



CITY OF DAVIS

2023 WASTEWATER RATE STUDY

Draft Financial Plan & Cost of Service Report
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Introduction & Background

The City retained Bartle Wells Associates (BWA) to conduct a wastewater rate study that examines current and projected costs and the existing wastewater rate structure as it pertains to California legislation.

The City's wastewater system is a self-sustaining enterprise, meaning revenues (primarily sourced from wastewater rates) aim to recover the cost to operate and maintain the wastewater system. Primary cost factors impacting wastewater rates include ongoing debt service requirements and the high cost of capital improvements to repair aging infrastructure.

Primary objectives of the rate study include:

- Develop long-term financial projections for the wastewater enterprise, including operations, maintenance, debt, and capital improvement costs;
- Determine rate revenue requirement sufficient to provide service and generate adequate funding for capital needs;
- Conduct a cost-of-service study to determine the ratepayer share of expenses attributable to each customer class; and
- Recommend wastewater rates designed to equitably recover the costs of providing service according to Proposition 218.

Based on input from City staff, vital guiding principles included developing rates that:

- Are fair and equitable to all customer classes;
- Recover the costs of providing service and generate adequate funding for capital needs;
- Are easy to understand and implement; and
- Comply with the legal requirements of Proposition 218 and other California laws.

Proposition 218

Utility rates are subject to the procedural and substantive requirements outlined in Proposition 218. Proposition 218 was adopted by California voters in 1996 and added Articles 13C and 13D to the California Constitution. Article 13D, Section 6 governs property-related charges, which the California Supreme Court subsequently ruled includes ongoing utility service charges such as water and wastewater. Article 13D, Section 6 establishes a) procedural requirements for imposing or increasing property-related charges and b) substantive requirements for those charges. Article 13D also requires voter approval for new or increased property-related charges but exempts from this voting requirement rates for water and wastewater service. The substantive requirements of Article 13D, Section 6 require the City's utility rates to meet the following conditions:

- Revenues derived from the fee or charge shall not exceed the funds required to provide the property-related service.
- Revenues derived from the fee or charge shall not be used for any purpose other than that for which the fee or charge was imposed.

- The amount of a fee or charge imposed upon any parcel or person as an incident of property ownership shall not exceed the proportional cost of the service attributable to the parcel.
- No fee or charge may be imposed for a service unless that service is used by, or immediately available to, the owner of the property in question.
- No fee or charge may be imposed for general governmental services, such as police or fire services, where the service is available to the public at large in substantially the same manner as it is to property owners.

The procedural requirements of Proposition 218 for all utility rate increases are as follows:

- **Noticing Requirement:** The City must mail notice of proposed rate increases to all affected property owners. The notice must specify the basis of the fee, the reason for the fee, and the date/time/location of a public rate hearing at which the proposed rates will be considered/adopted.
- **Public Hearing:** The City must hold a public hearing prior to adopting the proposed rate increases. The public hearing must be held not less than 45 days after the required notices are mailed.
- **Rate Increases Subject to Majority Protest:** At the public hearing, the proposed rate increases are subject to majority protest. If 50% plus one of the affected property owners submit written protests, the proposed rate increases, the increases cannot be adopted.

Use of Generally Accepted Rate-Making Principles

The California Constitution does not allow agencies to set rates purely based on policy preferences arbitrarily. Instead, it provides agencies with the flexibility to implement rates within a cost-of-service framework established by Proposition 218. The rates developed in this report are designed to achieve the City's policy preferences while complying with the requirements of the California Constitution.

The rates developed in this study use a straightforward methodology to establish an equitable system of fixed and variable charges that recover the cost of providing wastewater service and fairly apportion costs, first to fixed/variable cost components, and then to account, flow, and strength-based cost components. All cost allocations align with the framework of California legal requirements and industry-standard rate-making practices. The rates were developed using generally accepted cost-based principles and methodologies for establishing wastewater rates, charges, and fees.

BWA used the following criteria when developing our recommendations for the City's wastewater rates and finances:

- 1) *Revenue Sufficiency:* Rates should recover the annual cost of service and provide revenue stability.
- 2) *Rate Impact:* While rates are calculated to generate sufficient revenue to cover operating and capital costs, they should be designed to minimize, as much as possible, the impact on ratepayers.
- 3) *Equitability:* Rates should be fairly allocated among all customer classes based on their estimated demand characteristics. Each user class only pays its proportionate share.
- 4) *Practicality:* Rates should be simple in form and, therefore, adaptable to changing conditions, easy to administer, and easy to understand.

Financial Plan and Projected Revenue Requirements

Financial Plan Overview

BWA developed a long-term financial plan to review the financial condition of the wastewater enterprise and estimate annual revenue requirements to fund operating, debt and capital expenditures.

Bartle Wells Associates conducted an independent evaluation of the City's wastewater enterprise finances. Key observations are summarized as follows:

- As a self-supporting enterprise fund, the majority of revenues are derived from wastewater service charges (rates). Wastewater rates were last increased in December of 2014. Annual rate revenue totaled just under \$14.0 million in FY 2023.
- The wastewater enterprise has annual debt service payments totaling about \$2.1 million on one loan issued in 2014.
- The current Capital Improvement Plan, which addresses aging infrastructure and other needed improvements, totals \$12.8 million over the next 5 years. The 10-year capital program totals \$23.9 million.
- Wastewater expenses were projected over the next 20 years based on historical audits, the 2022/23 budget, and financial projections provided by the City. Projected expenses and minimum reserve fund targets were used to develop annual rate revenue requirements in the 20-year period.
- Within the 5-year rate structure recommendations in this study, the City will need to increase rates on an annual basis to meet the cost of wastewater service. The primary cost factors impacting wastewater rates are the significant capital improvement costs and inflationary pressure on resources.

This section details the revenue and expenditure assumptions used to project the wastewater utility's expenditures and determine the proposed annual rate revenue requirements. Detailed financial projections are provided in the Appendix of this report.

Current Rates

The existing wastewater rates became effective October 1, 2017, and include a fixed base rate for all users, a flat per unit charge for residential customers, and volumetric charges based on estimated sewer flow and effluent strength for each customer class in hundred cubic foot (CCF) units.

Residential Sewer Rates

Single family homes (both attached and detached), multi-family apartments and mobile home park customers are billed each month according to three rate categories: a fixed base rate reflecting administrative costs, a fixed per unit charge based on dwelling unit size, and a volumetric charge based on winter water use (November – February) in the prior year. Average winter water use is used to estimate sewer flow, where water used for irrigation that does not impact the sewer system cannot be determined from a customer with a single meter for both purposes. Average winter water use is capped at 24 units for a single-family home to avoid any irrigation use in wintertime. Non-single-family customers have reduced fixed per-unit charges and a lower cap on monthly average winter water use, reflecting a lower sewer demand from these customer classes.

Non-Residential Sewer Rates

Commercial customers are billed a monthly fixed base rate that recovers administrative expenses, and volumetric charges based on monthly average winter wastewater usage (per CCF) in the prior year. Commercial users do not face a fixed charge but pay higher volumetric rates to reflect the total commercial portion of rate revenues. Volumetric rates are charged according to seven customer classes (C1-C7) based on the sewer demand and strength for various commercial use categories.

The City's current wastewater rates are summarized in Table 1 below.

Table 1 – Current Rates

Rates Effective		10/1/2017
Base Rate - Monthly \$/account, all users		
Base Rate		\$3.94
Monthly Per Unit Rate (\$/dwelling unit, residential only)		
Single Family		18.26
Multi Family		
Condominium		12.46
Duplex		14.22
3 Units		15.02
4 Units		15.32
5+ Units		12.88
Mobile Home		12.85
Volumetric Rate (\$/CCF* by customer class)		
Single Family Residential		\$3.13
Commercial		
C-1	Office, Retail, Motels	\$4.53
C-2	Laundry, Dry Cleaning	\$4.69
C-3	Churches, Schools, Medical/Dental, Manufacturing, Storage	\$4.69
C-4	Convalescent Hospital	\$4.96
C-5	Auto Repair / Auto Dealers / Car Wash	\$5.33
C-6	Restaurants / Fast Food	\$8.12
C-7	Industrial	\$6.74
*CCF is equal to average monthly winter wastewater use from November - February of prior year		
Monthly Sewer Cap (maximum monthly CCF billable, by customer class)		
Single Family		24
Multi Family		
Condo		19
Duplex		36
Triplex		56
Quadplex		76
5+ units		19 CCF/unit
Mobile Home Park		19 CCF/unit

Current Wastewater Fund Revenues

The wastewater enterprise has multiple sources of revenue, including wastewater rates, capacity fees, interest earnings, and "other revenues." BWA evaluated current and projected revenues as summarized below:

- Rate Revenues:** Revenues from wastewater rates were derived from the fixed base, per unit, and volumetric wastewater rates paid by customers. In FY 2023/24 the City is projected to receive \$14.4 million in rate revenue, provided the first rate increase takes effect January 2024. Rate revenues currently represent 93 percent of the utility's total revenues. Future annual wastewater rate revenues are projected based on the required revenue increases, with adjustments made for customer growth estimated to be 0.5% per year.

FY 2021/22 rate revenues are summarized in Table 2.

Table 2 – Current Wastewater Rate Revenues

	Base Rates	Per Unit Rates	Volumetric Rates*	Total Revenue
**Inside City Revenue	\$746,602	\$5,102,432	\$7,751,049	\$13,600,084
Total Rate Revenue	\$762,034	\$5,207,893	\$7,911,253	\$13,881,179

**Reflects prior year average winter water use, November 2020 - February 2021. Residential users subject to usage cap*

***Does not include irrigation accounts or city accounts inside the City, El Macero, and North Davis Meadows accounts outside city (billed separately)*

- Investment Earnings:** Interest is earned on wastewater utility reserve funds and other investments. For fiscal year 2023/24, investment earnings are estimated to be \$133,166. Investment earnings projections were estimated based on a conservative market rate of 1 percent.
- Capacity Fees:** The City is projected to receive \$533,562 in capacity fee revenue from new connections in 2023/24. Capacity fee revenue projections were calculated based on the City's current capacity fees and projected new development through FY 2040. The City's current capacity fee is \$6,150 for a typical single family residential wastewater connection. Other fees are assigned EDU ratings according to their estimated demand in single family Equivalent Dwelling Units (EDUs). Fees are increased annually for inflation, approximately 3.0% per year. New development was projected based on assumed growth of 0.5% per year.
- Other Operating Revenues:** These revenues include sewer service fees, maintenance fees, pretreatment fees, and land lease revenues. Revenues in this "other operating revenue" category are expected to be \$370,376 in FY 2023/24 and are projected based on assumed inflation of 0.5% per year.

Wastewater Reserve Fund Balance

As of July 1, 2022, the wastewater enterprise held \$13.1 million in operations, capital, and expansion reserve funds. Currently the City is meeting its minimum policy fund balance targets as shown in Table 3.

Table 3 – Wastewater Fund Reserves Policy Targets

Fund Targets		
<u>Fund</u>	<u>Description</u>	<u>Target Minimum</u>
531	Operations	\$2,832,039
532	Capital Replacement	\$3,355,783
	Rate Stabilization	\$716,902
	Debt Funds Held as Required	\$2,086,828
Total Target		\$8,991,552
Total Wastewater Fund Balance - Working Capital		\$13,054,169

Reserve Fund Balance Policies

Maintaining a prudent minimal level of fund reserves provides a financial cushion for dealing with unanticipated expenses, revenue shortfalls, debt requirements, and emergency capital repairs. The financial plan was designed to meet the following fund balance targets:

- **Wastewater Operations:** The City shall maintain a reserve balance of at least 3 months of its annual operating cost.
- **Capital Replacement Fund:** Target reserve shall be the average of the planned expenditures in the 5-year CIP.
- **Rate Stabilization:** Target reserve shall be 5% of annual operating revenue for wastewater.
- **Debt funds held as required:** one year of debt service payments.

In addition to the reserve policy, the City holds debt funds as required. The City is legally required to abide by debt service covenants on each bond and must raise wastewater rates as needed to achieve a minimum of 110% coverage on annual debt service. In other words, annual net revenues (total revenues less total operations and maintenance expenses) must be at least 110% of combined annual debt service payments on all parity (i.e., first-lien) wastewater obligations. Coverage ratios are a financial measure of the wastewater utility's ability to repay outstanding debt and are a standard legal covenant for securing wastewater revenue bonds or similar debt financing. BWA has ensured that the City maintains a minimum 110% debt service coverage ratio each year of the financial plan.

Based on 2022/23 budget expenditures, the total minimum reserve fund for the wastewater enterprise is \$9.0 million.

Baseline Operating Expenses

Operations and maintenance costs are expenditures that the City incurs in the daily operations of the wastewater system. Operations and maintenance costs were budgeted to be \$11.3 million in 2022/23. BWA projected the annual wastewater operating expenditures according to City-provided estimates of labor costs, chemicals, treatment fees, and other expenditures. The wastewater operations fund faces an average overall

cost increases of 3% to 15% per year through FY 2025 followed by 3% per year through FY 2041. Detailed operating cost projections can be found in the Appendix.

Capital Improvement Plan

City staff developed a 20-year schedule of necessary capital improvement projects through FY 2041, including projects for the ongoing repair and replacement of wastewater system infrastructure, wastewater treatment projects, and ongoing annual repair and replacement. These projects are necessary for the long-term sustainability and integrity of the wastewater system.

The 5-year Capital Improvement Plan has a total project cost of \$12.8 million in current dollars. BWA has included a 5% annual inflation factor per year to reflect the average annual change in construction costs, resulting in a 5-year CIP total of \$14.5 million when adjusting for inflation. Inflation-adjusted CIP costs are summarized in Table 4.

Table 4 – Five Year Wastewater CIP Summary

	2023/24	2024/25	2025/26	2026/27	2027/28
Total CIP Project Cost (Inflation-Adjusted)	\$4,462,500	\$3,461,399	\$2,691,478	\$1,811,104	\$2,093,102

The detailed 20-year Capital Improvement Plan is provided in the Appendix.

Current Debt Service

The wastewater enterprise pays annual debt service on one loan, issued by the State Revolving Fund (SRF) loan in December 2014, to pay for Davis Wastewater Treatment Plant Secondary and Tertiary Improvement projects and meet the City's future wastewater treatment needs. Annual debt service payments for this loan are shown on Table 5:

Table 5 – Summary of Debt Service Payments

	Total Annual Payment
SRF Loan - WWTP 8010	\$2,086,828

Cash Flow Projection

BWA developed 5-year and 20-year cash flow projections to summarize the current and projected revenue and expenditures discussed in this report and evaluate the need for wastewater rate revenue adjustments.

The 5-year cash flow projection, including proposed rate adjustments, is provided in Table 6.

Table 6 – Five Year Wastewater Cash Flow Projection

Projection	Budget	Projection ->				
	1	2	3	4	5	6
Fiscal Year	<u>2022-23</u>	<u>2023-24</u>	<u>2024-25</u>	<u>2025-26</u>	<u>2026-27</u>	<u>2027-28</u>
Effective Date of First Rate Increase		1/1/2024	5/1/2025	5/1/2026	5/1/2027	5/1/2028
Effective Date of Second Rate Increase						
Proposed Rate Revenue Increase	0.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Growth	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
Beginning Fund Balance	\$13,054,169	\$12,272,076	\$8,871,524	\$9,613,110	\$8,591,357	\$8,951,586
REVENUE						
Operating Revenue						
Wastewater Rate Revenue	\$13,969,500	\$14,390,331	\$14,938,480	\$15,763,831	\$16,634,783	\$17,553,854
All Other Operating Revenue	\$368,534	\$370,376	\$372,228	\$374,089	\$375,960	\$377,839
Total Operating Revenue	\$14,338,034	\$14,760,707	\$15,310,708	\$16,137,920	\$17,010,742	\$17,931,694
Non- Operating Revenue						
Total Investment Income	\$131,847	\$133,166	\$134,497	\$135,842	\$137,201	\$138,573
Capacity Fees	\$515,444	\$533,562	\$552,316	\$571,730	\$591,826	\$612,629
All Other Non-Operating Revenue	\$2,000,000	\$0	\$3,000,000	\$0	\$0	\$0
Total Non-Operating Revenue	\$2,647,291	\$666,727	\$3,686,813	\$707,572	\$729,027	\$751,202
TOTAL REVENUE	\$16,985,324	\$15,427,434	\$18,997,521	\$16,845,493	\$17,739,769	\$18,682,896
EXPENDITURES						
Operating Expenses						
Total Salaries and Wages	\$3,610,525	\$4,152,104	\$4,320,767	\$4,450,390	\$4,583,902	\$4,721,419
Total Personnel Costs	\$740,636	\$794,653	\$834,385	\$859,417	\$885,200	\$911,755
Other Resources	\$6,976,996	\$7,331,902	\$7,552,556	\$7,779,132	\$8,012,506	\$8,252,881
Total Operating Expenses	\$11,328,157	\$12,278,659	\$12,707,708	\$13,088,940	\$13,481,608	\$13,886,056
Non-Operating Expenses						
Total CIP	\$4,352,432	\$4,462,500	\$3,461,399	\$2,691,478	\$1,811,104	\$2,093,102
Debt Service	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828
Total Non-Operating Expenditures	\$6,439,260	\$6,549,328	\$5,548,227	\$4,778,306	\$3,897,932	\$4,179,930
TOTAL EXPENDITURES	\$17,767,417	\$18,827,986	\$18,255,935	\$17,867,246	\$17,379,540	\$18,065,986
Net Revenue	(\$782,093)	(\$3,400,552)	\$741,586	(\$1,021,753)	\$360,229	\$616,910
Ending Fund Balance	\$12,272,076	\$8,871,524	\$9,613,110	\$8,591,357	\$8,951,586	\$9,568,496
Fund Balance Target	\$8,991,552	\$8,894,528	\$9,029,290	\$9,165,959	\$9,307,767	\$9,454,927
Debt Service Coverage	2.40	1.19	2.68	1.46	1.69	1.94

Rate Revenue Requirements

The 5-year cash flow projection indicates that the City will need increases to wastewater rate revenue to accomplish the following:

- Complete annual operations and Capital Improvement Plan funding
- Meet minimum fund balance targets
- Meet minimum debt service coverage of 110% net operating revenues

Due to the length of time since the City implemented a rate increase, BWA recommends that the City implement the first proposed rate increase of 5% on January 1, 2024. BWA recommends that thereafter, all rate increases be adopted on May 1 of each year (or as soon after as possible), beginning May 1, 2025.

The 5-year schedule of rate revenue requirements is shown in Table 7.

Table 7 – 5-Year Wastewater Cash Flow Projection: Proposed Rate Revenue Requirements

Fiscal Year	FY 2023/24	2024/25	2025/26	2026/27	2027/28
Adoption Date	1/1/24	5/1/25	5/1/26	5/1/27	5/1/28
Revenue Increase	5.0%	5.0%	5.0%	5.0%	5.0%
Rate Revenue	\$14,390,331	\$14,938,480	\$15,763,831	\$16,634,783	\$17,553,854

Please find additional details and long range cash flow projections in the Appendix tables attached.

Cost of Service Study

In addition to the proposed increases, Bartle Wells Associates recommends that the City make changes to the current rate structure to align with the latest cost of service. The rates recommended ensure compliance with the requirements set forth in Proposition 218, equality between customer classes, and provide greater security for revenue collection.

BWA conducted a comprehensive cost of service analysis of the City’s wastewater enterprise expenses first to fixed/variable cost components, and second to account, flow and strength cost components. Costs were analyzed in the base year FY 2022/23, on the basis of the proposed rate schedule, for inside City customers only.

System Demand Factors

First, costs were allocated to major demand factors that impact the Wastewater System. Cost components include:

1. Number of Accounts
2. Total Flow (shown as million gallons per day, or mgd)
3. Biochemical Oxygen Demand (BOD, shown as total lbs/day)
4. Total Suspended Solids (TSS, shown as total lbs/Day)
5. Ammonia (N, shown as mg/L)

Cost allocation percentages for each factor were based on the engineering and staff input on current system utilization.

Table 8 – 2023 Cost Allocation Summary

	% CS	% Flow	% BOD	% TSS	% Ammonia	Total
% Cost						
Allocation*	6%	62%	15%	15%	3%	100%
\$ Revenue						
Requirement	\$802,333	\$8,395,937	\$1,981,144	\$1,981,144	\$439,527	\$13,600,084

*Inside City rate revenues only, see Table 2

The FY 2022/23 revenue requirement was allocated to account, flow, BOD TSS, and Ammonia cost components. BWA used average system data from FY 2016-FY 2020 as the assumed demand factors for the cost of service study. Demand factors are summarized in Table 9.

Table 9 – Summary of Billable Units

Cost Component	Billable Units
Accounts	15,781
Flow (CCF)	2,242,430
BOD (lbs/Yr)	3,446,568
TSS (lbs/yr)	3,662,831
Ammonia (total N)	250

Unit rates were developed by dividing the rate revenue allocation by the demand factor for each cost component (account, flow, BOD, TSS, Ammonia). Unit rates should be used in any case where a customer's wastewater is tested on a regular basis, or they exceed the strength assumptions in the City's defined customer classes. Unit rates are calculated in Table 10 below. For the purpose of the cost allocation, this study uses flow and loading data provided by the City in 2021.

Table 10 – 2023 COS Proposed Unit Rates

	Customer Service	Flow	BOD	TSS	Ammonia
Total Cost Allocation	\$802,333	\$8,395,937	\$1,981,144	\$1,981,144	\$439,527
Billable Units	15,781	2,242,430	3,446,568	3,662,831	250
\$/Unit	\$4.24	\$3.74	\$0.57	\$0.54	\$1.76

A detailed cost allocation summary can be found in the Appendix tables.

Fixed Rates

Fixed Charge Recommendations

BWA Recommendation: Blended Multi Family Fixed Rate

The current schedule of per dwelling unit rates is difficult for customers to understand. While multi-family wastewater flow does not vary greatly with the number of apartments in each complex, demand for each class may vary based on the types of housing developments in the City at any given time. BWA recommends that the City consider condensing the current per-dwelling-unit classes to one single family and one multi-family user class. A single rate would apply more broadly and equitably to all multi-family customers.

BWA Recommendation: Dormitory-Style Multi Family Housing Fixed Rate

In recent years, several new student housing developments have been proposed or built that have as many as 8 beds per dwelling unit. This type of housing generates wastewater flow with high concentrations of wastewater flow per dwelling unit (i.e. more use of the same toilet, showers, and sinks) based on the number of beds in each unit.

BWA recommends that the City charge student housing complexes a fixed rate per bed (rather than per dwelling unit) based on a factor of 1/3 the single-family residential per dwelling unit rate as outlined in Table 11 below.

Table 11 – Dormitory Style Housing Assumptions

Gallons per capita per day, indoor	57
CCF single family monthly average	7
<u>Gallons per SFR per month</u>	<u>5,236</u>
Assumed number of people (beds) per SFR	3.06
Rounded factor for per-bed fixed charge	1/3
Proposed Dormitory-Style Housing Rate	\$8.78

This recommended charge per bed deviates from the current Per Unit rate category structured on a per-dwelling-unit basis. To avoid confusion, BWA recommends that the City rename this category of charges from “Per unit Charges” to “Residential Fixed Rates” in the future.

Fixed Charge Derivation

Customer Classes and Billing Units

Fixed rates include account-based rates and flow-based per dwelling unit charges (for residential customers only). Account data is assumed to be constant from FY 2019, while residential flow data reflects billable water use for each customer class.

A summary of wastewater customer data assumed for the fixed rate calculation (including adjustments to the fixed per-dwelling-unit customer classes) is shown on Table 12.

Table 12 – Fixed Rate Demand Assumptions

	# Accounts	# Dwelling Units	Flow (CCF)
Residential	15,229	27,393	1,968,798
Commercial Class			
Low Strength	249	249	93,206
Standard Strength	212	212	92,203
Medium Strength	2	2	12,020
High Strength	89	89	75,503

Fixed Base Rate Calculation

Proposed wastewater base rates were developed according to the customer service revenue requirement shown in Table 10 and the number of billing units as identified in the FY 2022/23 cost of service study. The proposed base rates are calculated on Table 13.

Table 13 – Proposed Base Rate Calculation

	FY 2022/23
Base Rate Revenue Requirement	\$802,333
Total Accounts (All Users)	15,781
Monthly Base Rate (\$/account)	\$4.24

Fixed Per Unit Rate Calculation

Fixed rates were developed based on flow-related costs for each residential housing type. BWA has updated the fixed revenue requirement by customer class according to the latest flow data from these customers and the updated overall rate revenue allocation to flow-related costs. Account-level water consumption was adjusted to reflect overall system flow. Revenue requirements and associated per-dwelling-unit rates are shown on Table 14.

Table 14 – Fixed, Per-Dwelling Unit Rates by Customer Class

Customer Class	# Units	\$ Revenue Req.	\$/Unit
Single Family (\$/unit)	13,008	\$2,850,368	\$26.33
Multi Family (\$/unit)	14,385	\$2,252,065	\$18.81
Dormitory-Style Housing (\$/bed)			\$8.78

Variable Rates

Variable Rate Recommendations

BWA Recommendation: Condense Customer Classes

BWA proposes that the City update the current commercial volumetric customer classes (C-1 to C-7) to a larger listing of commercial customer classes under four strength categories: low, standard, medium, and high strength). Examples of commercial user types in each category are shown in Table 15.

Table 15 – Example Customer Classes

Strength Category	Example Customer Classes
Low Strength	Banks & Financial Institutions, Barber Shops, Hair Salons, Dry Cleaners, Laundromats, Offices – Business and Professional, Offices- Medical/Dental (without surgery)
Standard Strength	Residential (All) Auto Dealers, Beauty Shops, Nail Salons, Pet Groomers, Bars & Taverns, Halls & Lodges, Fire Stations, Hospitals, Hotels, Motels, Vacation Rentals
Medium Strength	Restaurants without dishwasher/garbage disposal, Hotels/Motels with a restaurant, carpet cleaners, Funeral Homes, Tasting Rooms
High Strength	Restaurants with a Dishwasher, Bakeries, Butcher Shops, Markets with food service, dairy products, and specialty foods manufacturing

Proposed Variable Rate Derivation

Volumetric Demands

Account level strength factors including BOD, TSS, and Ammonia were developed based on Staff input, California State Revenue Guidelines, and BWA expertise. Total flows and strengths were adjusted to reflect the total average annual effluent strength measured at the wastewater plant. A summary of adjusted wastewater demand data by proposed customer class is shown on Table 16.

Table 16 – Volumetric Demands – Proposed Customer Classes

Strength Category	Flow (CCF)	BOD (mg/L)²	TSS (mg/L)²	Ammonia mg-N/L	BOD (lbs/Yr)	TSS (lbs/yr)	Ammonia (total N)
Residential	1,968,798	244	264	0.035	2,998,880	3,236,670	246
Commercial							
Low Strength	93,206	127	84	0.000	73,825	49,033	0.0
Standard Strength	92,903	137	166	0.005	79,538	96,148	1.5
Medium Strength	12,020	244	105	0.005	18,309	7,904	0.2
High Strength	75,503	586	580	0.008	276,015	273,076	1.9
Total	2,242,430				3,446,568	3,662,831	250

Proposed Variable Rates

Volumetric wastewater rates were calculated according to the volumetric rate revenue requirement and billable units. A summarized calculation of volumetric rates is shown on Table 17.

Table 17 – Proposed Volumetric Rates

							2022/23
Total Variable Rate Revenue Requirement							\$5,440,034
	<u>\$ Revenue Requirement</u>				<u>Billable Units</u>		<u>\$/ccf</u>
	<u>\$ Flow (Net)</u>	<u>BOD</u>	<u>TSS</u>	<u>Ammonia</u>	<u>Total</u>	<u>Flow (ccf)</u>	
Residential	\$13,707	\$1,723,806	\$1,750,642	\$433,455	\$3,921,610	1,968,798	\$1.99
Commercial							
Low Strength	\$348,975	\$42,436	\$26,521	\$0	\$417,932	93,206	\$4.48
Standard Strength	\$347,840	\$45,720	\$52,004	\$2,554	\$448,118	92,903	\$4.82
Medium Strength	\$45,004	\$10,524	\$4,275	\$330	\$60,134	12,020	\$5.00
High Strength	\$282,693	\$158,658	\$147,701	\$3,321	\$592,373	75,503	\$7.85
Total	\$1,038,219	\$1,981,144	\$1,981,144	\$439,660	\$5,440,167	273,632	

Proposed Rate Summary

The proposed restructured rates were calculated to generate approximately the same rate revenue as the 2022-23 budget while adjusting the proportional share of rates between customer classes based on the updated cost of service. In order to generate the annual rate revenue requirements established in the financial plan projection, the wastewater rate revenues will need to be increased.

Table 18 summarizes the proposed 5-year rate schedule.

Table 18 – 5-Year Schedule of Proposed Rates

Year	Current	Restructure	2	3	4	5	6
Fiscal Year	FY 2022/23	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	FY 2026/27	FY 2027/28
Effective Date			1/1/2024	5/1/2025	5/1/2026	5/1/2027	5/1/2028
Overall Rate Revenue Increase			5.0%	5.0%	5.0%	5.0%	5.0%
Fixed Charges							
Base Rate - Monthly \$/account, all users							
Base Rate	\$3.94	\$4.24	\$4.45	\$4.67	\$4.90	\$5.15	\$5.41
Monthly Per Unit Rate (\$/dwelling unit, residential only)							
Single Family	\$18.26	\$26.33	\$27.65	\$29.03	\$30.48	\$32.01	\$33.61
Multi Family	N/A	\$18.81	\$19.75	\$20.74	\$21.78	\$22.87	\$24.01
Dormitory-Style Housing (per bed)	N/A	\$8.78	\$9.22	\$9.68	\$10.16	\$10.67	\$11.20
Volumetric Rate (\$/CCF* by customer class) - No Structure Change							
Residential	\$3.13	\$1.99	\$2.09	\$2.20	\$2.31	\$2.42	\$2.54
Commercial							
Low Strength	\$4.53	\$4.48	\$4.71	\$4.94	\$5.19	\$5.45	\$5.72
Standard Strength	\$4.69	\$4.82	\$5.06	\$5.32	\$5.58	\$5.86	\$6.16
Medium Strength	\$4.96	\$5.00	\$5.25	\$5.52	\$5.79	\$6.08	\$6.39
High Strength	\$8.12	\$7.85	\$8.24	\$8.65	\$9.08	\$9.54	\$10.01

(1 CCF = 748 gallons)

*billable use equal to average monthly winter water use (in CCF) from November - February of prior year

Detailed rate calculations are provided in the appendix following this document.

DRAFT



City of Davis

Draft Wastewater COS Rate Study 2023

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Financial Plan

Table S1: Current Monthly Wastewater Rates
City of Davis
Draft Wastewater COS Rate Study 2023

Current Monthly Wastewater Rates

Rates Effective 7/1/2019

Base Rate - Monthly \$/account, all users

Base Rate \$3.94

Monthly Per Unit Rate (\$/dwelling unit, residential only)

Single Family	\$18.26
Multi Family	
Condominium	\$12.46
Duplex	\$14.22
3 Units	\$15.02
4 Units	\$15.32
5+ Units	\$12.88
Mobile Home	\$12.85

Volumetric Rate (\$/ccf* by customer class)

Residential	\$3.13
Commercial	
C-1 Office, Retail, Motels	\$4.53
C-2 Laundry, Dry Cleaning	\$4.69
C-3 Churches, Schools, Medical/Dental, Manufacturing, Storage	\$4.69
C-4 Convalescent Hospital	\$4.96
C-5 Auto Repair / Auto Dealers / Car Wash	\$5.33
C-6 Restaurants / Fast Food	\$8.12
C-7 Industrial	\$6.74

(1 ccf = 748 gallons)

**billable use equal to average monthly winter water use (in ccf) from November - February of prior year*

Monthly Sewer Cap (maximum monthly ccf billable, by customer class)

Single Family	24
Multi Family	
Condo	19
Duplex	36
Triplex	56
Quadplex	76
5+ units	19 ccf/unit
Mobile Home Park	19 ccf/unit
Commercial	N/A

Table S2: Wastewater O&M Expense Projection
 City of Davis
 Draft Wastewater COS Rate Study 2023

Wastewater O&M Expense Projection

		% Escalation -->				
Expense Category		2023-24	2024-25	2025-26	2026-27	2027-28
	New Labor	15%	5%	3%	3%	3%
	Existing Labor	15%	4%	3%	3%	3%
	Benefits	5%	5%	3%	3%	3%
	Administration	5%	3%	3%	3%	3%
	Supplies & Equipment	5%	3%	3%	3%	3%
	Services	0%	0%	0%	0%	0%

		Budget(1)	Projection ->				
Category		2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Salaries/Wages	Existing Labor	\$3,315,115	\$3,812,382	\$3,964,878	\$4,083,824	\$4,206,339	\$4,332,529
Part time Wages/Benefits	New Labor	\$224,310	\$257,957	\$270,854	\$278,980	\$287,349	\$295,970
Overtime/Standby/Callback	Existing Labor	\$71,100	\$81,765	\$85,036	\$87,587	\$90,214	\$92,921
Retirement	Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Leave	Benefits	\$24,600	\$25,830	\$27,122	\$27,935	\$28,773	\$29,636
Health/Dental/Cafeteria Plan	Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Retiree Medical	Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Add Pays	Benefits	\$546,186	\$573,495	\$602,170	\$620,235	\$638,842	\$658,007
Other Benefits	Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Workers Comp	Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Unemployment Insurance	Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Additional Labor Expenses**	New Labor	\$169,850	\$195,328	\$205,094	\$211,247	\$217,584	\$224,112
Resiliency	Benefits	\$0	\$0	\$0	\$0	\$0	\$0
<i>Other Resources (All Other Expenses)</i>							
45 Professional Services	Services	\$1,350,133	\$1,417,640	\$1,460,169	\$1,503,974	\$1,549,093	\$1,595,566
19 Transfers	Administration	\$0	\$0	\$0	\$0	\$0	\$0
13 Insurance	Administration	\$524,231	\$550,443	\$566,956	\$583,965	\$601,483	\$619,528
41 Internal Support Services	Services	\$1,082,855	\$1,136,998	\$1,171,108	\$1,206,241	\$1,242,428	\$1,279,701
Staff Development/Training	Administration	\$0	\$0	\$0	\$0	\$0	\$0
10 Leave Time Pay	Benefits	\$0	\$0	\$0	\$0	\$0	\$0
95 Transfers	Administration	\$0	\$0	\$0	\$0	\$0	\$0
88 Indirect Cost Recovery	Administration	\$1,245,160	\$1,307,418	\$1,346,641	\$1,387,040	\$1,428,651	\$1,471,510
49 Rental/Leasing	Administration	\$171,400	\$179,970	\$185,369	\$190,930	\$196,658	\$202,558
01 Regular Full Time	Existing Labor	\$0	\$0	\$0	\$0	\$0	\$0
11 Special Duty Pay	Existing Labor	\$20,562	\$23,646	\$24,592	\$25,330	\$26,090	\$26,873
12 Additional Pays	Existing Labor	\$40,000	\$46,000	\$47,840	\$49,275	\$50,753	\$52,276
23 Materials & Supplies	Supplies & Equipment	\$859,965	\$902,963	\$930,052	\$957,954	\$986,692	\$1,016,293
25 Small Tools & Equipment	Supplies & Equipment	\$186,000	\$195,300	\$201,159	\$207,194	\$213,410	\$219,812
43 Maint & Repair Services	Services	\$235,675	\$247,459	\$254,883	\$262,529	\$270,405	\$278,517
46 Technical Services	Services	\$287,000	\$301,350	\$310,391	\$319,702	\$329,293	\$339,172
04 Temporary Part Time	Existing Labor	\$0	\$0	\$0	\$0	\$0	\$0
05 Overtime Pay	Existing Labor	\$0	\$0	\$0	\$0	\$0	\$0
48 Special/Utility Services	Services	\$831,015	\$872,566	\$898,743	\$925,705	\$953,476	\$982,080
50 Payment To Other Agencies	Administration	\$143,000	\$150,150	\$154,655	\$159,294	\$164,073	\$168,995
<i>Total Other Resources</i>		\$6,976,996	\$7,331,902	\$7,552,556	\$7,779,132	\$8,012,506	\$8,252,881
Total Operations & Maintenance Expenses		\$11,328,157	\$12,278,659	\$12,707,708	\$13,088,940	\$13,481,608	\$13,886,056
<i>Overall Percent Change</i>			8%	3%	3%	3%	3%

**Staff augmentation and additional staff for identified needs

(1) FY 2022/23 Budget provided by the City.

Table S3: Capital Improvement Plan
 City of Davis
 Draft Wastewater COS Rate Study 2023

Capital Improvement Plan

	Budget(1)	Projection ->				
	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Sewer Lift Station 4 , 1 , 3	\$138,000	\$1,300,000	\$939,591			
WWTP Biofilter	\$408,032					
WWTP Storage Building						
WWTP Access Rd Repair	\$1,635,400					
Sewer Trunk Rehabilitation	\$950,000	\$1,000,000	\$2,000,000	\$2,000,000	\$750,000	\$500,000
Phase II MCC-60 Device Net Replacement	\$1,221,000					
Sed Tank 1 Rehab Coating/Equipment			\$100,000	\$100,000	\$100,000	\$300,000
Sed Tank 2 Rehab Coating/Equipment						
Sed tank 3 Complete Overhaul(1997)/Grit Basin Coating		\$1,400,000				
Primary/Scum Equipment Replacement (1997)		\$100,000	\$100,000	\$100,000	\$300,000	
Digester Improvement (Coating, Mixing system (1.2M)				\$125,000	\$125,000	\$125,000
Miscellaneous Improvements						
Influent barscreen Structure (5M)		\$450,000				\$500,000
Wastewater Resiliency Projects						
Equipment Replacement Schedule					\$215,000	\$215,000
Additional Aeration Basin/WWTP Future						
	\$0	\$0	\$0	\$0		
Total	\$4,352,432	\$4,250,000	\$3,139,591	\$2,325,000	\$1,490,000	\$1,640,000
Inflation Adjusted Total (5% per year)	\$4,352,432	\$4,462,500	\$3,461,399	\$2,691,478	\$1,811,104	\$2,093,102

(1) FY 2022/23 Capital Improvement Plan provided by the City.

Table S4: Current Debt Service
 City of Davis
 Draft Wastewater COS Rate Study 2023

Current Debt Service

			2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Issuance:	SRF Loan - WWTP 8010							
Annual Debt Service:	\$2,086,828	Interest	\$690,770	\$669,829	\$648,574	\$627,000	\$605,103	\$582,877
FYE 2023 Outstanding Principal:	\$44,655,262	Principal	<u>\$1,396,058</u>	<u>\$1,416,999</u>	<u>\$1,438,254</u>	<u>\$1,459,828</u>	<u>\$1,481,725</u>	<u>\$1,503,951</u>
Year of Final Payment:	2049	Annual Debt Service	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828
Description:	2014 loan for Davis Wastewater Treatment Plant Secondary and Tertiary Improvements project to meet the City's future wastewater treatment needs.							

Fund Balance & Targets

Fund Balance - Working Capital	Actual (1)
Total Fund Balance - Working Capital	\$13,054,169

Minimum Fund Balance Requirements	Current		Calculated Projection			
	FY 2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
1. Fund 531 - Operations	\$2,832,039	\$3,069,665	\$3,176,927	\$3,272,235	\$3,370,402	\$3,471,514
The City will maintain a target 3-month operating cost reserve balance						
2. Fund 532 - Capital Replacement	\$3,355,783	\$3,000,000	\$3,000,000	\$3,000,000	\$3,000,000	\$3,000,000
Target reserve shall be the average of the planned expenditures in the 5-year CIP <i>recommended: 5-year rolling average CIP, minimum of \$3 million</i>						
3. Rate Stabilization	\$716,902	\$738,035	\$765,535	\$806,896	\$850,537	\$896,585
5% of annual wastewater operating revenue						
4. Debt Funds Held as Required	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828
One year of debt service payments						
Total Minimum Fund Balance	\$8,991,552	\$8,894,528	\$9,029,290	\$9,165,959	\$9,307,767	\$9,454,927

(1) FY 2022/23 Current fund balance and fund policies provided by the City.

Table S6: Rate Revenue Requirements
 City of Davis
 Draft Wastewater COS Rate Study 2023

Rate Revenue Requirements

	Budget(1)	Projection ->				
	1	2	3	4	5	6
Fiscal Year	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Effective Date of First Rate Increase		1/1/2024	5/1/2025	5/1/2026	5/1/2027	5/1/2028
First Rate Revenue Increase		5.0%	5.0%	5.0%	5.0%	5.0%
Growth Projection	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
<i>Assumed # Months Growth</i>	12	12	12	12	12	12
<i># Months without Rate Increase</i>	12	6	10	10	10	10
<i># Months with First Rate Increase</i>		6	2	2	2	2
<i># Months with Second Rate Increase</i>		0	0	0	0	0
Revenue from Months without Rate Increase	\$13,969,500	\$7,019,674	\$12,345,851	\$13,027,959	\$13,747,754	\$14,507,318
Revenue from Months with First Rate Increase		\$7,370,657	\$2,592,629	\$2,735,871	\$2,887,028	\$3,046,537
Adjusted Total Rate Revenue Projection	\$13,969,500	\$14,390,331	\$14,938,480	\$15,763,831	\$16,634,783	\$17,553,854

(1) FY 2022/23 Budget provided by the City.

Table S7: Capacity Fee Revenue
 City of Davis
 Draft Wastewater COS Rate Study 2023

Capacity Fee Revenue

	Capacity Fees	Accounts	2022-23	2023-24	2024-25
Estimated Capacity Fee Increase ¹			3.0%	3.0%	3.0%
Capacity Fee, \$/EDU²	\$6,150	15,556	\$6,335	\$6,525	\$6,720
Residential					
Single-family	\$6,150	13,001			
Single-family condo	\$4,780	0			
Duplex	\$4,640	1,219			
Triplex	\$4,810	629			
Quadplex	\$4,860	62			
Multiple-family (five or more units)	\$3,320	88			
MH mobile homes	\$3,400	225			
Commercial/Industrial		562			
Flow (hcf/day, Nov-Feb)	\$14,346				
BOD (lbs/day)	\$1,556				
TSS (lbs/day)	\$853				
Estimated Annual Growth:		0.5%			
Estimated Growth, EDUs ³		157	81	82	82
Total EDUs		16,274	16,356	16,437	16,520
Estimated Revenue			\$515,444	\$533,562	\$552,316

(1) Estimated annual increase of Engineering News Record Construction Cost Index (ENR CCI) for San Francisco

Table S8: Total Revenue Projection
 City of Davis
 Draft Wastewater COS Rate Study 2023

Total Revenue Projection

% Escalation by Activity #	
Sales	0.5%
Investments	1.0%
Other Agencies	0.0%
SRF Reimbursements	0.0%

	Budget	% Escalation	Budget	Projected				
	2021-22		2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
531 - Operations and Maintenance								
Rate Revenue		0.5%	\$13,969,500	\$14,390,331	\$14,938,480	\$15,763,831	\$16,634,783	\$17,553,854
Install Fee	\$4,000	0.5%	\$4,020	\$4,040	\$4,060	\$4,081	\$4,101	\$4,122
El Macero	\$207,200	0.5%	\$208,236	\$209,277	\$210,324	\$211,375	\$212,432	\$213,494
North Davis Meadows	\$90,000	0.5%	\$90,450	\$90,902	\$91,357	\$91,814	\$92,273	\$92,734
Other Operating (Leases, etc.)	\$65,500	0.5%	\$65,828	\$66,157	\$66,487	\$66,820	\$67,154	\$67,490
Total Fund 531		0.5%	\$14,338,034	\$14,760,707	\$15,310,708	\$16,137,920	\$17,010,742	\$17,931,694
532 - Capital Replacement								
Interest Earned / From Investments	\$130,542	1.00%	\$131,847	\$133,166	\$134,497	\$135,842	\$137,201	\$138,573
Total Fund 532			\$131,847	\$133,166	\$134,497	\$135,842	\$137,201	\$138,573
533 - Capital Expansion								
Wastewater Capacity Fees		Growth Proj.	\$151,444	\$153,562	\$155,316	\$157,730	\$159,826	\$162,629
Total Fund 532			\$151,444	\$153,562	\$155,316	\$157,730	\$159,826	\$162,629
Total Revenue			\$14,985,324	\$15,427,434	\$15,997,521	\$16,845,493	\$17,739,769	\$18,682,896
Rate Revenue		0.5%	\$13,969,500	\$14,390,331	\$14,938,480	\$15,763,831	\$16,634,783	\$17,553,854
All Other Operating Revenue		0.5%	\$368,534	\$370,376	\$372,228	\$374,089	\$375,960	\$377,839
Total Operating Revenue			\$14,338,034	\$14,760,707	\$15,310,708	\$16,137,920	\$17,010,742	\$17,931,694
Total Investment Income		1.00%	\$131,847	\$133,166	\$134,497	\$135,842	\$137,201	\$138,573
Capacity Fees		Growth Proj.	\$151,444	\$153,562	\$155,316	\$157,730	\$159,826	\$162,629
All Other Non-Operating Revenue		0.00%	\$2,000,000		\$3,000,000			
Total Non-Operating Revenue			\$2,647,291	\$666,727	\$3,686,813	\$707,572	\$729,027	\$751,202

Table S9: Cash Flow Projection
City of Davis
Draft Wastewater COS Rate Study 2023

Cash Flow Projection

Projection	Budget	Projection ->				
	1	2	3	4	5	6
Fiscal Year	<u>2022-23</u>	<u>2023-24</u>	<u>2024-25</u>	<u>2025-26</u>	<u>2026-27</u>	<u>2027-28</u>
Effective Date of First Rate Increase		1/1/2024	5/1/2025	5/1/2026	5/1/2027	5/1/2028
Effective Date of Second Rate Increase						
Proposed Rate Revenue Increase	0.0%	5.0%	5.0%	5.0%	5.0%	5.0%
<i>Growth</i>	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
Beginning Fund Balance	\$13,054,169	\$12,272,076	\$8,871,524	\$9,613,110	\$8,591,357	\$8,951,586
REVENUE						
Operating Revenue						
Wastewater Rate Revenue	\$13,969,500	\$14,390,331	\$14,938,480	\$15,763,831	\$16,634,783	\$17,553,854
All Other Operating Revenue	\$368,534	\$370,376	\$372,228	\$374,089	\$375,960	\$377,839
<i>Total Operating Revenue</i>	<i>\$14,338,034</i>	<i>\$14,760,707</i>	<i>\$15,310,708</i>	<i>\$16,137,920</i>	<i>\$17,010,742</i>	<i>\$17,931,694</i>
Non- Operating Revenue						
Total Investment Income	\$131,847	\$133,166	\$134,497	\$135,842	\$137,201	\$138,573
Capacity Fees	\$515,444	\$533,562	\$552,316	\$571,730	\$591,826	\$612,629
All Other Non-Operating Revenue	\$2,000,000	\$0	\$3,000,000	\$0	\$0	\$0
<i>Total Non-Operating Revenue</i>	<i>\$2,647,291</i>	<i>\$666,727</i>	<i>\$3,686,813</i>	<i>\$707,572</i>	<i>\$729,027</i>	<i>\$751,202</i>
TOTAL REVENUE	\$16,985,324	\$15,427,434	\$18,997,521	\$16,845,493	\$17,739,769	\$18,682,896
EXPENDITURES						
Operating Expenses						
Total Salaries and Wages	\$3,610,525	\$4,152,104	\$4,320,767	\$4,450,390	\$4,583,902	\$4,721,419
Total Personnel Costs	\$740,636	\$794,653	\$834,385	\$859,417	\$885,200	\$911,755
Other Resources	\$6,976,996	\$7,331,902	\$7,552,556	\$7,779,132	\$8,012,506	\$8,252,881
Total Operating Expenses	\$11,328,157	\$12,278,659	\$12,707,708	\$13,088,940	\$13,481,608	\$13,886,056
Non-Operating Expenses						
Total CIP	\$4,352,432	\$4,462,500	\$3,461,399	\$2,691,478	\$1,811,104	\$2,093,102
Debt Service	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828	\$2,086,828
Total Non-Operating Expenditures	\$6,439,260	\$6,549,328	\$5,548,227	\$4,778,306	\$3,897,932	\$4,179,930
TOTAL EXPENDITURES	\$17,767,417	\$18,827,986	\$18,255,935	\$17,867,246	\$17,379,540	\$18,065,986
Net Revenue	(\$782,093)	(\$3,400,552)	\$741,586	(\$1,021,753)	\$360,229	\$616,910
Ending Fund Balance	\$12,272,076	\$8,871,524	\$9,613,110	\$8,591,357	\$8,951,586	\$9,568,496
<i>Fund Balance Target</i>	<i>\$8,991,552</i>	<i>\$8,894,528</i>	<i>\$9,029,290</i>	<i>\$9,165,959</i>	<i>\$9,307,767</i>	<i>\$9,454,927</i>
Debt Service Coverage	2.40	1.19	2.68	1.46	1.69	1.94

Demand and Accounts

Table S10: Revenue & Accounts
 City of Davis
 Draft Wastewater COS Rate Study 2023

Revenue & Accounts

Wastewater Customer Class	Current Demand			Current Rates			Wastewater Rate Revenue			
	# Accounts	# Dwelling Units	Billable Water Use (ccf)*	Fixed Unit Rates			Account Base Charges	Dwelling Unit Charges	Volumetric Revenue	Total
				Fixed Base Rates (\$/acct)	(\$/dwelling unit)	Volumetric Rates (\$/ccf)				
Single Family										
Inside City	13,001	13,008	1,135,155	\$3.94	\$18.26	\$3.13	\$614,699	\$2,850,368	\$3,553,035	\$7,018,102
El Macero	229	338	35,961	\$3.94	\$18.26	\$3.13	\$10,842	\$74,095	\$112,558	\$208,236
North Davis Meadows	97	143	15,222	\$3.94	\$18.26	\$3.13	\$4,589	\$31,365	\$47,646	\$90,450
Subtotal	13,328	13,490	1,186,338				\$630,130	\$2,955,828	\$3,713,239	\$7,316,788
Multi Family										
Condo *	1,219	1,280	63,309	\$3.94	\$12.46	\$3.13	\$57,650	\$191,438	\$198,157	\$447,245
Duplex	629	1,261	82,625	\$3.94	\$14.22	\$3.13	\$29,715	\$215,177	\$258,616	\$503,509
Triplex	62	186	13,372	\$3.94	\$15.02	\$3.13	\$2,931	\$33,525	\$41,854	\$78,310
Quadplex	88	352	21,804	\$3.94	\$15.32	\$3.13	\$4,161	\$64,712	\$68,247	\$137,119
5+ Units	225	10,741	633,977	\$3.94	\$12.88	\$3.13	\$10,650	\$1,660,090	\$1,984,349	\$3,655,089
Mobile Home Park	5	565	18,556	\$3.94	\$12.85	\$3.13	\$236	\$87,123	\$58,080	\$145,440
Subtotal MF	2,228	14,385	833,643				\$105,344	\$2,252,065	\$2,609,303	\$4,966,712
Total Residential	15,556	27,875	2,019,981				\$735,474	\$5,207,893	\$6,322,542	\$12,283,500
Commercial										
Office/Retail	249	249	93,206	\$3.94		\$4.53	\$11,761		\$422,223	\$433,984
Laundry	3	3	4,840	\$3.94		\$4.69	\$142		\$22,700	\$22,841
All Other	159	159	70,459	\$3.94		\$4.69	\$7,529		\$330,453	\$337,982
Conv. Hospital	2	2	12,020	\$3.94		\$4.96	\$95		\$59,619	\$59,714
Auto/Service Station	50	50	17,604	\$3.94		\$5.33	\$2,364		\$93,829	\$96,193
Restaurants	89	89	75,503	\$3.94		\$8.12	\$4,196		\$613,084	\$617,280
Industrial	10	10	6,944	\$3.94		\$6.74	\$473		\$46,803	\$47,275
Subtotal Commercial	562	562	280,576				\$26,560	\$0	\$1,588,711	\$1,615,270
**Inside City Revenue	15,791	27,955	2,249,374				\$746,602	\$5,102,432	\$7,751,049	\$13,600,084
Total Rate Revenue	16,117	28,436	2,300,557				\$762,034	\$5,207,893	\$7,911,253	\$13,898,770

% Total

*Reflects average winter water use, November 2020 - February 2021. Residential users subject to cap

**Does not include irrigation accounts or city accounts inside the City, El Macero and North Davis Meadows accounts outside city (billed separately)

Cost of Service Analysis

Table S11: Cost Allocation (60-40)
 City of Davis
 Draft Wastewater COS Rate Study 2023

Cost Allocation (60-40)

Revenue Requirement Derivation	2022-23 Budget	% CS	% Flow	% BOD	% TSS	% Ammonia	Total	% Fixed	% Variable	\$ CS	\$ Flow	\$ BOD	\$ TSS	\$ Ammonia	\$ Total	\$ Fixed	\$ Variable
Operations & Maintenance	\$11,328,157	6%	62%	15%	15%	3%	100%	61%	39%	\$668,301	\$6,993,375	\$1,650,189	\$1,650,189	\$366,103	\$11,328,157	\$6,911,051	\$4,417,106
Debt Service	\$2,086,828	6%	62%	15%	15%	3%	100%	61%	39%	\$123,112	\$1,288,292	\$303,991	\$303,991	\$67,442	\$2,086,828	\$1,273,126	\$813,702
Capital Improvement Plan	\$4,352,432	6%	62%	15%	15%	3%	100%	61%	39%	\$256,770	\$2,686,950	\$634,025	\$634,025	\$140,662	\$4,352,432	\$2,655,320	\$1,697,112
Total Expenditures¹	\$17,767,417	6%	62%	15%	15%	3%	100%	60%	40%	\$1,048,183	\$10,968,616	\$2,588,205	\$2,588,205	\$574,207	\$17,767,417	\$10,839,498	\$6,927,919
Total Revenue Requirement	\$13,600,084									\$802,333	\$8,395,937	\$1,981,144	\$1,981,144	\$439,527	\$13,600,084	\$8,160,050	\$5,440,034
<i>Overall Percent Allocation</i>		6%	62%	15%	15%	3%	100%	60%	40%								

(1) Rate Revenue Requirement for the cost allocation and rate design are based on the most recent billing units and customer data from 2020 for rate making and cost allocation purposes only in order to maintain proportionality of billing units. The expected rate revenue is shown in the cash flow analysis.

Table S12: Sewer Use by Customer Class
 City of Davis
 Draft Wastewater COS Rate Study 2023

Sewer Use by Customer Class

	<u># Accounts</u>	<u># Dwelling Units</u>	<u>Water Use</u> <u>Period</u>	<u>Flow (ccf)</u>	<u>Average</u> <u>(ccf/unit)</u>	<u>Strength Category</u>
Single Family	13,001	13,008	Nov - Feb	1,135,155	7	
Multi Family						
Condo	1,219	1,280	Nov - Feb	63,309	4	
Duplex	629	1,261	Nov - Feb	82,625	5	
Triplex	62	186	Nov - Feb	13,372	6	
Quadplex	88	352	Nov - Feb	21,804	5	
5+ Units	225	10,741	Nov - Feb	633,977	5	
Mobile Home Park	5	565	Nov - Feb	18,556	123	
Dormitory-Style Housing (per bed)			Nov - Feb			
Multi Family	2,228	14,385		833,643		
Subtotal Residential	15,229			2,019,981		
Commercial						
Office/Retail	249	249	All Use	93,206	31	Low Strength
Laundry	3	3	All Use	4,840	134	Standard Strength
All Other	159	159	All Use	70,459	37	Standard Strength
Conv. Hospital	2	2	All Use	12,020	501	Medium Strength
Auto/Service Station	50	50	All Use	17,604	29	Standard Strength
Restaurants	89	89	All Use	75,503	71	High Strength
Commercial	552	552		273,632		
Total	15,781	27,945		2,242,430		

Dormitory Style Multi Family Assumptions	
57	gallons per capita per DAY, indoor**
7	ccf single family MONTHLY average
5236	gallons per SFR per MONTH
3.06	assumed number of people (dorm beds) per SFR
1/3	Rounded factor for per-bed fixed charge

*proposed cap = 2.5 times the average monthly winter water consumption for each customer class, ccf per billing unit

**gpcd data provided by City Staff

Table S13: Flows & Loadings
 City of Davis
 Draft Wastewater COS Rate Study 2023

Flows & Loadings

	Strength Factor Assumptions			2021 Sewer Use by Customer Class			2021 Calculated Sewer Flows & Loadings					Adjusted Strength Factors			% total demand				
	BOD (mg/L) ²	TSS (mg/L) ²	Ammonia mg-N/L	# Accounts	# Dwelling Units	Flow (ccf)	Flow (mg)	Flow (gpd)	BOD (lbs/Yr)	TSS (lbs/yr)	Ammonia (total N)	BOD (mg/L) ²	TSS (mg/L) ²	Ammonia mg-N/L	% CS	% Flow	% BOD	% TSS	% N
Residential	244	264	0.035	15,229	27,393	1,968,798	1,473	4,034,968	2,998,880	3,236,670	246	244	264	0.035	97%	88%	87%	88%	99%
Customer Class - (4 commercial strength categories)																			
Low Strength	127	84	0.000	249	249	93,206	70	191,022	73,825	49,033	0.0	127	84	0.000	2%	4%	2%	1%	0%
Standard Strength	137	166	0.005	212	212	92,903	69	190,401	79,538	96,148	1.5	137	166	0.005	1%	4%	2%	3%	1%
Medium Strength	244	105	0.005	2	2	12,020	9	24,634	18,309	7,904	0.2	244	105	0.005	0%	1%	1%	0%	0%
High Strength	586	580	0.008	89	89	75,503	56	154,740	276,015	273,076	1.9	586	580	0.008	1%	3%	8%	7%	1%
Subtotal Commercial				15,781	27,945	2,242,430	1,677	4,595,765	3,446,568	3,662,831	250				100%	100%	100%	100%	100%

Table S14: Revenue Requirement Allocation
 City of Davis
 Draft Wastewater COS Rate Study 2023

Revenue Requirement Allocation

	% Demand					% Fixed		\$ Revenue Requirement						% Fixed		% Variable	
	% CS	% Flow	% BOD	% TSS	% N	% Fixed	% Variable	CS	Flow	BOD	TSS	Ammonia	Total	Fixed	Variable		
Total Revenue Requirem	6%	62%	15%	15%	3%	60%	40%	\$802,333	\$8,395,937	\$1,981,144	\$1,981,144	\$439,527	\$13,600,084	\$8,160,050	\$5,440,034		
															(CS+Flow)	(All Other)	
Demand by Customer Class - Alternative Option (4 strength categories)																	
Residential	97%	88%	87%	88%	99%	99.7%	72%	\$774,281	\$7,371,425	\$1,723,806	\$1,750,642	\$433,455	\$12,053,609	(CS Only)	(All Other)		
Low Strength	2%	4%	2%	1%	0%	0%	8%	\$12,647	\$348,975	\$42,436	\$26,521	\$0	\$430,579	\$12,647	\$417,932		
Standard Strength	1%	4%	2%	3%	1%	0%	8%	\$10,791	\$347,840	\$45,720	\$52,004	\$2,554	\$458,909	\$10,791	\$448,118		
Medium Strength	0%	1%	1%	0%	0%	0%	1%	\$102	\$45,004	\$10,524	\$4,275	\$330	\$60,236	\$102	\$60,134		
High Strength	1%	3%	8%	7%	1%	0%	11%	\$4,512	\$282,693	\$158,658	\$147,701	\$3,321	\$596,885	\$4,512	\$592,373		
Subtotal Commercial	3%	12%	13%	12%	1%	0.3%	28%	\$28,052	\$1,024,512	\$257,338	\$230,501	\$6,205	\$1,546,609	\$28,052	\$1,518,557		
Total	100%	100%	100%	100%	100%	100%	100%	\$802,333	\$8,395,937	\$1,981,144	\$1,981,144	\$439,660	\$13,600,217	\$28,052	\$1,518,557		

Unit Rate Calculation (Total costs/Total billable Units)

	CS	Flow	BOD	TSS	Ammonia
Total Cost Allocation	\$802,333	\$8,395,937	\$1,981,144	\$1,981,144	\$439,527
Billable Units	15,781	2,242,430	3,446,568	3,662,831	250
Unit Rates	\$4.24	\$3.74	\$0.57	\$0.54	\$1.76
	\$/acct	\$/hcf	\$/lb	\$/lb	\$/mg total N

Rate Design

Table S15: Fixed Rate Calculation
 City of Davis
 Draft Wastewater COS Rate Study 2023

Fixed Rate Calculation

Total Fixed Rate Revenue Requirement			2022-23 \$8,160,050
Base Rate Revenue Requirement			\$802,333
Total Accounts (All Users)			15,781
Monthly Base Rate (\$/account)			\$4.24
Monthly Per Dwelling Unit Rate (\$/unit, residential only)			
Dwelling Unit Rate Revenue Requirement			\$7,357,718
Total Residential Dwelling Units			27,393
Customer Class	# Units	\$ Rev Req.	\$/Unit
Single Family \$/Unit	13,008	\$2,850,368	\$26.33
Multi Family \$/Unit (Blended Rate)	14,385	\$2,252,065	\$18.81
Dormitory-Style Housing (per bed)	N/A	N/A	\$8.78

Table S16: Variable Rate Calculation
 City of Davis
 Draft Wastewater COS Rate Study 2023

Variable Rate Calculation

		Current							2023/24 2022/23			
Total Variable Rate Revenue Requirement		\$7,751,049							\$5,440,034		-30%	
% Total collected from variable rate		56%							40%			
		\$/ccf	\$ Revenue Requirement					Billable Units				
			Rate Rev	\$ Flow (Net)	BOD	TSS	Ammonia	Total	Flow (ccf)	\$/ccf		
Single Family	Single Family	(see below, R	\$4,110,236	\$139,925	\$993,899	\$1,009,372	\$273,041	\$2,416,237	1,135,155	Residential	#REF!	\$2,261,093
	Multi Family											\$0
	Condo *											\$0
	Duplex	\$3.13	\$276,054	-\$39,017	\$55,431	\$56,294	\$12,182	\$84,890	63,309	\$1.99	#REF!	\$126,104
	Triplex	\$3.13	\$310,286	-\$927	\$72,343	\$73,470	\$15,899	\$160,785	82,625	\$1.99	#REF!	\$164,579
	Quadplex	\$3.13	\$48,343	-\$1,724	\$11,708	\$11,890	\$2,573	\$27,895	13,372	\$1.99	#REF!	\$26,635
	5+ Units	\$3.13	\$93,314	-\$11,677	\$19,091	\$19,388	\$4,196	\$30,997	21,804	\$1.99	#REF!	\$43,431
	Mobile Home P: Dormitory-Style	\$3.13	\$2,393,854	-\$20,164	\$555,087	\$563,728	\$121,993	\$1,220,644	633,977	\$1.99	#REF!	\$1,262,807
	Subtotal Multi Family	N/A	\$125,632	-\$56,156	\$16,247	\$16,500	\$3,571	-\$19,838	18,556	\$1.99	#REF!	\$36,961
	Residential	\$3.13	\$3,247,482	-\$126,218	\$729,907	\$741,270	\$160,414	\$1,505,373	833,643			\$1,660,517
	Commercial (Existing Rate Structure)	\$3.13	\$7,357,718	\$13,707	\$1,723,806	\$1,750,642	\$433,455	\$3,921,610	1,968,798	\$1.99		\$3,921,610
	Office/Retail	\$4.53	\$0	\$348,975	\$42,436	\$26,521	\$0	\$417,932	93,206	\$4.48	#REF!	\$417,932
	Laundry	\$4.69	\$0	\$18,122	\$2,543	\$1,894	\$0	\$22,558	4,840	\$4.66	#REF!	\$22,558
	All Other	\$4.69	\$0	\$263,807	\$32,079	\$32,579	\$1,937	\$330,402	70,459	\$4.69	#REF!	\$330,402
	Conv. Hospital	\$4.96	\$0	\$45,004	\$10,524	\$4,275	\$330	\$60,134	12,020	\$5.00	#REF!	\$60,134
	Auto/Service St: Restaurants	\$5.33	\$0	\$65,912	\$11,098	\$17,532	\$484	\$95,025	17,604	\$5.40	#REF!	\$95,025
	Subtotal Commercial	\$8.12	\$0	\$282,693	\$158,658	\$147,701	\$3,321	\$592,373	75,503	\$7.85	#REF!	\$592,373
	Total			\$1,024,512	\$257,338	\$230,501	\$6,072	\$1,518,424	273,632			\$1,518,424
				\$1,038,219	\$1,981,144	\$1,981,144	\$439,527	\$5,440,034	2,242,430			\$5,440,034
	Commercial											
	Low Strength	\$4.53		\$348,975	\$42,436	\$26,521	\$0	\$417,932	93,206	\$4.48	#REF!	
	Standard Strength	\$4.69		\$347,840	\$45,720	\$52,004	\$2,554	\$448,118	92,903	\$4.82	#REF!	
	Medium Strength	\$4.96		\$45,004	\$10,524	\$4,275	\$330	\$60,134	12,020	\$5.00	#REF!	\$198,157
	High Strength	\$8.12		\$282,693	\$158,658	\$147,701	\$3,321	\$592,373	75,503	\$7.85	#REF!	\$258,616
	Total			\$1,038,219	\$1,981,144	\$1,981,144	\$439,660	\$5,440,167	273,632			\$68,247
												\$1,984,349

Table S17: Proposed Rate Summary
 City of Davis
 Draft Wastewater COS Rate Study 2023

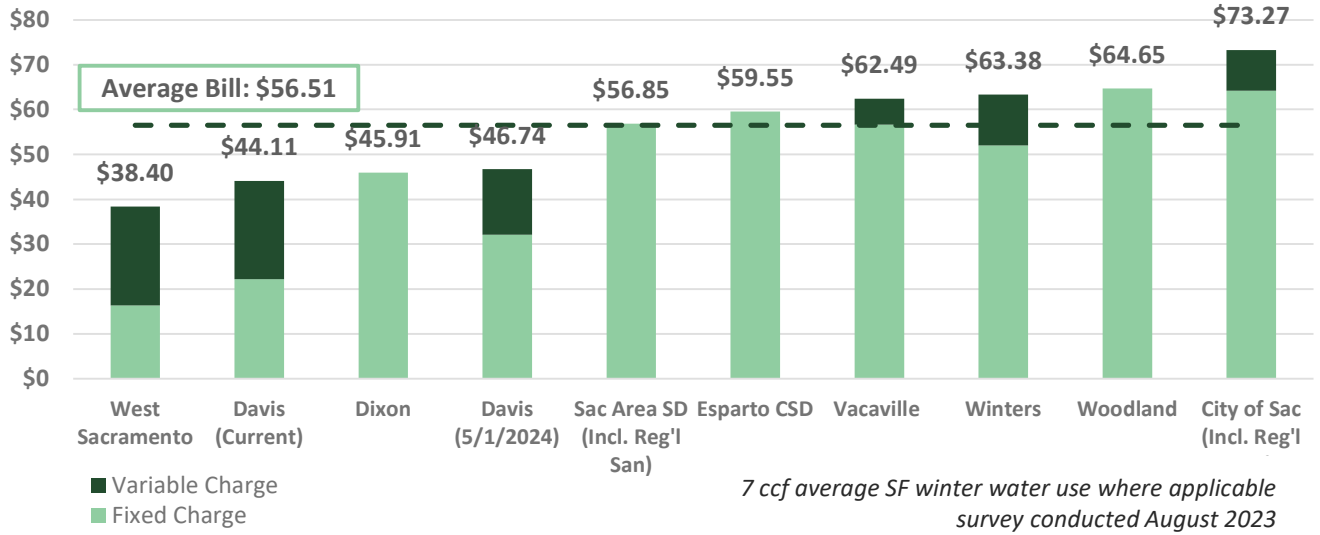
Proposed Rate Summary

Year	Current	Restructure	2	3	4	5	6
Fiscal Year	FY 2022/23	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	FY 2026/27	FY 2027/28
Effective Date			1/1/2024	5/1/2025	5/1/2026	5/1/2027	5/1/2028
Overall Rate Revenue Increase			5.0%	5.0%	5.0%	5.0%	5.0%
Fixed Charges							
Base Rate - Monthly \$/account, all users							
Base Rate	\$3.94	\$4.24	\$4.45	\$4.67	\$4.90	\$5.15	\$5.41
Monthly Per Unit Rate (\$/dwelling unit, residential only)							
Single Family	\$18.26	\$26.33	\$27.65	\$29.03	\$30.48	\$32.01	\$33.61
Multi Family	N/A	\$18.81	\$19.75	\$20.74	\$21.78	\$22.87	\$24.01
Dormitory-Style Housing (per bed)	N/A	\$8.78	\$9.22	\$9.68	\$10.16	\$10.67	\$11.20
Volumetric Rate (\$/CCF* by customer class) - No Structure Change							
Residential	\$3.13	\$1.99	\$2.09	\$2.20	\$2.31	\$2.42	\$2.54
Commercial							
Low Strength	\$4.53	\$4.48	\$4.71	\$4.94	\$5.19	\$5.45	\$5.72
Standard Strength	\$4.69	\$4.82	\$5.06	\$5.32	\$5.58	\$5.86	\$6.16
Medium Strength	\$4.96	\$5.00	\$5.25	\$5.52	\$5.79	\$6.08	\$6.39
High Strength	\$8.12	\$7.85	\$8.24	\$8.65	\$9.08	\$9.54	\$10.01

(1 CCF = 748 gallons)

*billable use equal to average monthly winter water use (in CCF) from November - February of prior year

Single Family Wastewater Monthly Bill Survey FY 2023



Single Family Bill Survey, Fixed & Variable Charges

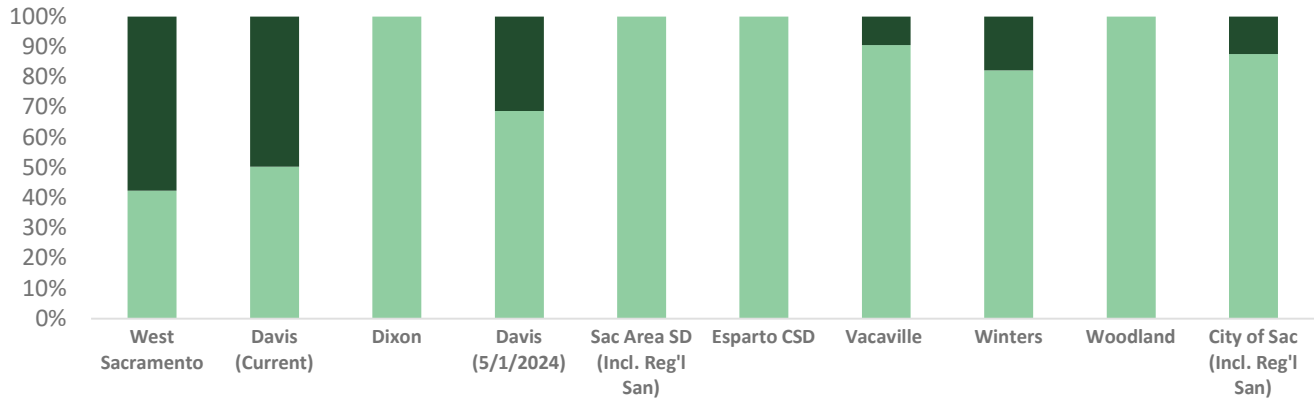


Table S19: Bill Impacts
 City of Davis
 Draft Wastewater COS Rate Study 2023

Bill Impacts

Average Winter Water Use <i>ccf</i>		1	2	3	4	5	6
		Current	FY 2023/24 5/1/2024 5%	FY 2024/25 5/1/2025 5%	FY 2025/26 5/1/2026 5%	FY 2026/27 5/1/2027 5%	FY 2027/28 5/1/2028 5%
Residential							
Single Family	7	\$44.11	\$46.74	\$46.74	\$49.07	\$51.53	\$54.10
Multi Family (5+ Units)	5	\$32.47	\$34.41	\$34.41	\$36.13	\$37.93	\$39.83
Commercial							
Low Strength	8	\$40.18	\$42.11	\$42.11	\$44.22	\$46.43	\$48.75
Standard Strength	8	\$41.46	\$44.97	\$44.97	\$47.21	\$49.58	\$52.05
Medium Strength	8	\$43.62	\$46.47	\$46.47	\$48.80	\$51.24	\$53.80
High Strength	8	\$68.90	\$70.35	\$70.35	\$73.87	\$77.56	\$81.44