FINAL REPORT

Lake Arrowhead Community Services District

Comprehensive Sewer Rate Study

January 2016

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January 4, 2016

Ms. Catherine Cerri
Finance Manager
Lake Arrowhead Community Services District
27307 State Highway 189, Suite 101
Lake Arrowhead, California 92352

Subject: Comprehensive Sewer Rate Study Final Report

Dear Ms. Cerri

HDR Engineering, Inc. (HDR) is pleased to present to the Lake Arrowhead Community Services District (District) the Final Report for the comprehensive sewer rate study. A key objective of the sewer rate study was to develop a financial plan and rates that generate sufficient revenue to fund the operating and capital needs of the District's sewer collection and treatment system. At the same time, the District's rates should be fair and equitable. This study outlines the overall approach used to achieve these objectives, along with our findings, conclusions and recommendations.

This study was developed utilizing the District's accounting, operating and management records. HDR has relied upon this cost and planning information to develop the analyses which provided the basis for our findings, conclusions and recommendations. At the same time, this study was developed utilizing industry recognized sewer rate setting principles and methodologies. This study provides the basis for developing and implementing rates which are cost-based, equitable and defensible to the District's customers.

We appreciate the assistance provided by the District's management team in the development of this study. More importantly, HDR appreciates the opportunity to provide these technical and professional services to the District.

Sincerely yours,
HDR Engineering, Inc.

Shawn Koorn
Associate Vice President

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Table of Contents

Executive Summary

Introduction

HDR was retained by the Lake Arrowhead Community Services District (District) to conduct a comprehensive sewer rate study. The objective of the rate study was to review the District's operating and capital costs in order to develop cost-based and equitable rates in compliance with State law. The financial plan is designed to meet the District's operation and maintenance (O&M) needs and the capital improvement program for the District's sewer system. This study determined the adequacy of the current sewer rates and provides the framework and cost basis for any needed future adjustments.

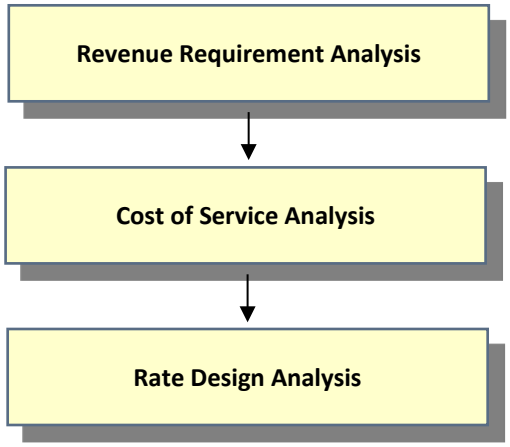
"This study determined the adequacy of current sewer rates and provides the framework and cost basis for any needed future adjustments."

The District owns and operates a sewer collection and treatment system. The findings, conclusions and recommendations from this study are related to collecting and treating wastewater received from the District's customers.

Overview of the Rate Study Process

The comprehensive sewer rate study uses three interrelated analyses to address the adequacy and equity of the District's sewer rates. These three analyses are a revenue requirement analysis, a cost of service analysis, and a rate design analysis. These three analyses are illustrated below in Figure ES-1.

Figure ES–1
Overview of the Comprehensive Sewer Rate Analyses



Compares the revenues to the expenses of the utility to determine the overall rate adjustment required

Allocates the revenue requirement to the various customer classes of service in a "fair and equitable" manner

Considers both the level and structure of the rate design to collect the target level of revenues

The above framework for reviewing and evaluating rates was utilized for the District's study.

Key Sewer Rate Study Results

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

- A revenue requirement analysis was developed for the projected time period of FY 2016 through FY 2029.
- The FY 2015 and FY 2016 budgets were used as the starting point of the analysis.
- Operation and maintenance expenses are projected to increase at inflationary levels with no changes to levels of service or anticipated extraordinary expenses.
- The District is planning on approximately $2.0 million per year in replacement capital projects over the next five years and the funding of these projects is one of the primary drivers behind the results and the recommendations for the proposed rate adjustments.
- Annual rate adjustments over the FY 2016 – FY 2020 time period are needed to support the operating and capital needs of the sewer utility.
- Proposed rate adjustments of 3.5% are projected annually starting in FY 2017 through FY 2020.
- The proposed rate adjustments are implemented on January 1 of each year starting January 1, 2017.
- In keeping with the District's pay as you go approach to funding capital improvements no new long-term debt will be issued.
- The results of the cost of service analysis indicated minor cost differences between the various customer classes of service. However, for a number of reasons, it is recommended that no adjustments to the cost/rate relationships between the classes of service be made at this time. All customer classes of service (rates) were adjusted equally (on a percentage basis).

Summary of the Revenue Requirement Analysis

A revenue requirement analysis is the first analytical step in the comprehensive sewer rate study process. This analysis determines the adequacy of the current sewer rates to fund operating and capital needs. From this analysis, a determination can be made as to the overall level of sewer rate adjustments needed to provide adequate and prudent funding for the sewer system.

For this study, the revenue requirement was developed for the projected time period (FY 2016 - 2029). As a practical matter, a multi-year time frame is recommended in an attempt to identify any major expenses that may be on the horizon. By anticipating future financial requirements, the District can begin planning for these changes sooner, thereby minimizing short-term rate impacts and overall long-term rates. However, the focus of the study was on the next five-year rate setting period of FY 2016 – FY 2020.

For the revenue requirement analysis a "cash basis" approach was utilized. The "cash basis" approach is the most commonly used methodology by municipal utilities to set their revenue

requirement and is composed of O&M expenses, transfer payments, annual debt service payments, and capital projects funded through rates. The primary financial inputs in the development of the revenue requirement were the District's FY 2015 and FY 2016 budget documents, historical billed customer and consumption data, and the District's capital improvement plan. Budgeted O&M expenses were projected using inflationary factors for the District's various expenses to provide sewer collection and treatment services over the projected time period.

The proper and adequate funding of capital projects is important to help minimize rate increases over time. A general financial guideline states that, at a minimum, a utility should fund an amount equal to or greater than annual depreciation expense through rates. Annual depreciation expense reflects the current investment in plant being depreciated or "losing" its useful life. Therefore, this portion of plant investment needs to be replaced to maintain the existing level of infrastructure (and service levels). However, it must be kept in mind that, in theory, annual depreciation expense reflects an investment in infrastructure that was placed in service an average of 15 years ago, assuming a 30-year useful, depreciable, life. Simply funding an amount equal to annual depreciation expense will not be sufficient to fund the replacement of an existing or depreciated facility. Therefore, consideration should be given to funding within rates some amount greater than annual depreciation expense for renewals and replacements.

"The proper and adequate funding of capital projects is important to help minimize rates over time. A general financial guideline states that, at a minimum, a utility should fund an amount equal to or greater than annual depreciation expense through rates."

As a part of this study, and in keeping with the District's past funding approach, a concerted effort was made to increase the overall level of "pay-as-you-go" (rate) funding for replacement capital projects. Provided below in Table ES-1 is a summary of the amount of rate funded capital over the five-year rate setting period. A more detailed analysis of the projected capital expenses is provided in Section 3.6 of the study.

Table ES–1
Summary of the Annual Rate Funded Capital ($000)

	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Total Capital Improvement Projects	$5,848	$2,359	$2,185	$3,358	$2,320
Less: Other Funding (reserves)	3,788	239	0	1,108	0
Total Rate Funded Capital	**$2,060**	**$2,120**	**$2,185**	**$2,250**	**$2,320**

As a point of reference, the District's annual depreciation expense is approximately $1.8 million (FY 2014). This financial plan has placed the District's rate funding for capital at approximately $2.0 million and increasing over time to prudently fund capital improvement needs. The annual funding through rates increases annually by approximately $65,000 over the rate setting time

period to reflect the increased renewal and replacement funding needs of the District over the time period reviewed. It is important to note and understand that depreciation expense is not the same as replacement cost. Thus, funding an amount which exceeds depreciation expense (i.e. $1.8 million) is appropriate. In developing this financial plan, HDR and the District have attempted to minimize rate impacts while funding the planned capital improvement projects of the District. However, as can be seen, this financial plan has strengthened the District's "pay-as-you-go" funding for capital projects.

Given a projection of operating and capital expenses, a summary of the revenue requirement analysis was developed. Provided below in Table ES-2 is a summary of the revenue requirement analysis (financial plan) for the District's sewer utility. A more detailed analysis of the revenue requirement analysis is provided in Section 3.5 of this study.

Table ES–2
Summary of the Sewer Revenue Requirement Analysis ($000)

	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Sources of Funds -					
Rate Revenues	$6,868	$6,875	$6,882	$6,896	$6,909
Misc. Revenues	3,283	3,268	3,279	3,295	3,298
Total Sources of Funds	$10,151	$10,143	$10,161	$10,191	$10,207
Expenses					
O&M Expenses	$6,030	$6,234	$6,445	$6,656	$6,875
Rate Funded Capital	2,060	2,120	2,185	2,250	2,320
Net Debt Service	1,833	1,834	1,218	1,219	1,219
Change in Working Capital	227	691	678	687	681
Total Expenses	$10,151	$10,263	$10,527	$10,812	$11,092
Balance/(Defic.) of Funds	$0	($120)	($366)	($620)	($885)
Defic. as a % of Rate Rev.	0.0%	1.7%	5.3%	9.0%	12.8%
Total Proposed Revenue Adjustment	**0.0%**	**3.5%**	**3.5%**	**3.5%**	**3.5%**

[1] - The proposed rate adjustments will be implemented on January 1 of each year, or midway through the fiscal year.

As can be seen, the revenue requirement has summed the O&M, rate funded capital, net debt service and the change in working capital. The total revenue requirement is then compared to the total sources of funds which include the rate revenues, at present rate levels, and other miscellaneous revenues. From this comparison a balance or deficiency of funds in each year can be determined. This balance or deficiency of funds is then compared to the rate revenues to determine the level of rate adjustment needed to meet the revenue requirement. It is important to note the "Balance/(Deficiency) of Funds" row is cumulative. That is, any

adjustments in the initial years will reduce the deficiency in the later years. Over this project time period, the total deficiency of rates is 12.8%.

As can be seen in Table ES-2 a rate transition plan has been developed to adjust rates over this time period. To better understand the impacts of these adjustments, Table ES-3 provides a summary of the impacts to residential rates.

Table ES–3
Summary of the District Rate Transition Plan and Residential Bill Impacts

	Present Bill	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Monthly Residential Bill -	$48.28					
Proposed Rate Adjustment [1]		0.0%	3.5%	3.5%	3.5%	3.5%
Mthly Bill After Rate Adj.		$48.28	$49.97	$51.72	$53.53	$55.40
$ Change/Bi-Month		0.00	1.69	1.75	1.81	1.87
Cumulative Bi-Mthly Change		0.00	1.69	3.44	5.25	7.12

[1] – The FY 2016 rate adjustment is effective January 1, 2016 and each subsequent January 1 through FY 2020.

As can be seen, the current monthly residential bill for sewer services is $48.28/month. With the proposed adjustments, the impacts will be approximately $1.78/month annual adjustments. Cumulatively, over the five year period the residential bill is projected to go from $48.28/month to $55.40/month, or a total change of $7.12/month.

Based on the revenue requirement analysis developed herein, HDR has concluded that the District will need to adjust their sewer rates over the next five years (FY 2016 – FY 2020). HDR has reached this conclusion for the following reasons:

- Rate adjustments are necessary to fund the District's capital improvement needs, of which a large portion is driven by the funding of replacement capital projects.
- Rate adjustments are necessary to fund the District's capital projects on a "pay-as-you-go" basis and avoid the need for the issuance of any long-term debt.
- The proposed rate adjustments maintain the District's strong financial health and provide long-term sustainable funding levels for the District.

In reaching this conclusion, HDR would recommend that the District adopt the proposed rates through FY 2020 in order to provide sufficient funding for the capital improvement program. Detailed technical exhibits of the revenue requirement analysis have been included within the Technical Appendix and can be found on Exhibits 1 – 6.

Summary of the Cost of Service Analysis

A cost of service analysis determines the equitable allocation of the revenue requirement to the various customer classes of service (i.e., residential, commercial). The objective of the cost of

service analysis is different from determining the revenue requirement. A revenue requirement analysis determines the utility's overall financial needs, while the cost of service analysis determines the fair and equitable manner to collect that revenue requirement.

In summary form, the cost of service analysis began by functionalizing the revenue requirement for the Arrowhead Woods system. The functionalized revenue requirement was then classified into their various cost components. The individual classification totals were then allocated to the various customer classes of service based on the appropriate allocation factors. The allocated expenses for each customer class were then aggregated to determine each customer class's overall revenue responsibility. Table ES-4 provides the summary of the cost of service analysis completed for the District's sewer utility customers.

Table ES-4
Summary of the Sewer Cost of Service Analysis ($000)

Class of Service	Present 2016 Rate Revenues	Allocated Costs	$ Difference	% Difference
Residential	$6,012	$5,971	$41	-0.7%
Commercial & Institutional	849	890	(41)	4.8%
Total	**$6,861**	**$6,861**	**($0)**	**0.0%**

The results of the cost of service analysis indicated very minor cost differences between the customer classes of service. In reaching this conclusion, one of the variables that is impacting the cost allocations is the trend of declining per capita water consumption for residential customers, magnified by the current drought conditions in California. These conditions certainly have an impact upon the sewer cost allocations which are based on winter(November - February) water consumption. While some minor cost differences exist, the overall allocation of costs between customers appears to be reasonable.

The cost is service analysis is a forward looking analysis based on projected costs and results. Thus, when reviewing the results of the cost of service analysis, it is important to understand that the results will not be "exact" each time the District updates its cost of service analysis. This is due to changing customer water consumption patterns which impact sewer flows, external impacts such as the current drought, cost increases outside of the District's control, and how the District incurs costs. As noted, the cost allocations were based on a single year of data, FY 2014 winter water consumption (water use billing records), which have been impacted by the current drought. The change in water consumption due to the drought response has impacted the cost allocations and has changed the relationship between the customer classes. Given this, implementing cost of service adjustments may result in unnecessary rate impacts to customers in the short-term and not reflect typical winter water consumption used to allocate costs. Therefore, HDR would recommend no cost of service adjustments in FY 2016.

As the District continues to monitor rates and cost of service results through future studies, cost of service adjustments may be made as the results are driven by customer consumption. At this time, no adjustments in the cost relationships between the customer classes of service

are recommended. As a result, the overall proposed revenue/rate adjustments will be applied equally across all customer groups.

Section 4 of this study provides a detailed discussion of the cost of service analysis conducted for the District's sewer system. The Technical Appendix contains the various exhibits associated with this analysis and may be found on Exhibits 7 - 15.

Summary of the Present and Proposed Sewer Rate Designs

The final step of the comprehensive rate study process is the design of the sewer rates to collect the desired levels of revenue, based on the results of the revenue requirement and cost of service analysis. The revenue requirement analysis provided a set of recommendations related to annual rate adjustments, while the cost of service results indicated that no interclass adjustments were needed at this time. Given the above, the District's existing sewer rates were equally adjusted in each of the years. Provided below in Table ES-5 is a summary of the present and proposed sewer rates.

Table ES–5
Summary of the Proposed Sewer Rates

	Present Rates	FY 2016 Jan. 1 2016	FY 2017 Jan. 1 2017	FY 2018 Jan. 1 2018	FY 2019 Jan. 1 2019	FY 2020 Jan. 1 2020
Proposed Rate Adjustment		0.0%	3.5%	3.5%	3.5%	3.5%
Residential						
Monthly Fixed Charge	$48.28	$48.28	$49.97	$51.72	$53.53	$55.40
Commercial/Institutional						
Monthly Fixed Charge	$48.28	$48.28	$49.97	$51.72	$53.53	$55.40
Volume Fee [1]	$6.99	$6.99	$7.23	$7.48	$7.74	$8.01

[1] – The volume fee is for all water use over 5 CCF per month for commercial/institutional customers

As can be seen in Table ES-5, the rates for FY 2016 have not been adjusted. The first rate adjustment to the District's sewer rates occurs in FY 2017 on January 1, 2017. The rates are adjusted each subsequent January 1. Section 5 of this study provides a detailed discussion of the present and proposed sewer rates for FY 2016 – FY 2020.

Summary of the Sewer Rate Study

This completes the overview of the development of the comprehensive sewer rate study for the District. The focus of this study has been the prudent and adequate funding of the utility, particularly as it relates to the needed capital improvement projects. The proposed rate adjustments maintain the District's financial position to meet its financial planning objectives. A full and complete discussion of the development of the comprehensive sewer rate study and the proposed rate adjustments can be found in following sections and exhibits of this study.

1. Introduction and Overview

1.1 Introduction

HDR Engineering, Inc. (HDR) was retained by the Lake Arrowhead Community Services District (District) to conduct a comprehensive sewer rate study. The objective of the sewer rate study was to review the District's operating and capital costs in order to develop cost-based and equitable rates in compliance with State law. The financial plan is designed to meet the District's operation and maintenance (O&M) needs and the capital improvement program for the sewer collection and treatment system. This study determined the adequacy of the existing sewer rates and provides the framework for any needed future adjustments.

1.2 Goals and Objectives

The District had a number of key objectives in developing the sewer rate study. These key objectives were as follows:

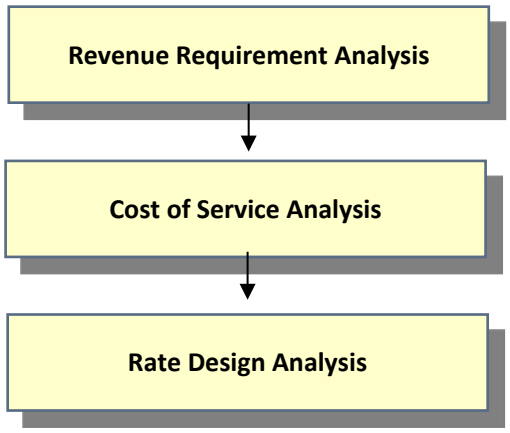
- Develop the study in a manner that is consistent with the principles and methodologies established by the Water Environment Federation (WEF), Manual of Practice No. 27, Financing and Charges for Sewer Systems.
- In financial planning and establishing the District's rates, review and utilize best industry practices, while recognizing and acknowledging the specific and unique characteristics of the District's system.
- Review the District's rates utilizing "generally accepted" rate making methodologies to determine adequacy and equity of the utility rates.
- Meet the District's financial planning criteria, particularly as it relates to adequate funding of capital infrastructure and maintenance of adequate and prudent reserve levels.
- Develop a final proposed financial plan which adequately supports the utility's funding requirements, while attempting to minimize overall impacts to rates.
- Provide rates which meet the legal requirements of California Constitution article XIII D, section 6 (commonly referred to as Proposition 218).

These key objectives provided a framework for policy decisions in the analysis that follows.

1.3 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 rate study is often performed. A comprehensive sewer rate study consists of three interrelated analyses. Figure 1-1 provides an overview of these analyses.

Figure 1–1
Overview of the Comprehensive Sewer Rate Analyses



Compares the revenues to the expenses of the utility to determine the overall rate adjustment required

Allocates the revenue requirement to the various customer classes of service in a "fair and equitable" manner

Considers both the level and structure of the rate design to collect the target level of revenues

The above framework for reviewing and evaluating rates was utilized for the District's study.

1.4 Organization of the Study

This study 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 District's sewer rates. The following sections comprise the District's sewer rate study report:

- Section 2 – Overview of Sewer Rate Setting Principles
- Section 3 – Development of the Revenue Requirement
- Section 4 – Development of the Cost of Service Analysis
- Section 5 – Development of the Proposed Sewer Rates

A Technical Appendix with exhibits is attached at the end of this report, which details the various technical analyses that were undertaken in the preparation of this report.

1.5 Summary

This study will review the comprehensive sewer rate analyses prepared for the District. This report has been prepared utilizing "generally accepted" sewer rate setting techniques, while taking into consideration legal requirements for establishing rates pursuant to the California Constitution. The next section of the study will provide a brief overview of the general rate setting process that was used to analyze and establish the proposed sewer rates for the District.

2. Overview of Sewer Rate Setting Principles

2.1 Introduction

This section of the study provides background information about the sewer rate setting process, including descriptions of generally accepted principles, types of utilities, methods of determining a revenue requirement, the cost of service approach, and rate design. This information is useful for gaining a better understanding of the details presented in Sections 3 through 5 of the District's study.

2.2 Generally Accepted Rate Setting Principles

As a practical matter, utilities should consider setting their rates around some generally accepted or global principles and guidelines. Utility rates should be:

- Cost-based, equitable, and set at a level that meets the utility's full revenue requirement.
- Easy to understand and administer.
- Designed to conform with "generally accepted" rate setting techniques.
- Stable in their ability to provide adequate revenues for meeting the utility's financial, operating, and regulatory requirements.
- Established at a level that is stable from year-to-year from a customer's perspective.

2.3 Types of Utilities

Utilities are generally divided into two types:

- **Public utilities** are usually owned by a city, county, or special district, and are theoretically operated at zero profit. A public utility is locally owned since its customers are also its owners. Public utilities are capitalized or financed by issuing debt and soliciting funds from customers through direct capital contributions or user rates. Public or municipal utilities are typically exempt from state and federal income taxes. A publicly elected City Council or Board of Directors usually regulates public utilities.
- **Private utilities** are "for profit" enterprises and are owned by a private company and/or stockholders. The shareholders are, in essence, the owners of the private utility. Therefore, the owners of a private utility may not be customers or local citizens, but rather numerous individuals or shareholders spread across the United States. A private utility is capitalized by issuing stock to the general public. Private utilities are taxable entities. Given their "for-profit" status, their rates and operations are generally regulated by a state public utility commission or other regulatory body.

As a point of reference, the District is a public (municipal) utility and the analysis has been based on the methodology generally utilized by a public utility.

2.4 Determining the Revenue Requirement

Most public utilities use the "cash basis" approach for establishing their revenue requirement and setting rates. This approach conforms to most public utility budgetary requirements and the calculation is easy to understand. A public utility totals its cash expenditures for a period of time to determine required revenues. The revenue requirement for a public utility is usually comprised of the following costs or expenses:

- **Total Operating Expenses:** This includes a utility's operation and maintenance (O&M) expenses, plus any applicable taxes or transfer payments. Operation and maintenance expenses include the materials, electricity, labor, supplies, etc. needed to keep the utility functioning.
- **Total Capital Expenses:** Capital expenses are calculated by adding debt service payments (principal and interest) to capital improvements financed with rate revenues. In lieu of including capital improvements financed with rate revenues, a utility sometimes includes a depreciation expense to stabilize its annual revenue requirement.

Under the "cash basis" approach, the sum of the total operating expenses plus the total capital expenses equals the utility's revenue requirement during any selected period of time (historical or projected).

Note 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 public utilities generally cannot finance all their capital facilities with long-term debt. At the same time, it is often difficult to pay for capital expenditures on a "pay-as-you-go" basis given that some major capital projects may have significant rate impacts upon a utility, even when financed with long-term debt. Many utilities have found that some combination of pay-as-you-go funding and long-term financing will often lead to minimization of rates over time.

Public utilities typically use the "cash basis"[1] approach to establish their revenue requirements. An exception occurs if a public utility provides service to a wholesale or contract customer. In this situation, a public utility could use the "utility basis" approach (see Table 2-1) to earn a fair return on its investment.

[1] "Cash basis" as used in the context of rate setting is not the same as the terminology used for accounting purposes and recognition of revenues and expenses. As used for rate setting, "cash basis" simply refers to the specific cost components to be included within the revenue requirement analysis.

Table 2–1 Cash versus Utility Basis Comparison			
	Cash Basis		**Utility Basis (Accrual)**
+	O&M Expenses	+	O&M Expenses
+	Taxes/Transfer Payments	+	Taxes/Transfer Payments
+	Capital Improv. Funded From Rates (≥ Depreciation Expense)	+	Depreciation Expense
+	Debt Service (Principal + Interest)	+	Return on Investment
=	Total Revenue Requirement	=	Total Revenue Requirement

2.5 Analyzing Cost of Service

After the total revenue requirement is determined, it is allocated to the users of the service. The allocation, usually analyzed through a cost of service analysis, reflects the cost relationships for producing and delivering services. A cost of service analysis requires three analytical steps:

1. Costs are ***functionalized*** or grouped into the various cost categories related to providing service (collection, pumping, treatment, etc.). This step is largely accomplished by the utility's accounting system.
2. The functionalized costs are ***classified*** to specific cost components. Classification refers to the arrangement of the functionalized data into cost components. For example, a sewer utility's costs are typically classified as volume[2], strength[3], or customer-related (e.g., customer billings and collections).
3. Once the costs are classified into components, they are proportionally ***allocated*** to the customer classes of service (residential, non-residential, etc.). The allocation is based on each customer class' relative contribution to the cost component. For example, customer-related costs are allocated to each class of service based on the total number of customers in that class of service. Once costs are allocated, the revenues from each customer class of service required to achieve cost-based rates can be determined.

2.6 Designing Sewer Rates

Rates that meet the utility's objectives are designed based on both the revenue requirement and the cost of service analysis. This approach results in rates that are strictly cost-based and does not consider other non-cost based goals and objectives (economic development, ability to pay, revenue stability, etc.). In designing final proposed rates, factors such as ability to pay, continuity of past rate philosophy, economic development, ease of administration, and customer understanding may be taken into consideration. However, the proposed rates must meet the requirements of California Constitution article XIII D, section 6.

[2] "Volume" refers to the amount of wastewater discharged.
[3] "Strength" refers to the level of constituents (biological oxygen demand, or BOD, and total dissolved solids, or TSS) in wastewater discharged.

2.7 Economic Theory and Rate Setting

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. This statement's implications on utility rate designs are significant. For example, a sewer utility usually incurs strength-related costs in treating high strength sewer. It follows that the customers who have higher strength levels and create greater treatment costs should pay for those strength-related costs in proportion to their contribution to total plant loadings. When costing and pricing techniques are refined, consumers have a more accurate picture of what the commodity costs to produce and deliver. This price-equals-cost concept provides the basis for the subsequent analysis and comments.

"Economic theory suggests that the price of a commodity must roughly equal its cost if equity among customers is to be maintained."

2.8 Summary

This section of the study has provided a brief introduction to the general principles, techniques, and economic theory used to set sewer rates. These principles and techniques will become the basis for the District's comprehensive sewer rate study.

3. Development of the Revenue Requirement

3.1 Introduction

This section describes the development of the revenue requirement analysis for the District's sewer system. The revenue requirement analysis is the first analytical step in the comprehensive rate study process. From this analysis a determination can be made as to the overall level of rate adjustments needed to provide adequate and prudent funding for both operating and capital needs of the utility. Typically, one of the main objectives of a rate study is to develop fair and equitable rates while attempting to minimize the impacts to the utility's customers.

3.2 Determining the Revenue Requirement

In developing the District's sewer revenue requirement, the utility must financially "stand on its own" and be properly funded. As a result, the revenue requirement analysis, as developed herein, assumes the full and proper funding needed to operate and maintain the District's sewer system on a financially sound and prudent basis.

". . . the revenue requirement analysis as developed herein assumes the full and proper funding needed to operate and maintain the District's sewer system on a financially sound and prudent basis."

Provided below is a more detailed discussion of the development of the revenue requirement analysis for the District.

3.3 Establishing a Time Frame and Approach

The first step in calculating the revenue requirement for the District's sewer system was to establish a time frame for the revenue requirement analysis. For this study, the revenue requirement was developed for the projected time period (FY 2016 – FY 2029). However, for rate setting purposes the next five-year period was the focus of the study. This five-year time frame was composed of the District's current FY 2016 budget and projected budgets through FY 2020. Reviewing a multi-year time period is recommended since it attempts to identify any major expenses that may be on the horizon. By anticipating future financial requirements, the District can begin planning for these changes sooner, thereby minimizing short-term rate impacts and overall long-term rates.

The second step in determining the revenue requirement was to decide on the basis of accumulating costs. In this particular case, for the revenue requirement analysis a "cash basis" approach was utilized. The "cash basis" approach is the most commonly used methodology by municipal utilities to set their revenue requirement. This is also the methodology that the District has historically used to establish their sewer revenue requirements. Table 3-1 provides a summary of the "cash basis" approach and cost components used to develop the District's sewer revenue requirement.

Table 3–1
Overview of the District's "Cash Basis" Revenue Requirements

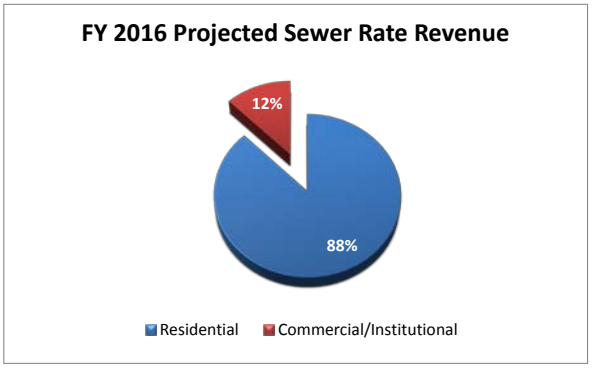
+	Sewer Operation and Maintenance Expenses
+	Rate Funded Capital
+	Debt Service (Principal + Interest) – Existing and Future
±	Change in Working Capital
=	Total Sewer Revenue Requirement
–	Miscellaneous Revenues
=	Net Revenue Requirement (Balance Required from Rates)

Given a time period around which to develop the revenue requirement and a method to accumulate the costs; the focus shifts to the development and projection of the revenues and expenses of the District's sewer system.

The primary financial inputs in the development of the revenue requirement were the District's FY 2015 and FY 2016 budget documents, recent billed customer and consumption data, and the District's capital improvement plan. Presented below is a detailed discussion of the steps and key assumptions contained in the development of the projections of the District's sewer revenue requirement analysis.

3.4 Projecting Rate and Other Miscellaneous Revenues

The first step in developing the revenue requirement was to develop a projection of the sewer rate revenues, at present rate levels. In general, this process involved developing projected billing units for each customer group. The billing units for each customer group were then multiplied by the applicable current sewer rates. This method of independently calculating revenues links the projected revenues used within the analysis to the projected billing units. It also helps to confirm that the billing units used within the study are reasonable for purposes of projecting future revenues, allocating costs and, ultimately, establishing proposed rates.



The vast majority of the District's rate revenues are derived from residential customers. The District also serves a variety of commercial and institutional customers. In total, and at currently adopted rate levels, the District's sewer system is projected to receive approximately $6.87 million in rate revenue in FY 2016. Over time, the study has assumed a conservative level customer growth of less than 1%/year. By FY 2020, the rate revenues, assuming no rate adjustments, are projected to be approximately $6.91 million.

In addition to rate revenues, the District also receives miscellaneous revenues. These are revenues related to lease income, interest income, property tax income, etc. In total, the District is projected to receive approximately $3.3 million annually in miscellaneous revenues. Of the total miscellaneous revenues, approximately $3.0 million is annual property tax proceeds. Annual property tax revenues were estimated to remain flat over the study time period. Miscellaneous revenues are anticipated to increase slightly over the projected time period due to the estimated annual increase of less than 1% for revenues other than property tax revenues.

On a combined basis, taking into account the rate revenues and the miscellaneous revenues, the District's sewer utility has total projected revenues of approximately $10.15 million in FY 2016, increasing to approximately $10.21 million in FY 2020 as a result of estimated growth as noted above. The assumptions used for growth can be found in Exhibit 2 of the technical appendix.

3.5 Projecting Operation and Maintenance Expenses

Operation and maintenance (O&M) expenses are incurred by the District to maintain and improve the sewer collection and treatment system. The starting point of the projection of O&M expenses was the FY 2015 and FY 2016 budgets. Budgeted O&M expenses were projected over the rate study time period based on historical inflationary factors. These factors took into consideration the District's historical cost increases and projected increases. The factors ranged from 1.5% to 6.0% annually for the various types of expenses (e.g., salaries, benefits, supplies). In total, O&M expenses were projected at an annual inflation rate of approximately 3.3% over the rate study time period. The total operation and maintenance expenses budgeted for the sewer utility are projected to be approximately $6.03 million in FY 2016. Over the five-year planning horizon, the total O&M expenses are projected to increase to approximately $6.87 million by FY 2020.

3.6 Projecting Capital Funding Needs

A key component in the development of the sewer revenue requirement was properly and adequately funding capital improvement needs. One of the major issues facing many utilities across the U.S. is the amount of deferred capital projects and the funding pressure from growth/expansion-related improvements. The proper and adequate funding of capital projects is an important issue for all sewer utilities and is not just a local issue or concern of the District.

In general, there are three types of capital projects that the District may need to fund. These include the following types:

- Renewal and replacement projects
- Growth/capacity expansion projects
- Regulatory-related projects

A renewal and replacement project is essentially maintaining the existing system that is in place today. As the existing plant becomes worn out, obsolete, etc., the District should be making continuous investments to maintain the integrity of its facilities. In contrast to this, the District

may make capital investments to expand the capacity of facilities to accommodate future customers. Finally, certain projects may be a function of a regulatory requirement in which the Federal or State government mandates the need for an improvement to the system to meet a regulatory standard. Understanding these different types of capital projects is important because it may help to explain why costs are increasing and the cost drivers for any needed rate adjustment. In addition, and more importantly, the way in which projects are funded may vary by the type of capital project. For example, renewal and replacement projects may be paid for via rates and funded on a "pay-as-you-go basis". In contrast to this, growth or capacity expansion projects may be funded through the collection of new development capacity fees (i.e., growth-related charges) in which new development pays a proportional and equitable share of the cost of improvements required as a result of their connection (impact). Finally, regulatory projects may be funded by a variety of different means, which may include rates, long-term debt, grants, etc.

While the above discussion appears to neatly divide capital projects into three clearly defined categories, the reality of working with specific capital projects may be more complex. For example, a pump may be replaced, but while being replaced, it is up-sized to accommodate greater capacity. There are many projects that share these "joint" characteristics. At the same time, projects may not be "replacement" related, but rather "improvement" related. For purposes of the rate study the District provided its capital improvement plan over the next 15 years. Provided below in Table 3-2 is a summary of the sewer capital funding analysis.

Table 3–2
Summary of the Sewer Capital Improvement Plan ($000)

	FY 2016	FY 2107	FY 2018	FY 2019	FY 2020
Capital Improvement Projects					
Total Treatment Plant Improvements	$1,517	$118	$58	$1,088	$58
Total Pump Stations	122	150	0	76	90
Total Pipeline Rehab & Replacement	2,000	2,000	2,000	2,000	475
Total Other Wastewater System Capital Expenditures	2,209	91	97	194	60
Future Unidentified Capital Projects	0	0	0	0	1,000
Transfer to Capital Reserve	0	0	30	0	637
Total Capital Improvement Projects	**$5,848**	**$2,359**	**$2,185**	**$3,358**	**$2,320**
Less: Other Funding Sources					
Reserves - Operating Fund	$0	$0	$0	$0	$0
Reserves - Capital Fund	3,788	239	0	1,108	0
Grant	0	0	0	0	0
Low Interest Loans	0	0	0	0	0
Revenue Bonds	0	0	0	0	0
Total Other Funding Sources	**$3,788**	**$239**	**$0**	**$1,108**	**$0**
Rate Funded Capital	**$2,060**	**$2,120**	**$2,185**	**$2,250**	**$2,320**

As can be seen in Table 3-2, there are a number of projects which vary from year-to-year. A more detailed listing of the capital projects may be found on Exhibit 4 of the Technical Appendix.

While the total amount of a project may vary from year to year, this sewer capital funding plan has attempted to provide a consistent funding source for the replacement fund. In this case, the sewer utility's rates will annually fund an amount ranging from $2.06 million to $2.32 million. As a point of reference, the District's annual depreciation expense is approximately $1.8 million. A desirable funding target for rate funded capital is an amount equal to or greater than annual depreciation expense. This level of funding slightly exceeds the minimum level of rate funded capital based on annual depreciation expenses. However, even with this level of funding, depending upon the timing of future replacement capital projects, additional funding from rates may be needed at some point in time to address the renewal and replacement of existing assets.

As noted previously, the District's annual depreciation expense is approximately $1.8 million (2014). This financial plan has placed the District's rate funding for capital at $2.32 million by FY 2020. It is important to note and understand that depreciation expense is not the same as replacement cost. Thus, funding an amount which exceeds depreciation expense (i.e., $1.8 million) is both prudent and appropriate. In developing this financial plan, HDR and the District have attempted to minimize rate impacts while funding the planned capital improvement projects of the District.

3.7 Projection of Debt Service

The District currently has two outstanding long-term debt issues, a 2009 Certificates of Participation (COPs) and a State Revolving Fund (SRF) loan, as well as a CalPERS repayment loan. No new long-term debt issues are assumed over the projected five-year period. In total annual debt service payments are approximately $1.8 million in FY 2016 and decrease to approximately $1.2 million in FY 2020 based on the debt repayment schedules provided by the District and summarized in Exhibit 5 of the technical analyses included in the appendix.

"No new long-term debt issues are assumed over the projected five year period."

3.8 Change in Working Capital

The final component of the revenue requirement analysis is the change in working capital, or additional transfers to reserve funds to maintain prudent ending fund balances or for future funding of specific projects. The rate analysis assumes an annual transfer to the capital and operating funds on an annual basis to maintain minimum fund balances. The annual transfer to the capital fund is used to fund capital improvements in future years. The annual level of transfers to reserves is based on maintaining the target minimum reserves for the operating fund, and providing sufficient funds in the capital reserve to fund capital improvements in each year of the analysis. The target ending reserve balance for the operating fund is based on 90 days of O&M expenses. This is a typical industry standard level of ending reserve fund balance.

The capital reserve ending balance is set to maintain 1 year of annual capital funding as a minimum reserve. This provides funding for necessary improvements prior to the need for adjusting rates or long-term borrowing to fund improvements. Even with the annual transfers to the capital reserve, the fund decreases over the five-year rate setting period to fund capital improvements.

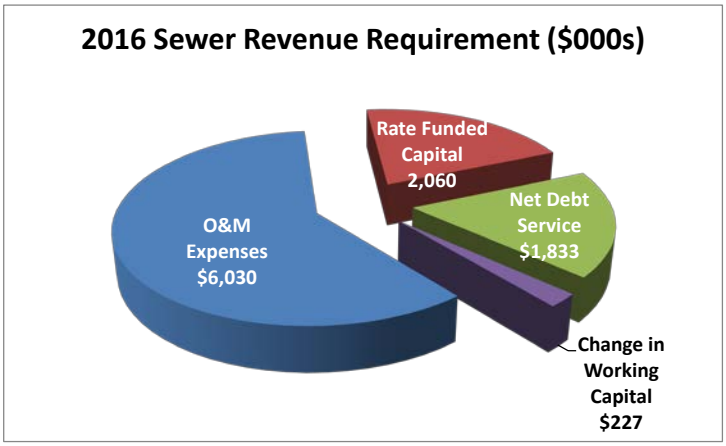
3.9 Summary of the Revenue Requirement

Given the above projections of revenues and expenses, a summary of the sewer revenue requirement analysis can be developed. In developing the revenue requirement analysis, consideration was given to the financial planning considerations of the District. In particular, emphasis was placed on attempting to minimize rates, yet still have adequate funds to support the operational activities and capital projects throughout the projected time period. Presented below in Table 3-3 is a summary of the District's projected sewer revenue requirement. Detailed exhibits of this analysis can be found in the Technical Appendix (Exhibits 1 – 6).

Table 3–3
Summary of the Sewer Revenue Requirement Analysis ($000)

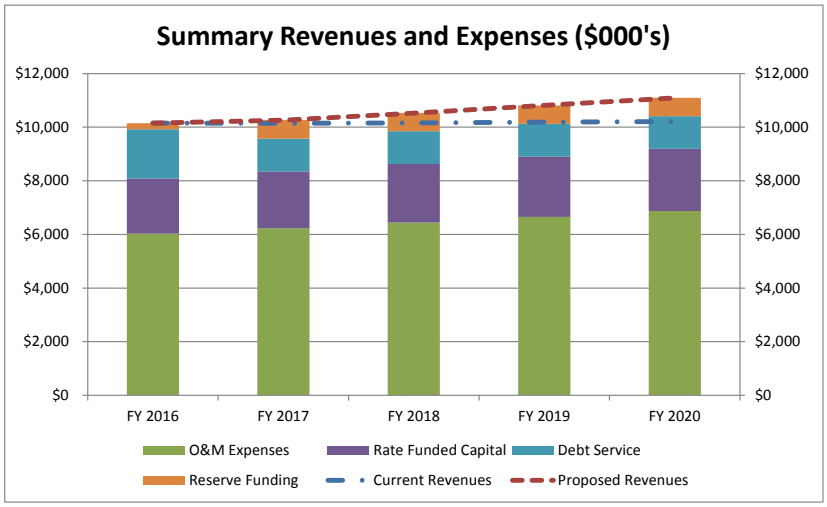
	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Sources of Funds -					
Rate Revenues	$6,868	$6,875	$6,882	$6,896	$6,909
Misc. Revenues	3,283	3,268	3,279	3,295	3,298
Total Sources of Funds	$10,151	$10,143	$10,161	$10,191	$10,207
Expenses					
O&M Expenses	$6,030	$6,234	$6,445	$6,656	$6,875
Rate Funded Capital	2,060	2,120	2,185	2,250	2,320
Net Debt Service	1,834	1,218	1,219	1,219	1,217
Change in Working Capital	227	691	678	687	681
Total Expenses	$10,151	$10,263	$10,527	$10,812	$11,092
Balance/(Defic.) of Funds	$0	($120)	($366)	($620)	($885)
Defic. as a % of Rate Rev.	0.0%	1.7%	5.3%	9.0%	12.8%
Total Proposed Revenue Adjustment	**0.0%**	**3.5%**	**3.5%**	**3.5%**	**3.5%**

[1] - The proposed rate adjustments will be implemented on January 1 of each year, or midway through the fiscal year



As can be seen, the revenue requirement has summed the O&M, rate funded capital, net debt service and the change in working capital. The total revenue requirement is then compared to the total sources of funds which include the rate revenues, at present rate levels, and other miscellaneous revenues. From this comparison a balance or deficiency of funds in each year can be determined. This balance or deficiency of funds is then compared to the rate revenues to determine the level of rate adjustment needed to meet the revenue requirement. It is important to note the "Balance/(Deficiency) of Funds" row is cumulative. That is, any adjustments in the initial years will reduce the deficiency in the later years. Over this project time period, the total deficiency of rates is 12.8%.

The revenue requirements developed in Table 3-3 has been developed to meet financial planning objectives of the District. More specifically, the District desires to adequately and prudently fund its sewer operating and capital needs. In doing so, any needed rate adjustments should avoid large adjustments in any single year. Table 3-3 has also included a set of proposed rate adjustments (blue band) which are sufficient to meet the total revenue requirements over the projected time period. The proposed rate adjustments are a function of assumed inflation over this time period, coupled with the need to increase the capital improvement funding from rates (renewal and replacement funding) and meet minimum reserve levels. If not sewer rate adjustments are made the District will not have sufficient funding for annual O&M or capital expenses to maintain and operate the sewer system. Over the five year time period annual deficiencies range from $120,000 to $885,000.



3.10 Consultant's Conclusions

Based on the revenue requirement analysis developed herein, HDR has recommended that the District adjust sewer rates over the next five years (FY 2016 – FY 2020). HDR has reached this conclusion for the following reasons:

- Rate adjustments are necessary to fund the District's capital improvement needs, of which a large portion is driven by the funding of replacement capital projects.
- Rate adjustments are necessary to fund the District's capital projects on a "pay-as-you-go" basis and avoid the need for the issuance of any long-term debt.
- The proposed rate adjustments maintain the District's strong financial health and provide long-term sustainable funding levels for the District.

In reaching this conclusion, HDR would recommend that the District adopt the proposed rates through FY 2020 in order to provide sufficient funding for annual O&M and capital improvement program.

3.11 Summary

This section of the study has provided a discussion of the District's sewer revenue requirement analysis. The revenue requirement analysis developed a rate transition plan to support the District's operating and capital needs. The next section will discuss the cost of service analysis developed for District's sewer system.

4. Development of the Cost of Service Analysis

4.1 Introduction

In the previous section, the revenue requirement analysis focused on the total sources and application of funds required to adequately fund the District's sewer collection and treatment system. This section will provide an overview of the cost of service analysis developed for the District.

A cost of service analysis is concerned with the proportionate allocation of the total revenue requirement between the various customer classes of service (e.g., residential and commercial). The previously developed revenue requirement was utilized in the development of the cost of service analysis.

4.2 Objectives of a Cost of Service Study

There are two primary objectives in conducting a sewer cost of service study:

- Allocate the District's revenue requirement among the customer classes of service; and
- Derive average unit costs for subsequent rate designs

The objectives of the cost of service analysis are different from determining a revenue requirement. As noted in the previous section, a revenue requirement analysis determines the utility's overall financial needs, while the cost of service analysis determines the fair and equitable manner to proportionately collect the revenue requirement from the District's various customer classes of service.

The second rationale for conducting a cost of service analysis is to ensure that proposed rates are designed such that it properly reflects the costs incurred by the District. For example, a sewer utility typically incurs costs related to flow (wastewater volumes), strength, and customer cost components. Each of these types of costs may be collected in a slightly different manner as to allow for the development of rates that collect costs in the same manner as they are incurred.

4.3 Determining the Customer Classes of Service

The first step in a cost of service analysis is to determine the customer classes of service. Based on the current rates the classes of service used within the cost of service analysis were:

- Residential
- Commercial/Institutional

In determining classes of service for cost of service purposes, the objective is to group customers together into similar or homogeneous groups based upon facility requirements and/or flow characteristics. HDR reviewed the current customer classes of service used by the District and found them consistent with typical industry practices.

4.4 General Cost of Service Procedures

In order to determine the cost to serve each customer class of service on the District's system, a cost of service analysis is conducted. A cost of service study utilizes a three-step approach to review costs. These steps take the form of functionalization, classification, and allocation. Provided below is a detailed discussion of the sewer cost of service study conducted for the District, and the specific steps taken within the analysis.

4.4.1 Functionalization of Costs

The first analytical step in the cost of service process is called functionalization. Functionalization is the arrangement of expenses and asset (plant) data by major operating functions (e.g., collection, pumping, treatment). Within this study, there was a limited amount of functionalization of the cost data, as the District's records functionalized a majority of the costs.

4.4.2 Classification of Costs

The second analytical task performed in a sewer cost of service study is the classification of the costs. Classification determines why the expenses were incurred or what type of need is being met. The following cost classifiers were used to develop the cost of service analysis:

- **Volume Related Costs:** Volume related costs are those costs which tend to vary with the total quantity of wastewater collected and treated.
- **Strength Related Costs:** Strength related costs are those costs associated with the additional handling and treatment of high "strength" sewer. Strength of sewer is typically measured in biochemical oxygen

Terminology of a Wastewater Cost of Service Analysis

Functionalization – The arrangement of the cost data by functional category (e.g. collection, pumping, treatment).

Classification – The assignment of functionalized costs to cost components (e.g. volume, strength, and customer related).

Allocation – Allocating the classified costs to each class of service based upon each class's proportional contribution to that specific cost component.

Volume Costs – Costs that are classified as volume related vary with the total flow of wastewater (e.g., power for pumping).

Strength Costs – Costs classified as strength related refer to the wastewater treatment function. Typically, strength-related costs are further defined as biochemical oxygen demand (BOD) and suspended solids (SS). Different types of customers may have high wastewater strength characteristics and high strength wastewater costs more to treat. Treatment facilities are often designed and sized around meeting these costs.

Customer Costs – Costs classified as customer related vary with the number of customers on the system, e.g., billing costs.

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

demand[4] (BOD) and total suspended solids[5] (SS). Increased levels of BOD or SS generally equate to increased treatment costs.

- **Customer Related Costs:** Customer-related costs vary with the addition or deletion of a customer or a cost which is a function of the number of customers served. Customer related costs typically include the costs of billing, collecting, and accounting.
- **Revenue Related Costs:** Some costs associated with the utility may vary with the amount of revenue received by the utility. An example of a revenue related cost would be a utility tax which is based on gross utility revenue.

The classification of costs is provided in Exhibit 11.1 for the infrastructure (sewer assets) and Exhibit 12.1 for the test period revenue requirement. The basis, or methodology, for the classification process is the WEF MOP #27. The methodology provided in the manual was then applied to the District's specific circumstances and operations to develop the appropriate classification.

4.4.3 Development of Allocation Factors

Once the classification process is complete, and the customer groups have been defined, the various classified costs were allocated to each customer class of service. The District's classified costs were allocated to the customer classes of service using the following allocation factors.

- **Volume Allocation Factor:** Volume-related costs are generally allocated on the basis of contribution to sewer flows. Sewer flows were calculated based on winter (November – February) water flow estimates for the residential customers and volumetric billing information of the commercial customers. Because the District does not directly meter wastewater discharges, metered water data is used to estimate contributed average wastewater volume units of service. In recognition of the significant amount of water used for outdoor uses (e.g., irrigation of landscaping) that are not discharged to the wastewater system, for allocation purposes this study used winter (November – February) months water usage (where irrigation is minimal) to estimate contributed wastewater volumes. Provided in Table 4-1 is a summary of the data used to establish the residential winter water flow.

Table 4–1
Average Residential Winter Water Consumption (CCF)

November	December	January	February	Average Winter Month Flow	Annualized Wastewater Flow
6.76	4.60	5.33	4.31	5.25	653,751

[4] BOD is the amount of dissolved oxygen that must be present in water in order for microorganisms to decompose the organic matter in the wastewater.
[5] TSS is the entire amount of organic and inorganic particles dispersed in wastewater.

The average monthly flow is multiplied by 12 months and the number of residential sewer customers. As noted, commercial customers are billed on the basis of water consumption over 5 CCF per month. The volume allocation factor was based on the actual billed flow for FY 2014. A detailed analysis of the allocation of volume related costs are shown in the Technical Appendix (Exhibit 7).

- **Strength Allocation Factor:** Strength-related costs are classified between BOD and SS. Both of these types of costs are allocated to each of the classes of service based upon the assumed domestic strength level of 225 mg/l for BOD and SS. The strength level was based on average strength levels measured at the wastewater treatment plant and provided by the District. A detailed analysis of the allocation of volume related costs are shown in the Technical Appendix (Exhibit 9).
- **Customer Allocation Factor:** Customer costs within the cost of service analysis are allocated to the various customer classes of service based upon their respective customer counts. Two types of customer allocation factors were developed; actual and weighted. The actual customer allocation factor assumes that there is no disproportionate cost associated with serving a customer (e.g., postage for bills is the same regardless of the size or usage of the customer). In contrast, a weighted customer allocation factor assumes that there is some disproportionality associated with serving different types of customers and attempts to estimate the level of difference in serving the customers. A detailed analysis of the allocation of volume related costs are shown in the Technical Appendix (Exhibit 8).
- **Revenue Related Allocation Factor:** The revenue related allocation factor was developed from the projected rate revenues for FY 2016. A detailed analysis of the allocation of volume related costs are shown in the Technical Appendix (Exhibit 10).

The development of allocation factors is based on generally accepted principles as developed in the WEF MOP #27. The summary of the allocation of the test period revenue requirement is provided in Exhibit 13 of the technical appendix.

4.5 Summary of the Sewer Cost of Service Analysis

In summary form, the cost of service analysis began by functionalizing the District's plant asset records and O&M expenses. The functionalized plant and expense accounts were then classified into their various cost components. Provided below is a summary of the classification of the FY 2016 test period revenue requirement using the methodology outlined in the WEF MOP #27.

Table 4–2
Summary of the Classification of the FY 2016 Revenue Requirement ($000's)

Total	Volume	BOD	TSS	Customer	Revenue
$6,868	$4,594	$1,078	$1,073	$104	$19

As shown in Table 4-2 the Total revenue requirement for FY 2016 has been classified between the various cost components based on generally accepted methodologies. Next, the individual

classification totals were then allocated to the various customer groups based on the appropriate allocation factors. For example, volume related costs were allocated based on each customer class' share of total wastewater contributions. In this case, approximately 87% is allocated to the residential customers and the remaining 13% allocated to commercial customers. The total costs classified to each cost component were allocated between the customer classes using the allocation factors. Provided below in Table 4-3 is a summary of the total allocation of costs, by cost component, to the customer classes of service.

Table 4–3
Summary of the Classification of the FY 2016 by Customer Class ($000's)

	Total	Residential	Commercial/ Institutional
Volume	$4,594	$3,990	$604
BOD	1,078	936	142
TSS	1,073	932	141
Customer	104	102	2
Revenue	19	17	2
Total	**$6,868**	**$5,977**	**$891**

A more detailed analysis of the functionalization and classification of costs are shown in the Technical Appendix (Exhibits 11.1 and 12.1).

The allocated expenses for each customer group were then aggregated to determine each customer group's overall revenue responsibility. Provided in Table 4-4 is a summary of the cost of service analysis.

Table 4–4
Summary of the Sewer Cost of Service Analysis ($000)

Class of Service	Present 2016 Rate Revenues	Allocated Costs	$ Difference	% Difference
Residential	$6,018	$5,977	$41	-0.7%
Commercial & Institutional	850	891	(41)	4.8%
Total	$6,868	$6,868	$0	0.0%

The results of the cost of service analysis indicated very minor cost differences between the customer classes of service. When reviewing the results of the cost of service analysis, it is important to understand that the results will not be "exact" each time the District updates its cost of service analysis. This is due to changing customer water consumption patterns which impact sewer flows, external impacts such as the current drought, and how the District incurs costs. In addition, given the changing usage patterns resulting from the current drought which has changed the relationships between the customer classes and may not reflect typical winter

water consumption used to allocate costs, HDR would recommend no cost of service adjustments at this time. A detailed analysis of the allocation of the revenue requirement between the residential and commercial customer classes is shown in the Technical Appendix (exhibits 13 and 14).

4.6 Consultant's Conclusions and Recommendations

While some minor cost differences exist, the overall allocation of costs between customers generally appears to be reasonable. In reaching this conclusion, one of the variables which is impacting the cost allocations is the trend of declining per capita water consumption for residential customers, along with the current drought conditions with California. These conditions certainly have an impact upon consumptive use and cost allocations and do not reflect future winter water consumption patterns which are used to establish the basis for allocating costs for sewer related services over the next five year period. This is also a single point in time, reaching conclusions based on one data point that may or may not reflect customer impacts on the system can result in rates that do not reflect actual customer impacts on the sewer system.

Given the changing usage patterns and current drought, HDR believes the focus of this study should be on the overall rate adjustment needs based on the District's need to fund capital improvement projects over the next few years. As the District continues to monitor rates and cost of service results through future studies, cost of service adjustments may be made as the results are driven by customer consumption. For this study, and for projecting revenues and expenses, the consumption for each class of service was assumed to remain at current levels due to the ongoing drought and minimal growth on the District's system. Given that, no adjustments in the cost relationships between the customer classes of service are recommended at this time. As a result, the overall proposed revenue/rate adjustments will be applied equally across all customer groups.

4.7 Summary

This section of the study has provided a summary of the cost of service analysis developed for the District. This analysis was prepared using generally accepted cost of service techniques and principles. The next section of the study will review the present and proposed sewer rates for the District.

5. Development of the Rate Designs

5.1 Introduction

The final step of the District's comprehensive sewer rate study is the design of rates to collect the desired levels of revenues, based on the results of the revenue requirement and cost of service analyses. In reviewing District's rates, consideration is given to the level of the rates and the structure of the rates.

5.2 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 efficient use, economic development, etc.)
- Provide revenue stability from month to month and year to year
- Promote efficient allocation of the resource
- Equitable and non-discriminatory (cost-based)

Compliance with State law

It is important that the District provide its customers with a proper price signal as to what their usage or volumetric contributions are costing. This goal may be approached through rate level and structure. When developing the proposed rate designs, all 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 the goals and objectives listed above. For example, it may be difficult to design a rate that takes into consideration customers' ability to pay, and one which is cost-based. In designing rates, there are always trade-offs between these various goals and objectives.

5.3 Development of Cost-Based Sewer Rates

As mentioned, developing cost-based and equitable rates is of paramount importance in developing proposed water rates. While always a key consideration in developing rates, meeting the legal requirements, and documenting the steps taken to meet the requirements, has been in the forefront with the recent legal challenges in the State of California on utility rates. Given this, the development of the District's proposed sewer rates have been developed to meet the legal requirements of California Constitution article XIII D, section 6 (Article XIII D). A key component of Article XIII D is the development of rates which reflect the cost of providing service and are proportionally allocated between the various customer classes of service. HDR

would point out that there is no single methodology for equitably assigning costs to the various customer groups. The Water Environment Federation Manual of Practice #27 provides various methodologies which may be used to establish cost-based rates. Unfortunately, Article XII D is not prescriptive and does not provide a specific methodology for establishing rates. Given that, HDR developed the District's proposed sewer rates based on generally accepted rate setting methodologies to meet the requirements of Article XIII D.

HDR is of the opinion that the proposed rates meet the legal requirements of Article XIII D. HDR reaches this conclusion based upon the following:

- **The revenue derived from sewer rates does not exceed the funds required to provide the property related service (i.e., wastewater service).** The proposed rates are designed to collect the overall revenue requirement of the District's sewer system.
- **The revenues derived from sewer rates shall not be used for any purpose other than that for which the fee or charge is imposed.** The revenues derived from the District's sewer rates are used exclusively to operate and maintain the District's sewer system.
- **The amount of a fee or charge imposed upon a parcel or person as an incident of property ownership shall not exceed the proportional costs of the service attributable to the parcel.** This study has focused almost exclusively on the issue of proportional assignment of costs to customer classes of service. The proposed rates have appropriately grouped customers into customer classes of service (residential and commercial/institutional) that reflect the varying consumption patterns and system requirements (i.e., the benefits they receive from and burdens they place on the system) of each customer class of service. The grouping of customers and rates into these classes of service creates the equity and fairness expected under Proposition 218 by having differing rates by customer classes of service which reflect both the level of revenue to be collected by the utility, and the manner in which these costs are incurred and equitably assigned to customer classes of service based upon their proportional impacts.

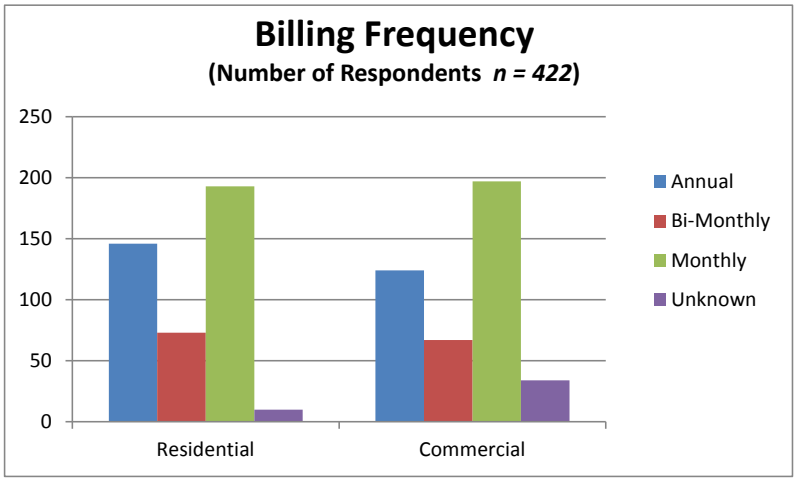
5.4 Current Industry Sewer Rate Structure Approach

At the present time, there are no specific federal or state agencies or national association requirements/regulation on sewer rate structures. The vast majority of sewer utilities follow the guiding principles of establishing cost-based rates that meet the utility's O&M and capital infrastructure requirements. The Environmental Protection Agency (EPA) provides pricing guidelines for wastewater utilities, but the focus is primarily on assuring adequate funding to maintain facilities, and not on a specific rate structure.

The California Urban Water Conservation Council (CUWCC) does have Best Management Practices (BMP) encouraging the adoption of volumetric-based sewer utilities. The CUWCC and other conservation experts believe that having volume-based sewer rates, where the billing is based upon water consumption, encourages water conservation. Whether the majority of consumers make the connection between the volumetric portion of their sewer bill and their water consumption is unclear. Simply stated, most sewer utilities do not adopt volume-based

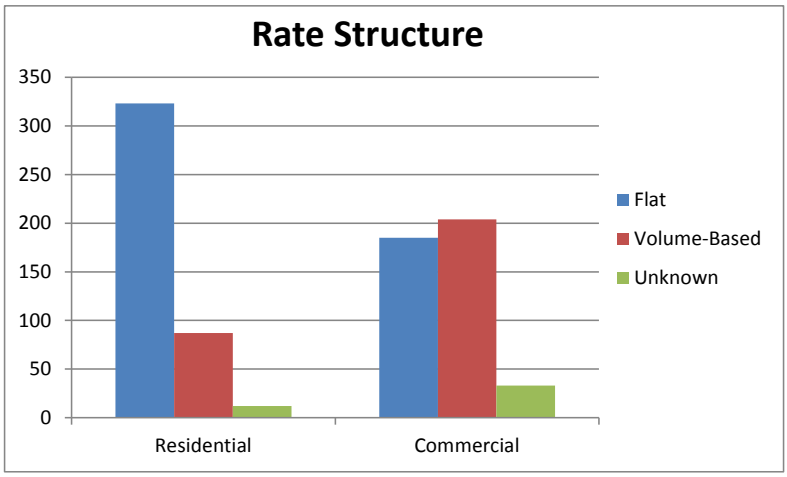
sewer rates to encourage water conservation. Rather, most sewer utilities view volumetric-based billing as a method that may enhance customer equity.

To gain a better perspective of wastewater rates is to review the wastewater rate structures in place throughout California. HDR reviewed the State Water Board 2012/13 Wastewater User Charge User Survey to provide a perspective on how utilities are billing for wastewater services.

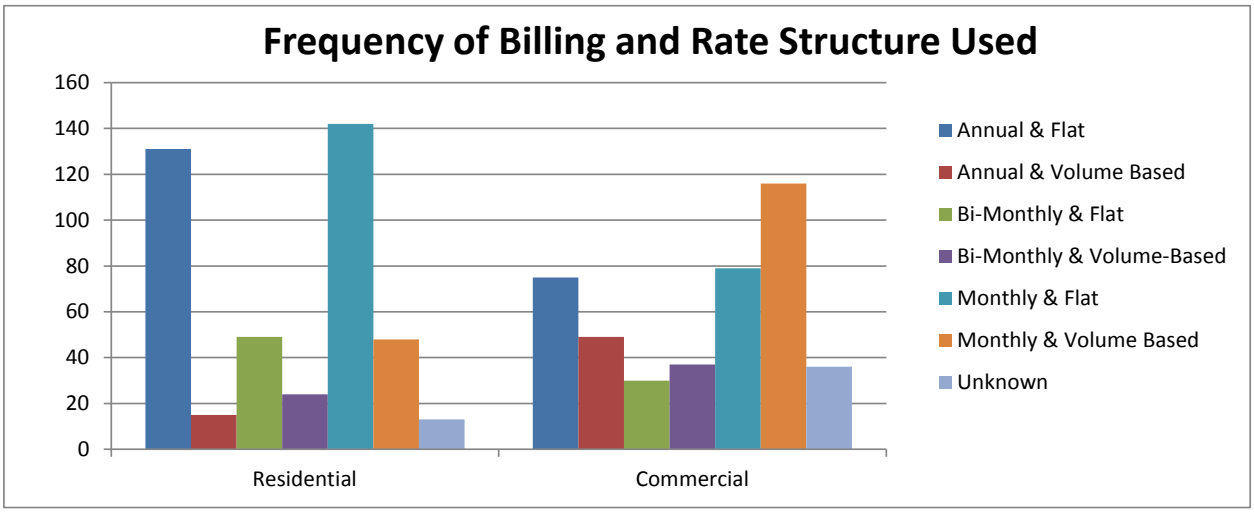


For the 422 respondents, the data was sorted to determine billing frequency for residential and commercial customers. In viewing the billing frequency graph, it can be seen that the most common billing frequency is monthly. An annual billing frequency was also very common. Bi-monthly billing is also used, but it is less common. The monthly basis for billing is likely used by utilities which are a combined water and wastewater utility. Billing for water on a monthly basis is a common water utility industry practice.

The next perspective reviewed was the rate structure used for each of the customer groups. As can be seen in the graphic, different rate structures are used. The survey did not provide detailed information on the rate structure other than a "flat" rate or "variable based upon water use." In the graph, the "variable based upon water use" has been identified as "volume-based." As can be seen in the rate structure graph, the predominate rate structure for the residential customers is a flat rate. In contrast to this, a volume based rate is more commonly used for commercial customers, but a flat rate is also used frequently.



What is unclear from the graphs above is the most common approach when frequency of billing and rate structure are viewed at the same time. Provided below is a graph which views these two perspectives taken together.



In summary, when viewing California utilities, the predominate approach for residential customers is to bill on a monthly basis using a flat rate structure. For the commercial customers, billing on a monthly basis using volumetric rates is the predominate approach. This is the same method of billing used by the District for its residential and commercial customers.

5.5 Overview of the District's Present Sewer Rate Structure

The District currently has a flat monthly fixed charge rate for the residential sewer customers. As noted above, this is a generally accepted sewer rate structure and used across California as well as the U.S. The flat rate provides revenue stability for the District as well as reflects the fact that the majority of the District's costs are fixed.

The sewer rate structure for the commercial and institutional customers includes a monthly fixed charge and a volume charge for all water consumption over 5 CCF (hundred cubic feet). Again, as noted in the prior section, this is a common approach to billing commercial and institutional customers.

The fixed monthly charge is the same for both the residential and commercial/institutional customers. This fixed charge reflects the costs of providing wastewater service for the typical residential customer. As noted in Table 4-1, the typical residential customer's wastewater flow is estimated at approximately 5 CCF. Therefore, the unit costs for the residential customers, as developed in the cost of service analysis, are used to set the fixed charge for all customers, both residential and commercial. The volume charge for all use over 5 CCF for the commercial and institutional customers is then based on the unit costs in the cost of service reflecting the additional costs for volumes greater than 5 CCF.

5.6 Development of the Proposed Sewer Rates

As noted above, the District's current sewer rates are contemporary and reflect current industry trends. Given this, no proposed changes to the wastewater rate structure have been

proposed and the level of the District's wastewater rates will be adjusted based on the results of the revenue requirement and cost of service analyses.

The revenue requirement analysis was used to determine the adequate and prudent level of funding needed to operate the District's sewer system. The revenue requirement reviewed the time period of FY 2016 – FY 2020 for rate setting purposes. The results of the revenue requirement analysis indicates the need for annual revenue adjustments for FY 2017 – FY 2020, no rate adjustment was necessary in FY 2016. The proposed rates to be developed in this section of the study will assume these revenue adjustments for each of the fiscal years reviewed. Provided below in Table 5-1 is a summary of the target revenues in each year of the study and the calculated revenues resulting from the proposed rates.

Table 5–1
Comparison of the Proposed and Target Revenues ($000's)

	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Proposed Residential Revenue					
Fixed Charge	$6,018	$6,123	$6,338	$6,566	$6,796
Proposed Commercial/Institutional Revenue					
Fixed Charge	142	145	150	155	160
Volume Charge	708	720	745	772	798
Total Proposed Revenues	**$6,868**	**$6,988**	**$7,232**	**$7,493**	**$7,755**
Target Rate Revenues	**$6,868**	**$6,995**	**$7,247**	**$7,516**	**$7,795**
$ Difference	$0	$7	$15	$23	$40
% Difference	0.0%	0.1%	0.2%	0.3%	0.5%

The difference between the total proposed revenues and the target revenues is due to rounding of the rates and the timing of the rate adjustment half way through the fiscal year.

Given the development of the overall revenue needs of the sewer utility, the next component of the sewer rates is to review the cost of service results, or the proportionality between the customer classes of service. As noted in Section 4 of this report, no cost of service adjustments were proposed given the results of the study. As a result, the unit costs developed in the cost of service study were compared to the current fixed and volumetric charges. While not exactly the same, the level of the fixed and volume charges is reasonable. Provided below in Table 5-2 is a summary of the present rates and the unit costs from the cost of service study.

Table 5–2 Comparison of the Present Rates and Unit Costs				
	Present Rates	**Unit Costs**	**$ Difference**	**% Difference**
Residential				
Fixed Charge	$48.28	$47.95	($0.33)	-0.7%
Commercial/Institutional				
Fixed Charge	$48.28	$47.95	($0.33)	-0.7%
Volume Charge	$6.99	$7.19	$0.20	2.9%

As shown in Table 5-2, the present rates and the unit costs developed in the cost of service analysis are only slightly different. As noted in Section 4, the results of the cost of service will change over time and the unit costs may not be exact. However, for the District's study, the results reasonably reflect the current rates for the fixed and volume charges.

As a result, the proposed rate adjustments would be applied equally (i.e., receive equal percentage rate adjustments) to each component of the rate structure, or the fixed and volumetric rate. In this way, only the level of the rate structure has been adjusted and the current rate structure has been maintained to reflect the results of the study.

5.7 Summary of the District's Present and Proposed Sewer Rates

As noted, the District's residential customers are charged a fixed monthly charge, and the commercial customers are charged a fixed monthly charge plus a volume charge for all consumption over 5 CCF. No adjustments to the rate structure have been proposed and only the level of the rates has been adjusted based on the results of the study. Provided below in Table 5-3 is a summary of the present and proposed sewer rates for the FY 2016 through FY 2020 time period.

Table 5–3 Summary of the Proposed Sewer Rates						
	Present Rates	**FY 2016 Jan. 1 2016**	**FY 2017 Jan. 1 2017**	**FY 2018 Jan. 1 2018**	**FY 2019 Jan. 1 2019**	**FY 2020 Jan. 1 2020**
Proposed Rate Adjustment		0.0%	3.5%	3.5%	3.5%	3.5%
Residential						
Monthly Fixed Charge	$48.28	$48.28	$49.97	$51.72	$53.53	$55.40
Commercial/Institutional						
Monthly Fixed Charge	$48.28	$48.28	$49.97	$51.72	$53.53	$55.40
Volume Fee [1]	$6.99	$6.99	$7.23	$7.48	$7.74	$8.01

[1] – The volume fee is for all water use over 5 CCF per month for commercial/institutional customers

As can be seen in Table 5-1, the rates for FY 2016 have not been adjusted. The first rate adjustment to the District's sewer rates occurs in FY 2017 on January 1, 2017. The rates are adjusted each subsequent January 1.

5.8 Summary of the Sewer Rate Designs

The development of the proposed rates is based on the overall level of revenues developed as part of the revenue requirement analysis and the proportional allocation of costs to the customer classes of service based on the cost of service recommendations. Therefore, the rates as proposed are cost-based, equitable, proportionate to the cost of service, and reflect the specific costs of the District's sewer system attributable to the two customer classes.

5.9 Summary of the Sewer Rate Study

This completes the comprehensive sewer rates study for the District. This study has provided a comprehensive review of the District's sewer rates. Adoption of the proposed rates will allow the District to meet their current and projected sewer system financial obligations and major capital projects for the time period reviewed.

Technical Appendix