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SEWER RATE STUDY REPORT

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SUBJECT: **SEWER RATE STUDY**

DATE: **FEBRUARY 27, 2014**

PURPOSE

The purpose of this report is to summarize NBS' findings resulting from the Sewer Rate Study performed for the City of Sausalito ("City" or "Utility"). As a part of this rate study, NBS projected revenues and expenditures, developed net revenue requirements, evaluated cost-of-service cost allocations and rate design alternatives. This report summarizes the results of this rate study and recommends new sewer rates. Three appendices are included at the end of this report for the purpose of further documenting these results, and contain key tables and figures from the Sewer Rate Study.

SUMMARY OF RATE STUDY RESULTS

After extensive review of financial plans, including capital improvements and new debt issuance, NBS and City staff concluded that an initial 30% increase in the annual revenue from sewer rates will be needed in FY 2014/15, followed by smaller increases of 3% and 4% in FY 2015/16 through FY 2018/19. Additionally, winter water consumption data and effluent generation estimates for each customer class have resulted in changes in how costs are allocated to each customer class.[1] As a result, the scale of rate increases for individual customer classes has also changed. Other recommendations include:

- For residential customers, add a volumetric charge based on the most recent (i.e., 2013) winter water consumption data (this is shown below as Alternative 2).
- For non-residential customers:
  - Change the City's current practice of using the maximum annual consumption over the previous five years, and instead apply the most recent year's annual water consumption to calculate their volumetric charges.
  - Instead of collecting fixed charges on a per parcel basis (the City's current practice), fixed charges will be collected based on the number of equivalent dwelling units per non-residential parcel.

[1] Marin Municipal Water District water use data was used to calculate the cost allocations for each customer class; a description and summary of these new allocations is provided in Appendices 1 and 2.

- Residential and non-residential volumetric rates collectively should collect 12% of the rate revenue.[2]

Figure 1 below summarizes the current and proposed sewer rates over the next five years, followed by an overview of the Sewer Rate Study, a description of its methodology and assumptions, outcomes, findings and recommendations.

Figure 1. Summary of Current and Proposed Sewer Rates

Sewer Rates	Current Rates	Proposed Rates				
	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19
Proposed Residential Rates *($/year/Dwelling Unit, Fixed Charge plus a volumetric charge based on average winter water use)*						
Single-Family	$492.33	$476.25	$490.53	$505.25	$525.46	$546.48
Single-Family Attached	$327.07	$341.40	$351.65	$362.20	$376.68	$391.75
Duplexes	*N.A.*	$366.89	$377.89	$389.23	$404.80	$420.99
Multi-Family Residential	$243.36	$270.36	$278.48	$286.83	$298.30	$310.24
Volumetric Rate ($/ccf)[1]	*N.A.*	$0.91	$0.98	$1.01	$1.05	$1.10
Non-Residential Rates *(Allocated Capacity based on Historic Maximum Water Use)*						
Commercial ($/year)[2]	$305.04	$476.25	$490.53	$505.25	$525.46	$546.48
Volumetric Rate ($/ccf)[3]	$2.45	$0.91	$0.98	$1.01	$1.05	$1.10

1. The volumetric rate is applied to previous year's 2-month winter water use (annualized by multiplying by 6). The FY 2015/16 rate has been adjusted assuming there is a 5% reduction in winter water use after FY 2014/15 due to projected conservation by customers.
2. Current rate is applied on a per-parcel basis; new rates (after FY 2013/14) are applied to the number of equivalent dwelling units per-parcel.
3. The current volumetric rate is applied to the maximum annual water use over the previous five-year period. The proposed rate is applied to just the previous year's total annual water consumption. The FY 2015/16 rate has been adjusted assuming there is a 5% reduction in annual water use after FY 2014/15 due to projected conservation by customers.

OVERVIEW OF THE RATE STUDY

The City is undertaking this study to evaluate its sewer rates, and wanted a review that validates whether the City is appropriately examining future revenue requirements and using sewer rates that meet both legal requirements and industry standards. Besides ensuring the City collects sufficient revenue to cover O&M and capital costs; sewer rates need to demonstrate the fairness and equity required by Prop. 218, ensure that the customer classes and rate structure are appropriate for the City's purposes, and that the overall structure meets current practices and adheres to recent court decisions.[3]

Additionally, the City requested this study evaluate the feasibility and associated costs of moving the City from a flat rate sewer charge for residential customers to an indoor water-use-based sewer service charge (i.e., a volumetric charge). These potential changes were reviewed in light of the City's collection-only sewer system, since Sausalito's sewer bills do not include treatment, which is provided by the Sausalito-Marin City Sanitary District (SMCSD).

A comprehensive sewer rate study typically includes the three key components shown in Figure 2 on the next page, and summarizes the industry standards such as the American Water Works Association (AWWA) M-1 Manual and Water Environment Federation (WEF) cost-of-service methodologies. The cost-of-service Component (Step 2) in particular addresses the equity and fairness requirements of Prop 218.[4]

[2] See Appendix 3 for the separate analysis of variable vs. fixed costs for the City's sewer collection system.

[3] In November 1996, California voters passed Proposition 218, the "Right to Vote on Taxes Act". This constitutional amendment protects taxpayers by limiting the methods by which local governments can create or increase taxes, fees and charges without taxpayer consent. Proposition 218 requires voter approval prior to imposition or increase of general taxes, assessments, and certain user fees. Proposition 218 recognized that water & sewer services are essential city services so the law prescribes that city's use the protest hearing as the voter approval process to ensure continuation of services that protect health, safety and welfare.

[4] NBS is not providing legal advice to the City, and statements and opinions presented in this report should not be construed as legal advice. The City has retained specialized legal counsel for this purpose, and NBS recommends and assumes those attorneys will review current legal aspects of the proposed rates presented in this report.

Figure 2. Primary Components of a Rate Study

Step 1: Financial Plan/ Revenue Requirements – Compares current sources of funds (revenues) to uses of funds (expenses) and determines the revenue needed from rates.

Step 2: Cost-of-Service Analysis – Allocates the revenue requirements to the various customer classes in a "fair and equitable" manner that complies with Prop 218.

Step 3: Rate Design – Considers what rate structure alternatives will best meet the City's need to collect the annual revenue requirements from each customer class.

In addition to significant attention to how the City will be funding capital improvement program costs, this Study also focused on the timing and level of rate increases and evaluating the rate structure and customer classes. A detailed review of sewer customer and water consumption data that form the basis for sewer charges was also performed.

An overview of the methodologies, data used, and the results of these two rate alternatives are presented below.

SEWER RATE STUDY

KEY SEWER RATE STUDY ISSUES

This Sewer Rate Study was undertaken with several specific objectives in mind, including:

- Ensuring sufficient revenue is collected to meet projected funding requirements, particularly for capital improvements and debt service payments.
- Reviewing winter water consumption and the number of equivalent dwelling units within each customer class and making adjustments if this analysis indicates these cost allocation factors have changed.
- Developing and comparing two rate design alternatives for residential customers:
    - Alternative 1 – Flat rates (the current rate structure)
    - Alternative 2 – Adding a volumetric charge based on average winter water use in order to improve overall equity and fairness.
- Evaluating rate design with respect to the percentage of revenue derived from fixed vs. variable (volumetric) charges.

Detailed tables used in calculating the new sewer rates for Rate Alternatives 1 and 2 are shown in the Appendices at the end of this report.

SEWER UTILITY REVENUE REQUIREMENTS

To identify the City's long-term financial needs, NBS developed a five-year financial plan that forecasts sewer revenues and expenditures, including reserves. This plan is based on the City's current operating budget for the utility, discussions with City staff, and related information such as current debt service schedules, planned capital improvements, and timing and amounts of new debt issuances to fund these capital improvements.

V.W. Housen and Associates provided a detailed review of the City's planned capital improvements, including the priority, timing, and costs of individual projects[5]. In coordination with City staff, the recommended improvements have been incorporated into projected annual expenditures. Additionally, NHA Advisors provided projections of debt service schedules based on planned debt issuances. As a part of this sewer rate study, the trade-off between cash-funding (i.e., pay-as-you-go) capital improvements and issuance of new debt was evaluated with the intent of finding an optimal combination of pay-as-you-go and debt that would provide minimal, predictable and steady rate increases.

The City's financial plan addresses four primary objectives:

- **Meeting Operations Costs:** The sewer utility must generate sufficient revenue to cover the expenses of sewer operations, including administration, maintenance, and collection operations.[6] For Fiscal Years 2014/15 through 2018/19, the net annual revenue requirement (total annual expenses, including debt service, less non-rate revenues) is approximately $2.2 to $2.5 million.
- **Meeting Capital Improvement Costs:** The sewer utility must also be able to fund necessary capital improvements. The City, with the assistance of V.W. Housen and Associates, has identified roughly $5.05 million in planned capital improvements for the next five years. Following discussions with NHA Advisors and City staff, the City plans to fund the vast majority of these costs with an existing state revolving fund loan and new revenue bonds.
- **Maintaining Adequate Bond Coverage:** The City is required by its existing bond covenant to maintain a coverage ratio of rates to debt service obligations of at least 1.1 for the outstanding state revolving fund loan and will likely be expected to maintain a coverage ratio of 1.15 to 1.20 for the planned debt issuance. The benefit of maintaining a higher coverage ratio is that it strengthens the City's credit rating, which can help lower the interest rates for debt-funded capital projects and reduce annual debt service payments for future debt issues. The City is also working with NHA Advisors to determine where projected coverage ratios could be improved, if necessary, by short-term use of reserves. Ultimately, proposed rate increases were calculated to meet these projected coverage ratios.
- **Building and Maintaining Reserve Funds:** The Utility should maintain sufficient reserves for a number of reasons. NBS recommends that the City adopt the following target reserve fund levels:
    - **Operating Reserves** equal to 25% of the Utility's budgeted annual operating expenses. This reserve target is equal to a three month (or 90-day) cash cushion for normal operations. An Operating Reserve is intended to promote financial stability in the event of any unexpected short-term or emergency cash needs.
    - **Capital Reserves** equal to 3% of net depreciable capital assets of the utility for capital repair and replacement needs. This target serves simply as a starting point for addressing longer-term needs. If ratepayers can generate revenues at this level and pace, they will have reserved a partial cash resource that can be applied toward future replacement and rehabilitation needs, thereby eliminating the need to borrow this portion of the capital cost of maintaining the utility's collection system infrastructure.
    - **Debt Reserve** equal to the reserve requirement for the outstanding state revolving fund loan and the expected reserve requirement for the planned new debt obligation, which is equal to the maximum annual debt service payment due on outstanding bonds.

Figure 3 summarizes the five years in the financial plan, showing "sources and uses" of funds, along with the estimated annual contribution to (surplus) or reliance on (deficiency) reserves. Figure 4 shows a summary of the utility's projected reserve funds and target balances.

[5] See Appendix 5 for V.W. Housen and Associates report

[6] Wastewater treatment service is provided by Sausalito-Marin City Sanitary District (SMCSD), which separately bills each Sausalito customer.

Figure 3. Summary of Sewer Revenue Requirements

Summary of Sources and Uses of Funds and Net Revenue Requirements	Budget	Projected				
	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19
Sources of Sewer Funds						
Rate Revenue Under Prevailing Rates	$1,750,677	$1,750,677	$1,750,677	$1,750,677	$1,750,677	$1,750,677
Non-Rate Revenues	1,000	1,000	1,000	1,000	1,000	1,000
Interest Earnings	3,270	56,387	55,497	40,618	15,870	19,793
Total Sources of Funds	**$1,754,947**	**$1,808,064**	**$1,807,174**	**$1,792,295**	**$1,767,547**	**$1,771,470**
Uses of Sewer Funds						
Operating Expenses	$1,708,984	$1,779,315	$1,852,709	$1,929,305	$2,009,250	$ 2,092,697
Debt Service	-	435,078	432,378	434,678	435,878	431,878
Rate-Funded Capital Expenses	270,100	-	-	-	-	-
Total Use of Funds	**$1,979,084**	**$2,214,393**	**$2,285,086**	**$2,363,983**	**$2,445,128**	**$ 2,524,574**
Surplus (Deficiency) before Rate Increase	**$(224,137)**	**$(406,329)**	**$(477,912)**	**$(571,688)**	**$(677,581)**	**$ (753,104)**
Additional Revenue from Rate Increases	-	525,203	593,480	663,804	760,383	860,826
Surplus (Deficiency) after Rate Increase	**$(224,137)**	**$ 118,874**	**$ 115,567**	**$ 92,116**	**$ 82,803**	**$ 107,721**
Projected Annual Increase in Rate Revenue	***0.0%***	***30.0%***	***3.0%***	***3.0%***	***4.0%***	***4.0%***
Cumulative Rate Increases	*0.0%*	*30.0%*	*33.9%*	*37.9%*	*43.4%*	*49.2%*
Net Revenue Requirement[1]	**$1,974,814**	**$2,157,006**	**$2,228,589**	**$2,322,365**	**$2,428,258**	**$ 2,503,781**
Debt Coverage After Rate Increase	N/A	1.3	1.3	1.2	1.2	1.2

1. Total Use of Funds less non-rate revenues and interest earnings. This is the annual amount needed from sewer rates.

Figure 4. Summary of Sewer Reserve Funds

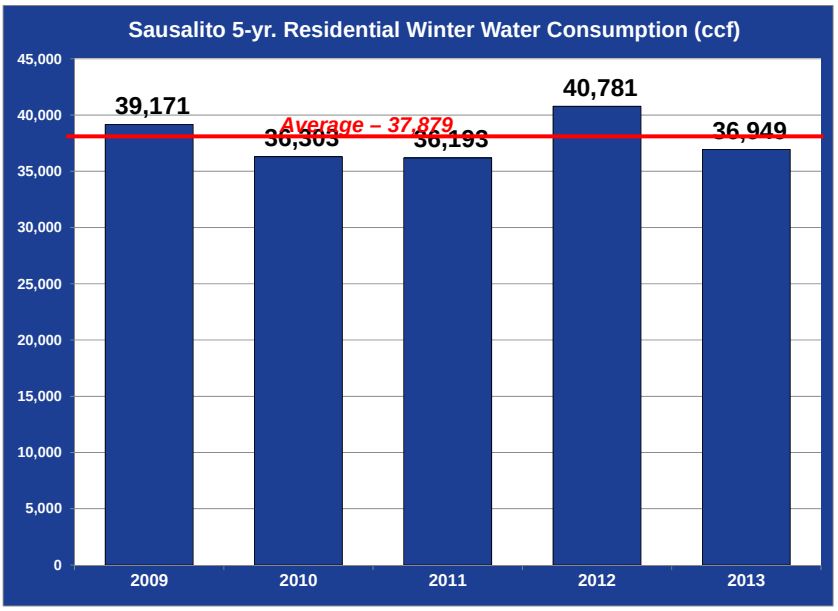
Beginning Reserve Fund Balances and Recommended Reserve Targets	Budget	Projected				
	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19
Operating & Maintenance Reserve						
Ending Balance	$ 211,838	$ 257,584	$ 373,152	$ 465,268	$ 502,000	$ 523,000
Recommended Minimum Target	*427,000*	*445,000*	*463,000*	*482,000*	*502,000*	*523,000*
Capital Rehab & Replacement Reserve						
Ending Balance	$ -	$ -	$ -	$ -	$ 46,070	$ 132,791
Recommended Minimum Target	*182,700*	*187,900*	*185,900*	*181,700*	*119,400*	*115,800*
Debt Reserve						
Ending Balance	$ -	$ 441,578	$ 441,578	$ 441,578	$ 441,578	$ 441,578
Recommended Minimum Target	*-*	*441,578*	*441,578*	*441,578*	*441,578*	*441,578*
Total Beginning Balance	**$ 211,838**	**$ 699,162**	**$ 814,729**	**$ 906,845**	**$ 989,648**	**$ 1,097,369**
Total Recommended Minimum Target	***$ 609,700***	***$ 1,074,478***	***$ 1,090,478***	***$ 1,105,278***	***$ 1,062,978***	***$ 1,080,378***

RESIDENTIAL WINTER CONSUMPTION

The historical residential winter consumption[7] for the last five years is shown in Figure 5 below, and indicates that the 2013 consumption is slightly less than the five-year average (i.e., it is 2.5% less that the five-year average). This provides what NBS considers sufficient confidence that the 2013 winter water use, which is used for the residential volumetric charges, is not unusually large. Therefore, basing a residential volumetric rate on this water use is a reasonable methodology. The rationale for the industry-wide practice of using winter water rates is that outdoor use is minimal in winter and outdoor water use does not flow to the sanitary sewer system.

[7] Units of water consumption are all shown in hundred cubic feet, or ccf, which equals 748 gallons per ccf.

Figure 5. Historical Residential Winter Water Use



Nevertheless, ongoing conservation efforts and likely water rate increases over the next five years (which will incentivize further conservation) are expected to continue to reduce winter consumption. Because of this, NBS has assumed a five-percent conservation-based reduction in the 2013 winter water use in calculating the residential volumetric charge after FY'14-15 in Rate Alternative 2.[8]

Figure 6 summarizes key data for 2013 used in the cost-of-service analysis, including winter water consumption for individual residential classes[9].

[8] This same five percent reduction was assumed for non-residential annual water use.

[9] Note: Minor differences in total 2013 consumption in Figures 5 and 6 are due to different data sources and dates of Marin Municipal Water District records. Figure 5 provides a consistent comparison of similar periods, whereas Figure 6 provides a more detailed summary for each residential customer class.

Figure 6. Water Use and Equivalent Dwelling Unit Calculations by Customer Class

Summary of Residential and Commercial Dwelling Units and Water Use[1]					
Customer Class	No. of Dwelling Units (DU's)	Annualized Water Use (ccf)[2]	Avg. Water Use[3] (ccf/DU/yr.)	Equivalent Dwelling Units (EDU's)[4] EDU's	% of Total
Residential Classes					
Single-Family	1,252	89,592	71.6	1,252	29.8%
Single-Family Attached[5]	191	9,798	51.3	137	3.3%
Duplexes	1,187	65,436	55.1	914	21.7%
Multi-Family Residential[6]	1,160	47,124	40.6	659	15.7%
Total - All Residential	3,790	211,950	55.9	2,962	70.4%
Commercial/Industrial Class					
Commercial/Industrial	*N.A.*	88,981	*N.A.*	1,243	**29.6%**
Total - Residential & Comm./Ind.	*N.A.*	300,931	*N.A.*	4,205	100.0%

1. Source of Data: County Assessor's Parcel Data (APN's) and water use data from Marin-Municipal Water District (MMWD). Data excludes vacant, exempt, and parcels noted as "Septic".
2. Residential is winter water use for January & February 2013 from MMWD records, multiplied by 6. Commercial/Industrial is the 2012 annual average consumption.
3. Annualized water use divided by No. of Dwelling Units (DU's).
4. For residential classes, this is the annualized water use divided by Dwelling Units. For commercial/ industrial classes, this is annual water use divided by the Single-Family average water use (ccf/DU/yr.).
5. Although County Use Codes do not elaborate on the definition of "Single-Family Attached" homes, NBS and City staff have assumed they are primarily condominiums.
6. Dwelling Units are total units for all County use code 21 with more than two dwelling units.

The total residential consumption of 211,950 represents an annualized total of January and February 2013 that Marin Municipal Water District (MMWD) identifies as its “winter” period. This is the quantity that NBS has used to calculate the proposed residential volumetric charge.

The data shown in Figure 6 was also used to develop the number of equivalent dwelling units (EDU’s) for each customer class. These EDU’s are important in determining how costs should be allocated between customer classes, and resulted in adjustments to the City’s current sewer charges. While these cost-of-service-based adjustments affect sewer charges to and the total revenue collected from each customer class, they do not change the total annual revenue requirements in the financial plan shown in Figure 3.

PROPOSED SEWER RATES

Overview of Rate Design Issues – Prop. 218 requires the City to set sewer rates so that customers do not pay more than the proportionate cost of serving them. There is no one "right" way to allocate costs among customer classes; instead, this is a discretionary determination of the City Council. This report frames recommendations to the City Council based on industry practices, legal requirements, and the experience of the City’s rate-making consultant and its staff. If the City Council makes different choices among its rate-making options, the City will supplement this report to document the cost-basis of the adopted rates.

The Council directed staff to develop a fair and equitable allocation formula. The allocation used in the City's 2009 rate-making was reasonable, but staff and the consultant developed a more detailed analysis including a volumetric component for residential classes as well as an additional residential category to more accurately reflect usage within the residential classes. Accordingly, the current cost of service analysis apportions rates among classes based on non-irrigation water used, as measured by average winter water use for residential customers and average annual water use by others.

This difference is because non-residential water customers are able to separately meter irrigation water and such meters are excluded from this accounting of non-irrigation water demand. The City Council believes this method is more equitable and staff and NBS agree that it is a common rate-making approach and appropriate for use in calculating the City’s sewer rates. Thus, the proposed rate structure is meaningfully different from the current rate structure and comparisons between current and proposed rates are difficult.

Proposed Rate Structure – For residential customers, NBS developed a new rate structure for the City that includes volumetric charges based on average winter water consumption; for non-residential customers, the volumetric charges are based on average annual consumption. This new rate structure collects 12% of the total revenue requirement from a volumetric charge. This 12% volumetric charge is the result of a separate analysis NBS prepared that evaluated the appropriateness of a volumetric charge for residential customers and estimated the percentage of rate revenue that could be collected from volumetric residential rates.[10] The decision to apportion revenues between fixed and variable rate components is a policy question that considers the improved fairness and equity resulting from volumetric rates, and revenue stability (which is enhanced by a larger fixed component).

Recent MMWD consumption data used in calculating proposed sewer rates was summarized in Figure 6. Figure 7 summarizes the percentage changes in current vs. proposed rates.

Figure 7. Comparison of Changes in Current vs. Proposed Sewer Rates

Sewer Rates	Current Rates FY 2013/14	Proposed Rates FY 2014/15	$ Change
Residential Rates			
Single-Family	$492.33	$476.25	($16.09)
Single-Family Attached	$327.07	$341.40	$14.33
Duplexes	*N.A.*	$366.89	*N.A.*
Multi-Family Residential	$243.36	$270.36	$27.01
Volumetric Rate ($/ccf)[1]	*N.A.*	$0.91	*N.A.*
Non-Residential Rates			
Commercial ($/yr./parcel)[2]	$305.04	$476.25	$171.21
Volumetric Rate ($/ccf)[3]	$2.45	$0.91	($1.54)

1. Applied to annualized 2013 winter water use (i.e., 2-month winter use times 6).
2. Current fixed charges are applied on a per parcel basis; new charges are applied based on the calculated number of EDUs per parcel, with EDUs calculated by dividing the annual wate use per parcel by the annualized average winter water use per Single-Family dwelling unit.
3. Current rates are applied to the maximum year of the last 5-years of water use. Proposed rates are applied to the previous year's annual water use per MMWD records.

Figure 8 shows a comparison of the annual sewer bill for single family residential customers for the first year of the rate adjustment. Figures 9 and 10 show single family residential bill comparisons over the next five years.

[10] This separate analysis is summarized in a technical memo (Summary of Residential Volumetric Sewer Rate Option) dated January 22, 2014.

Figure 8. Comparison of Single Family Annual Sewer Bills – FY 2014/15

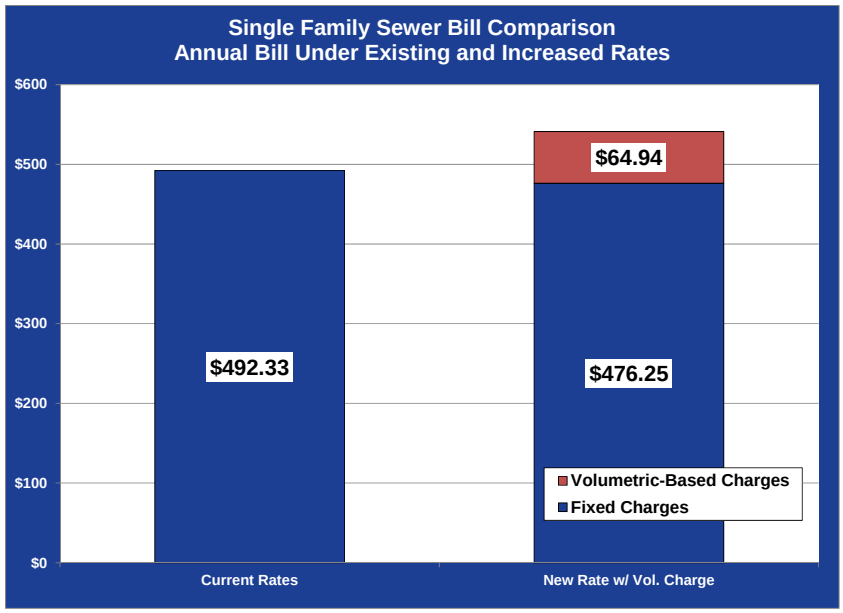
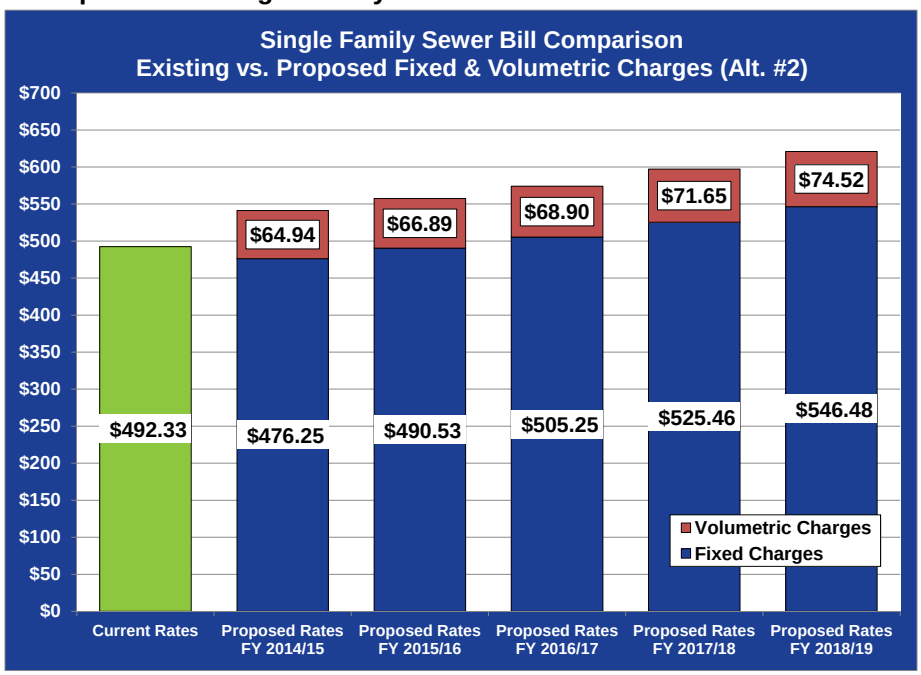


Figure 9. Comparison of Single Family Annual Sewer Bills Fiscal Years 2014/15 – 2018/19



The volumetric charges represented in Figures 8 and 9 are based on an average single-family dwelling unit's water consumption of 11.9 ccf in winter months, approximately 71.6 ccf per year; therefore, the annual sewer bill for the average single-family residential user (i.e., those whose average winter water use is 11.9 ccf) is the same regardless of the rate alternative. This is apprpropriate because the recommended rate structure is intended to generate the same annual rate revenue.

RECOMMENDATIONS AND NEXT STEPS

CONSULTANT RECOMMENDATIONS

NBS recommends the City take the following actions:

- **Complete Public Hearing and Proposition 218 Noticing**: The City Council has reviewed the proposed sewer rates and directed staff to proceed with adoption and implementation of the new rates. Therefore, the City will need to comply with Proposition 218 requirements by mailing out Prop. 218-compliant public notices and holding a public hearing no sooner than 45 days after notices are mailed.
- **Annually Review Rates and Revenue** – Any time a utility adopts new rates and/or rate structures, those new rates should be closely monitored over the next several years to ensure the revenue generated is sufficient to meet the annual revenue requirements. Changing economic and water consumption patterns underscore the need for this review, as well as potential and unseen changing revenue requirements, particularly those related to environmental regulations, that can significantly affect capital improvements and repair and replacement costs.

PRINCIPAL ASSUMPTIONS AND CONSIDERATIONS

In preparing this report and opinions and recommendations included herein, NBS has relied on information and a number of principal assumptions and considerations with regard to financial matters, capital improvement costs, market conditions, and events that may occur in the future. This information and assumptions, including the City's budgets, information from City staff and engineering consultants, review of legal issues provided by legal counsel, and financial advisors, and account and water use records from the County Assessor's Office and the Marin Municipal Water District (MMWD), were provided by sources we believe to be reliable.

While we believe NBS' use of such information and assumptions is reasonable for the purpose of this report, some assumptions will invariably not materialize as stated herein and may vary significantly due to unanticipated events and circumstances. Therefore, the actual results can be expected to vary from those projected to the extent that actual future conditions differ from those assumed by us or provided to us by others. Ratemaking relies on predictions of future costs and revenues that are inherently imprecise. The use of reserves assists in stabilizing utility revenues in light of this inherent unpredictability.

Nothing in this report is an attempt by NBS to provide legal advice and should not be construed as such. NBS recommends the City continue to have the special legal counsel, which they have retained for this purpose, review the proposed rates and related assumptions and concerns in light of recent Proposition 218-related utility rate court rulings.

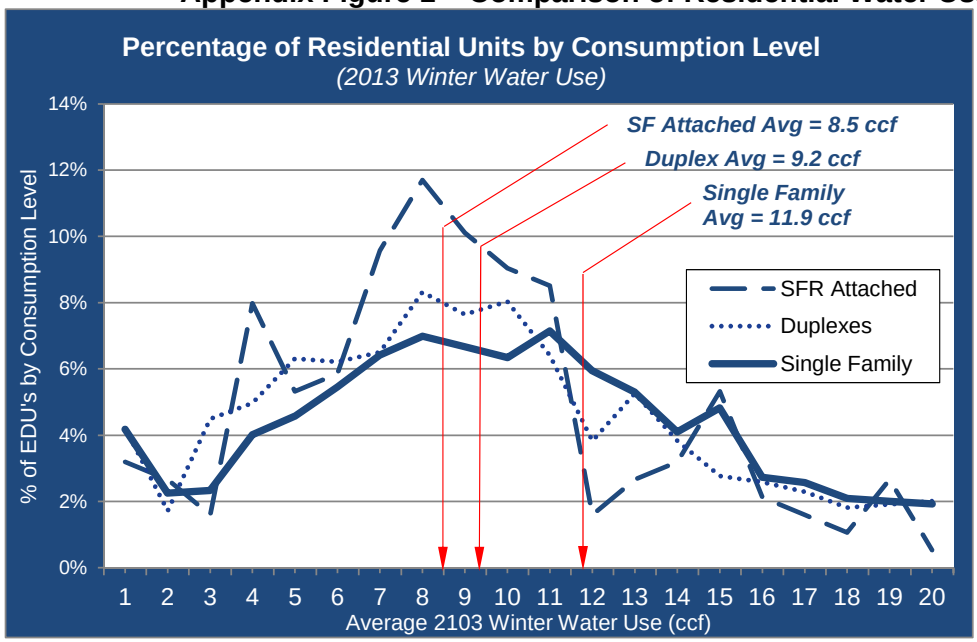
Note: The attached Appendices provide more detailed information on the analyses of the sewer revenue requirements, cost-of-service, cost allocations, volumetric rates, and the rate design that have been summarized in this report.

Appendix 1 – Comparison of Residential Consumption Levels

Appendix Figure 1 below illustrates the percentage of residential units at various water consumption levels for winter 2013 consumption records from MMWD.[11] This data provides the basis for setting rates within the residential classes of single-family, single-family attached, and multi-family (which consists of three or more apartment units per parcel).

Appendix Figure 2 summarizes the residential dwelling units and water use, plus commercial usage, along with the calculation of total equivalent dwelling units (EDU's) for each customer class.[12]

Appendix Figure 1 – Comparison of Residential Water Usage



Percent of Residential Users by Consumption Level (2013 Winter Water Use)	
% of Customers	Consumption Levels
Single Family	
0 - 25%	0 - 6.3 ccf
26 - 50%	6.4 - 10 ccf
51 - 75%	10.1 - 15.5 ccf
75% - 100%	15.6 ccf+
SFR Attached	
0 - 25%	0 - 5.4 ccf
26 - 50%	5.5 - 8.2 ccf
51 - 75%	8.3 - 11 ccf
75% - 100%	11.1 ccf+
Duplexes	
0 - 25%	0 - 5.6 ccf
26 - 50%	5.7 - 9 ccf
51 - 75%	9.1 - 13.2 ccf
75% - 100%	13.3 ccf+

[11] Multi-Family data is not shown because of the variation in the number of units per parcel makes it difficult to compare to water consumption per dwelling unit of the other residential classes.

[12] This is the same table shown in the report as Figure 6, and is presented here for reference purposes.

Figure 2. Water Use and Equivalent Dwelling Unit Calculations by Customer Class

Summary of Residential and Commercial Dwelling Units and Water Use[1]					
Customer Class	No. of Dwelling Units (DU's)	Annualized Water Use (ccf)[2]	Avg. Water Use[3] (ccf/DU/yr.)	Equivalent Dwelling Units (EDU's)[4] EDU's	% of Total
Residential Classes					
Single-Family	1,252	89,592	71.6	1,252	29.8%
Single-Family Attached[5]	191	9,798	51.3	137	3.3%
Duplexes	1,187	65,436	55.1	914	21.7%
Multi-Family Residential[6]	1,160	47,124	40.6	659	15.7%
Total - All Residential	3,790	211,950	55.9	2,962	70.4%
Commercial/Industrial Class					
Commercial/Industrial	*N.A.*	88,981	*N.A.*	1,243	**29.6%**
Total - Residential & Comm./Ind.	*N.A.*	300,931	*N.A.*	4,205	100.0%

1. Source of Data: County Assessor's Parcel Data (APN's) and water use data from Marin-Municipal Water District (MMWD). Data excludes vacant, exempt, and parcels noted as "Septic".
2. Residential is winter water use for January & February 2013 from MMWD records, multiplied by 6. Commercial/Industrial is the 2012 annual average consumption.
3. Annualized water use divided by No. of Dwelling Units (DU's).
4. For residential classes, this is the annualized water use divided by Dwelling Units. For commercial/ industrial classes, this is annual water use divided by the Single-Family average water use (ccf/DU/yr.).
5. Although County Use Codes do not elaborate on the definition of "Single-Family Attached" homes, NBS and City staff have assumed they are primarily condominiums.
6. Dwelling Units are total units for all County use code 21 with more than two dwelling units.

Appendix 2 – Key Rate Study Tables

TABLE 1
FINANCIAL PLAN AND SUMMARY OF REVENUE REQUIREMENTS

RATE REVENUE REQUIREMENTS SUMMARY	Budget	Projected				
	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19
Sources of Sewer Funds						
Rate Revenue Under Prevailing Rates *(1)*	$ 1,750,677	$ 1,750,677	$ 1,750,677	$ 1,750,677	$ 1,750,677	$ 1,750,677
Non-Rate Revenues	1,000	1,000	1,000	1,000	1,000	1,000
Interest Earnings (in O&M, Capital and Debt Reserves)	3,270	56,387	55,497	40,618	15,870	19,793
Total Sources of Funds	**$ 1,754,947**	**$ 1,808,064**	**$ 1,807,174**	**$ 1,792,295**	**$ 1,767,547**	**$ 1,771,470**
Uses of Sewer Funds						
Salaries and Benefits	$ 953,066	$ 1,000,719	$ 1,050,755	$ 1,103,293	$ 1,158,458	$ 1,216,381
Operations	593,635	611,444	629,787	648,681	668,141	688,186
Admin Charges	162,283	167,151	172,166	177,331	182,651	188,130
Subtotal: Operating Expenses	$ 1,708,984	$ 1,779,315	$ 1,852,709	$ 1,929,305	$ 2,009,250	$ 2,092,697
Other Expenditures:						
Existing Debt Service	$ -	$ 73,128	$ 73,128	$ 73,128	$ 73,128	$ 73,128
New Debt Service (2)	-	361,950	359,250	361,550	362,750	358,750
Rate-Funded Capital Expenses	270,100	-	-	-	-	-
Subtotal: Other Expenditures	$ 270,100	$ 435,078	$ 432,378	$ 434,678	$ 435,878	$ 431,878
Total Uses of Sewer Funds	**$ 1,979,084**	**$ 2,214,393**	**$ 2,285,086**	**$ 2,363,983**	**$ 2,445,128**	**$ 2,524,574**
plus: Revenue from Rate Increases	-	525,203	593,480	663,804	760,383	860,826
Annual Surplus/(Deficit)	**$ (224,137)**	**$ 118,874**	**$ 115,567**	**$ 92,116**	**$ 82,803**	**$ 107,721**
Net Revenue Reqt. *(3)*	**$ 1,974,814**	**$ 2,157,006**	**$ 2,228,589**	**$ 2,322,365**	**$ 2,428,258**	**$ 2,503,781**
Total Rate Revenue After Rate Increases	**$ 1,750,677**	**$ 2,275,880**	**$ 2,344,157**	**$ 2,414,481**	**$ 2,511,060**	**$ 2,611,503**
Projected Annual Rate Increase	***0.00%***	***30.0%***	***3.0%***	***3.0%***	***4.0%***	***4.0%***
Cumulative Increase from Annual Rate Increases	0.00%	*30.0%*	*33.9%*	*37.9%*	*43.4%*	*49.2%*
Debt Coverage After Rate Increase (4)	N/A	1.3	1.3	1.2	1.2	1.2

(1) Customer growth is assumed to be flat for the City of Sausalito.
(2) From NHA Advisors, Sausalito 2014 Sewer Revenue Bonds 140123 (Level DS).pdf, 1-23-14.
(3) Total Uses less Non-Rate Revenue and Interest Earnings.
(4) The City's financial advisor (NHA) estimates the required coverage ratio is likely to be 1.15 to 1.2.

Figure 3 – Summary of Revenue Requirements

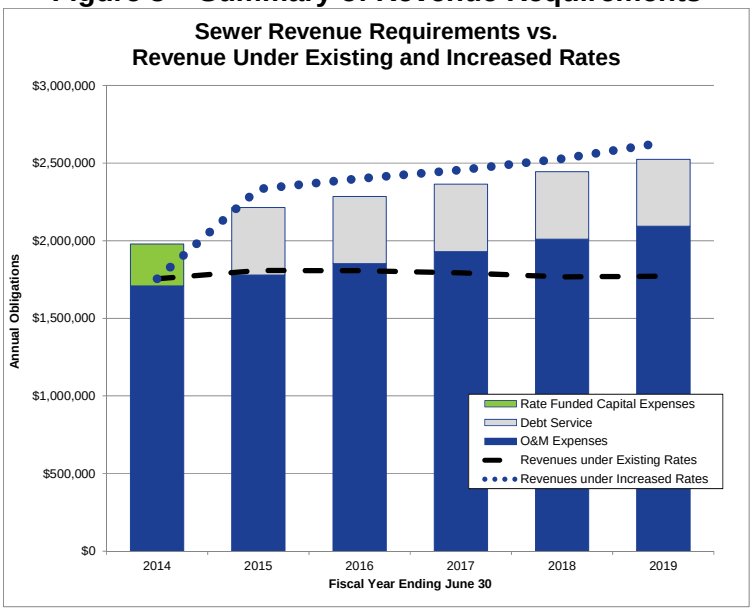


TABLE 2
RESERVE FUND SUMMARY

SUMMARY OF CASH ACTIVITY	Budget	Projected				
	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19
Total Beginning Cash (1)	**$ 435,975**					
Sewer Operating & Maintenance Reserve						
Beginning Reserve Balance	$ 435,975	$ 211,838	$ 257,584	$ 373,152	$ 465,268	$ 502,000
Plus: Net Cash Flow (After Rate Increases)	(224,137)	118,874	115,567	92,116	82,803	107,721
Plus: Transfer of Debt Reserve Surplus	-	-	-	-	-	-
Less: Transfers Out to Capital Replacement Reserve	-	-	-	-	(46,070)	(86,721)
Less: Transfer to Debt Reserve to Fund Reserve Req't. (2)	-	(73,128)	-	-	-	-
Ending Operating Reserve Balance	***$ 211,838***	***$ 257,584***	***$ 373,152***	***$ 465,268***	***$ 502,000***	***$ 523,000***
Target Ending Balance (3 months of Annual O&M)	*$ 427,000*	*$ 445,000*	*$ 463,000*	*$ 482,000*	*$ 502,000*	*$ 523,000*
Sewer Capital Rehab & Replacement Reserve						
Beginning Reserve Balance	$ -	$ -	$ -	$ -	$ -	$ 46,070
Plus: Grant Proceeds	-	-	-	-	-	-
Plus: State Revolving Fund Loan Proceeds	1,100,000	-	-	-	-	-
Plus: Transfer of Operating Reserve Surplus	-	-	-	-	46,070	86,721
Less: Use of Reserves for Capital Projects	(1,100,000)	-	-	-	-	-
Ending Repair & Replacement Balance	***$ -***	***$ -***	***$ -***	***$ -***	***$ 46,070***	***$ 132,791***
Target Ending Balance (3% of Net Assets in FY 2012/13) (3)	*$ 182,700*	*$ 187,900*	*$ 185,900*	*$ 181,700*	*$ 119,400*	*$ 115,800*
Ending Balance - All Reserves	**$ 211,838**	**$ 257,584**	**$ 373,152**	**$ 465,268**	**$ 548,070**	**$ 655,791**
Recommended Target Ending Balance - All Reserves	**$ 609,700**	**$ 632,900**	**$ 648,900**	**$ 663,700**	**$ 621,400**	**$ 638,800**
Ending Surplus/(Deficit) Compared to Reserve Targets	***$ (397,862)***	***$ (375,316)***	***$ (275,748)***	***$ (198,432)***	***$ (73,330)***	***$ 16,991***
Restricted Reserves:						
Sewer Revenue Bond Project Fund						
Beginning Reserve Balance	$ -	$ 5,426,818	$ 3,740,609	$ 1,893,105	$ -	$ -
Plus: Revenue Bond Proceeds	5,426,818	-	-	-	-	6,389,695
Less: Use of Reserves for Capital Projects	-	(1,686,208)	(1,847,504)	(1,893,105)	-	-
Ending Revenue Bond Project Fund Balance	***$ 5,426,818***	***$ 3,740,609***	***$ 1,893,105***	***$ -***	***$ -***	***$ 6,389,695***
Target Ending Balance	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*
Sewer Debt Reserve						
Beginning Reserve Balance	$ -	$ -	$ 441,578	$ 441,578	$ 441,578	$ 441,578
Plus: Reserve Funding from New Debt Obligations	-	441,578	-	-	-	-
Less: Transfer of Surplus to Operating Reserve	-	-	-	-	-	-
Ending Debt Reserve Balance	***$ -***	***$ 441,578***	***$ 441,578***	***$ 441,578***	***$ 441,578***	***$ 441,578***
Target Ending Balance	*$ -*	*$ 441,578*	*$ 441,578*	*$ 441,578*	*$ 441,578*	*$ 441,578*
Annual Interest Earnings Rate (4)	*0.75%*	*1.00%*	*1.25%*	*1.50%*	*1.75%*	*2.00%*

(1) Beginning cash balances are from the Trial Balance report for July 1, 2012 through September 30, 2012, provided by City Staff. Both the beginning cash balance and LAIF investments are considered cash in this analysis. NBS assumes that the City is holding sufficient funds to meet the reserve requirement for the State Revolving Fund Loan, so that amount is segregated into the Debt Reserve for purposes of this analysis.
(2) NBS assumes that reserve funding for the SRF loans will come from rates in FY 2014/15 when it needs to be funded.
(3) The target Capital Reserve balance is 3% of Net Capital Assets in FY 2012/13 (value of capital assets less accumulated depreciation). This represents an average replacement cycle of 33 years. However, given the advanced age of the City's system, this represents the low end of recommended reserve balances.
(4) Historical interest earning rates were referenced on the California Treasurer's Office website for funds invested in LAIF. Future years earnings were conservatively estimated through FY 2016/17 and phase into the historical 10 year average interest earnings rate.

Figure 4 – Summary of Projected Reserves

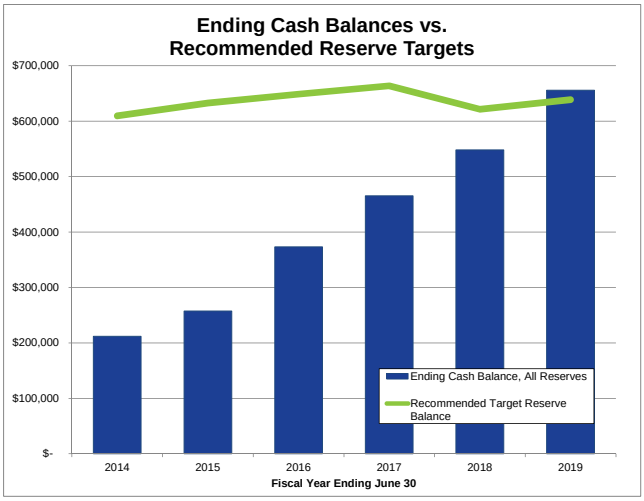


Table 3 Estimated Revenue Requirements by Residential vs. Commercial			
Customer Class	Estimated EDU's	% of Estimated EDU's	Revenue Reqts.[1] (FY 14/15)
All Residential	2,962	70.4%	**$1,602,936**
All Commercial	1,243	29.6%	**$672,944**
Grand Total	4,205	100%	**$ 2,275,880**

1. Revenue requirements are based on percentage of estimated EDU's.

Table 4 Residential - Base/Fixed and Volumetric Rate Calculations			
Residential Customer Class	***Allocated Costs***		
	Fixed	**Variable**	**Total**
Percentage Allocations[1]	88%	12%	**100%**
Total Residential Revenue Requirement[2]	**$1,410,584**	**$192,352**	**$1,602,936**

1. Percent based on NBS' review of cost allocations. See Appendix 3.
2. Revenue requirements are allocated based on EDU's.

Table 5 - Revenue Requirements by Residential Customer Class					
Residential Customer Class	**% of Resid. EDU's[1]**	**Customer Class Rev. Req't.[2]**	**Base Charge Rev. $/yr.**	**Volumetric Charge Rev. $/Yr.**	**Total Residential Revenue**
Single-Family	42.3%	$677,567	$596,259	$81,308	$677,567
Single-Family Attached	4.6%	$74,100	$65,208	$8,892	$74,100
Duplexes	30.9%	$494,880	$435,494	$59,386	$494,880
Multi-Family Residential	22.2%	$356,390	$313,623	$42,767	$356,390
Total Costs	100.0%	**$1,602,936**	**$1,410,584**	**$192,352**	**$1,602,936**

1. Total percentage of Equivalent Dwelling Units (EDU's) based on average winter water use.
2. Cost allocations to customer classes are based on percent of residential EDU's.

Table 6 - Average Residential Charges and Volumetric Rate				
Residential Customer Class	No. of Dwelling Units (DU)[1]	***Sewer Rates*** *($/Unit/Year)*[2]		
		Base Charge ($/DU/Yr.)	*Annual Vol. Charge (Avg.)*	*Total Annual Charge (Avg.)*
Single-Family	1,252	$476.25	$64.94	$541.19
Single-Family Attached	191	$341.40	$46.56	$387.96
Duplexes	1,187	$366.89	$50.03	$416.92
Multi-Family Residential	1,160	$270.36	$36.87	$307.23
Grand Total	3,790			
Annual Volumetric Charge in $/ccf[3]			***$0.91***	

1. From Co. Assessor's data. These are actual number of dwelling units that will be billed on the tax roll.
2. Includes projected rate increase. Annual volumetric charge is the average; actual rates will be based on the actual winter water use of each residential customer.
3. Total residential volumetric-based revenue divided by total 2013 residential consumption (note: the annual consumption is the average 2-month winter use times 6).

Table 7 - Base Charge and Volumetric Rate for Non-Residential Customers						
Non-Residential Customer Classes	Calcvulated No. of EDU's[1]	Estimated Billed Water Use[2]	**Customer Class Rev. Req't.**[3]	***Sewer Rates*** *($/Unit/Year)*[4]		
				Base Charge ($/EDU/Yr.)	*Annual Vol. Charge (Avg.)*	*Total Annual Charge (Avg.)*
All Commercial/Industrial						
Base Charges (Fixed)	1,243	*N.A.*	$592,190	**$476.25**	*N.A.*	$476.25
Volumetric Charges ($/ccf/annual use)[4]	*N.A.*	89,000	$80,753	*N.A.*	***$0.91***	$64.94
Total Revenue Req't. and Avg. Annual Bill	**--**	**--**	**$672,944**			**$541.19**

1. Based on County Assessor's APN data and MMWD water use data, non-residential parcels will be billed based on the number of EDU's calculated by dividing annual water use per parcel by the average annualized Single-Family winter consumption per dwelling unit.

2. This is 2012 water use for commercial/industrial customers that includes 18 "exempt" APNs that will now be billed for sewer service. Since exempt parcels do not appear on County APN records, they have historically not been charged. However, the City will now bill these parcel directly. These 18 previously exempt APNs are assumed to have the same water use as commercial APN's.

3. Reflects 88% from Fixed Charges and 12% from Volumetric Charges (i.e., same as residential customers).

4. Rate is applied to the customer's previous year's annual water use. Includes the recommended rate increase.

Appendix 3 – Summary of a Residential Volumetric Sewer Rate Option

PURPOSE

The purpose of this technical memo is to summarize the rationale for why the City might want to consider using a volumetric charge for Sausalito's residential sewer customers and provide an estimate of the percentage of rate revenue that could be collected from volumetric residential rates. *(Note: Figure and Table numbers are not continuous from the preceding report or appendices.)*

BACKGROUND

The City is considering moving from a 100% flat rate sewer service charge for residential customers to a combination of fixed and volumetric charges. Current residential sewer rates consist of a flat charge, while commercial rates include fixed and volumetric charges.

This memo reviews the general criteria and industry standards used in designing sewer rate structures with the intent of addressing three questions: (1) could the overall equity of the City's sewer rates be improved using a volumetric rate for residential customers; (2) what percentage of rate revenue could be collected from volumetric charges? and, (3) what other factors should the City consider in deciding whether to implement a volumetric-based residential rate? To respond to these questions, we have provided the following brief discussion of rate-making practices and industry standards, as well as a short analysis of the percentage of residential rate revenue that could be collected form volumetric charges.

RESIDENTIAL VOLUMETRIC CHARGES – RATE-MAKING PRACTICES

Many communities throughout California are switching from strictly flat sewer rates for residential customers to a combination of fixed and volumetric charges, with residential customer's volumetric rates based on their average winter water use. Most communities that have already adopted or are considering a volumetric charge for sewer services provide both collection and treatment services to their customers, whereas Sausalito only provides collection related services; treatment services are provided by the Sausalito-Marin City Sanitary District (SMCSD).

The following is a summary of the factors typically considered in evaluating whether to implement volumetric-based sewer charges:

- **Equity in Cost Allocations** – Inequities can and do exist in sewer charges when residential customers with significantly different effluent generation quantities are all charged the same rates. Even sewer systems consisting of only collection facilities, such as Sausalito's, can include variable (i.e., volumetric-based) costs, such as higher pumping costs related to peak flows and higher capital costs incurred to meet peak demands compared to base-load flows. Because of this, residential customers' actual cost-of-service may vary with the amount of effluent they generate. If those variations are not reflected in their sewer charges, customers generating greater than average flows are arguably being subsidized by those generating less than average flows.
- **Fixed vs. Variable Costs** – Since Sausalito's sewer system is a collection-only system, with treatment services provided by Sausalito-Marin City Sanitary District (SMCSD), the costs for the City's sewer utility are primarily related to effluent flows vs. treatment-related costs[13]. These collection system costs can be classified as either fixed or variable costs. The American Water

[13] Effluent flow related costs include maintenance, repair and replacement of collection pipes and pump stations, and capital costs of collection-related improvements and other capital projects. We note that the City's sewer O&M budget does include "Technical Services" that include outsourced treatment costs according to City staff.

Works Association (AWWA) M-1 Manual, a commonly accepted industry standard for water and sewer rate-making practices, defines these terms as follows:[14]

- ***"Fixed Costs** are those capital and operating costs that remain relatively unchanged over a given operating period, such as a year. Fixed costs include virtually all capital costs such as debt service, or depreciation expenses and return, as well as costs of operating and maintaining system facilities.*"
- ***"Variable Costs** are those costs that tend to vary directly with the volume of water produced. Examples of variable costs include chemicals used in treatment and the energy portion of the costs of power used in pumping*."

Fixed and variable costs are typically applied to water and sewer systems in very similar manners. Generally, fixed costs are collected through fixed sewer charges and variable costs are collected through volumetric-based charges.

- **Industry Standards and Cost of Service vs. Rate Design** – It is important to note the distinctions between "cost-of-service" and "rate design" in considering whether using volumetric rates for Sausalito's residential customers is consistent with industry standards and Proposition 218. The primary components in water or sewer rate studies include the following components, with further definitions listed below Figure 1:

Figure 1. Primary Components of a Rate Study

- *Financial Plan/Revenue Requirements:* Compare current sources of funds (revenues) to uses of funds (expenses) and determine the revenue needed from rates, but does not address how costs are allocated to customer classes or rate design issues.
- *Cost of Service*: Determines how costs are allocated to each *customer class* in a "fair and equitable" manner that complies with Prop. 218, but does not dictate what type of rate structure should be used to collect those costs from each customer class. That is, as long as the correct amount of revenue is collected from (in this case) residential customers, the cost-of-service test and the most critical aspects of Proposition 218 equity mandates can be met.
- *Rate Design* – Numerous rate designs are used in California and the choice among them is a policy decision for the City Council. As long as the rate design collects the cost-of-service determined revenue requirements from each customer class, and there are no obvious subsidies, these various rate structures can comply with the requirements of Proposition 218. In general, rate design must simply demonstrate that rates are reasonably equitable and non-discriminatory. Other goals such as revenue stability, conservation incentives, etc. are policy matters rather than legal mandates.

[14] *Principles of Water Rates, Fees, and Charges*, Manual of Water Supply Practices, M1, AWWA, fifth edition, 2000, p. 51.

- **Latitude in Sewer Rate Design** – AWWA's *Principles of Water Rates, Fees, and Charges* (the M-1 Manual), does not mandate the use of either flat rates or volumetric charges for residential sewer customers. Instead, it grants a certain amount of latitude to communities in determining the type of rate structure to use, as noted in the following statements:[15]

  > *"…the costs of water rates and charges should be recovered costs <u>from classes of customers</u> in proportion to the cost of serving those customers. However … other considerations <u>may be equally or more important</u> in determining rates and charges and may better reflect emerging objectives of the utility or the community it serves."*
  >
  > *and*
  >
  > *"…pricing policies may support a community's social, economic, political, and environmental concerns."*

  In essence, this means that there is no one rate structure (i.e., any specific combination of fixed and volumetric charges) that must be used in any particular case. Rather, choice among competing rate structures is a policy question for the City Council.

- **Rate Design Issues to Consider** – A volumetric rate based on winter water use is intended to reflect indoor water use, and is generally considered to be a reasonable estimate of effluent generation, as well as reflection of each customer class' share of collection system capacity demands. However, there are always some residential customers that have significantly larger than average consumption that is not likely to be representative of their effluent generation. For example, if average winter water use is 11 hcf, a customer using more than 100 hcf is unlikely to have most of this water use returned to the sewer collection system because the figure likely includes outdoor water use. Likewise, some customers may be on vacation during the winter months and, therefore, have no winter water use and would not have a volumetric charge. Yet they may be likely to generate effluent at other periods during the year. Some type of cap (or "ceiling"), as well as a minimum (or "floor"), could be a component of this new charge, although again, this is a choice and policy-related question for the City Council to make.

- **Other Factors to Consider** – In addition to cost-of-service and engineering related aspects of rate studies, there are also many more pragmatic factors that can and should be considered in decisions about rate design. These include such factors as ease of administration, availability of data, capability of billing systems, and ease of understanding of rates by customers. Clearly the addition of a volumetric charge to residential sewer rates would impose certain administrative costs on City staff, increase complexity, and require changes to current procedures.

  It is likely that establishing a residential volumetric sewer charge would require several weeks of City staff time to coordinate this new charge, in addition to consultant time to finalize a list of residential customers and their winter water consumption data. Consultant time should not exceed $10,000 total. The intent would be to establish a complete list of accounts and their charges in order to be able to tell individual customers what their new sewer charges would be.

ANALYSIS OF RESIDENTIAL VOLUMETRIC CHARGES

The following is a summary of NBS' analysis of the costs that could be allocated to variable costs and, therefore, to volumetric charges. This analysis is based on a review of the Sausalito sewer collection system's capacity, including the percentages of costs that are incurred to serve peak system flow requirements.

In general, if all customers had the same effluent flows, or their base loads were the same all the time, the collection system would only need to be sized to meet those base loads. Instead, the collection system was sized to meet peak flows, which can be reflected in what can be referred to an "extra-capacity" and "system peaking" requirements. These concepts are applied to the sewer utility's O&M and capital costs below.

[15] *Principles of Water Rates, Fees, and Charges*, Manual of Water Supply Practices, M1, AWWA, fifth edition, 2000, pp. xix and 79 (*underlines add by NBS*). Also see *Financing and Charges for Wastewater Systems*, Manual of Practice No. 27, Water Environment Federation, 2004, page 91.

Costs Allocated to Volumetric Charges

Table 1 below summarizes the overall percentage of annual O&M and capital costs that could be assigned to variable cost components or volumetric sewer rates for residential customers. As this table shows, approximately 12% of the FY 2014/15 costs could be allocated to volumetric charges. More detailed cost allocation tables are provided in Appendix 4, and rely on available data on the City's effluent generation and general rate-making cost allocations.

Table 1. Summary of Allocations to Volumetric Sewer Rates

SEWER RATE REVENUE REQUIREMENTS	Projected FY 2014/15	Allocation to Volumetric Charges/Basis		
Uses of Sewer Funds		*%*	*Allocated Cost*	*Basis*
Salaries and Benefits	$991,189	13%	$129,898	*Extra capacity costs* [1]
Operations	$611,444	13%	$80,131	*Extra capacity costs* [1]
Admin Charges	$167,151	13%	$21,906	*Extra capacity costs* [1]
Subtotal: Operating Expenses	$1,769,784		$231,935	
Other Expenditures:				
Existing Debt Service	$73,128	9%	$6,581	*System Peaking* [2]
New Debt Service	$368,450	9%	$33,161	*System Peaking* [2]
Subtotal: Other Expenditures	$441,578		$39,742	
Total Uses of Sewer Funds	**$2,211,362**	**12%**	**$271,677**	

1. Extra capacity costs reflect the variable component of sewer O&M Costs. See Appendix 4 - Table 1.

2. System peaking capacity capital costs reflect the variable component of sewer O&M Costs. See Appendix Table 2.

O&M Cost Allocations

In light of the fact that the City's sewer system consists only of collection facilities, most but not all O&M costs are fixed rather than varying with the amount of effluent (flow). AWWA defines fixed costs as "base costs" and "customer costs", while "extra capacity" costs are variable (volumetric) costs. Even though base and extra capacity terms are more typically applied to water rates, the concepts can be applied in the same manner to sewer rates as sewer service demand is closely related to water demand — a predictable fraction of potable water use becomes wastewater which the City must collect and transport. The following are AWWA's definitions that were applied in allocating the City's sewer utility O&M costs to these categories[16]:

- ***"Base costs** are costs that tend to vary with the total quantity of water used plus those O&M expenses and capital costs associated with service to customers under average load conditions, without the elements of cost incurred to meet water use variations and resulting peaks in demand."*
- ***"Extra capacity costs** are costs associated with meeting rate of use requirements in excess of average and include O&M expenses and capital costs for system capacity beyond that required for average rate of use."*
- ***"Customer costs** comprise those costs associated with serving customers, irrespective of the amount or rate of water use."*

Appendix Table 1 presents the allocation of the City's current (FY 2013/14) O&M costs and shows that 13% of O&M costs could be allocated to volumetric charges.

[16] *Principles of Water Rates, Fees, and Charges*, Manual of Water Supply Practices, M1, AWWA, fifth edition, 2000, page 51.

Capital Improvement Cost Allocations

Similar to O&M costs, capital improvement costs can be allocated to average system flows vs. extra capacity flows. Average and extra-capacity in this case can be represented by average and peak level effluent generation, or the amount of effluent discharged to the SMCSD treatment plant.

Appendix Table 2 presents the allocation of the City's capital improvement costs over the next four years and calculates the percentage of costs that could be allocated to volumetric charges. Appendix Table 3 summarizes the specific capital project costs through 2017, and Appendix Table 4 presents the monthly discharges to the SMCSD treatment plant and indicates the City has a relatively low sewer effluent discharge peaking factor of 1.1, resulting in extra-capacity related costs of 9% compared to base capacity costs of 91%.

FINDINGS AND RECOMMENDATIONS

Findings

- **Could the overall equity of the City's sewer rates be improved using a volumetric rate for residential customers?** Yes. Despite the City's collection-only sewer facilities, there is a portion of the City's sewer system costs that could be allocated to and collected through volumetric charges. For example, both O&M and capital-related costs that are commonly associated with meeting peak effluent generation needs can be allocated to volumetric charges. Allocating some portion of these variable costs to volumetric charges would be more equitable, and would reduce charges to residential customers with less-than-average flows (average and peak) but also increase charges to those with greater-than-average flows.
- **What percentage of rate revenue could be collected from volumetric charges?** A detailed cost allocation analysis indicates that only a small percentage (12%) could be allocated to volumetric charges. However, there are no definitive standards that dictate how these allocations should be done, and similar communities can and do choose to collect significantly different percentages of sewer system costs from volumetric charges a this involves a policy-laden trade-off of conservation incentives (accomplished by higher volumetric rate components) and revenue stability (promoted by higher fixed rate components).

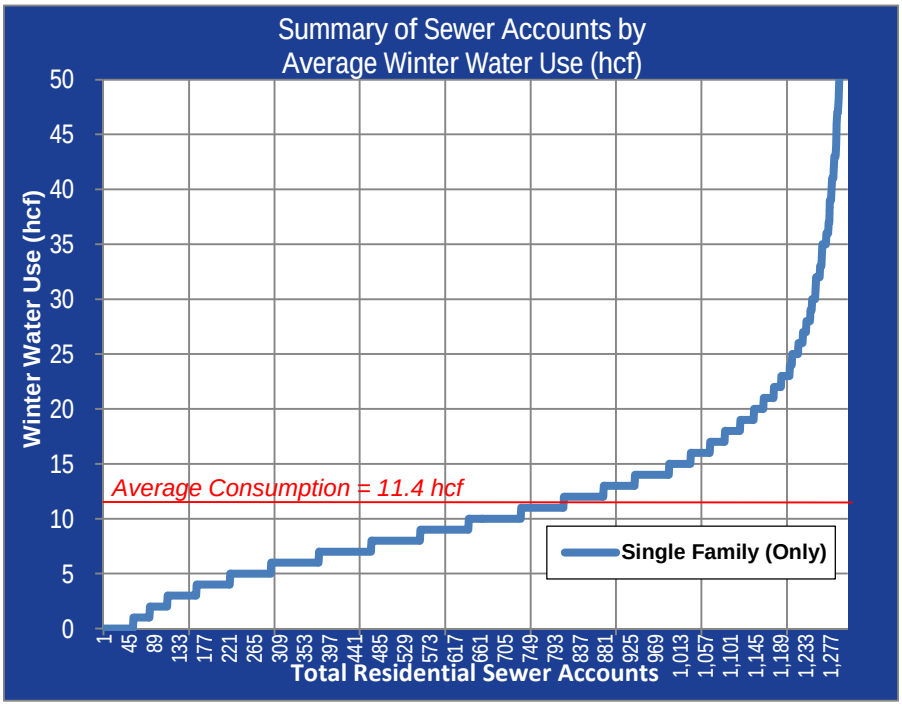
Conclusions

- **Using a Volumetric-based charge is reasonable and acceptable** – This approach is commonly accepted, and has been implemented, in many other California communities. It is relatively easy for customers to understand that their cost of service varies with estimate effluent generation levels. It is also typically viewed more as an equity issue than a Prop. 218 or rate practice-required methodology. Additionally, a relatively small volumetric charge (say less than 20% of total residential sewer rate revenue) will not dramatically impact the sewer bills of the vast majority of residential customers.

Recommendations

- **Consider Other Implications of Adopting Volumetric-Based Residential Sewer Rates** – As noted above, communities can and should consider other implications associated with rate design, including using volumetric rates. These might include, in addition to customer equity and fairness, the ease of customer's understanding of rates and bills, ease of administration, administrative costs, and the capabilities of the City's billing system to accommodate volumetric charges.
- **Review Specific Customer Bill Impacts** – The City should consider how volumetric charges would affect individual customer bills. The following graph summarizes the number of single-family residential sewer accounts by their average winter water use, and indicates that, for example, about two-thirds (approximately 800 accounts) have less than the average residential

customer usage of 11.4 hcf.[17] Therefore, they would have a volumetric charge that is less than the average volumetric charge. NBS can separately provide more detailed analysis of customer bill impacts prior to the City's implementing volumetric charges for residential customers.



PRINCIPAL ASSUMPTIONS AND CONSIDERATIONS

In preparing this report's findings and recommendations, NBS has relied on various sources of data and information. While we believe such data and information are reasonable for the purpose of this technical memo, to the extent that future data may vary from those presented herein, future results are also likely to vary from those presented here. Therefore, the City should periodically review these data and make adjustments as necessary.

[17] Note – This average reflects only accounts the County classifies as single family, which includes 55 accounts with duplexes.

Appendix 4 – Supporting Tables for Appendix 3

Appendix Table 1 - Allocation of Operating Costs to Fixed vs. Variable Sewer Charges											
Operating Expenses	**2014**	Base Costs (Fixed Costs)			Extra Capacity (Variable Costs)			Customer Costs (Fixed Costs)			
		%	$		%	$		%	$		
Non-Salary/Benefit Operating Expenses [1]:											
Repair & Maint Buildings	$ 1,000	100%	$	1,000	0%	$	-	0%	$	-	
Repair of Sewer Infrastructure	$ 25,000	100%	$	25,000	0%	$	-	0%	$	-	
MERA - Principal Share	$ 3,232	100%	$	3,232	0%	$	-	0%	$	-	
MERA - Interest Share	$ 1,111	100%	$	1,111	0%	$	-	0%	$	-	
MERA - New Debt	$ 576	100%	$	576	0%	$	-	0%	$	-	
MERA - Operating Costs	$ 4,330	100%	$	4,330	0%	$	-	0%	$	-	
Insurance - Liability	$ 17,500	100%	$	17,500	0%	$	-	0%	$	-	
Permits	$ 16,000	100%	$	16,000	0%	$	-	0%	$	-	
Conferences	$ 7,000	100%	$	7,000	0%	$	-	0%	$	-	
Training and Workshops	$ 12,000	100%	$	12,000	0%	$	-	0%	$	-	
Dues and Subscriptions	$ 2,000	100%	$	2,000	0%	$	-	0%	$	-	
Supplies - General	$ 43,260	100%	$	43,260	0%	$	-	0%	$	-	
Office Supplies	$ 2,000	100%	$	2,000	0%	$	-	0%	$	-	
Oil and Gasoline	$ 7,426	100%	$	7,426	0%	$	-	0%	$	-	
Uniforms	$ 10,200	100%	$	10,200	0%	$	-	0%	$	-	
Safety Supplies	$ 5,000	100%	$	5,000	0%	$	-	0%	$	-	
Books	$ 1,000	100%	$	1,000	0%	$	-	0%	$	-	
Technical Services[2]	$ 200,000	75%	$	150,000	25%	$	50,000	0%	$	-	
Utilities - Electricity	$ 6,000	75%	$	4,500	25%	$	1,500	0%	$	-	
Utilities - Telephone	$ 8,000	0%	$	-	0%	$	-	100%	$	8,000	
Utilities - Water	$ 2,000	0%	$	-	0%	$	-	100%	$	2,000	
Utilities - Solid Waste	$ 10,000	0%	$	-	0%	$	-	100%	$	10,000	
Cleaning Services	$ 10,000	0%	$	-	0%	$	-	100%	$	10,000	
Advertising - Noticing	$ 1,000	0%	$	-	0%	$	-	100%	$	1,000	
Printing - External Service	$ 1,000	0%	$	-	0%	$	-	100%	$	1,000	
Total of Selected Operating Costs	$ 396,635	79%	$	313,135	13%	$	51,500	8%	$	32,000	
Misc. Non-Salary/Benefit Operating Expenses: [2]											
Professional Services	$ 100,000	79%	$	78,948	13%	$	12,984	8%	$	8,068	
Repair & Maint Vehicles	$ 5,000	79%	$	3,947	13%	$	649	8%	$	403	
Rental Mach and Equip	$ 10,000	79%	$	7,895	13%	$	1,298	8%	$	807	
Sewer Management Prog.	$ 25,000	79%	$	19,737	13%	$	3,246	8%	$	2,017	
Riverwatch Settlement	$ 57,000	79%	$	45,000	13%	$	7,401	8%	$	4,599	
Admin Charge - General Fund	$ 162,283	79%	$	128,119	13%	$	21,071	8%	$	13,093	
Salaries and Benefits: [3]											
Salaries & Wages	$ 607,529	79%	$	479,631	13%	$	78,883	8%	$	49,015	
Overtime	$ 5,000	79%	$	3,947	13%	$	649	8%	$	403	
Transportation Allowance	$ 1,500	79%	$	1,184	13%	$	195	8%	$	121	
Cafeteria Plan	$ 144,637	79%	$	114,188	13%	$	18,780	8%	$	11,669	
Medicare	$ 8,809	79%	$	6,955	13%	$	1,144	8%	$	711	
PERS Employer Contribution	$ 92,016	79%	$	72,645	13%	$	11,948	8%	$	7,424	
State Unemployment	$ 6,075	79%	$	4,796	13%	$	789	8%	$	490	
Workers' Compensation	$ 87,500	79%	$	69,079	13%	$	11,361	8%	$	7,059	
Total: Operating Expenses	**$1,708,984**	79%	$	1,349,207	**13%**	$	221,898	8%	$	137,879	

1. NBS allocation percentages; these reflect NBS' professional experience with the cost structures of comparable utilities.

2. Includes City's outsourced treatment cost plus $100k additional studies, per Charlie Francis. NBS estimates about half the treatment-related costs of $100,000 would be associated with flow-related charges.

3. Average of operating cost allocations shown above are used.

Appendix Table 2 - Summary of Planned Capital Improvement Costs				
Project Description	**2014-2017**	**Allocation to Volumetric Rates**		
	$	%	$	Basis
Pump Stations	$ 1,614,000	9%	$145,260	*Peaking Factor*[1]
Collection System	$ 4,689,000	9%	$422,010	*Peaking Factor*[1]
Other	$ 123,500	0%	$0	*N.A.*
Total: Current Cost Estimate Per Year	$ 6,426,500	**9%**	$567,270	--

1. See Appendix Table 4 below (which is from the CDM 2009 Rate Study).

Appendix Table 3 - Capital Cost - Details				
Project Description	**2014**	**2015**	**2016**	**2017**
Pump Stations				
Spinnaker Main and Anchor PS	$ 1,114,000	$ -	$ -	$ -
Whiskey Sprinks PS Upgrade	$ 50,000	$ 225,000	$ 225,000	$ -
Total Pump Stations	$ 1,164,000	$ 225,000	$ 225,000	$ -
Collection System				
Gate 5 Road Pipeline	$ 82,600	$ 743,400	$ -	$ -
Bee Street Pipeline	$ -	$ 110,000	$ -	$ -
Alexander Ave./Beach Street Design	$ -	$ 550,000	$ -	$ -
Bridgeway Waterfront	$ -	$ -	$ 881,000	$ -
Coloma Street	$ -	$ -	$ 423,000	$ -
Nevada Street	$ -	$ -	$ 194,000	$ -
Caledonia at Turney	$ -	$ -	$ -	$ 459,000
Josephine Street	$ -	$ -	$ -	$ 238,000
Santa Rosa Avenue	$ -	$ -	$ -	$ 277,000
Pine Street	$ -	$ -	$ -	$ 212,000
Main Street	$ -	$ -	$ -	$ 260,000
Bulkley Avenue	$ -	$ -	$ -	$ 259,000
Total Collection System	$ 82,600	$ 1,403,400	$ 1,498,000	$ 1,705,000
Other				
Other General Capital Expenses[1]	$ 123,500	$ -	$ -	$ -
Total: Current Cost Estimate Per Year	**$ 1,370,100**	**$ 1,628,400**	**$ 1,723,000**	**$ 1,705,000**

1. Includes Machinery and Equipment, Vehicle (excavation truck), and Computer expenses from FY 2013/14 budget.

Appendix Table 4 - Sausalito Sewer System Wastewater Discharge	
Month	MGD/Mo.
January	0.66
February	0.66
March	0.66
April	0.56
May	0.62
June	0.59
July	0.73
August	0.73
September	0.72
October	0.66
November	0.66
December	0.66
Average	0.66
Maximum	0.73
Peaking Factor [1]	***1.1***
Allocation to Base Loads [2] **:**	***91%***
Allocation to Peak Loads [3] **:**	***9%***

1. From CDM 2009 Rate Study (Sanitary Sewer Fee Study - Final , June 2009, Appendix 3.
2. Average/Maximum
3. (Maximum - Average)/Maximum

V.W. HOUSEN & ASSOCIATES

TECHNICAL MEMORANDUM

Date: November 19, 2013

To: Charlie Francis, City of Sausalito
Greg Clumpner, NBS

Cc: Nicole Kissam, NBS

Subject: Projected Sewer System Capital Improvement Needs for City of Sausalito

Since 2009, the City has completed a progression of sewer system planning efforts to define near-term (i.e., 5- to 10-year) capital improvement plan (CIP) needs. These efforts have included the following:

- February 2009 Documentation of CIP Needs
- October 2010 Capacity Assurance Plan
- October 2010 Rehabilitation and Replacement Plan

Several of the projects that were recommended in these plans have been completed, and several of the larger projects are in the process of being designed or constructed. However, a majority of the projects have not been initiated.

Collectively, these documents provide a good starting point for defining CIP needs for the next five to eight years. It is likely that project requirements and priorities have not changed significantly since 2010. However, this memorandum presents an updated CIP that includes additional annual studies to help confirm the projects and priorities.

The three referenced planning documents and their recommendations are discussed further below.

1. **"City of Sausalito Sewer Rehabilitation Projects – Project Definition and Prioritization," February 9, 2009.** The purpose of this document was to evaluate, consolidate, and prioritize 17 projects that the City had on its historical CIP list, and to add any new projects that were needed to address issues identified by a 2008 City inflow and infiltration study.

   The resulting list included 10 projects with a total cost of $7.6 million to be completed by June 30, 2013. Current status of the planned projects is as follows:

   - The Spinnaker Grease Interceptor, Spinnaker Main, and Anchor Street Pump Station project is under construction and will be completed by March 2014 (funded by SRF)
   - The portion of the Hurricane Gulch project that involves pipeline replacements on 4th Street, 3rd Street, and Main Street has been bid. However, contract award is on hold due to lack of funding.
   - Design of the Gate 5 Road project is 65 percent complete. Final design is on hold until additional funding is obtained.
   - The Alexander Avenue Force Main and Whiskey Springs Pump Station projects were removed from the list and will be managed by SMCSD. The City has agreed to reimburse SMCSD for its appropriate share of each project. The Bridgeway portion of the Alexander Avenue Force Main project remains on the City's priority list.

- The Toyon Lane to Woodward Avenue pipeline replacement has been completed
- The Prospect Ave to Sausalito Avenue project was intended to replace pipe in coordination with a planned stairway replacement project. The stairway project was canceled. As a result, the sewer rehabilitation project scope was significantly reduced and completed.

The estimated cost for the projects, subtracting the cost for the completed Toyon Lane to Woodward Avenue project, was $7.1M in 2008 dollars[18].

2. **Capacity Assurance Plan, October 2010.** This plan described the development of a sewer hydraulic model and evaluation of the City's sewer system under a design storm. The model identified four capacity improvement projects. Two of the projects shared common assets with the Gate 5 Road and Whiskey Springs projects that were discussed in the 2009 report.

3. **"City of Sausalito Rehabilitation and Replacement Program 10-year Capital Improvement Plan", October 15, 2010.** This plan took the February 9, 2009 effort and expanded the list of recommendations based on a review of historical CCTV inspection data. The CIP was augmented with 23 new rehabilitation and replacement projects, as well as the new capacity improvement projects that were identified in the Capacity Assurance Plan. The resulting 10-year CIP presented a continuous progression of projects to be completed for a total annual cost of approximately $1M between FY2010/11 and FY2020/21.

   The estimated cost for the 10-year CIP was $7.5M in 2010 dollars (CCI ENR 9909.67). After removing the completed or eliminated projects (Toyon to Woodward and Prospect to Sausalito, respectively), and escalating this cost to current dollars, the estimated CIP cost is $7.9M.

   The CIP list that was presented in the October 15, 2010 report is repeated as Table 1, below. Projects are listed in order of relatively priority, with the highest priority projects listed first.

[18] 2008 construction costs were referenced to Engineering News Record (ENR) Construction Cost Index (CCI) for San Francisco of 9781.61. Current costs reference San Francisco ENR CCI of 10909.09.

Table 1. Summary of Rehabilitation and Replacement Projects from October 15, 2010 Report

Project Name	2010 Cost	2013 Cost	Comments
Gate 5 Road Pipeline	$750,000	$826,000	65% design complete
Spinnaker Main & Anchor PS	$1,012,000	$1,114,000	Under construction
Prospect to Sausalito	$15,000	$0	Significantly reduce and completed
Woodward to Toyon	$150,000	$0	Completed
Bee Street Pipeline	$100,000	$110,000	
Whiskey Springs Generator	$100,000	$0	Completed
Alexander Avenue and Beach Street Design	$500,000	$550,000	Alexander Avenue portion managed by SMCSD
Bridgeway Waterfront	$800,000	$881,000	
Coloma Street	$384,000	$423,000	To be combined with Whiskey Springs PS Upgrade, described below
Nevada Street	$176,000	$194,000	
Caledonia at Turney	$417,000	$459,000	
Josephine Street	$216,000	$238,000	
Santa Rosa Avenue	$252,000	$277,000	
Pine Street	$193,000	$212,000	
Main Street	$236,000	$260,000	Part of 2013 priority projects – bids have been received
Bulkley Avenue	$235,000	$259,000	
Bridgeway @ Ebbtide	$108,000	$119,000	
Filbert Avenue	$138,000	$152,000	
West Street	$125,000	$138,000	
Bridgeway @ Dunphy Park	$208,000	$229,000	
Crescent Avenue	$126,000	$139,000	
Cazneau Avenue	$188,000	$207,000	
Tomales Street	$109,000	$120,000	
Bridgeway at Princess	$115,000	$127,000	
Spring Street	$174,000	$192,000	
Caledonia @ Litho	$166,000	$183,000	
Woodward Avenue	$81,000	$89,000	
Sausalito Blvd	$168,000	$185,000	
Monte Mar Drive	$102,000	$112,000	
Kendell Court	$88,000	$97,000	
Liberty Ship Way	$35,000	$39,000	
Total	**$7,467,000**	**$7,931,000**	

Since 2010, the City has added the Whiskey Springs Pump Station Upgrade to the near-term CIP. This project is under evaluation by SMCSD as part of a broader pump station study, and a placeholder of $500,000 has been included for the implementation of project recommendations.

The total estimated cost for the 5-year period from FY2014/15 through FY2018/19 is $5,056,400. This cost includes all projects up to including the Bulkley Avenue project, as well as the Whiskey Springs Pump Station Upgrade project. The total estimated cost for the remaining projects, which are planned for completion during the 5-year period from

FY2019/20 through FY2023/24, is $5,000,000. Future replacements are projected to require approximately $1,000,000 in funding annually.

The City is planning to accelerate the initial 5-year plan and complete the proposed projects within a 3-year period ending FY2016/17. Similarly, the subsequent 5-year plan is proposed for completion in a 3-year period ending FY2021/22. Table 2 on the following page shows an example projection of project costs for the 10-year period beginning in FY2014/15. Planned expenditures for FY2013/14 are also provided for reference.

Average annual expenditures of $100,000 for field studies including flow monitoring, smoke testing, CCTV inspection, hydraulic model updates, and other activities that will help to refine the CIP are also anticipated, and would be budgeted separately from the proposed CIP. These field studies may result in changes to individual project descriptions or priorities. However, if the project list changes, the CIP can be adjusted to maintain projected expenditures of approximately $5 million in the first three years and an additional $5 million in the sixth through eighth years of the program.

Table 2. Projected Costs for City of Sausalito Sewer Rehabilitation Projects

Project	Total Cost	Fiscal Year 2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	Future
Gate 5 Road Pipeline	$826,000	82,600	743,400										
Spinnaker Main and Anchor Pump Station	$1,114,000	1,114,000											
Bee Street Pipeline	$110,000		110,000										
Alexander Avenue and Beach Street Design	$550,000		550,000										
Bridgeway Waterfront	$881,000			881,000									
Coloma Street	$423,000			423,000									
Nevada Street	$194,000			194,000									
Caledonia at Turney	$459,000				459,000								
Josephine Street	$238,000				238,000								
Santa Rosa Avenue	$277,000				277,000								
Pine Street	$212,000				212,000								
Main Street	$260,000				260,000								
Bulkley Avenue	$259,000				259,000								
Bridgeway @ Ebbtide	$119,000							119,000					
Filbert Avenue	$152,000							152,000					
West Street	$138,000							138,000					
Bridgeway @ Dunphy Park	$229,000							229,000					
Crescent Avenue	$139,000							139,000					
Cazneau Avenue	$207,000							207,000					
Tomales Street	$120,000							120,000					
Bridgeway at Princess	$127,000							127,000					
Spring Street	$192,000							192,000					
Caledonia @ Litho	$183,000							183,000					
Woodward Avenue	$89,000								89,000				
Sausalito Blvd	$185,000								185,000				
Monte Mar Drive	$112,000								112,000				
Kendell Court	$97,000								97,000				
Liberty Ship Way	$39,000								39,000				
Whiskey Springs PS Upgrade	$500,000	50,000	225,000	225,000									
	$2,872,000								1,172,000	1,700,000			See Note
Total	**$11,303,000**	**$1,246,600**	**$1,628,400**	**$1,723,000**	**$1,705,000**	**$0**	**$0**	**$1,606,000**	**$1,694,000**	**$1,700,000**	**$0**	**$0**	**$0**

Note: Future planned expenditures are approximately $1M annually in current dollars.