This document is formatted for double-sided printing
March 6, 2019

Mr. Roland Williams
General Manager
Castro Valley Sanitary District
21040 Marshall Street
Castro Valley, CA 94546

Subject: Wastewater Rate and Cost of Service Study

Dear Mr. Williams:

HF&H Consultants, LLC (HF&H), is pleased to submit this Wastewater Rate and Cost of Service Study to the Castro Valley Sanitary District (CVSan). The report summarizes the projected cost of utility service and the related revenue requirements over the next six fiscal years, updates the cost of service allocation among the customer classes, and provides a detailed schedule of updates in utility service rates for the next six years. Our report summarizes the results for FYs 2019/20 through 2024/25; a copy of our model, which projects revenue, expenses, and the necessary rate increases for the next six fiscal years, can be found in the Appendix to this report.

This report is organized into six sections:

- **Executive Summary** – A summary of the Findings and Recommendations of the proposed sewer service charges and modifications based on the cost of service analysis.
- **Introduction** – A brief description of the study purpose and project background.
- **Revenue Requirement Projections** – The estimated costs that must be covered by rates and the recommended revenue increases to cover such costs and maintain adequate reserves.
- **Cost of Service Analysis** – The allocation of the revenue requirement to the residential and non-residential customers.
- **Rate Design** – A description of the application of the cost of service adjustments and the required rate increases to CVSan’s sewer service charges.
• **Bill Comparisons with Neighboring Agencies** – A series of graphs which compare CVSan’s current and recommended FY 2019/20 sewer service charges with neighboring agencies.

Because of the adjustments required to align the rates with the cost of service, each customer class experiences different percentage rate increases in the first fiscal year (FY 2019/20), followed by across-the-board, equal percentage increases in subsequent years.

It has been a pleasure to assist CVSan with this rate update.

Very truly yours,

HF&H CONSULTANTS, LLC

John W. Farnkopf, P.E., Senior Vice President
Rick Simonson, C.M.C., Vice President
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# ACKNOWLEDGEMENTS

CVSan Board
- Daniel M. Akagi, President
- Dave Sadoff, President Pro-Tem
- Ralph Johnson, Secretary
- Melody Appleton, Secretary Pro-Tem
- Timothy McGowan, Member

CVSan Staff
- Roland Williams, General Manager
- Brittany Newport, MPA, Administrative Technician
- Kiki Bian, Financial Specialist

HF&H Consultants
- John W. Farnkopf, P.E., Senior Vice President
- Rick Simonson, C.M.C., Vice President
- Geoffrey Michalczyk, Associate Analyst
ACRONYMS

BOD  Biochemical Oxygen Demand; a component of wastewater strength  
CIP  Capital Improvement Program  
COSA  Cost of Service Analysis  
CVSan  Castro Valley Sanitary District  
DU  Dwelling Unit  
FY  Fiscal Year  
GPD  Gallons per Day  
HCF  Hundred cubic feet, which is equivalent to 748.052 gallons  
Mg/l  Milligrams per Liter  
Mgd  Million gallons per day  
O&M  Operations and Maintenance  
PAYGo  Pay-As-You-Go, in reference to funding capital improvements from cash rather than from borrowed sources of revenue  
SS or TSS  Suspended Solids or Total Suspended Solids; a component of wastewater strength

LIMITATIONS

This document was prepared solely for CVSan in accordance with the contract between CVSan and HF&H and is not intended for use by any other party for any other purpose.

In preparing this analysis, we relied on information and instructions from CVSan, which we considered to be accurate and reliable and did not independently verify.

Rounding differences caused by stored values in electronic format may exist.

This document addresses relevant laws, regulations, and court decisions but should not be relied upon as legal advice. Questions concerning the interpretation of legal authorities referenced in this document should be referred to a qualified attorney.
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CVSan engaged HF&H to determine the cost of service and associated sewer service charges for FYs 2019/20 through 2024/25. CVSan intends to issue a notice of public hearing to rate payers in compliance with Proposition 218. The cost-of-service analysis, documented in this report, will form the basis of the sewer service charges and will serve as part of the administrative record.

**Findings and Recommendations**

**Current Rates**

Currently, residential customers are charged a flat rate of $419 per dwelling unit per year. Residential customers include single-family and multi-family (e.g., duplexes, condominiums, townhomes, apartments, mobile homes). Non-residential commercial and institutional customers are categorized in 35 customer classes. The charges for each customer class are based on each class’ respective discharge volume and strength based on prior discharge characteristic studies. CVSan’s current rates for FY 2018/19 are shown in Figure 1-1.

**Projected Annual Revenue Increases**

The necessary annual increases in revenue for the six-year planning period (FYs 2019/20 through 2024/25), are based on CVSan’s operating budget covering FYs 2019/2020 and 2020/21, CVSan’s six-year capital improvement program, the CVSan/Oro Loma treatment plant (Treatment Plant) 10-year capital improvement program, and FY 2018/19 estimated actuals for revenue. The two-year operating budget has been escalated through FY 2024/25. The annual inflation factors and other key assumption details can be seen in Table 1B of Appendix A (the cost-of-service rate model).

Rates have been projected in this financial plan that are based on a number of assumptions and information that should be reviewed and updated prior to adopting any future rate increases.

The annual revenue increases indicated in Figure 1-2 reflect revenue and expenses assumptions, based on currently available information. Multi-
year revenue requirement projections, and anticipated revenue at current rates, indicate the need to increase rate revenue as further described below.

**Cost-of-Service Analysis**

The need to increase revenues by 5.0% for FY 2019/20 shown in Figure 1-2 applies differently to each of CVSan’s customer classes’ sewer service charges because of adjustments in the cost-of-service analysis (COSA). Figure 1-3 summarizes the differences between the current rates for FY 2018/19 and the rates based on the COSA, for FY 2019-20, performed for this report. The COSA determined the rates for non-residential customers with higher strength wastewater (i.e., customers with on-site food preparation, such as restaurants, bakeries, grocery markets, etc.) have not kept pace with the increasing costs of treating high strength wastewater. This is not uncommon as regulations for treating wastewater for BOD and TSS continue to become more stringent over the years.

<table>
<thead>
<tr>
<th>Figure 1-3. Results of FY 2019/20 Cost-of-Service Analysis</th>
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<td><strong>Customer Classification</strong></td>
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<tr>
<td>Residential Per Dwelling Unit</td>
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<tr>
<td>Commercial Auto Repair Services</td>
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<tr>
<td>Bakeries</td>
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<tr>
<td>Barbers</td>
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<tr>
<td>Bars/Drinking Places</td>
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<tr>
<td>Beauty Services</td>
</tr>
<tr>
<td>Car Washes</td>
</tr>
<tr>
<td>Coin Operated Laundromats</td>
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<tr>
<td>Dentists</td>
</tr>
<tr>
<td>Eating Places - Fast Food</td>
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<tr>
<td>Eating Places - Other</td>
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<tr>
<td>Eating Places - Rest. 0-50 Seats</td>
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<td>Eating Places - Rest. &gt; 50 Seats</td>
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<td>Eating Places - Take Out</td>
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<td>Fitness Centers/Health Clubs</td>
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<tr>
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<tr>
<td>Hairdressers</td>
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</table>

**Rate Design**

We prepared a six-year rate projection based on the COSA charges for FY 2019/20, presented in Figure 1-3 above. Those charges reflect the cost of service adjustments in FY 2019/20 followed by across-the-board 5.0% rate increases in subsequent years. The resulting rate projections for the next six years are shown in Figure 1-4. However, given the magnitude of the increases to high strength customers and decreases to some other customer classes, we recommend phasing in the impacts of the COSA changes. Working with staff, and incorporating input from the finance committee chair, we have developed a phase-in approach which is presented in Figure 1-5. An explanation of the approach for phasing in the changes follows Figure 1-5.
## Figure 1-4. Proposed Rates (FY 2019/20 through FY 2024/25) – WITHOUT PHASE-IN

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<td>Per Dwelling Unit</td>
<td>$419</td>
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<td>4.2%</td>
<td>$458</td>
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<td>$481</td>
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<td><strong>Commercial</strong></td>
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<td>$1,264</td>
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<td>Coin Operated Laundromats</td>
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<td>$2,698</td>
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<td>Eating Places - Fast Food</td>
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<td>$6,720</td>
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<td>Eating Places - Restaurant 0-50 Seats</td>
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<td>Churches</td>
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<td>Nursing/Care Homes (Per Bed)</td>
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<tr>
<td>Parks</td>
<td>$937</td>
<td>$920</td>
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<td>Schools</td>
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</table>
Phase-in Approach for High Strength Customers

The phase-in of the sewer service charges for high strength customers was accomplished by increasing their respective charges a maximum of 10% per year until their respective charge, for the given fiscal year, equals the cost of service charge for that same fiscal year shown in Figure 1-5. In all cases, the phase-in for the high strength customers is complete by FY 2024/25.

Phase-in Approach for All Other Customers

None of the other customer classes are experiencing increases greater than 10% in the first year (and some classes actually see a decrease the first year only to be increased something greater the following year); therefore, we would recommended phasing in all other customer classes' respective sewer service charge adjustments over a two-year period. The resulting charges shown in Figure 1-5 reflect two equal annual dollar increases (some increases differ by $1 due to rounding) over the first two years, so that the service charges from the phase-in approach in FY 2020/21 are equal to the cost of service charges for FY 2020/21 shown in Figure 1-4.
SECTION 2. INTRODUCTION

Study Purpose

The purpose of this study is to update CVSan’s rates to ensure that they generate sufficient revenue to recover CVSan’s costs and that the rate structure reflects CVSan’s current rate-making objectives. CVSan’s rate-making objectives include the following:

- Rates must comply with Proposition 218 and applicable state codes.
- Provide revenue sufficiency and financial stability to fund the projected capital and O&M costs of CVSan, which includes wastewater treatment O&M and capital costs at the Treatment Plant co-owned with the Oro Loma Sanitary District.
- Reflects the costs of service.
- Meet CVSan’s operations and capital funds reserve targets.
- Assess rates that reflect equity of costs in proportion to the level of service.
- Provide for efficient administration and execution of utility billing.
- Assess rates that are clear and understandable to the customers.

Background

CVSan is an independent special district that provides wastewater collection, treatment, and disposal services to more than 15,500 properties within the unincorporated community of Castro Valley. In addition, CVSan is in charge of the administration of a refuse collection franchise to the same properties.

To provide wastewater services, CVSan maintains a large number of facilities and equipment, including more than 140 miles of sewer lines, 9 sewage pump stations, 4 miles of outfall to receiving waters in the San Francisco Bay, a 25% ownership in the Treatment Plant, as well as other infrastructure. As of late, the primary focus of CVSan’s Capital Improvement Program has been on rehabilitation, replacement, and repair of its aging infrastructure, pump stations and treatment plant equipment.

CVSan is responsible for charging its customers fair rates that cover its cost of service. In December 2018, CVSan engaged HF&H to determine the cost of service and associated sewer service charges for FYs 2019/20 through 2024/25.
A six-year spreadsheet model was developed to derive revenue requirements for FY 2019/20 through FY 2024/25. The revenue requirements represent the costs that must be recovered from rate revenues. CVSan’s two-year O&M budget for FYs 2019/20 and 2020/21 served as the starting point for projecting CVSan’s expenses and revenues for the six-year planning period.

Figure 3-1 summarizes the major categories comprising the revenue requirements, indicating the annual change.

CVSan Operating Expenses
CVSan’s Operating Expenses (net of non-operating revenue such as inspection fees, special discharge permit fees, etc.) are projected to increase, on average, by 4.8% per year from approximately $3.8 million in FY 2019/20 to $4.5 million in FY 2024/25. Annual increases are generally no greater than the estimated rate of inflation or cost escalation for most recurring expenses, one notable exception is an 8% annual escalation factor for health care premiums, based on recent historical increases. Please refer to the model in Appendix A for further detail on the expenses and the assumptions applied to each line-item expense.

CVSan Debt Service
CVSan currently has debt service obligations associated with a 30-year $7.5 million 2018 Revenue Bond (Bond) and a State Revolving Fund (SRF) loan. CVSan currently projects no new issuances during the six-year planning period.
The Bond was issued to finance their 25% share of an upgrade to the Treatment Plant to provide a higher quality of effluent to reduce the amount of nitrogen remaining in the final effluent. This project will include a new aeration basin, the replacement and upgrade of the existing aeration system, and the construction of a new effluent pump station. It is expected that this will allow for the nitrification and denitrification of flows up to 30 MGD. With the upgrades to the Treatment Plant, CVSan’s effluent quality is expected to meet or exceed all projected effluent limits for at least twenty years. In addition, a portion of the proceeds will be used to finance CVSan’s Gravity Sewer Capacity Improvement and Repair & Rehabilitation Project1.

A $4.28 million SRF loan was obtained by CVSan in February 2011 from the Clean Water State Revolving Fund to finance collection system repair and replacement projects. The final payment on the SRF loan will be made in 2032, unless paid off in advance.

Figure 3-2 summarizes CVSan’s existing annual debt service payments over the six-year planning period.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2018 Revenue Bonds</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Principal</td>
<td>$185,000</td>
<td>$165,000</td>
<td>$170,000</td>
<td>$170,000</td>
<td>$175,000</td>
<td>$180,000</td>
</tr>
<tr>
<td>Interest</td>
<td>$268,000</td>
<td>$264,500</td>
<td>$261,150</td>
<td>$257,750</td>
<td>$254,300</td>
<td>$249,850</td>
</tr>
<tr>
<td>Total</td>
<td>$453,000</td>
<td>$429,500</td>
<td>$431,150</td>
<td>$427,750</td>
<td>$429,300</td>
<td>$429,850</td>
</tr>
<tr>
<td><strong>SRF Loan</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Principal</td>
<td>$192,736</td>
<td>$197,747</td>
<td>$202,888</td>
<td>$208,163</td>
<td>$213,575</td>
<td>$219,128</td>
</tr>
<tr>
<td>Interest</td>
<td>$51,285</td>
<td>$48,201</td>
<td>$45,037</td>
<td>$41,791</td>
<td>$38,460</td>
<td>$35,043</td>
</tr>
<tr>
<td>Service Charge</td>
<td>$32,053</td>
<td>$30,126</td>
<td>$28,148</td>
<td>$26,119</td>
<td>$24,038</td>
<td>$21,902</td>
</tr>
<tr>
<td>Total</td>
<td>$276,074</td>
<td>$276,074</td>
<td>$276,073</td>
<td>$276,073</td>
<td>$276,073</td>
<td>$276,073</td>
</tr>
<tr>
<td><strong>Total Debt Service</strong></td>
<td>$729,074</td>
<td>$705,574</td>
<td>$707,223</td>
<td>$703,823</td>
<td>$705,373</td>
<td>$705,923</td>
</tr>
</tbody>
</table>

CVSan Capital Expenses

CVSan’s capital expenses are summarized in Figure 3-3. CVSan currently projects $1.4 million per year for general repair and replacement projects of its collection system and $8 million for the development of CVSan’s Center Street property. In 2013, CVSan acquired surplus property from the California Department of Transportation. CVSan plans to develop a corporation yard at the Center Street site which will consolidate wastewater operations, as the wastewater department is currently situated at two different sites. The corporation yard will improve operations for staff and be more efficient for members of the community when they have wastewater concerns that they would like to discuss with CVSan staff. The projected costs summarized in Figure 3-3 include a 3.1% annual inflation factor based on the historical annual change in the construction cost index, published by Engineering News-Record, from September 2013 to September 2018. CVSan staff confirmed this inflation factor, which ensures that model projections are consistent with budgeted values.

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1 Project description from the 2018 Revenue Bond Official Statement
As shown in **Figure 3-3**, the capital improvement costs vary from year to year. Therefore, rates are not set to match these annual variations, which would result in rate instability, increasing one year and decreasing the next. Instead, rates are based on multi-year averages. The net revenue requirement assumes equal annual contributions of $2,901,194, based on the average capital expenditures during the six-year planning period.

![Figure 3-3. CVSan Capital Expenses](image)

**Treatment Plant Capital Expenses**

The projected capital expenses at the Treatment Plant are summarized in **Figure 3-4**. The projected expenses are from a 10-year capital improvement plan recently developed by the Treatment Plant and is included as Appendix B to this report. The capital improvement plan is made up of over two dozen projects covering a ten-year period from FY 2018-19 through FY 2027-28. The more significant projects include a nutrient optimization project, a cogeneration system upgrade/replacement, and digester upgrades and demolitions. CVSan is responsible for contributing 25% of the capital costs of the Treatment Plant, unless otherwise noted on the capital improvement plan, included as Appendix B.

The projected costs summarized in **Figure 3-4** include a 3.1% annual inflation factor based on the historical annual change in the construction cost index, published by Engineering News-Record, from September 2013 to September 2018.

As was the case with CVSan’s collection system capital expenses, the capital improvement costs at the treatment plant vary from year to year. Therefore, rates are not set to match these annual variations, which would result in rate instability, increasing one year and decreasing the next. Instead, rates are based on multi-year averages. The net revenue requirement assumes equal annual contributions of $1,572,154, based on the average capital expenditures during the six-year planning period.
Treatment Plant Operating Expenses

As shown in Figure 3-1, Treatment Plant operating expenses (including wastewater disposal, renew and replacement of vehicles and equipment, CVSan’s 25% share of a CalPERS unfunded liability, etc.) are increasing from approximately $3.3M in FY 2019/20 to $3.9M in FY 2024/25, an average annual increase of approximately 3% per year. In some years, expenses decrease due to the volatility of the renewal and replacement of vehicles and equipment, as such acquisitions do not happen on an annual basis.

Reserve Funds

In addition to recovering the annual expenses, shown in Figure 3-1, CVSan’s sewer service charges need to generate sufficient revenue to maintain adequate operations and capital reserves. CVSan needs to maintain an adequate fund balance for cash flow purposes, so that CVSan can pay operating and capital expenses in a timely manner.

Minimum Reserve Balances

The Operating Reserve provides working capital for monthly O&M expenses. Because of the lag between collection and transfer of sewer service charge payments from the County tax assessor to CVSan, the minimum Operations Reserve balance is set equal to 10 months of annual O&M expenses to provide adequate cash flow. If this minimum balance is maintained, CVSan should be able to fund its monthly operations cash flow over this extended period without relying on the use of a short-term loan. Maintaining the minimum balance for the Operations Reserve is recommended as the highest priority for CVSan’s reserves.

Target Reserve Balances

The target balance is derived by adding a contingency for capital improvements, and a rate stabilization fund, to the minimum fund balance.

The capital reserve depends on the level of construction and is equal to the average annual project capital expenditures (for both collection and treatment) over the six-year planning period ($4,473,348) plus an emergency capital reserve of $400,000. The capital allowance provides working capital to maintain sufficient funds in order to pay contractors so that work can proceed without delay. Emergency reserves help manage risks associated with sudden asset failures caused by emergencies such as natural disasters or human error. Emergency reserves are a form of capital reserve that can provide a measure of self-insurance so that immediate funding is available for disaster recovery until loans can be arranged.
In addition, we recommend a rate stabilization reserve equal to 5% of annual sewer service charges, to help manage the risk of unexpected collection system operating costs and operating costs at the Treatment Plant, which is outside CVSan’s control.

**Projected Reserve Fund Balances**

*Figure 3-5* shows the projected annual year-end fund balances with the recommended 5% annual revenue increases (solid green line) and without the rate increases (dashed green line).

With the proposed revenue adjustments, CVSan’s reserve fund balance (solid green line) will be above the minimum balance (solid red line), which covers CVSan’s operating reserve requirements and the reserve fund balance is projected to reach the target (operating, capital, and rate stabilization reserve requirements) by FY 2024/25, the sixth year of the six-year planning period. It should be noted that CVSan’s reserve balance is estimated to be higher than it typically is at FYE 2018/19 (the current fiscal year) as the balance reflects the infusion of cash from the $7.5M Revenue Bond issued in 2018, which is being used to fund a portion of CVSan’s capital improvement obligations at the Treatment Plant.

It should be noted, although the projections show straight lines between years, the fund balance will be drawn down substantially during each year. In other words, the reserves are actively drawn on at all times during the year (for salaries, benefits, capital projects, etc.) but only periodically added to when payments are received from the County. The reserves are not simply accumulated without being used.
SECTION 4: COST OF SERVICE ANALYSIS

A cost of service analysis (COSA) determines how much of the total revenue requirement should be paid by each customer class based on its respective share of flow and wastewater strength (i.e., chemical oxygen demand and total suspended solids, the standard measures of wastewater strength). A COSA should be conducted periodically to account for any material changes in the loadings from each class. A COSA was last completed in 2013.

The COSA involves the following steps:

1. Determination of the total costs to be recovered from rates;
2. Allocation of the total costs to be recovered from rates to the loading parameters: Customer, Flow, Chemical Oxygen Demand (COD) and Total Suspended Solids (TSS);
3. Calculation of total units of service;
4. Calculation of the cost per unit of service;
5. Allocation of costs to each customer class based on their respective units of service multiplied by the cost per unit;
6. Determination of the rates for each customer class.

This section of the report discusses the allocation of operating and capital costs to the Customer, Flow, COD and TSS parameters, the determination of the unit costs, and the calculation of user rates by customer class based on their loading characteristics.

Total Costs Recovered from FY 2019/20 Rates

As part of the COSA, revenue from other sources except from sewer service charges are deducted from the respective annual revenue requirements detailed in Section 3. As shown in Figure 3-1, the net revenue requirement for FY 2019/20 is $12,353,208. Current revenues at current rates will generate $9,321,918, a $3,031,290 or 32.5% variance. As shown in Figure 3-5, there are sufficient reserves available to cover the total revenue requirement with a 5% increase in rates and the use of a portion of CVSan’s current reserves. The reserves have been built over time with SRF and Bond proceeds and sewer service charges, to accommodate years in which capital expenditures are higher than average years, such is the case during the first few years of this six-year financial planning period.

As such, and shown in Figure 4-1, $2,565,194 of the projected shortfall will be covered using reserves, leaving sewer service charges to cover $9,788,014, which is a 5% overall increase in rate revenue and shall be allocated among the customer classes:

Figure 4-1. FY 2019/20 Total Cost of Service to be Allocated

<table>
<thead>
<tr>
<th>FY 2019/20 Revenue Requirement ($12,353,208) from Figure 3-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfer from Reserves</td>
</tr>
<tr>
<td>Net Costs from Rates</td>
</tr>
<tr>
<td>Current Revenue at Current Rates</td>
</tr>
<tr>
<td>Shortfall before rate increase</td>
</tr>
<tr>
<td>Increase in rate revenue</td>
</tr>
<tr>
<td>$2,565,194</td>
</tr>
<tr>
<td>($9,788,014)</td>
</tr>
<tr>
<td>$9,321,918</td>
</tr>
<tr>
<td>$466,096</td>
</tr>
<tr>
<td>5%</td>
</tr>
</tbody>
</table>
Allocation of Costs to Functions

The COSA is a process by which the total costs for FY 2019/20 of $9,788,014, which are shown in Figure 4-1, are allocated to functional categories that represent the functions performed by CVSan’s facilities: flow, biochemical oxygen demand (BOD), and total suspended solids (TSS). These functions are related to the “loading” on the collection system and treatment plant produced by the volume of flow and the strength of wastewater. The allocations are commensurate with the function provided to each class. For example, CVSan’s operations and administration of its sewage collection system is allocated to flow, while CVSan’s treatment cost is allocated between flow, BOD, and TSS based on the allocation of wastewater system asset values in CVSan’s recent Sewer Capacity Fee Study conducted by Bartle Wells Associates in December 2017.

Figure 4-2 shows the allocation factors that were applied to each line item of CVSan’s direct expenses related to the maintenance, replacement, and repair of CVSan’s sewer lines, as well as costs related to treatment at the Treatment Plant. The total allocations for each of the functional categories are summed up at the bottom of Figure 4-2. These amounts indicate how much of CVSan’s revenue requirements are associated with each of the functions.

Figure 4-2. FY 2019/20 Allocation of Costs to Functions

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Flow</td>
<td>BOD</td>
<td>TSS</td>
</tr>
<tr>
<td><strong>Treatment Plant Costs</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wastewater Treatment</td>
<td>$2,385,738</td>
<td>60.0%</td>
<td>20.0%</td>
</tr>
<tr>
<td>Unfunded Liab. (CalPERS)</td>
<td>$190,000</td>
<td>60.0%</td>
<td>20.0%</td>
</tr>
<tr>
<td>Wastewater Disposal</td>
<td>$422,476</td>
<td>60.0%</td>
<td>20.0%</td>
</tr>
<tr>
<td>Renew and Replacement</td>
<td>$355,250</td>
<td>60.0%</td>
<td>20.0%</td>
</tr>
<tr>
<td>Revenue-Funded Capital</td>
<td>$1,572,154</td>
<td>60.0%</td>
<td>20.0%</td>
</tr>
<tr>
<td>Debt Service</td>
<td>$ -</td>
<td>60.0%</td>
<td>20.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$4,925,618</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>District Operating Expenses</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salaries and Benefits</td>
<td>$1,557,514</td>
<td>100.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>District Admin</td>
<td>$1,097,414</td>
<td>100.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Other Operating Expense</td>
<td>$759,607</td>
<td>100.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Utilities</td>
<td>$46,834</td>
<td>100.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Gasoline, Oil and Fuel</td>
<td>$20,000</td>
<td>100.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$3,479,606</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>District Capital Expenses</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trans. to Capital Projects Fund</td>
<td>$2,901,194</td>
<td>100.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Debt Service</td>
<td>$729,074</td>
<td>100.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Renew and Replacement</td>
<td>$397,810</td>
<td>100.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$4,028,078</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Direct Expenses</strong></td>
<td>$12,433,301</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Non-Operating Exp/(Rev)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transfer to/from Reserves</td>
<td>$(2,565,194)</td>
<td>84.2%</td>
<td>7.9%</td>
</tr>
<tr>
<td>Bad Debt</td>
<td>$97,880</td>
<td>84.2%</td>
<td>7.9%</td>
</tr>
<tr>
<td>Non-Operating Expense</td>
<td>$5,000</td>
<td>84.2%</td>
<td>7.9%</td>
</tr>
<tr>
<td>Non-Operating Revenue</td>
<td>$(182,974)</td>
<td>84.2%</td>
<td>7.9%</td>
</tr>
<tr>
<td><strong>Total Composite Expenses</strong></td>
<td>$(2,645,288)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Direct and Composite Expenses</strong></td>
<td>$9,788,014</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Units of Service

The units of service provided by CVSan to its customers are the sum of the flow, BOD, and TSS services provided to each of CVSan’s customer classes. The total units of service for each loading function (e.g., flow, BOD, and TSS) are used to calculate the overall cost per unit. The overall cost per unit will be applied to each customer class’ loading characteristics to calculate their annual sewer service charge. Figure 4-3 calculates the total units of service for each loading function based on CVSan’s current customer base and their respective wastewater discharge characteristics. The estimates of average customer flow, BOD, and TSS associated with each customer class are summarized and totaled in Figure 4-3. The current number of accounts, or dwelling units for residential, is based on the FY 2018/19 tax rolls.

Figure 4-3. Summary of Total Units of Services (by Customer Class)

<table>
<thead>
<tr>
<th>Customer Class</th>
<th>Current Accts/DUs</th>
<th>Discharge Characteristics per Act/DU</th>
<th>Total System-wide Units of Service</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Avg Flow (gpd)</td>
<td>BOD (mg/l)</td>
</tr>
<tr>
<td>Residential Dwelling Units</td>
<td>189</td>
<td>240</td>
<td>240</td>
</tr>
<tr>
<td>Auto Repair Services</td>
<td>668</td>
<td>180</td>
<td>280</td>
</tr>
<tr>
<td>Bakeries</td>
<td>682</td>
<td>1,000</td>
<td>600</td>
</tr>
<tr>
<td>Barbers</td>
<td>348</td>
<td>180</td>
<td>280</td>
</tr>
<tr>
<td>Bars/Drinking Places</td>
<td>561</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Beauty Services</td>
<td>666</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Car Washes</td>
<td>3,662</td>
<td>20</td>
<td>150</td>
</tr>
<tr>
<td>Churches</td>
<td>698</td>
<td>130</td>
<td>100</td>
</tr>
<tr>
<td>Coin Operated Laundromats</td>
<td>1,254</td>
<td>150</td>
<td>110</td>
</tr>
<tr>
<td>Community Services/Organizations</td>
<td>497</td>
<td>130</td>
<td>100</td>
</tr>
<tr>
<td>Dentists</td>
<td>659</td>
<td>130</td>
<td>80</td>
</tr>
<tr>
<td>Eating Places - Fast Food</td>
<td>1,966</td>
<td>1,000</td>
<td>800</td>
</tr>
<tr>
<td>Eating Places - Other</td>
<td>908</td>
<td>800</td>
<td>800</td>
</tr>
<tr>
<td>Eating Places - Restaurant 0-50 Seats</td>
<td>1,272</td>
<td>1,000</td>
<td>600</td>
</tr>
<tr>
<td>Eating Places - Restaurant &gt;50 Seats</td>
<td>2,545</td>
<td>1,000</td>
<td>600</td>
</tr>
<tr>
<td>Eating Places - Take Out</td>
<td>1,001</td>
<td>800</td>
<td>800</td>
</tr>
<tr>
<td>Eden Hospital</td>
<td>32,467</td>
<td>240</td>
<td>240</td>
</tr>
<tr>
<td>Fitness Centers/Health Clubs</td>
<td>821</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Gas Stations</td>
<td>977</td>
<td>180</td>
<td>280</td>
</tr>
<tr>
<td>Grocery Markets</td>
<td>1,365</td>
<td>800</td>
<td>800</td>
</tr>
<tr>
<td>Hairdressers</td>
<td>689</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Health Services</td>
<td>550</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Laundering Services</td>
<td>1,026</td>
<td>450</td>
<td>240</td>
</tr>
<tr>
<td>Limited Food Markets</td>
<td>733</td>
<td>450</td>
<td>240</td>
</tr>
<tr>
<td>Miscellaneous Commercial</td>
<td>350</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Miscellaneous Institutional</td>
<td>502</td>
<td>250</td>
<td>100</td>
</tr>
<tr>
<td>Mortuaries/Funeral Homes</td>
<td>486</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Motels/Hotels (Per Room)</td>
<td>189</td>
<td>320</td>
<td>140</td>
</tr>
<tr>
<td>Nursing/Care Homes (Per Bed)</td>
<td>65</td>
<td>240</td>
<td>240</td>
</tr>
<tr>
<td>Parks</td>
<td>432</td>
<td>130</td>
<td>100</td>
</tr>
<tr>
<td>Pre Schools/Daycare Facilities</td>
<td>487</td>
<td>130</td>
<td>100</td>
</tr>
<tr>
<td>Professional Offices</td>
<td>355</td>
<td>130</td>
<td>80</td>
</tr>
<tr>
<td>Retail</td>
<td>354</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>Schools</td>
<td>5,378</td>
<td>130</td>
<td>100</td>
</tr>
<tr>
<td>Veterinarian Services</td>
<td>501</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Warehousing</td>
<td>380</td>
<td>130</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2,045,178</td>
<td>3,372,826</td>
</tr>
</tbody>
</table>

2 The wastewater characteristics have been extensively studied by CVSan over the years. The average flow, BOD, and TSS characteristics are consistent with the previous cost-of-service study conducted in 2013.
Per-Unit Costs of Service

The units of service for customer flow, BOD, and TSS for each customer class in Figure 4-3 are combined with the functionalized costs in Figure 4-2 to calculate the per-unit costs in Figure 4-4. These per-unit costs are the costs of providing the units of service to all customer classes without exception, thereby ensuring that all customer classes pay their share in proportion to their respective units of service.

<table>
<thead>
<tr>
<th>Allocated Functional Costs</th>
<th>Flow</th>
<th>BOD</th>
<th>TSS</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>(From Fig. 4-2)</td>
<td>$8,236,953</td>
<td>$775,530</td>
<td>$775,530</td>
<td>$9,788,014</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Units of Service</th>
<th>Flow</th>
<th>BOD</th>
<th>TSS</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>(from Fig. 4-3)</td>
<td>HCF</td>
<td>Pounds</td>
<td>Pounds</td>
<td></td>
</tr>
<tr>
<td>Per-unit Costs</td>
<td>$4.03</td>
<td>$0.23</td>
<td>$0.24</td>
<td></td>
</tr>
</tbody>
</table>

The per-unit costs are not rates. Rather, the-unit costs are used to calculate each class’ respective sewer service charges based on their unique wastewater discharge characteristics. The calculation of the sewer service charges is done in the following section, Section 5: Rate Design.
SECTION 5: RATE DESIGN

Sewer service charges are developed based on applying the per-unit costs developed in Figure 4-4 to the individual discharge characteristics for each customer within their respective class, which are shown in Figure 4-3. The per-customer characteristics in Figure 4-3 are expressed in gallons per day for flow and milligrams per liter for BOD and TSS. Therefore, before the sewer service calculation can be made, the individual discharge characteristics are converted into the units of service for each customer within their respective class, as shown in Figure 5-1. The units of service are converted to hundred cubic feet\(^3\) per year for flow and total pounds per year for BOD and TSS.

**Figure 5-1. Units of Service (per account/dwelling unit)**

<table>
<thead>
<tr>
<th>Customer Class</th>
<th>Discharge Characteristics per Acct/DU</th>
<th>Units of Service per Account/Dwelling Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Avg Flow (gpd)</td>
<td>BOD (mg/l)</td>
</tr>
<tr>
<td>Residential Dwelling Units</td>
<td>189</td>
<td>240</td>
</tr>
<tr>
<td>Auto Repair Services</td>
<td>668</td>
<td>180</td>
</tr>
<tr>
<td>Bakeries</td>
<td>682</td>
<td>1,000</td>
</tr>
<tr>
<td>Barbers</td>
<td>348</td>
<td>180</td>
</tr>
<tr>
<td>Bars/Drinking Places</td>
<td>561</td>
<td>200</td>
</tr>
<tr>
<td>Beauty Services</td>
<td>666</td>
<td>200</td>
</tr>
<tr>
<td>Car Washes</td>
<td>1,662</td>
<td>20</td>
</tr>
<tr>
<td>Churches</td>
<td>698</td>
<td>130</td>
</tr>
<tr>
<td>Coin Operated Laundromats</td>
<td>1,254</td>
<td>150</td>
</tr>
<tr>
<td>Community Services/Organizations</td>
<td>497</td>
<td>130</td>
</tr>
<tr>
<td>Dentists</td>
<td>659</td>
<td>130</td>
</tr>
<tr>
<td>Eating Places - Fast Food</td>
<td>1,966</td>
<td>1,000</td>
</tr>
<tr>
<td>Eating Places - Other</td>
<td>908</td>
<td>800</td>
</tr>
<tr>
<td>Eating Places - Restaurant 0-50 Seats</td>
<td>1,272</td>
<td>1,000</td>
</tr>
<tr>
<td>Eating Places - Restaurant over 50 Seats</td>
<td>2,545</td>
<td>1,000</td>
</tr>
<tr>
<td>Eating Places - Take Out</td>
<td>1,001</td>
<td>800</td>
</tr>
<tr>
<td>Eden Hospital</td>
<td>32,467</td>
<td>240</td>
</tr>
<tr>
<td>Fitness Centers/Health Clubs</td>
<td>821</td>
<td>200</td>
</tr>
<tr>
<td>Gas Stations</td>
<td>977</td>
<td>180</td>
</tr>
<tr>
<td>Grocery Markets</td>
<td>1,365</td>
<td>800</td>
</tr>
<tr>
<td>Hairdressers</td>
<td>689</td>
<td>200</td>
</tr>
<tr>
<td>Health Services</td>
<td>550</td>
<td>200</td>
</tr>
<tr>
<td>Laundering Services</td>
<td>1,026</td>
<td>450</td>
</tr>
<tr>
<td>Limited Food Markets</td>
<td>733</td>
<td>450</td>
</tr>
<tr>
<td>Miscellaneous Commercial</td>
<td>350</td>
<td>200</td>
</tr>
<tr>
<td>Miscellaneous Institutional</td>
<td>502</td>
<td>250</td>
</tr>
<tr>
<td>Mortuaries/Funeral Homes</td>
<td>486</td>
<td>200</td>
</tr>
<tr>
<td>Motels/Hotels (Per Room)</td>
<td>189</td>
<td>320</td>
</tr>
<tr>
<td>Nursing/Care Homes (Per Bed)</td>
<td>65</td>
<td>240</td>
</tr>
<tr>
<td>Parks</td>
<td>432</td>
<td>130</td>
</tr>
<tr>
<td>Pre Schools/Daycare Facilities</td>
<td>487</td>
<td>130</td>
</tr>
<tr>
<td>Professional Offices</td>
<td>355</td>
<td>130</td>
</tr>
<tr>
<td>Retail</td>
<td>354</td>
<td>150</td>
</tr>
<tr>
<td>Schools</td>
<td>5,378</td>
<td>130</td>
</tr>
<tr>
<td>Veterinarian Services</td>
<td>501</td>
<td>200</td>
</tr>
<tr>
<td>Warehousing</td>
<td>380</td>
<td>130</td>
</tr>
</tbody>
</table>

\(^3\) Hundred Cubic Feet (HCF) of discharge = 748.052 gallons
The overall revenue increase of 5.0% shown in Figure 1-2 for FY 2019/20 applies differently to CVSan’s customer classes because of adjustments in the COSA. Figure 5-3 summarizes the current and proposed sewer service charges (calculated in Figure 5-2). Recent rate increases for commercial customers with higher strength wastewater (i.e., customers with on-site food preparation, such as restaurants, bakeries, grocery markets, etc.) have not kept pace with the increasing costs of treating high strength wastewater. Accordingly, the high strength customer rate increases are increasing something greater than the average revenue increase of 5.0%, while regular strength and low strength customer classes (e.g., residential customers, professional offices) are seeing a rate increase of something less than the 5.0% average, with some customer
classes seeing a reduction. Annual changes range from a reduction of $516 per year (Schools) to an increase of $2,959 per year (Eden Hospital).

**Figure 5-3. Current and Proposed FY 2019/20 COS Sewer Service Charges (by class)**

<table>
<thead>
<tr>
<th>Customer Class</th>
<th>Current Annual Charge</th>
<th>Proposed FY 2019/20 Annual Charge</th>
<th>$ Chg</th>
<th>% Chg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential Dwelling Units</td>
<td>$419</td>
<td>$437</td>
<td>$18</td>
<td>4.2%</td>
</tr>
<tr>
<td>Auto Repair Services</td>
<td>$1,477</td>
<td>$1,535</td>
<td>$58</td>
<td>3.9%</td>
</tr>
<tr>
<td>Bakeries</td>
<td>$1,656</td>
<td>$2,120</td>
<td>$464</td>
<td>28.0%</td>
</tr>
<tr>
<td>Barbers</td>
<td>$772</td>
<td>$800</td>
<td>$28</td>
<td>3.6%</td>
</tr>
<tr>
<td>Bars/Drinking Places</td>
<td>$1,235</td>
<td>$1,264</td>
<td>$29</td>
<td>2.3%</td>
</tr>
<tr>
<td>Beauty Services</td>
<td>$1,467</td>
<td>$1,500</td>
<td>$33</td>
<td>2.3%</td>
</tr>
<tr>
<td>Car Washes</td>
<td>$3,594</td>
<td>$3,473 ($121)</td>
<td>-3.4%</td>
<td></td>
</tr>
<tr>
<td>Churches</td>
<td>$1,520</td>
<td>$1,487 ($33)</td>
<td>-2.2%</td>
<td></td>
</tr>
<tr>
<td>Coin Operated Laundromats</td>
<td>$2,733</td>
<td>$2,698 ($35)</td>
<td>-1.3%</td>
<td></td>
</tr>
<tr>
<td>Community Services/Organizations</td>
<td>$1,078</td>
<td>$1,059 ($19)</td>
<td>-1.8%</td>
<td></td>
</tr>
<tr>
<td>Dentists</td>
<td>$1,433</td>
<td>$1,394 ($39)</td>
<td>-2.7%</td>
<td></td>
</tr>
<tr>
<td>Eating Places - Fast Food</td>
<td>$4,850</td>
<td>$6,400</td>
<td>$1,550</td>
<td>32.0%</td>
</tr>
<tr>
<td>Eating Places - Other</td>
<td>$2,203</td>
<td>$2,829</td>
<td>$626</td>
<td>28.4%</td>
</tr>
<tr>
<td>Eating Places - Restaurant 0-50 Seats</td>
<td>$3,087</td>
<td>$3,953</td>
<td>$866</td>
<td>28.1%</td>
</tr>
<tr>
<td>Eating Places - Restaurant &gt;50 Seats</td>
<td>$6,174</td>
<td>$7,910</td>
<td>$1,736</td>
<td>28.1%</td>
</tr>
<tr>
<td>Eating Places - Take Out</td>
<td>$2,426</td>
<td>$3,118</td>
<td>$692</td>
<td>28.5%</td>
</tr>
<tr>
<td>Eden Hospital</td>
<td>$72,047</td>
<td>$75,006</td>
<td>$2,959</td>
<td>4.1%</td>
</tr>
<tr>
<td>Fitness Centers/Health Clubs</td>
<td>$1,806</td>
<td>$1,849</td>
<td>$43</td>
<td>2.4%</td>
</tr>
<tr>
<td>Gas Stations</td>
<td>$2,162</td>
<td>$2,245</td>
<td>$83</td>
<td>3.8%</td>
</tr>
<tr>
<td>Grocery Markets</td>
<td>$3,309</td>
<td>$4,252</td>
<td>$943</td>
<td>28.5%</td>
</tr>
<tr>
<td>Hairdressers</td>
<td>$1,520</td>
<td>$1,552</td>
<td>$32</td>
<td>2.1%</td>
</tr>
<tr>
<td>Health Services</td>
<td>$1,213</td>
<td>$1,239</td>
<td>$26</td>
<td>2.1%</td>
</tr>
<tr>
<td>Laundering Services</td>
<td>$2,315</td>
<td>$2,521</td>
<td>$206</td>
<td>8.9%</td>
</tr>
<tr>
<td>Limited Food Markets</td>
<td>$1,656</td>
<td>$1,801</td>
<td>$145</td>
<td>8.8%</td>
</tr>
<tr>
<td>Miscellaneous Commercial</td>
<td>$772</td>
<td>$788</td>
<td>$16</td>
<td>2.1%</td>
</tr>
<tr>
<td>Miscellaneous Institutional</td>
<td>$1,104</td>
<td>$1,111</td>
<td>$7</td>
<td>0.7%</td>
</tr>
<tr>
<td>Mortuaries/Funeral Homes</td>
<td>$1,069</td>
<td>$1,095</td>
<td>$26</td>
<td>2.4%</td>
</tr>
<tr>
<td>Motels/Hotels (Per Room)</td>
<td>$419</td>
<td>$433</td>
<td>$14</td>
<td>3.4%</td>
</tr>
<tr>
<td>Nursing/Care Homes (Per Bed)</td>
<td>$143</td>
<td>$150</td>
<td>$7</td>
<td>5.0%</td>
</tr>
<tr>
<td>Parks</td>
<td>$937</td>
<td>$920 ($17)</td>
<td>-1.8%</td>
<td></td>
</tr>
<tr>
<td>Pre Schools/Daycare Facilities</td>
<td>$1,058</td>
<td>$1,037 ($21)</td>
<td>-2.0%</td>
<td></td>
</tr>
<tr>
<td>Professional Offices</td>
<td>$772</td>
<td>$751 ($21)</td>
<td>-2.7%</td>
<td></td>
</tr>
<tr>
<td>Retail</td>
<td>$772</td>
<td>$772</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Schools</td>
<td>$11,971</td>
<td>$11,455 ($516)</td>
<td>-4.3%</td>
<td></td>
</tr>
<tr>
<td>Veterinarian Services</td>
<td>$1,104</td>
<td>$1,129</td>
<td>$25</td>
<td>2.2%</td>
</tr>
<tr>
<td>Warehousing</td>
<td>$826</td>
<td>$804 ($22)</td>
<td>-2.7%</td>
<td></td>
</tr>
</tbody>
</table>

[1] From Figure 5-2

A six-year rate projection was prepared based on these FY 2019/20 cost of service charges presented in Figure 5-3, above. Those charges reflect the COSA, which establishes the allocation of the revenue requirement among the user classes based on their relative proportionate share of cost components in FY 2019/20, as discussed in detail in Section 4 of this report. In setting the annual sewer service charges for last five-years of the six-year planning period (FYs 2020-21...
through 2024/25), all of the cost of service rates in Figure 5-3 were increased 5.0%, equally across-the-board, to generate the necessary revenue. The resulting rate projections for the next six years are shown in Figure 5-4. However, given the magnitude of the increases to high strength customers and decreases to some other customer classes, we recommend phasing in the impacts of the COSA changes. Working with staff, and input from the finance committee chair, we have developed a phase-in approach which is presented in Figure 5-5. An explanation of the approach for phasing-in the changes follows Figure 5-5.

Figure 5-4. Proposed Rates (FY 2019/20 through FY 2024/25) – WITHOUT PHASE-IN
Phase-in Approach for High Strength Customers

The phase-in of the sewer service charges for high strength customers was accomplished by increasing their respective charges a maximum of 10% per year until their respective charge, for the given fiscal year, equals the cost of service charge, for that same fiscal year shown in Figure 5-5. In all cases, the phase-in for the high strength customers is complete by FY 2024/25.

Phase-in Approach for All Other Customers

Because none of the other customer classes’ are experiencing increases greater than 10% in the first year (and some classes actually see a decrease the first year only to be increased something greater the following year), we would recommended phasing in all other customer classes’ respective sewer service charge adjustments over a two-year period. The resulting charges shown in Figure 5-5 reflect two equal annual dollar increases (some increases differ by $1 due to rounding) over the first two years, so that the service charges from the phase-in approach in FY 2020/21 are equal to the cost of service charges for FY 2020/21 shown in Figure 5-4.

---

### Table: Proposed Rates (FY 2019/20 through FY 2024/25) - WITH PHASE-IN

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>$419</td>
<td>$439</td>
<td>$458</td>
<td>$481</td>
<td>$505</td>
<td>$531</td>
<td>$557</td>
</tr>
<tr>
<td>Commercial</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auto Repair Services</td>
<td>$1,477</td>
<td>$1,544</td>
<td>$1,612</td>
<td>$1,692</td>
<td>$1,777</td>
<td>$1,866</td>
<td>$1,959</td>
</tr>
<tr>
<td>Bakeries</td>
<td>$1,656</td>
<td>$1,822</td>
<td>$2,004</td>
<td>$2,204</td>
<td>$2,425</td>
<td>$2,576</td>
<td>$2,705</td>
</tr>
<tr>
<td>Barbers</td>
<td>$772</td>
<td>$806</td>
<td>$840</td>
<td>$882</td>
<td>$926</td>
<td>$972</td>
<td>$1,025</td>
</tr>
<tr>
<td>Bars/Drinking Places</td>
<td>$1,235</td>
<td>$1,281</td>
<td>$1,327</td>
<td>$1,393</td>
<td>$1,463</td>
<td>$1,536</td>
<td>$1,613</td>
</tr>
<tr>
<td>Beauty Services</td>
<td>$1,467</td>
<td>$1,521</td>
<td>$1,575</td>
<td>$1,654</td>
<td>$1,737</td>
<td>$1,824</td>
<td>$1,915</td>
</tr>
<tr>
<td>Car Washes</td>
<td>$3,594</td>
<td>$3,620</td>
<td>$3,647</td>
<td>$3,829</td>
<td>$4,021</td>
<td>$4,222</td>
<td>$4,433</td>
</tr>
<tr>
<td>Coin Operated Laundromats</td>
<td>$2,733</td>
<td>$2,783</td>
<td>$2,833</td>
<td>$2,974</td>
<td>$3,123</td>
<td>$3,279</td>
<td>$3,443</td>
</tr>
<tr>
<td>Dentists</td>
<td>$1,433</td>
<td>$1,448</td>
<td>$1,464</td>
<td>$1,537</td>
<td>$1,614</td>
<td>$1,694</td>
<td>$1,779</td>
</tr>
<tr>
<td>Eating Places - Fast Food</td>
<td>$4,850</td>
<td>$5,335</td>
<td>$5,869</td>
<td>$6,455</td>
<td>$7,101</td>
<td>$7,779</td>
<td>$8,168</td>
</tr>
<tr>
<td>Eating Places - Other</td>
<td>$2,201</td>
<td>$2,423</td>
<td>$2,666</td>
<td>$2,932</td>
<td>$3,225</td>
<td>$3,438</td>
<td>$3,610</td>
</tr>
<tr>
<td>Eating Places - Restaurant 0-50 Seats</td>
<td>$3,087</td>
<td>$3,396</td>
<td>$3,735</td>
<td>$4,109</td>
<td>$4,520</td>
<td>$4,805</td>
<td>$5,046</td>
</tr>
<tr>
<td>Eating Places - Restaurant over 50 Seats</td>
<td>$6,174</td>
<td>$6,791</td>
<td>$7,471</td>
<td>$8,218</td>
<td>$9,039</td>
<td>$9,614</td>
<td>$10,095</td>
</tr>
<tr>
<td>Eating Places - Take Out</td>
<td>$2,426</td>
<td>$2,669</td>
<td>$2,935</td>
<td>$3,229</td>
<td>$3,552</td>
<td>$3,791</td>
<td>$3,980</td>
</tr>
<tr>
<td>Fitness Centers/Health Clubs</td>
<td>$1,806</td>
<td>$1,874</td>
<td>$1,942</td>
<td>$2,039</td>
<td>$2,141</td>
<td>$2,248</td>
<td>$2,360</td>
</tr>
<tr>
<td>Gas Stations</td>
<td>$2,162</td>
<td>$2,260</td>
<td>$2,357</td>
<td>$2,475</td>
<td>$2,599</td>
<td>$2,729</td>
<td>$2,865</td>
</tr>
<tr>
<td>Grocery Markets</td>
<td>$3,309</td>
<td>$3,640</td>
<td>$4,004</td>
<td>$4,404</td>
<td>$4,845</td>
<td>$5,169</td>
<td>$5,427</td>
</tr>
<tr>
<td>Hairdressers</td>
<td>$1,520</td>
<td>$1,575</td>
<td>$1,630</td>
<td>$1,711</td>
<td>$1,797</td>
<td>$1,887</td>
<td>$1,981</td>
</tr>
<tr>
<td>Health Services</td>
<td>$1,213</td>
<td>$1,257</td>
<td>$1,301</td>
<td>$1,366</td>
<td>$1,434</td>
<td>$1,506</td>
<td>$1,581</td>
</tr>
<tr>
<td>Laundering Services</td>
<td>$2,315</td>
<td>$2,481</td>
<td>$2,647</td>
<td>$2,780</td>
<td>$2,919</td>
<td>$3,065</td>
<td>$3,218</td>
</tr>
<tr>
<td>Limited Food Markets</td>
<td>$1,656</td>
<td>$1,774</td>
<td>$1,981</td>
<td>$1,986</td>
<td>$2,085</td>
<td>$2,189</td>
<td>$2,299</td>
</tr>
<tr>
<td>Miscellaneous Commercial</td>
<td>$772</td>
<td>$800</td>
<td>$828</td>
<td>$869</td>
<td>$913</td>
<td>$958</td>
<td>$1,006</td>
</tr>
<tr>
<td>Mortuaries/Funeral Homes</td>
<td>$1,069</td>
<td>$1,109</td>
<td>$1,150</td>
<td>$1,207</td>
<td>$1,267</td>
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<td>Professional Offices</td>
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<td>$811</td>
<td>$851</td>
<td>$894</td>
<td>$938</td>
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<td>$791</td>
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<td>$851</td>
<td>$894</td>
<td>$938</td>
<td>$985</td>
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<td>$183</td>
<td>$192</td>
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SECTION 6: BILL COMPARISONS

A regional wastewater rate survey was conducted to compare CVSan’s current and proposed sewer service charges (for FY 2019/20) to other regional agencies that provide similar services.

The following figures compare a sampling of CVSan’s current and proposed sewer service charges (assuming the rates from the phase-in approach from Figure 5-5, effective July 1, 2019) with neighboring agencies’ current rates. Residential customer class comparisons include: single family (Figure 6-1) and multi-family (Figure 6-2). Non-residential customer class comparisons include: professional offices (to represent a typical low strength customer; Figure 6-3); retail (to represent a typical average strength customer; Figure 6-4); and, Restaurants with 0-50 seats (to represent a typical high strength customer; Figure 6-5)

We note that the calculated sewer service charge for other agencies are based on currently available published rates as of January 1, 2019, which are subject to change during the year. Any proposed rate increases that have not yet been implemented are not shown.

Figure 6-1. Single Family Sewer Service Charge Comparison
Figure 6-2. Multi Family Sewer Service Charge Comparison (per dwelling unit)

Figure 6-3. Non-Residential Sewer Service Charge Comparison (Low Strength)
**Figure 6-4. Non-Residential Sewer Service Charge Comparison (Average Strength)**

![Bar chart showing non-residential sewer service charge comparison (average strength).](chart1)

*Indicates flow-based rate structure; Assumes 354 gallons per day and average strength

**Retail customer class

**Figure 6-5. Non-Residential Sewer Service Charge Comparison (High Strength)**

![Bar chart showing non-residential sewer service charge comparison (high strength).](chart2)

*Indicates flow-based rate structure; Assumes 1,272 gallons per day and high strength

**Restaurants with 50-50 seats customer class
APPENDIX A:
WASTEWATER RATE MODEL
AND COST OF SERVICE ANALYSIS
### Castro Valley Sanitary District

#### Sewer Rate Study

#### Table 1A. Summary

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
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<td><strong>Fiscal Year:</strong></td>
<td>FY 2018/19</td>
<td>FY 2019/20</td>
<td>FY 2020/21</td>
<td>FY 2021/22</td>
<td>FY 2022/23</td>
<td>FY 2023/24</td>
<td>FY 2024/25</td>
<td>Notes</td>
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<td><strong>Overall Revenue Increases</strong></td>
<td>5.0%</td>
<td>5.0%</td>
<td>5.0%</td>
<td>5.0%</td>
<td>5.0%</td>
<td>5.0%</td>
<td>5.0%</td>
<td>To Tables 3, 4</td>
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<tr>
<td><strong>Cumulative Increase</strong></td>
<td>5.0%</td>
<td>10.3%</td>
<td>15.8%</td>
<td>21.6%</td>
<td>27.6%</td>
<td>34.0%</td>
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<td>From Table 3</td>
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<td><strong>Debt coverage ratio (1.25 minimum)</strong></td>
<td>4.03</td>
<td>4.46</td>
<td>5.26</td>
<td>5.20</td>
<td>5.94</td>
<td>6.58</td>
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<td>From Table 6</td>
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<td><strong>Projected Year-End Fund Balances (in Millions)</strong></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Projected YE Fund Balance with rate increases</strong></td>
<td>(Includes $7.5M bond proceeds)</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td><strong>Target Reserve</strong></td>
<td>(Minimum + Avg. Annual Capital + Emergency Capital + Rate Stabilization)</td>
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<td></td>
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<td></td>
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<tr>
<td><strong>Minimum Reserve</strong></td>
<td>(10 mos. O&amp;M expenses)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Projected YE Fund Balance without rate increases</strong></td>
<td>(Includes $7.5M bond proceeds)</td>
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<td></td>
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</table>

**HF&H Consultants, LLC**

2/27/2019  6:45 PM

CVSan Sewer Model v6

1A. Summary
### List of Model Worksheets

- Table 1A. Summary
- Table 1B. General
- Table 2. Revenue Requirement
- Table 3. Revenue Increases
- Table 4. Reserves
- Table 5. Capital Projects
- Table 6. Debt Service Schedules
- Table 7. Unit Cost Calculation
- Table 8. System-wide Units of Service Calculation
- Table 9. COS Rate Calculations (FY 2019/20)

### Assumptions

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<td>19</td>
<td>General Inflation</td>
<td>Per Budget</td>
<td>Per Budget</td>
<td>Per Budget</td>
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<td>3.0%</td>
<td>3.0%</td>
<td>3.0%</td>
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<td>20</td>
<td>Utilities</td>
<td>Per Budget</td>
<td>Per Budget</td>
<td>Per Budget</td>
<td>5.0%</td>
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<tr>
<td>21</td>
<td>Salaries &amp; Benefits</td>
<td>Per Budget</td>
<td>Per Budget</td>
<td>Per Budget</td>
<td>4.0%</td>
<td>4.0%</td>
<td>4.0%</td>
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<tr>
<td>22</td>
<td>Healthcare</td>
<td>Per Budget</td>
<td>Per Budget</td>
<td>Per Budget</td>
<td>8.0%</td>
<td>8.0%</td>
<td>8.0%</td>
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<tr>
<td>23</td>
<td>Interest on Earnings</td>
<td>0.25%</td>
<td>0.25%</td>
<td>0.25%</td>
<td>0.25%</td>
<td>0.25%</td>
<td>0.25%</td>
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<td>To Table 4</td>
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<tr>
<td>24</td>
<td>Non-rate Revenues</td>
<td>Per Budget</td>
<td>Per Budget</td>
<td>Per Budget</td>
<td>1.0%</td>
<td>1.0%</td>
<td>1.0%</td>
<td>1.0%</td>
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<td>25</td>
<td>% Increase in Revenue due to Growth</td>
<td>Per Budget</td>
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<td>0.0%</td>
<td>0.0%</td>
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<td>0.0%</td>
<td>0.0%</td>
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<td>26</td>
<td>Bad debt (% of revenue)</td>
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<td>1.0%</td>
<td>1.0%</td>
<td>1.0%</td>
<td>1.0%</td>
<td>1.0%</td>
<td>1.0%</td>
<td>To Table 2</td>
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<td>Construction Cost Inflation</td>
<td>Per Budget</td>
<td>3.1%</td>
<td>3.1%</td>
<td>3.1%</td>
<td>3.1%</td>
<td>3.1%</td>
<td>3.1%</td>
<td>from ENR SF CCI September to September 2013-2018; To Table 5</td>
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### Target Fund Balances

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<th>Purpose</th>
<th>Minimum balance</th>
<th>Target balance</th>
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<td>30</td>
<td>Operating Fund</td>
<td>For O&amp;M cash flow during the year</td>
<td>Cannot go negative</td>
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</tr>
<tr>
<td>32</td>
<td></td>
<td></td>
<td></td>
<td>Ten months of operating expenses</td>
</tr>
<tr>
<td>34</td>
<td></td>
<td></td>
<td></td>
<td>(to accommodate biannual receipt of fees from County tax roll)</td>
</tr>
<tr>
<td>35</td>
<td>Capital Asset Fund</td>
<td>To be used for replacement of Equipment/ Facilities</td>
<td>Cannot go negative</td>
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<tr>
<td>36</td>
<td></td>
<td></td>
<td>$4,473,348</td>
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<tr>
<td>39</td>
<td>Emergency Reserve</td>
<td>To be used for emergencies</td>
<td>Cannot go negative</td>
<td>$400,000</td>
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<tr>
<td>44</td>
<td>Rate Stabilization Reserve</td>
<td>To be used to stabilize rates</td>
<td>Cannot go negative</td>
<td>5% of SSC</td>
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<tr>
<td>50</td>
<td>SBF Reserve Fund</td>
<td>To meet State SRF Loan requirements</td>
<td>1 year SRF Loan D/5</td>
<td>$276,074</td>
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**Notes**: All funds have a minimum balance of zero and cannot go negative.
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<td>-1.5%</td>
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| Treatment & Disposal |       | $2,641,250        | $2,385,738         | $2,457,310| $2,531,029          | $2,606,960| $2,685,169| $2,765,724|       |
| Subtotal, Treatment Plant Unfunded Liab. | c | $190,000          | $190,000           | $190,000  | $197,600            | $205,504  | $213,724  | $222,273  |       |
| Wastewater Disposal  | a   | $401,658          | $422,476           | $443,600  | $456,908            | $470,615  | $484,733  | $499,275  | $401,658 |
| Projected: 2018 Revenue Bond | c | $112,438          | $453,000           | $429,500  | $431,150            | $431,150  | $431,150  | $431,150  | $431,150 |
| Source: "10-Year Treatment Plant Collections Projections FY 18-19 - BA 1.xlsx" | | | | | | | | | |
## Table 2. Revenue Requirement

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### Non-Operating (Revenues)/Expenses

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<td>($2,814)</td>
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<td>($81,955)</td>
<td>($84,413)</td>
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<td>Addition/Relocate Permits</td>
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### Total O&M Expenses Less Net Non-Op Income Plus transfer to Capital Fund

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<td>Net Revenue Requirement</td>
<td>$9,321,918</td>
<td>$9,788,014</td>
<td>$10,277,415</td>
<td>$10,791,285</td>
<td>$11,330,850</td>
<td>$11,897,392</td>
<td>$12,492,262</td>
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### Additional Notes

- **Annual Change**
  - 5.0%
  - 5.0%
  - 5.0%
  - 5.0%
  - 5.0%

- **Cumulative Change**
  - 5.0%
  - 10.3%
  - 15.8%
  - 21.6%
  - 27.6%
  - 34.0%

HF&H Consultants, LLC
2/27/2019  6:45 PM  CVSan Sewer Model v6
Table 2. Rev Req
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<td>($11,897,392)</td>
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<td>To/(From) operations before Rate Incr.</td>
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<td>($466,096)</td>
<td>($955,497)</td>
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<td>$9,321,918</td>
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**2018 Revenue Bonds ($7.5M)**

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<td>$185,000</td>
<td>$165,000</td>
<td>$170,000</td>
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<td>$175,000</td>
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<td>Interest</td>
<td>$112,438</td>
<td>$268,000</td>
<td>$264,500</td>
<td>$261,150</td>
<td>$257,750</td>
<td>$254,300</td>
<td>$249,850</td>
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<tr>
<td>Total</td>
<td>$112,438</td>
<td>$453,000</td>
<td>$429,500</td>
<td>$431,150</td>
<td>$427,750</td>
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**Future Bonds**

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**SRF Loan**

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<td>Principal</td>
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<td>$192,736</td>
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<td>Interest</td>
<td>$54,291</td>
<td>$51,285</td>
<td>$48,201</td>
<td>$45,037</td>
<td>$41,791</td>
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<td>Service Charge</td>
<td>$33,992</td>
<td>$32,053</td>
<td>$30,126</td>
<td>$28,148</td>
<td>$26,119</td>
<td>$24,038</td>
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<tr>
<td>Total</td>
<td>$276,134</td>
<td>$276,074</td>
<td>$276,074</td>
<td>$276,073</td>
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**Total Debt Service**

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<tr>
<td>Total Debt Service</td>
<td>$388,512</td>
<td>$729,074</td>
<td>$705,574</td>
<td>$707,223</td>
<td>$703,823</td>
<td>$705,373</td>
<td>$705,923</td>
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**Debt Service Coverage**

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</thead>
<tbody>
<tr>
<td>Rate Revenue</td>
<td>$9,788,014</td>
<td>$10,277,415</td>
<td>$10,791,285</td>
<td>$11,330,850</td>
<td>$11,897,392</td>
<td>$12,492,262</td>
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<tr>
<td>Non Operating Revenues</td>
<td>$182,974</td>
<td>$163,579</td>
<td>$168,486</td>
<td>$173,541</td>
<td>$178,747</td>
<td>$184,110</td>
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<td>Interest Revenue</td>
<td>$47,537</td>
<td>$37,056</td>
<td>$28,948</td>
<td>$25,818</td>
<td>$27,178</td>
<td>$31,310</td>
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<tr>
<td>Total Revenues</td>
<td>$10,018,524</td>
<td>$10,478,050</td>
<td>$10,988,720</td>
<td>$11,530,209</td>
<td>$12,103,318</td>
<td>$12,707,681</td>
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**Expenses**

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</thead>
<tbody>
<tr>
<td>O&amp;M</td>
<td>$7,081,161</td>
<td>$7,333,760</td>
<td>$7,266,664</td>
<td>$7,868,750</td>
<td>$7,910,946</td>
<td>$8,060,802</td>
<td>$8,060,802</td>
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<tr>
<td>Net Revenue</td>
<td>$2,937,364</td>
<td>$3,144,290</td>
<td>$3,722,056</td>
<td>$3,661,459</td>
<td>$4,192,372</td>
<td>$4,646,879</td>
<td>$4,646,879</td>
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<tr>
<td>Total Debt Service</td>
<td>$729,074</td>
<td>$705,574</td>
<td>$707,223</td>
<td>$703,823</td>
<td>$705,373</td>
<td>$705,923</td>
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**Debt Service Coverage**

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Coverage</td>
<td>4.03</td>
<td>4.46</td>
<td>5.26</td>
<td>5.20</td>
<td>5.94</td>
<td>6.58</td>
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**Notes**

- Source: Official Statement
- Source: SRF 5351-110 EX Amend No. 2_6-19-18
## Table 7. Unit Cost Calculation

### Treatment Plant Costs

<table>
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<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Flow</td>
<td>BOD</td>
<td>TSS</td>
</tr>
<tr>
<td>Wastewater Treatment</td>
<td>$2,385,738</td>
<td>60.0%</td>
<td>20.0%</td>
</tr>
<tr>
<td>Unfunded Liab. (CalPERS)</td>
<td>$190,000</td>
<td>60.0%</td>
<td>20.0%</td>
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<tr>
<td>Wastewater Disposal</td>
<td>$422,476</td>
<td>60.0%</td>
<td>20.0%</td>
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<tr>
<td>Renew and Replacement</td>
<td>$355,250</td>
<td>60.0%</td>
<td>20.0%</td>
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<tr>
<td>Revenue-Funded Capital</td>
<td>$1,572,154</td>
<td>60.0%</td>
<td>20.0%</td>
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<tr>
<td>Debt Service</td>
<td>$ -</td>
<td>60.0%</td>
<td>20.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$4,925,618</td>
<td><strong>$2,955,371</strong></td>
<td><strong>$985,124</strong></td>
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### District Operating Expenses

<table>
<thead>
<tr>
<th>Cost Categories</th>
<th>Allocation Factors</th>
<th>Allocated Costs</th>
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<tbody>
<tr>
<td></td>
<td>Flow</td>
<td>BOD</td>
</tr>
<tr>
<td>Salaries and Benefits</td>
<td>$1,555,751</td>
<td>100.0%</td>
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<tr>
<td>District Admin</td>
<td>$1,097,414</td>
<td>100.0%</td>
</tr>
<tr>
<td>Other Operating Expense</td>
<td>$759,607</td>
<td>100.0%</td>
</tr>
<tr>
<td>Utilities</td>
<td>$46,834</td>
<td>100.0%</td>
</tr>
<tr>
<td>Gasoline, Oil and Fuel</td>
<td>$20,000</td>
<td>100.0%</td>
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<tr>
<td><strong>Total</strong></td>
<td>$3,479,606</td>
<td><strong>$3,479,606</strong></td>
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### District Capital Expenses

<table>
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<tr>
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</thead>
<tbody>
<tr>
<td></td>
<td>Flow</td>
<td>BOD</td>
</tr>
<tr>
<td>Trans. to Capital Projects Fund</td>
<td>$2,901,194</td>
<td>100.0%</td>
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<td>Debt Service</td>
<td>$729,074</td>
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<tr>
<td>Renew and Replacement</td>
<td>$397,810</td>
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<tr>
<td><strong>Total</strong></td>
<td>$4,028,078</td>
<td><strong>$4,028,078</strong></td>
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### Total Direct Expenses

| Total Direct Expenses | $12,433,301 |
| % of Total Direct Exp | 84.2% | 7.9% | 7.9% | 100.0% |

### Non-Operating Exp/(Rev)

<table>
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<tr>
<th>Cost Categories</th>
<th>Allocation Factors</th>
<th>Allocated Costs</th>
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<td>Transfer to/(from) Reserves</td>
<td>$2,565,194</td>
<td>84.2%</td>
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<td>Bad Debt</td>
<td>$97,880</td>
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<tr>
<td>Non-Operating Expense</td>
<td>$5,000</td>
<td>84.2%</td>
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<tr>
<td>Non-Operating Revenue</td>
<td>$(182,974)</td>
<td>84.2%</td>
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<tr>
<td><strong>Total Composite Expenses</strong></td>
<td>$(2,645,288)</td>
<td><strong>$(2,226,101)</strong></td>
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</table>

### Total Composite Expenses

| Total Direct and Composite Expenses | $9,788,014 |
| % of Total Composite Exp | 84.2% | 7.9% | 7.9% | 100.0% |

### System-wide Units of Service

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<th>Unit Type</th>
<th>HCF</th>
<th>Pounds</th>
<th>Pounds</th>
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<td>From Table 8</td>
<td>2,045,178</td>
<td>3,372,826</td>
<td>3,203,494</td>
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### Unit Costs

| Unit Costs | $4.03 | $0.23 | $0.24 |
| $/HCF | $/lb | $/lb |

---

HF&H Consultants, LLC
2/27/2019 6:45 PM
CVSan Sewer Model v6
Table 7. Unit Cost Calculation
Table 8. System-wide Units of Service Calculation

<table>
<thead>
<tr>
<th>Customer Class</th>
<th>Avg Flow (gpd)</th>
<th>BOD (mg/l)</th>
<th>TSS (mg/l)</th>
<th>Flow (hcf)</th>
<th>BOD (lbs)</th>
<th>TSS (lbs)</th>
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<tr>
<td>Residential Dwelling Units</td>
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<td>240</td>
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<td>1,701,635</td>
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<td>Auto Repair Services</td>
<td>668</td>
<td>180</td>
<td>280</td>
<td>31</td>
<td>10,104</td>
<td>17,661</td>
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<td>Bakeries</td>
<td>682</td>
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<td>600</td>
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<td>Bars/Drinking Places</td>
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<td>Beauty Services</td>
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<td>1,622</td>
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<td>Eating Places - Other</td>
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<td>10</td>
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<td>5,001</td>
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<td>6,000</td>
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<td>250</td>
<td>100</td>
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<td>Mortuaries/Funeral Homes</td>
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<td>200</td>
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<td>237</td>
<td>296</td>
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<td>Motels/Hotels (Per Room)</td>
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<td>320</td>
<td>140</td>
<td>177</td>
<td>16,323</td>
<td>14,265</td>
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<tr>
<td>Nursing/Care Homes (Per Bed)</td>
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<td>240</td>
<td>240</td>
<td>674</td>
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<td>32,026</td>
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<td>100</td>
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<td>0</td>
<td>0</td>
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<tr>
<td>Pre Schools/Daycare Facilities</td>
<td>487</td>
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Castro Valley Sanitary District
Sewer Rate Study
Table 9. COS Rate Calculations (FY 2019/20)

**Discharge Characteristics per Acct/DU**
- Avg Flow (gpd)
- BOD (mg/l)
- TSS (mg/l)

**Units of Service per Account/Dwelling Unit**
- Annual Flow (hcf)
- BOD (lbs)
- TSS (lbs)

**Sewer Service Charge Components**
- Flow
- BOD
- TSS
- Total

---

HF&H Consultants, LLC
2/27/2019 6:45 PM
CVSan Sewer Model v6
Table 9. COS Rate Calculations
APPENDIX B:
ORO LOMA/CVSAN
WASTEWATER TREATMENT PLANT
10-YEAR CAPITAL IMPROVEMENT PLAN
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**5-Year Average**: $4,063