may avoid certain surcharges, particularly as they relate to the peak BOD loading surcharge. Finally, the dairy may determine that it is unwilling to invest in pretreatment facilities and they are unable to change their operations to any significant level to modify their loadings. In that case, the dairy will be charged the rates as shown in this study and likely incur the estimated bills as shown within this study.

To assess the above options, the dairy will need time to determine the costs and benefits of each of the options. Simply stated, the dairy will need to develop a business case for each alternative option. For that reason, this report is not recommending an immediate increase in the dairy's rates, to the levels shown in Table 3-11. Rather, the City should work with the dairy to allow them sufficient time to make a reasoned business decision on the construction of pretreatment facilities. If the dairy determines that it will build a pretreatment facility, the City should reward them for this decision and hold their rates at the proposed commercial level, with current level surcharges. This assumes that the City will provide the dairy with a reasonable date for the final completion and start-up of the facility. Failure to meet this completion date could, at the City's discretion, trigger the implementation of the rates as shown in Table 3-11. Finally, if the dairy

determines that they will forego building a pretreatment facility, then the City should implement the rates as shown in Table 3-11, since these are cost-based and reflect the impacts to the City's wastewater facility from the high BOD loadings by the dairy.

The City needs a firm commitment from the Dairy within a specified time regarding which course of action they will take (e.g. six months). The dairy's intent or plan of action should be established in a letter agreement between the City and the dairy specifying the reasonable time table for completion of the plant and the consequences if the time period is exceeded. If the time period is exceeded, the City should have the right to implement the full rate adjustment, and possibly retroactively.⁴ If the Dairy chooses not to build pretreatment the full cost of service rate adjustment should be implemented immediately after the dairy's decision.

3.5 Summary of the Wastewater Rate Study

This section of the report has discussed the development and results of the comprehensive wastewater rate study conducted for the City. The results of the wastewater rate study indicated that wastewater rates are deficient for the projected time period reviewed. A key issue for this study is establishing cost-based rates for the dairy. It is important for the City to enter in an agreement with the Dairy as soon as possible to establish a plan of action to address this issue. The timeline is critical to the overall operational permitting process for the wastewater treatment plant and the required capital improvements. The implementation of rate adjustments, as shown in the rate transition plan, should generate the additional revenue needed to meet the City's increased wastewater operating and capital needs, along with the City's financial and rate setting philosophy.

The wastewater rates, as proposed herein, are cost-based and were developed using "generally accepted" rate making methods and principles. The proposed rates should enable the City's wastewater utility to operate in a financially sound and prudent manner.

⁴ Retroactive rates should only apply if the dairy starts down a path of building pretreatment and for whatever reason clearly abandons the pretreatment project.

TECHNICAL APPENDIX