

Timeline

2015 Draft -Wastewater Rate Study

A rate study marked (2015 DRAFT) was initially prepared by Black Water Consulting Engineers, Inc and funded as part of a CWSRF Planning Application (Project 7849-110). The purpose of the rate study was to evaluate and recommend wastewater rates that accurately reflect the cost to serve customers and address the needs of treatment alternatives. The study was developed using the 2014/2015 operating cost and anticipated capital needs.

Three treatment plan alternatives that were feasible for the WWTP considering the flow capacity and other conditions included a membrane bioreactor, oxidation ditch, and land (pond) based treatment. The project objectives were to increase storage in pond 4, replace chlorine contact basin & effluent filters, replace 3 ponds with title 22 mechanical treatment process, and build additional storage. While the recommended project addressed WWTP deficiencies, a significant increase to the current sewer rates would be required to fund the capital and on-going cost of the recommended improvements creating a financial burden on the district rate payers. The draft analyzed five funding scenarios using the Weber, Ghio, & Associates 2014 Project Reports. The conclusion and recommendation in the 2015 draft report was to utilize funding scenario 3 and apply for loans, CWSRF grant, use available reserves, and raise rates as shown on page 13.

The draft was presented to the Board at the October 15, 2015, board meeting. Based on the extreme rate increase recommendations the district managers decided to reevaluate the proposed project.

After consideration of the WWTP 2014 project to construct treatment alternatives such as an oxidation ditch and adding effluent storage, a significant increase to the current sewer rates would have been required to fund capital and ongoing costs of the improvement. The district managers wanted to investigate current existing issues and what corrections needed to be made. These changes amended the project cost and description of future upgrades.

2016 Final Wastewater Rate Study

The district hired Black Water Consulting Engineers, Inc. to replace Weber, Ghio, and Associates. Black Water Consulting Engineers, Inc. prepared an updated WWTP facilities project (WWTP Upgrade I) and CIP in 2016. A revised wastewater rate study was conducted using the 2016/2017 proposed budget, 2016 WWTP facilities project report, and CIP. The 2016 WWTP facilities project (WWTP Upgrade I) was intended to be a lower cost alternative that would improve reliability and deficiencies. It was reported that due to budgetary constraints, treatment alternatives will not be evaluated as part of the new project. The goal of the new project was to improve hydraulic capacity and treatment capability of the existing pond system. Included in the new project report was to relocate the headworks facilities to the plant and new influent screening technology, influent pump station and pipeline, pond aeration system, increase effluent storage in pond 4, new chlorine contact basin, and sludge removal. For the district to be in compliance with the current WDR's, upgrades were required.

The final wastewater rate study analyzed three funding scenarios. All scenarios were based on no rate increase for 10 years at the direction of management. In addition, only 3 operating expenses accounted for basic inflation, 3% for maintenance/repairs/supplies, 4% & 5% for other/utilities,

and wages projected an increase of a flat rate increase of \$6,000 per year. The remaining expense accounts stayed the same over a 10-year period. See page 26.

Actual expenses for the years on page 26 have been noted and do not account for current debt service. The covid pandemic was unforeseen and therefore actual expenses dramatically increased versus the projections due to record high inflation.

The WWTP Upgrade I was completed in 2021 at an estimated cost of 5.5 million of which 75% was grant funded and 25% was debt financed.

2017 Fiscal Sustainability Plan (FSP)

In 2017, Black Water Consulting Engineers, Inc. prepared a Fiscal Sustainability Plan. The purpose of the plan was to assist with fiscal planning for long-term management of assets and making future cost-effective decisions. The FSP is a living document that has not been updated since 2017.

Today

The MSD Board of Directors continue to discuss when or if the district should have a rate study to review the financial health of the district. The district has not initiated rate increases since 2009. The current wastewater rate for customers is a fixed rate of \$60 per month. Commercial billing is calculated based on usage and has not been recalculated since 2018. Commercial businesses have been paying the same rate regardless of usage since. There is no ordinance outlining the billing cycle of commercial billing, although letters in business files indicate annually. The methodology of commercial billing is outlined in the ordinance.

Most major upgrades and repairs have been deferred until maintenance or replacement is required or was assisted with grant awards to complete. Securing grant awards continues to be the goal of the board and district management. In addition to grant awards, management is continually seeking alternative future funding.

A wastewater rate study proposal was submitted to the board by Hansford Economic Consulting (HEC). The analysis would estimate the District's revenue requirement and the current rate structure will be assessed for alignment with current district goals and objectives. Alternative rate structures may be discussed outlining rate calculations for commercial accounts.

Management has advised Black Water Engineering, Inc. of the need to update the FSP and CIP to align with current and anticipated district assets and fiscal planning. Especially, if or when a rate study is approved the two living documents will play vital roles in the planning.

MURPHYS SANITARY DISTRICT WASTEWATER RATE STUDY

DRAFT

September 2015

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Section 1 Introduction

1.1 Purpose

This rate study was conducted by Black Water Consulting Engineers, Inc. (Black Water) to evaluate and recommend wastewater rates that accurately reflect the cost to serve customers served by the Murphys Sanitary District (MSD). The wastewater rates discussed herein are developed using 2014-15 operating costs to conduct MSD's normal day-to-day operations, and anticipated operating and capital needs.

1.2 Background

Murphys is a small historical town of approximately 4 square miles in the Sierra Nevada Mountains and has a population of approximately 2,000 residents. A wastewater treatment plant (WWTP), owned and operated by MSD, serves the small community. The WWTP provides equivalent secondary treatment via pond treatment. Disinfected effluent is discharged to be used for agricultural irrigation.

Section 2 Wastewater Utility Financial Planning

2.1 Operating Revenue

The current wastewater rate for residential customers is a fixed charge of \$60 per month. This fixed rate is considered to be one Equivalent Single Family Unit (ESFU). Most single family residences are assigned one ESFU, while commercial customers are assigned multiple ESFUs dependent on the volume of wastewater generated.

Revenues from customer rates are the primary source of income to MSD and are the most reliable and stable source of income. A summary of ESFUs assigned to each customer group, along with the associated rates and revenues for MSD are shown in Table 2.1. Non-recurring revenue sources, such as penalty and reconnection fees and new connections, are considered non-operating and are not included when determining monthly budgets. Interests gained from reserve accounts are not included in this rate study as the revenue generated from these can vary greatly over time. Revenue from non-operating sources should be applied towards reserves or debt payments at the District's discretion.

Table 2.1 – Summary of Current Wastewater Rates and Revenue

| <i>Description</i> | <i>Monthly Rates</i> | <i>No. of Accounts (ESFU)</i> | <i>Monthly Revenue</i> | <i>Annual Revenue</i> |
|--------------------|----------------------|-------------------------------|------------------------|-----------------------|
| Residential | \$60.00 | 931.27 | \$55,876.20 | \$670,514.40 |
| Commercial | \$60.00 | 233.97 | \$14,038.20 | \$168,458.40 |
| Total | - | 1165.24 | \$69,914.40 | \$838,972.80 |

2.2 Customer Growth

In July 2014, Weber, Ghio & Associates prepared the Murphy's Sanitary District Project Report [2] (2014 Project Report) which evaluated long-term solutions for the concerns and needs of the MSD WWTP. The

2014 Project Report determined that the anticipated service growth of the District will occur at a rate of 1.7% per year. See Table 2.2 for anticipated growth trends.

Table 2.2 – Projection of Number of Customers

| <i>Description</i> | <i>2014-15</i> | <i>2015-16</i> | <i>2016-17</i> | <i>2017-18</i> | <i>2018-19</i> | <i>2019-20</i> |
|--|----------------|----------------|----------------|----------------|----------------|----------------|
| Number of Residential Customers (ESFU) | 931.27 | 947.10 | 963.20 | 979.58 | 996.23 | 1013.17 |
| Number of Commercial Customers (ESFU) | 1,165.24 | 1,185.05 | 1,205.19 | 1,225.68 | 1,246.52 | 1,267.71 |

2.3 Operation Expenses

Operating and maintenance (O&M) costs are the day-to-day expenses that are required to provide wastewater collection, treatment, and disposal to customers. Expenses include administration, labor, water quality testing, insurance, materials, electricity and chemicals. These expenses are increasing due to inflation and rising energy costs. An O&M expense of \$773,719 has been estimated for the fiscal year 2014/15, as shown in the approved 2014/2015 budget provided in Appendix A. Projected annual increases of expenses are presented in Table 2.3.

Table 2.3 – Operation Expenses

| Expenses | 2014/15 Budget | Annual % Increase | 2015/16 Budget | 2016/17 Budget | 2017/18 Budget | 2018/19 Budget | 2019/20 Budget |
|--------------------------|---------------------|-------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Wages | \$249,100.00 | 3.00% | \$256,573.00 | \$264,270.19 | \$272,198.30 | \$280,364.24 | \$288,775.17 |
| Employee Benefits | \$86,483.93 | 3.00% | \$89,078.45 | \$91,750.80 | \$94,503.33 | \$97,338.43 | \$100,258.58 |
| PR Taxes | \$31,909.31 | 3.00% | \$32,866.59 | \$33,852.59 | \$34,868.16 | \$35,914.21 | \$36,991.64 |
| Workman's Comp | \$20,200.00 | 3.00% | \$20,806.00 | \$21,430.18 | \$22,073.09 | \$22,735.28 | \$23,417.34 |
| Maintenance & Repairs | \$42,500.00 | 3.00% | \$43,775.00 | \$45,088.25 | \$46,440.90 | \$47,834.12 | \$49,269.15 |
| Operations Supplies | \$53,000.00 | 3.00% | \$54,590.00 | \$56,227.70 | \$57,914.53 | \$59,651.97 | \$61,441.53 |
| Operations Utilities | \$30,500.00 | 5.00% | \$32,025.00 | \$33,626.25 | \$35,307.56 | \$37,072.94 | \$38,926.59 |
| Other Maintenance | \$62,581.00 | 4.00% | \$65,084.24 | \$67,687.61 | \$70,395.11 | \$73,210.92 | \$76,139.36 |
| Rents - Leases | \$4,920.00 | | \$4,920.00 | \$4,920.00 | \$4,920.00 | \$4,920.00 | \$4,920.00 |
| Administrative Supplies | \$18,500.00 | 3.00% | \$19,055.00 | \$19,626.65 | \$20,215.45 | \$20,821.91 | \$21,446.57 |
| Administrative Utilities | \$7,500.00 | 5.00% | \$7,875.00 | \$8,268.75 | \$8,682.19 | \$9,116.30 | \$9,572.11 |
| Other Administrative | \$63,025.00 | 4.00% | \$65,546.00 | \$68,167.84 | \$70,894.55 | \$73,730.34 | \$76,679.55 |
| Insurance | \$16,000.00 | | \$16,000.00 | \$16,000.00 | \$16,000.00 | \$16,000.00 | \$16,000.00 |
| Professional Services | \$32,500.00 | | \$32,500.00 | \$32,500.00 | \$32,500.00 | \$32,500.00 | \$32,500.00 |
| License - Permits | \$23,000.00 | | \$23,000.00 | \$23,000.00 | \$23,000.00 | \$23,000.00 | \$23,000.00 |
| Marketing | \$2,000.00 | | \$2,000.00 | \$2,000.00 | \$2,000.00 | \$2,000.00 | \$2,000.00 |
| Engineering | \$30,000.00 | | \$30,000.00 | \$30,000.00 | \$30,000.00 | \$30,000.00 | \$30,000.00 |
| Total | \$773,719.24 | | \$795,694.28 | \$818,416.81 | \$841,913.17 | \$866,210.65 | \$891,337.57 |

Actual 596,640 581,032 647,587 643,956 622,759 750,703.

2.4 Capital Improvement Program

The Weber, Ghio & Associates 2014 Project Report [2] recommended a new Oxidation Ditch and other process improvements to remove biodegradable organics at the WWTP at an estimated cost of \$5,106,500 for this capital improvement. See Appendix B for the detailed capital improvement cost estimates.

2.5 Wastewater Utility System Reserves

Reserve balances are funds that are set aside for a specific cash flow requirement, financial need, project, task or legal covenant. A sufficient reserve helps to assure that the utility will have adequate funds available to meet all of its financial obligations, especially in times of varying needs. MSD should maintain a reserve adequate to cover the following services:

2.5.1 Debt Service Reserve

Wastewater utilities that have debt to pay for capital assets will often have required reserves that are specifically defined to meet the legal covenants of the debt for an entire year. MSD currently has two loans, with annual payments of \$9,302 until 2018; and \$24,047 until 2024. An annual debt service of \$33,349 has been included for the fiscal year 2014/15, as provided in the approved 2014/2015 budget given in Appendix A. The recommended debt service reserve for MSD is \$33,349 and represents an amount equal to one full annual loan payment. This amount will change as debts are paid off and/or new debts are acquired.

2.5.2 Operating Reserve

Operating reserves are established to provide the utility with the ability to withstand short term cash flow fluctuations. For example, often times there can be a significant length of time between when a utility system provides a service and when a customer has the ability to pay for that service. In addition, a utility system's cash flow can be affected by weather and seasonal demand patterns. Because of potential unexpected cash flow demands, many utilities attempt to keep an amount of cash equal to at least 45 days, approximately one-eighth of their annual O&M expenses, in an operating reserve. Using the assumed operating expenses of \$773,719.24 for fiscal year 2014/15, the recommended 45 days operating reserve to mitigate potential cash flow problems for MSD is \$95,390.04. As the projected operating cost increases, as shown on Table 2.3, the recommended operating reserve will increase as well.

2.5.3 Emergency Reserve

In addition to operating reserves, emergency reserves are an important tool for financial sustainability. Emergency reserves are intended to help utilities deal with short-term emergencies which arise from time to time, such as main breaks or equipment failures. The appropriate amount of emergency reserve is dependent on major infrastructure assets and intended to fund the immediate replacement or reconstruction of the system's single most critical asset; an asset whose failure will result in an immediate interruption of service or threat of public safety. The most expensive critical component is the Hydro Flusher with a recommended emergency reserve of \$42,000.

2.5.4 Capital Improvement Reserve

A capital improvement reserve is intended to provide funds for anticipated capital improvements (C.I.). MSD is currently developing a plan for expansion and adding major improvements to the existing WWTP. The full scope and costs of the improvements have not yet been determined, therefore will not be included as part of this analysis. For this rate study, a 5-percent project cost of the recommended improvements from the 2014 Project Report, \$255,325, will be used as the recommended C.I. Reserve. It is recommended that MSD fund the capital improvement reserves for future improvements based on the age and replacement costs of the new equipment when it has been purchased. Rates that will cover funding of those reserves should be established at that time.

2.4.5 Recommended Reserves Summary

The total recommended reserves for MSD to adequately meet all financial obligations are summarized in Table 2.4.

Table 2.4 – Recommended Reserves for 2014/15 FY

| Reserve | | Amount |
|-----------------------------------|---|------------------|
| Debt Service Reserve | | \$33,349 |
| Operating Reserve | + | \$95,390 |
| Emergency Reserve | + | \$42,000 |
| Capital Improvement Reserve | + | \$255,325 |
| Total Recommended Reserves | | \$426,064 |

At the time of this rate study, MSD had an available reserve balance of \$1,082,715, which is greater than the recommended reserves of \$426,064 outlined above. Due to the volatility of operating costs it is recommended that MSD continue contributing annual surplus to the reserve funds even if the recommended funds are available in an effort to avoid having to rely on debt to pay for expenses.

2.6 Affordability Index

The affordability index (AI) measures the burden of costs passed from the wastewater utility to the users against the median household income (MHI) for the area and is used by funding agencies to determine eligibility for grants and low interest loans. Many funding agencies look for a minimum affordability ratio of 1.5-percent before approving grant money to low income communities.

$$AI = \left(\frac{\text{Average Residential Annual Bill}}{MHI} \right) \times 100\%$$

Pursuant to the 2008-2012 American Community Service (ACS) data, Murphys has an estimated MHI of \$44,377. Under MSD's current rate structure the affordability index computes at 1.62-percent, and therefore, it is recommended that MSD apply for grants and low-income eligible loans for its capital improvement expenses.

2.7 Wastewater Rate Scenarios and Assessment

This Rate Study analyzed five scenarios using the 2014 Project Reports recommended C.I. discussed in section 2.5.

2.7.1 Scenario 1 – No C.I.

Scenario 1 would not pursue the C.I. outlined in the 2014 Project Report. No increase in sewer rates would be necessary as the available reserves would sufficiently cover the increasing costs of operation, as shown in Table 2.5. Beyond FY 2024/25 the adequacy of current rates to meet target reserves would need to be reevaluated.

Table 2.5 – Required Rates per ESFU (Scenario 1 – No C.I.)

| <i>Description</i> | <i>2014/15 Budget</i> | <i>2015/16 Budget</i> | <i>2016/17 Budget</i> | <i>2017/18 Budget</i> | <i>2018/19 Budget</i> | <i>2019/20 Budget</i> |
|--|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| Operational Expenses ¹ | \$773,719 | \$795,694 | \$818,417 | \$841,913 | \$866,211 | \$891,338 |
| C.I. Loan Repayment ² | \$33,349 | \$33,349 | \$33,349 | \$33,349 | \$24,047 | \$24,047 |
| Required Revenue | \$807,068 | \$829,043 | \$851,766 | \$875,262 | \$890,258 | \$915,385 |
| Number of ESFR ³ | 1165 | 1185 | 1205 | 1226 | 1247 | 1268 |
| Monthly Rate per ESFR | \$60.00 | \$60.00 | \$60.00 | \$60.00 | \$60.00 | \$60.00 |
| Annual Revenue | \$838,973 | \$853,235 | \$867,740 | \$882,492 | \$897,494 | \$912,752 |
| Rate Increase (%) | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Surplus (Defecit) | \$31,905 | \$24,192 | \$15,975 | \$7,230 | \$7,237 | (\$2,633) |
| Available Reserves | \$1,114,620 | \$1,138,812 | \$1,154,786 | \$1,162,016 | \$1,169,253 | \$1,166,620 |
| ¹ From Table 2.3 | | | | | | |
| ² Assumes no additional loan payments. Actual amount is based on the amount necessary to satisfy debt requirements. | | | | | | |
| ³ 1.7-percent annual service growth increase to residential and commercial customers | | | | | | |

2.7.2 Scenario 2 –C.I. Funded with Grants, Reserves and Rate Increases

Scenario 2 would seek a Clean Water State Revolving Fund (CWSRF) grant (or loan with principal forgiveness) to fund half of the construction costs for the C.I., \$2,553,250. The remaining cost would be paid for by increasing service rates until the available C.I. reserves can cover the remaining cost and maintain the recommended reserves. The increase in sewer rates would reflect the building reserves, inflation of operational costs and an additional \$60,000 annual operational cost for the new WWTP additions, as shown in Table 2.6a and 2.6b. See Appendix C for the monthly fee calculations.

Table 2.6a – Required Rates per ESFU (Scenario 2 – Capital Improvements Funded with Grants, Reserves and Rate Increases)

| <i>Description</i> | <i>2014/15 Budget</i> | <i>2015/16 Budget</i> | <i>2016/17 Budget</i> | <i>2017/18 Budget</i> | <i>2018/19 Budget</i> | <i>2019/20 Budget</i> |
|--|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| Operational Expenses ¹ | \$773,719 | \$795,694 | \$818,417 | \$841,913 | \$866,211 | \$891,338 |
| C.I. Loan Repayment ² | \$33,349 | \$33,349 | \$33,349 | \$33,349 | \$24,047 | \$24,047 |
| C.I. Costs ³ | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Required Revenue | \$807,068 | \$829,043 | \$851,766 | \$875,262 | \$890,258 | \$915,385 |
| Number of ESFR ⁴ | 1165 | 1185 | 1205 | 1226 | 1247 | 1268 |
| Monthly Rate per ESFR | \$60.00 | \$63.50 | \$67.00 | \$71.00 | \$73.00 | \$75.00 |
| Annual Revenue | \$838,973 | \$903,007 | \$968,977 | \$1,044,282 | \$1,091,951 | \$1,140,940 |
| Rate Increase (%) | 0.0% | 5.8% | 5.5% | 6.0% | 2.8% | 2.7% |
| Surplus (Defecit) | \$31,905 | \$73,964 | \$117,211 | \$169,020 | \$201,694 | \$225,555 |
| Available Reserves | \$1,114,620 | \$1,188,584 | \$1,305,795 | \$1,474,815 | \$1,676,508 | \$1,902,064 |
| ¹ From Table 2.3, includes \$60,000 O&M cost increase starting 2024/25. | | | | | | |
| ² Assumes no additional loan payments. Actual amount is based on the amount necessary to satisfy debt requirements. | | | | | | |
| ³ Capital cost of \$2,553,250 to be funded with increasing rates from 2015/16 until 2024/2025. Customer rates would then be adjusted to build Reserves. | | | | | | |
| ⁴ 1.7-percent annual service growth increase to residential and commercial customers | | | | | | |

Table 2.6b – Required Rates per ESFU (Scenario 2) continued

| <i>Description</i> | <i>2020/21 Budget</i> | <i>2021/22 Budget</i> | <i>2022/23 Budget</i> | <i>2023/24 Budget</i> | <i>2024/25 Budget</i> |
|--|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| Operational Expenses ¹ | \$916,741 | \$942,868 | \$969,740 | \$997,377 | \$1,085,802 |
| C.I. Loan Repayment ² | \$24,047 | \$24,047 | \$24,047 | \$24,047 | \$24,047 |
| C.I. Costs ³ | \$0 | \$0 | \$0 | \$0 | \$2,553,250 |
| Required Revenue | \$940,788 | \$966,915 | \$993,787 | \$1,021,424 | \$3,663,099 |
| Number of ESFR ⁴ | 1289 | 1311 | 1333 | 1356 | 1379 |
| Monthly Rate per ESFR | \$76.00 | \$77.00 | \$78.00 | \$79.00 | \$80.00 |
| Annual Revenue | \$1,175,807 | \$1,211,530 | \$1,248,127 | \$1,285,619 | \$1,324,025 |
| Rate Increase (%) | 1.3% | 1.3% | 1.3% | 1.3% | 1.3% |
| Surplus (Defecit) | \$235,019 | \$244,615 | \$254,341 | \$264,195 | (\$2,339,074) |
| Available Reserves | \$2,137,083 | \$2,381,697 | \$2,636,038 | \$2,900,233 | \$561,159 |
| ¹ From Table 2.3, includes \$60,000 O&M cost increase starting 2024/25. | | | | | |
| ² Assumes no additional loan payments. Actual amount is based on the amount necessary to satisfy debt requirements. | | | | | |
| ³ Capital cost of \$2,553,250 to be funded with increasing rates from 2015/16 until 2024/2025. Customer rates would then be adjusted to build Reserves. | | | | | |
| ⁴ 1.7-percent annual service growth increase to residential and commercial customers | | | | | |

2.7.3 Scenario 3 – C.I. Funded with Grants, Reserves and Loans

Scenario 3 includes the \$2,553,250 CWSRF loan described in Scenario 2. The remaining construction cost would be paid for using \$500,000 from the available C.I. reserves and acquiring a low-interest loan for \$2,053,250 during the 2015/16 FY. A 20-year, 3-percent interest loan would result in a \$11,387 monthly, \$136,644 annually, repayment plan beginning in 2018/19. Increases in sewer rates also reflect the inflation of operational costs and increased recommended reserves, as shown in Table 2.7a and 2.7b. See Appendix C for the loan monthly fee calculations.

Table 2.7a – Required Rates per ESFU (Scenario 3 - C.I. Funded with Grants, Reserves and Loans)

| <i>Description</i> | <i>2014/15 Budget</i> | <i>2015/16 Budget</i> | <i>2016/17 Budget</i> | <i>2017/18 Budget</i> | <i>2018/19 Budget</i> | <i>2019/20 Budget</i> |
|--|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| Operational Expenses ¹ | \$773,719 | \$795,694 | \$818,417 | \$841,913 | \$926,211 | \$951,338 |
| C.I. Loan Repayment ² | \$33,349 | \$33,349 | \$33,349 | \$33,349 | \$160,691 | \$160,691 |
| C.I. Costs ³ | \$0 | \$500,000 | \$0 | \$0 | \$0 | \$0 |
| Required Revenue | \$807,068 | \$1,329,043 | \$851,766 | \$875,262 | \$1,086,902 | \$1,112,029 |
| Number of ESFR ⁴ | 1165 | 1185 | 1205 | 1226 | 1247 | 1268 |
| Monthly Rate per ESFR | \$60.00 | \$60.00 | \$66.00 | \$67.65 | \$69.34 | \$71.07 |
| Annual Revenue | \$838,973 | \$853,235 | \$954,514 | \$995,010 | \$1,037,223 | \$1,081,227 |
| Rate Increase (%) | 0.0% | 0.0% | 10.0% | 2.5% | 2.5% | 2.5% |
| Surplus (Defecit) | \$31,905 | (\$475,808) | \$102,749 | \$119,747 | (\$49,679) | (\$30,801) |
| Available Reserves | \$1,114,620 | \$638,812 | \$741,560 | \$861,308 | \$811,629 | \$780,828 |
| ¹ From Table 2.3, includes \$60,000 O&M cost increase starting 2018/19. | | | | | | |
| ² Loan repayments include additional \$136,644 based on 20 year repayment period @ 3-percent, starting 2018/19. | | | | | | |
| ³ Up-front C.I. reserve payment of \$500,000 to be funded from available reserves. Customer rates would then be adjusted to build Reserves. | | | | | | |
| ⁴ 1.7-percent annual service growth increase to residential and commercial customers | | | | | | |

Table 2.7b – Required Rates per ESFU (Scenario 3) continued

| <i>Description</i> | <i>2020/21 Budget</i> | <i>2021/22 Budget</i> | <i>2022/23 Budget</i> | <i>2023/24 Budget</i> | <i>2024/25 Budget</i> |
|--|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| Operational Expenses ¹ | \$976,741 | \$1,002,868 | \$1,029,740 | \$1,057,377 | \$1,145,802 |
| C.I. Loan Repayment ² | \$160,691 | \$160,691 | \$160,691 | \$160,691 | \$160,691 |
| C.I. Costs ³ | \$0 | \$0 | \$0 | \$0 | \$0 |
| Required Revenue | \$1,137,432 | \$1,163,559 | \$1,190,431 | \$1,218,068 | \$1,306,493 |
| Number of ESFR ⁴ | 1289 | 1311 | 1333 | 1356 | 1379 |
| Monthly Rate per ESFR | \$74.63 | \$74.63 | \$74.63 | \$74.63 | \$76.49 |
| Annual Revenue | \$1,154,588 | \$1,174,216 | \$1,194,178 | \$1,214,479 | \$1,266,003 |
| Rate Increase (%) | 5.0% | 0.0% | 0.0% | 0.0% | 2.5% |
| Surplus (Defecit) | \$17,157 | \$10,658 | \$3,748 | (\$3,589) | (\$40,490) |
| Available Reserves | \$797,984 | \$808,642 | \$812,389 | \$808,800 | \$768,310 |
| ¹ From Table 2.3, includes \$60,000 O&M cost increase starting 2018/19. | | | | | |
| ² Loan repayments include additional \$136,644 based on 20 year repayment period @ 3-percent, starting 2018/19. | | | | | |
| ³ Up-front C.I. reserve payment of \$500,000 to be funded from available reserves. Customer rates would then be adjusted to build Reserves. | | | | | |
| ⁴ 1.7-percent annual service growth increase to residential and commercial customers | | | | | |

2.7.4 Scenario 4 – C.I. Funded with Rate Increases

Scenario 4 determines the rate increases necessary to pay for the C.I. without any outside funding. The costs would be funded by the C.I. reserve payments over the course of 10 years, as shown in Table 2.8a and 2.8b.

Table 2.8a – Required Rates per ESFU (Scenario 4 - C.I. Funded with Rate Increases)

| <i>Description</i> | <i>2014/15 Budget</i> | <i>2015/16 Budget</i> | <i>2016/17 Budget</i> | <i>2017/18 Budget</i> | <i>2018/19 Budget</i> | <i>2019/20 Budget</i> |
|--|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| Operational Expenses ¹ | \$773,719 | \$795,694 | \$818,417 | \$841,913 | \$866,211 | \$891,338 |
| C.I. Loan Repayment ² | \$33,349 | \$33,349 | \$33,349 | \$33,349 | \$24,047 | \$24,047 |
| C.I. Costs ³ | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Required Revenue | \$807,068 | \$829,043 | \$851,766 | \$875,262 | \$890,258 | \$915,385 |
| Number of ESFR ³ | 1165 | 1185 | 1205 | 1226 | 1247 | 1268 |
| Monthly Rate per ESFR | \$60.00 | \$65.50 | \$71.00 | \$76.50 | \$82.00 | \$87.50 |
| Annual Revenue | \$838,973 | \$931,449 | \$1,026,826 | \$1,125,177 | \$1,226,576 | \$1,331,096 |
| Rate Increase (%) | 0.0% | 9.2% | 8.4% | 7.7% | 7.2% | 6.7% |
| Surplus (Defecit) | \$31,905 | \$102,405 | \$175,060 | \$249,915 | \$336,318 | \$415,712 |
| Available Reserves | \$1,114,620 | \$1,217,025 | \$1,392,085 | \$1,642,000 | \$1,978,318 | \$2,394,030 |
| ¹ From Table 2.3, includes \$60,000 O&M cost increase starting 2024/25. | | | | | | |
| ² Assumes no additional loan payments. Actual amount is based on the amount necessary to satisfy debt requirements. | | | | | | |
| ³ Capital cost of \$5,106,500 to be funded with increasing rates from 2015/16 until 2024/2025. Customer rates would then be adjusted to build Reserves. | | | | | | |
| ⁴ 1.7-percent annual service growth increase to residential and commercial customers | | | | | | |

Table 2.8b – Required Wastewater Rate per ESFU (Scenario 4) continued

| <i>Description</i> | <i>2020/21 Budget</i> | <i>2021/22 Budget</i> | <i>2022/23 Budget</i> | <i>2023/24 Budget</i> | <i>2024/25 Budget</i> |
|--|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| Operational Expenses ¹ | \$916,741 | \$942,868 | \$969,740 | \$997,377 | \$1,085,802 |
| C.I. Loan Repayment ² | \$24,047 | \$24,047 | \$24,047 | \$24,047 | \$24,047 |
| C.I. Costs ³ | \$0 | \$0 | \$0 | \$0 | \$5,106,500 |
| Required Revenue | \$940,788 | \$966,915 | \$993,787 | \$1,021,424 | \$6,216,349 |
| Number of ESFR ⁴ | 1289 | 1311 | 1333 | 1356 | 1379 |
| Monthly Rate per ESFR | \$93.00 | \$98.50 | \$104.00 | \$109.50 | \$115.00 |
| Annual Revenue | \$1,438,816 | \$1,549,814 | \$1,664,170 | \$1,781,966 | \$1,903,286 |
| Rate Increase (%) | 6.3% | 5.9% | 5.6% | 5.3% | 5.0% |
| Surplus (Defecit) | \$498,028 | \$582,899 | \$670,383 | \$760,542 | (\$4,313,064) |
| Available Reserves | \$2,892,058 | \$3,474,957 | \$4,145,340 | \$4,905,882 | \$592,818 |
| ¹ From Table 2.3, includes \$60,000 O&M cost increase starting 2024/25. | | | | | |
| ² Assumes no additional loan payments. Actual amount is based on the amount necessary to satisfy debt requirements. | | | | | |
| ³ Capital cost of \$5,106,500 to be funded with increasing rates from 2015/16 until 2024/2025. Customer rates would then be adjusted to build Reserves. | | | | | |
| ⁴ 1.7-percent annual service growth increase to residential and commercial customers | | | | | |

3.1.1 Scenario 5 – C.I. Funded Through Grants Only

Scenario 5 would seek to completely fund the construction cost of the C.I. through the CWSRF and other grants. This scenario can only be considered if MSD is able to obtain multiple grants. Increases in sewer rates would only reflect the general reserve payment, inflation of operational costs and the additional \$60,000 annual costs for the new WWTP additions, as shown in Table 2.6. See Appendix C for the monthly fee calculations.

Table 2.9 – Required Rates per ESFU (Scenario 4 – C.I. Funded Through Grants Only)

| <i>Description</i> | <i>2014/15 Budget</i> | <i>2015/16 Budget</i> | <i>2016/17 Budget</i> | <i>2017/18 Budget</i> | <i>2018/19 Budget</i> | <i>2019/20 Budget</i> |
|--|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| Operational Expenses ¹ | \$773,719 | \$795,694 | \$818,417 | \$841,913 | \$926,211 | \$951,338 |
| C.I. Loan Repayment ² | \$33,349 | \$33,349 | \$33,349 | \$33,349 | \$9,302 | \$9,302 |
| Required Revenue | \$807,068 | \$829,043 | \$851,766 | \$875,262 | \$935,513 | \$960,640 |
| Number of ESFR ³ | 1165 | 1185 | 1205 | 1226 | 1247 | 1268 |
| Monthly Rate per ESFR | \$60.00 | \$60.00 | \$60.00 | \$60.00 | \$60.00 | \$60.00 |
| Annual Revenue | \$838,973 | \$853,235 | \$867,740 | \$882,492 | \$897,494 | \$912,752 |
| Rate Increase (%) | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Surplus (Defecit) | \$31,905 | \$24,192 | \$15,975 | \$7,230 | (\$38,018) | (\$47,888) |
| Available Reserves | \$1,114,620 | \$1,138,812 | \$1,154,786 | \$1,162,016 | \$1,123,998 | \$1,076,110 |
| ¹ From Table 2.3, includes \$60,000 O&M cost increase starting 2018/19. | | | | | | |
| ² Assumes no additional loan payments. Actual amount is based on the amount necessary to satisfy debt requirements. | | | | | | |
| ³ 1.7-percent annual service growth increase to residential and commercial customers | | | | | | |

Section 3 Conclusion and Recommendations

Table 3.1a –Projected Rate Increase Comparison

| <i>Description</i> ¹ | <i>2015/16 ESFR Rate</i> | <i>2016/17 ESFR Rate</i> | <i>2017/18 ESFR Rate</i> | <i>2018/19 ESFR Rate</i> | <i>2019/20 ESFR Rate</i> |
|---|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| Scenario 2 | \$60.00 | \$63.50 | \$67.00 | \$71.00 | \$73.00 |
| Scenario 3 | \$60.00 | \$60.00 | \$66.00 | \$67.65 | \$69.34 |
| Scenario 4 | \$60.00 | \$65.50 | \$71.00 | \$76.50 | \$82.00 |
| ¹ Scenarios 1 and 5 are not shown as they do not include rate increases through 2024/25. | | | | | |

Table 3.1b –Projected Rate Increase Comparison (continued)

| <i>Description</i> ¹ | <i>2020/21 ESFR Rate</i> | <i>2021/22 ESFR Rate</i> | <i>2022/23 ESFR Rate</i> | <i>2023/24 ESFR Rate</i> | <i>2024/25 ESFR Rate</i> |
|---|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| Scenario 2 | \$75.00 | \$76.00 | \$77.00 | \$78.00 | \$79.00 |
| Scenario 3 | \$71.07 | \$74.63 | \$74.63 | \$74.63 | \$74.63 |
| Scenario 4 | \$87.50 | \$93.00 | \$98.50 | \$104.00 | \$109.50 |
| ¹ Scenarios 1 and 5 are not shown as they do not include rate increases through 2024/25. | | | | | |

Due to the high AI at MSD, Black Water recommends that the MSD utilize Scenario 3 and apply for loans, CWSRF grant and/or principal forgiveness loans to cover the cost of C.I.; use available reserves and raise rates per ESFR in order to maintain financial health. Scenarios 2 and 4 are not recommended due to the potential increase in construction costs when reserves have reached their recommended status, and uncertainties in the future available funding from CWSRF. Increased rates as outlined in this report were

calculated to determine a rate increase that will both meet the proposed budget and place a proportional responsibility on each category of customer. When implementing the rate increase it is important to consider the following points:

- Successful utilities are transparent. MSD should strive to promote its services and needs (even unpopular ones), and continually educate its customers on why it is necessary to adjust rates.
- The ability of the current rate structure to generate adequate revenue will depend on following a vigorous collection and shut-off policy to keep delinquent accounts at a minimum.
- Continued development of a Capital Improvement Plan when the anticipated C.I. have been completed and incorporate the necessary CIP reserve funding into a new rate structure. Failure to save adequate CIP reserves will force MSD to finance a larger percentage of future capital projects, incurring the added cost of interest.
- Establish policies for reserve accounts as recommended above and distribute existing unrestricted reserves accordingly. CIP reserves should be moved to and maintained in the highest interest bearing accounts available to offset inflation.
- Begin the process of increasing wastewater rates to the recommended rates above and review the costs of operation and reserve funding after the anticipated C.I. have been concluded.

Section 4 References

[1] Weber, Ghio & Associates, Inc. (June 2014). *Murphys Sanitary District Alternatives Evaluation Report*.

[2] Weber, Ghio & Associates, Inc. (July 2014). *Murphys Sanitary District Project Report*.

Appendix A - MSD 2014/2015 Budget

Appendix B - Capital Improvement Cost Estimates

Appendix C - Capital Improvement Monthly Fee Estimates

MURPHYS SANITARY DISTRICT WASTEWATER RATE STUDY



November 2016

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Section 1 Introduction

1.1 Purpose

This rate study was conducted by Black Water Consulting Engineers, Inc. (Black Water) to evaluate and recommend wastewater rates that accurately reflect the cost to serve customers served by the Murphys Sanitary District (MSD or District). The wastewater rates discussed herein are developed using 2016-17 proposed budget for the operating costs to conduct MSD's normal day-to-day operations, and anticipated operating and capital needs.

1.2 Background

Murphys is a small historical town of approximately 4 square miles in the Sierra Nevada Mountains and has a population of approximately 2,000 residents. A wastewater treatment plant (WWTP), owned and operated by MSD, serves the small community. The WWTP provides equivalent secondary treatment via pond treatment. Disinfected effluent is discharged for agricultural irrigation. This Rate Study provides a financial plan reviewing the District's operating costs, reserves and funding requirements in preparation of the WWTP improvements. These improvements are detailed in the following reports prepared by Black Water:

- Updated Murphys Sanitary District Wastewater Treatment Facilities Planning (2016 Project Report) [1]
- 2016 Capital Improvement Project Report (2016 CIP) [2]

1.3 Proposition 218 Requirements

Proposition 218 was established in November 1996 and establishes requirements for imposing any new or increasing property-related fees and charges. In accordance with Proposition 218, the "Right to Vote on Taxes Act", the District may only increase rates to provide necessary services and those increases must be proportional with the services attributed to each customer. In addition to the restrictions placed on rate increases, Proposition 218 also established the following procedural requirements:

- A notice of the proposed rate increases must be mailed to all affected rate-payers. Notice must specify the increase amount, basis for increase, and date/time/location of a public hearing to consider/adopt the rate increase
- A public hearing to adopt the rate increase must be held within 45 days after the notices are mailed
- If more than 50% of the affected rate-payers protest the rate increase at the Public Hearing it cannot be adopted.

Section 2 Wastewater Utility Financial Planning

2.1 Operating Revenue

The current wastewater rate for customers is a fixed charge of \$60 per month per Equivalent Dwelling Unit (EDU). This service charge is considered to be the fee for one EDU. Most single family residences are assigned one EDU, while commercial customers are assigned multiple EDUs, depending on the volume of wastewater generated. Revenues from customer rates are the primary source of income to MSD and are the most reliable and stable source of income. Non-recurring revenue sources include: penalty fees for late payments and reconnections; revenue from taxes; interest from reserves; vacant lot billings; refunds and rebates; and other services provided by the District. Total anticipated revenues are summarized in Table 2.1.

Table 2.1 – Summary of Current Wastewater Rates and Revenue

| <i>Description</i> | <i>Anticipated 2016/17 Service Charge Revenue</i> |
|-------------------------------------|---|
| Residential | \$630,529 |
| Apartments | \$40,860 |
| Lodges/Churches | \$6,360 |
| School | \$6,394 |
| Commercial | \$169,174 |
| <i>Total Service Charge Revenue</i> | <i>\$799,703</i> |
| <i>Total Non-recurring Revenue</i> | <i>\$93,700</i> |
| Total Anticipated Revenue | \$893,403 |

2.2 Customer Growth

The average EDU for each category of customer determined by the 2016 Project Report is provided in Table 2.2. The 2016 Project Report also calculated an annual EDU growth of 1.12-percent with an additional 45 EDU in 2020 for a new subdivision. See Table 2.3 for anticipated growth trends.

Table 2.2 – Summary of Existing Number of Customers

| <i>Description</i> | <i>2015/16 Average EDU¹ (EDU)</i> |
|--------------------|--|
| Residential | 876 |
| Apartments | 57 |
| Lodges/Churches | 9 |
| School | 9 |
| Commercial | 235 |
| Total | 1,186 |

¹ Calculated EDU based on water use rates

Table 2.3 – Projection of Number of Customers

| <i>Year</i> | <i>Projected Total EDU¹</i> |
|-------------|--|
| 2016/17 | 1,199 |
| 2017/18 | 1,213 |
| 2018/19 | 1,226 |
| 2019/20 | 1,240 |
| 2020/21 | 1,299 ² |
| 2021/22 | 1,314 |
| 2022/23 | 1,328 |
| 2023/24 | 1,343 |
| 2024/25 | 1,358 |
| 2025/26 | 1,374 |

¹Assumes a growth rate of 1.12 percent annually

²Includes an additional 45 EDUs for the proposed Murphys Oaks Subdivision

2.3 Operating Expenses

Operating and maintenance (O&M) costs for MSD are considered to be the day-to-day expenses required to provide wastewater collection, treatment, and disposal to customers. Expenses include administration, labor, water quality testing, insurance, materials, electricity and chemicals. These expenses will increase over time due to inflation and rising energy costs. An O&M expense of \$678,578 has been estimated for the fiscal year 2016/17. Projected annual increases of expenses are presented in Table 2.4.

Table 2.4 – Projected Operating Expenses

| Expenses | 2016/17 Budget | 2017/18 Budget | 2018/19 Budget | 2019/20 Budget | 2020/21 Budget | 2021/22 Budget | 2022/23 Budget | 2023/24 Budget | 2024/25 Budget | 2025/26 Budget |
|---------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Wages | \$255,750.00 | \$261,750.00 | \$267,750.00 | \$273,750.00 | \$279,750.00 | \$285,750.00 | \$291,750.00 | \$297,750.00 | \$303,750.00 | \$309,750.00 |
| Employee Benefits | \$73,388.09 | \$73,388.09 | \$73,388.09 | \$73,388.09 | \$73,388.09 | \$73,388.09 | \$73,388.09 | \$73,388.09 | \$73,388.09 | \$73,388.09 |
| PR Taxes | \$23,470.00 | \$23,470.00 | \$23,470.00 | \$23,470.00 | \$23,470.00 | \$23,470.00 | \$23,470.00 | \$23,470.00 | \$23,470.00 | \$23,470.00 |
| Workman's Comp | \$19,000.00 | \$19,000.00 | \$19,000.00 | \$19,000.00 | \$19,000.00 | \$19,000.00 | \$19,000.00 | \$19,000.00 | \$19,000.00 | \$19,000.00 |
| Maintenance & Repairs ¹ | \$23,500.00 | \$24,205.00 | \$24,911.15 | \$25,617.30 | \$26,323.45 | \$27,029.60 | \$27,735.75 | \$28,441.90 | \$29,148.05 | \$29,854.20 |
| Operations Supplies ¹ | \$50,200.00 | \$51,706.00 | \$53,212.00 | \$54,718.00 | \$56,224.00 | \$57,730.00 | \$59,236.00 | \$60,742.00 | \$62,248.00 | \$63,754.00 |
| Other Utilities ³ | \$34,200.00 | \$35,910.00 | \$37,705.50 | \$39,590.78 | \$41,570.31 | \$43,648.83 | \$45,831.27 | \$48,122.83 | \$50,528.98 | \$53,055.42 |
| Rents – Leases | \$39,700.00 | \$41,288.00 | \$42,939.52 | \$44,657.10 | \$46,443.38 | \$48,301.12 | \$50,233.17 | \$52,242.49 | \$54,332.19 | \$56,505.48 |
| Administrative Supplies ¹ | \$7,920.00 | \$7,920.00 | \$7,920.00 | \$7,920.00 | \$7,920.00 | \$7,920.00 | \$7,920.00 | \$7,920.00 | \$7,920.00 | \$7,920.00 |
| Administrative Utilities ² | \$11,700.00 | \$12,051.00 | \$12,412.53 | \$12,784.91 | \$13,168.45 | \$13,563.51 | \$13,970.41 | \$14,389.52 | \$14,821.21 | \$15,265.85 |
| Other Administrative ³ | \$9,700.00 | \$10,185.00 | \$10,694.25 | \$11,228.96 | \$11,790.41 | \$12,379.93 | \$12,998.93 | \$13,648.87 | \$14,331.32 | \$15,047.88 |
| Insurance | \$36,550.00 | \$38,012.00 | \$39,532.48 | \$41,113.78 | \$42,758.33 | \$44,468.66 | \$46,247.41 | \$48,097.31 | \$50,021.20 | \$52,022.05 |
| Professional Services | \$18,000.00 | \$18,000.00 | \$18,000.00 | \$18,000.00 | \$18,000.00 | \$18,000.00 | \$18,000.00 | \$18,000.00 | \$18,000.00 | \$18,000.00 |
| License - Permits | \$22,500.00 | \$22,500.00 | \$22,500.00 | \$22,500.00 | \$22,500.00 | \$22,500.00 | \$22,500.00 | \$22,500.00 | \$22,500.00 | \$22,500.00 |
| Marketing | \$34,000.00 | \$34,000.00 | \$34,000.00 | \$34,000.00 | \$34,000.00 | \$34,000.00 | \$34,000.00 | \$34,000.00 | \$34,000.00 | \$34,000.00 |
| Engineering | \$4,000.00 | \$4,000.00 | \$4,000.00 | \$4,000.00 | \$4,000.00 | \$4,000.00 | \$4,000.00 | \$4,000.00 | \$4,000.00 | \$4,000.00 |
| Total | \$15,000.00 | \$15,000.00 | \$15,000.00 | \$15,000.00 | \$15,000.00 | \$15,000.00 | \$15,000.00 | \$15,000.00 | \$15,000.00 | \$15,000.00 |
| Total | \$678,578.09 | \$692,385.09 | \$706,500.70 | \$720,937.59 | \$735,708.98 | \$750,828.64 | \$766,310.93 | \$782,170.82 | \$798,423.94 | \$815,086.55 |

Actual 14/17 647,587 17/18 643,954 18/19 622,789 19/20 750,103 20/21 719,582 21/22 817,913 22/23 937,327 23/24 1,006,195 24/25 1,077,990
 projection
 projection
 projection
 Budget
 Budget
 projection

2.4 Capital Improvement Program

MSD approved a 10 year capital improvement program (CIP) in May 2016. The approved CIP is provided in Appendix A. The proposed projects are included in the funding scenarios analyzed in Section 2.7 of this Rate Study. The CIP included a draft project cost for the Wastewater Treatment Plan Improvement Project evaluated under the 2016 Project Report. The final project cost for the WWTP Improvement Project, as noted in the 2016 Project Report, is \$3,987,102.

2.5 Wastewater Utility System Reserves

Reserve balances are funds that are set aside for a specific cash flow requirement, financial need, project, task or legal covenant. A sufficient reserve helps to assure that the utility will have adequate funds available to meet all of its financial obligations, especially in times of varying needs. The current MSD reserve policy is to maintain a reserve balance of \$300,000 in order to adequately cover the following services:

- Debt service
- Operating costs
- Emergency costs
- Capital improvements

2.6 Affordability Index

The affordability index (AI) measures the burden of costs passed from the wastewater utility to the users against the median household income (MHI) for the area and is used by funding agencies to determine eligibility for grants and low interest loans. Many funding agencies look for a minimum affordability ratio of 1.5-percent before approving grant money to low income communities.

$$AI = \left(\frac{\text{Average Residential Annual Bill}}{MHI} \right) \times 100\%$$

Pursuant to the 2008-2012 American Community Service (ACS) data, Murphys has an estimated MHI of \$44,377. Under MSD's current rate structure the affordability index computes at 1.62-percent, and therefore, it is recommended that MSD apply for grants and low-income eligible loans for its capital improvement expenses.

2.7 Wastewater Rate Scenarios and Assessment

This Rate Study analyzed three funding scenarios using the information provided in the approved 2016/17 budget and 2016 CIP. This section describes the funding alternatives being considered.

2.7.1 Scenario 1 – No WWTP Improvements

Scenario 1 would not pursue the WWTP Improvement Project outlined in the 2016 Project Report. No increase in sewer rates would be necessary as the available reserves would sufficiently cover the increasing costs of operation and scheduled CIP, as shown in Table 2.5. The adequacy of current rates to meet target reserves would need to be reevaluated beyond FY 2025/26.

Table 2.5 – Scenario 1 – No WWTP Improvements

| Description | 2016/17 Budget | 2017/18 Budget | 2018/19 Budget | 2019/20 Budget | 2020/21 Budget | 2020/21 Budget | 2021/22 Budget | 2022/23 Budget | 2023/24 Budget | 2024/25 Budget |
|-----------------------------------|--------------------|--------------------|------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Anticipated Expenses | | | | | | | | | | |
| Operational Expenses ¹ | \$678,578 | \$692,385 | \$706,501 | \$720,938 | \$735,709 | \$750,829 | \$766,311 | \$782,171 | \$798,424 | \$815,087 |
| Debt Repayment ² | \$161,000 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| CIP Expenses | \$0 | \$473,715 | \$0 | \$173,858 | \$0 | \$509,119 | \$0 | \$114,536 | \$0 | \$165,341 |
| Total Expenses | \$839,578 | \$1,166,100 | \$706,501 | \$894,796 | \$735,709 | \$1,259,948 | \$766,311 | \$896,707 | \$798,424 | \$980,428 |
| Anticipated Revenue | | | | | | | | | | |
| Number of EDU ³ | 1199 | 1213 | 1226 | 1240 | 1299 | 1314 | 1328 | 1343 | 1358 | 1374 |
| Monthly Rate per EDU | \$60.00 | \$60.00 | \$60.00 | \$60.00 | \$60.00 | \$60.00 | \$60.00 | \$60.00 | \$60.00 | \$60.00 |
| Annual EDU Charges | \$863,505 | \$873,198 | \$883,000 | \$892,911 | \$935,334 | \$945,833 | \$956,450 | \$967,187 | \$978,043 | \$989,022 |
| Other Charges | \$93,700 | \$93,700 | \$93,700 | \$93,700 | \$93,700 | \$93,700 | \$93,700 | \$93,700 | \$93,700 | \$93,700 |
| Annual Revenue | \$957,205 | \$966,898 | \$976,700 | \$986,611 | \$1,029,034 | \$1,039,533 | \$1,050,150 | \$1,060,887 | \$1,071,743 | \$1,082,722 |
| Surplus (Deficit) | \$117,627 | (\$183,452) | \$270,199 | \$95,641 | \$293,325 | (\$220,414) | \$283,840 | \$164,180 | \$273,319 | \$102,294 |
| Reserves Forward Balance | \$1,014,576 | \$1,132,203 | \$948,751 | \$1,218,950 | \$1,314,591 | \$1,607,916 | \$1,387,502 | \$1,671,342 | \$1,835,522 | \$2,108,841 |

¹ From Table 2.4

² Assumes a one-time payoff of existing debt in FY 2016/17 with no additional payment after

³ 1.12-percent annual service growth increase to residential and commercial customers

2.7.2 Scenario 2 – CIP Funded with Grants and Reserves

Under Scenario 2, a Clean Water State Revolving Fund (CWSRF) grant would be obtained to fund half of the construction costs for the proposed WWTP Improvement Project, which equates to \$1,993,551. The remaining improvement costs of \$1,993,551 would be paid for using available reserves. No increase in sewer rates would be required if the project were to commence in FY 2025/26 when sufficient reserves would be available, however, no additional CIPs would be able to be completed the same year. A summary of funding under Scenario 2 is provided in Table 2.6.

Table 2.6 – Scenario 2 – CIP Funded with Grants and Available Reserves

| Description | 2016/17 Budget | 2017/18 Budget | 2018/19 Budget | 2019/20 Budget | 2020/21 Budget | 2021/22 Budget | 2022/23 Budget | 2023/24 Budget | 2024/25 Budget | 2025/26 Budget |
|-----------------------------------|--------------------|--------------------|------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Anticipated Expenses | | | | | | | | | | |
| Operational Expenses ¹ | \$678,578 | \$692,385 | \$706,501 | \$720,938 | \$735,709 | \$750,829 | \$766,311 | \$782,171 | \$798,424 | \$815,087 |
| Debt Repayment ² | \$161,000 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| CIP Expenses | \$0 | \$473,715 | \$0 | \$173,858 | \$0 | \$509,119 | \$0 | \$114,536 | \$0 | \$0 |
| WWTP Improvements | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Total Expenses | \$839,578 | \$1,166,100 | \$706,501 | \$894,796 | \$735,709 | \$1,259,948 | \$766,311 | \$896,707 | \$798,424 | \$4,802,189 |
| Anticipated Revenue | | | | | | | | | | |
| Number of EDU ³ | 1199 | 1213 | 1226 | 1240 | 1299 | 1314 | 1328 | 1343 | 1358 | 1374 |
| Monthly Rate per EDU | \$60 | \$60 | \$60 | \$60 | \$60 | \$60 | \$60 | \$60 | \$60 | \$60 |
| Annual EDU Charges | \$863,505 | \$873,198 | \$883,000 | \$892,911 | \$935,334 | \$945,833 | \$956,450 | \$967,187 | \$978,043 | \$989,022 |
| Other Charges | \$93,700 | \$93,700 | \$93,700 | \$93,700 | \$93,700 | \$93,700 | \$93,700 | \$93,700 | \$93,700 | \$93,700 |
| SRF Grant | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Annual Revenue | \$957,205 | \$966,898 | \$976,700 | \$986,611 | \$1,029,034 | \$1,039,533 | \$1,050,150 | \$1,060,887 | \$1,071,743 | \$3,076,273 |
| Surplus (Deficit) | \$117,627 | (\$199,201) | \$270,199 | \$91,815 | \$293,325 | (\$220,414) | \$283,840 | \$164,180 | \$273,319 | (\$1,725,916) |
| Reserves Forward Balance | \$1,014,576 | \$1,132,203 | \$933,001 | \$1,203,200 | \$1,295,016 | \$1,588,341 | \$1,367,927 | \$1,651,767 | \$1,815,947 | \$2,089,266 |

¹ From Table 2.4

² Assumes a one-time payoff of existing debt in FY 2016/17 with no additional payment after

³ 1.12-percent annual service growth increase to residential and commercial customers

2.7.3 Scenario 3 – CIP Funded with Grants and Loans

Scenario 3 includes obtaining the 50-percent CWSRF \$1,993,551 grant described in Scenario 2 and funding the remaining construction costs by acquiring a low-interest SWSRF loan for the remaining costs. This analysis assumes a 30-year, 2-percent interest loan, which would result in a \$88,423 annual repayment plan beginning in 2020/21. A summary of funding under Scenario 3 is provided in Table 2.7.

Section 3 Conclusion and Recommendations

Due to the high A.I. at MSD, Black Water recommends that the MSD utilize Scenario 3 and apply for CWSRF grant and principal forgiveness loan to cover the cost of the WWTP upgrades project. No rate increases would be required to fulfill the new loan repayments and maintain financial health.

Scenario 1 is not recommended as it does not address the need for the recommended WWTP improvements. Scenario 2 is not recommended as it would draw too much from the reserves, but could be used in the case if a grant is not available.

Section 4 References

[1] Black Water Consulting Engineers, Inc. (October 2016). *Murphys Sanitary District Wastewater Treatment Facilities Planning, 2016 Project Engineering Report Update.*

[2] Black Water Consulting Engineers, Inc. (May 2016). *Murphys Sanitary District 10 Year Capital Improvement Projects.*

Table 2.7 – Scenario 3 – CIP Funded with Grants, Reserves and Loans

| Description | 2016/17 Budget | 2017/18 Budget | 2018/19 Budget | 2019/20 Budget | 2020/21 Budget | 2021/22 Budget | 2022/23 Budget | 2023/24 Budget | 2024/25 Budget | 2025/26 Budget |
|-----------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Anticipated Expenses | | | | | | | | | | |
| Operational Expenses ¹ | \$678,578 | \$692,385 | \$706,501 | \$720,938 | \$735,709 | \$750,829 | \$766,311 | \$782,171 | \$798,424 | \$815,087 |
| Debt Repayment ² | \$161,000 | \$0 | \$0 | \$0 | \$0 | \$59,631 | \$59,631 | \$59,631 | \$59,631 | \$59,631 |
| CIP Expenses | \$0 | \$473,715 | \$0 | \$173,858 | \$0 | \$509,119 | \$0 | \$114,536 | \$0 | \$165,341 |
| WWTP Improvements | \$0 | \$0 | \$3,987,102 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Total Expenses | \$839,578 | \$1,166,100 | \$4,693,603 | \$894,796 | \$735,709 | \$1,342,405 | \$848,768 | \$979,164 | \$880,881 | \$1,062,885 |
| Anticipated Revenue | | | | | | | | | | |
| Number of EDU ³ | 1199 | 1213 | 1226 | 1240 | 1299 | 1314 | 1328 | 1343 | 1358 | 1374 |
| Monthly Rate per EDU | \$60.00 | \$60.00 | \$60.00 | \$60.00 | \$60.00 | \$60.00 | \$60.00 | \$60.00 | \$60.00 | \$60.00 |
| Annual EDU Charges | \$863,505 | \$873,198 | \$883,000 | \$892,911 | \$935,334 | \$945,833 | \$956,450 | \$967,187 | \$978,043 | \$989,022 |
| Other Charges | \$93,700 | \$93,700 | \$93,700 | \$93,700 | \$93,700 | \$93,700 | \$93,700 | \$93,700 | \$93,700 | \$93,700 |
| SRF Grant | \$0 | \$0 | \$1,993,551 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| WWTP Loan | \$0 | \$0 | \$1,993,551 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Annual Revenue | \$957,205 | \$966,898 | \$4,963,802 | \$986,611 | \$1,029,034 | \$1,039,533 | \$1,050,150 | \$1,060,887 | \$1,071,743 | \$1,082,722 |
| Surplus (Deficit) | \$117,627 | (\$199,202) | \$270,199 | \$91,816 | \$293,325 | (\$308,837) | \$195,417 | \$75,757 | \$184,897 | \$13,872 |
| Reserves Forward Balance | \$1,014,576 | \$1,132,203 | \$933,001 | \$1,203,200 | \$1,295,016 | \$1,588,341 | \$1,279,505 | \$1,474,922 | \$1,550,679 | \$1,735,575 |

¹ From Table 2.4

² Assumes a one-time payoff of existing debt in FY 2016/17 with additional SRF payments beginning in FY 2020/21

³ 1.12-percent annual service growth increase to residential and commercial customers

Murphys Sanitary District

Fiscal Sustainability Plan

OCTOBER 2017

Prepared for:

MURPHYS SANITARY DISTRICT
15 Ernest Street, Suite A
Murphys, CA 95247
(209) 728-3094

Prepared by:

BLACK WATER CONSULTING ENGINEERS, INC.
605 Standiford Suite N
Modesto, CA 95350
(209) 322-1817



BLACKWATER
CONSULTING ENGINEERS, INC.

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APPENDICES

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| Appendix A | Proposed Murphys Sanitary District WWTP Upgrades Project Preliminary Plans |
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1 Introduction

This Fiscal Sustainability Plan (FSP) has been prepared for the Murphys Sanitary District (MSD) Wastewater Treatment Facilities. The purpose of this document is to assist the MSD with comprehensive fiscal planning for the long-term management of assets and making cost effective decisions through the creation, acquisition, operation & maintenance, and disposal of the physical components within the utility. This FSP will evaluate the assets associated with the existing wastewater treatment plant (WWTP) and the recommended project (Project) in the Murphys Sanitary District Wastewater Treatment Facilities Planning Project Engineering Report Update (Project Report) [1].

The Project includes the relocation of some facilities and improvements to the existing influent pump station and WWTP. The scope of the Project includes the following:

- Complete necessary improvements to the influent pump station for facility access and pumping of wastewater to the WWTP.
- Relocate the headworks facilities to the WWTP.
- Complete necessary improvements at the existing WWTP for screening, aeration, storage, and disinfection.

This FSP provides a fiscal plan for the maintenance, repair, replacement, and expansion of the MSD Wastewater Treatment Facility assets over a 20-year planning period. The objective is to recognize the lowest long-term cost rather than short-term savings. The FSP is considered a living document and will be updated every five years to reflect current conditions of these assets. To comply with the Water Resources Reform and Development Act (WRRDA) of 2014, Clean Water State Revolving Fund (CWSRF) loan recipients are required to develop and implement an FSP that meets the following minimum requirements:

1. An inventory of critical assets that are part of the treatment works project.
2. An evaluation of the condition and performance of those assets.
3. A certification that the loan recipient has evaluated and will be implementing water and energy conservation efforts as part of the plan.
4. A plan for maintaining, repairing, and replacing assets and plan for funding such activities – fiscal planning.

This FSP considers these levels of service when determining strategies for the management of the WWTP and its assets.

Preliminary drawings for the proposed Project is provided in Appendix A. An inventory of the existing critical assets is provided in Appendix B, while an inventory of projected critical assets after completion of the Project is provided in Appendix C.

- Minimize sanitary sewer overflows (SSO).
- Minimize sewer rates and annual operation and maintenance costs.
- Meet current regulatory requirements as well as the ability to meet potential future regulatory requirements.

5 Fiscal Planning

5.1 Plan for Maintenance, Rehabilitation, and Replacement of Project Assets

Table 5-1 summarizes a plan for maintenance, rehabilitation, and replacement of WWTP assets over a 20-year planning period. The purpose of the table is to establish a long-term budget to cover future anticipated expenses for the management of the MSD WWTP assets. Costs were estimated based on original equipment costs and recent bids for similar types of assets. These projects assume that the Project has been implemented.

Table 5-1 – Maintenance, Rehabilitation, and Replacement Plan for Existing WWTP Assets

| Rating | Description | Years Until Project | Est. Cost, \$ | Reserve Required Each Year, \$ |
|--------|-------------------------------|---------------------|---------------|--------------------------------|
| 1 | Laboratory Equipment | 1 | 10,000 | 10,000 |
| 2 | Computer Replacement | 3 | 1,500 | 500 |
| 3 | Aeration Diffuser Replacement | 10 | 25,000 | 2,500 |
| 4 | Office Furniture | 10 | 10,000 | 1,000 |
| 5 | Pond 4 Pump 1 Replacement | 20 | 25,000 | 1,250 |
| 6 | Pond 4 Pump 2 Replacement | 20 | 25,000 | 1,250 |
| 7 | Chlorination Dosing Pump | 20 | 15,000 | 750 |

Note: Order of completion of improvements subject to change based on funding availability and potential for failure of asset.

5.2 Funding Options

An important component of a Fiscal Sustainability Plan is to ensure that the costs for facilities are incorporated into the district's annual budget and future rate determinations so that sufficient funding is available when needed. A combination of the following funding mechanisms is proposed to fund future expenses for the MSD Wastewater Treatment Facilities:

- Sewer Service Connection/Capacity Fees
- Monthly Sewer Rates
- Federal and State Grants and Loans
 - Clean Water State Revolving Fund Loans
 - Energy Efficiency Funding Program Rebates and Grants

The primary source of dependable funding for MSD is the sewer rates. A rate study was completed in July of 2016 to evaluate and recommend wastewater rates that accurately reflect the cost to serve MSD customers [3]. The rate study projected sewer service rates for three scenarios, with the recommended scenario including applying for a Clean Water State Revolving Fund (CWSRF) grant. The Board of Directors last approved a Resolution of the Murphys Sanitary District amending and establishing new sewer utility rates in 2009. The adopted rates were necessary to pay for the operations and maintenance of sewer systems and facilities, to comply with State and Federal guidelines, and to establish a financial reserve.

APPENDIX A

**PROPOSED MURPHYS SANITARY DISTRICT
WASTEWATER TREATMENT PLANT UPGRADES PROJECT
PRELIMINARY PLANS**

PRELIMINARY



BLACK WATER CONSULTING ENGINEERS, INC.
 605 STANFORD AVE., SUITE N, MODESTO, CA 95350 PH. 209.223.1817

| REV. | DATE | DESCRIPTION |
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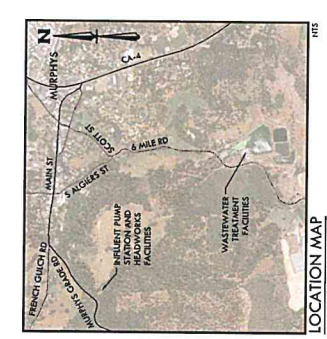
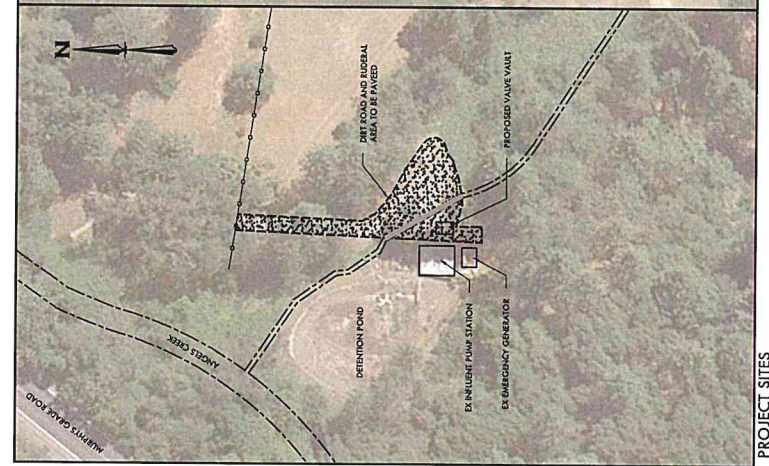
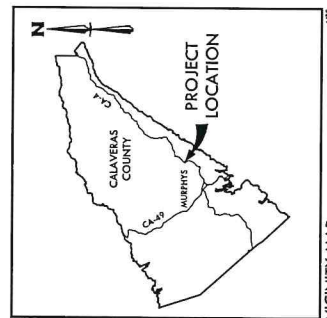
MURPHYS SANITARY DISTRICT INFLUENT PUMP STATION AND WASTEWATER TREATMENT FACILITIES IMPROVEMENT PROJECT

TITLE SHEET

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MURPHYS SANITARY DISTRICT INFLUENT PUMP STATION AND WASTEWATER TREATMENT FACILITIES IMPROVEMENT PROJECT

MURPHYS, CALIFORNIA



- PREPARED FOR:** MURPHYS SANITARY DISTRICT
 15 BENNET STREET, SUITE A
 MURPHYS, CA 95347
 TEL: 209.238.8094
 FAX: 209.241.9314
- | SHEET NUMBER | DRAWING NAME |
|--------------|---|
| 1 | TITLE SHEET |
| 2 | ABBREVIATIONS AND GENERAL NOTES |
| 3 | C-01 INFLUENT PUMP STATION SITE PLAN |
| 4 | C-02 CHLORINE CONTACT BASIN SITE PLAN AND DETAILS |
| 5 | C-03 WWTF POND |
| 6 | C-04 HEADWORKS SCREEN DETAILS |

PRELIMINARY



BLACK WATER CONSULTING ENGINEERS, INC. 605 STARBUCK AVENUE, SUITE 14, MODESTO, CA 95350 PH: 209.221.8171

Table with 2 columns: REV, DATE, DESCRIPTION

MURPHY'S SANITARY DISTRICT INFLUENT TREATMENT FACILITIES IMPROVEMENT PROJECT

Table with 2 columns: DATE, DESCRIPTION

ABBREVIATIONS table listing symbols and their corresponding full names for materials and equipment.

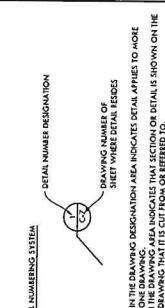
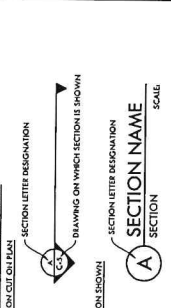


Table with 2 columns: SECTION LETTER DESIGNATION, SECTION NAME

Table with 2 columns: DETAIL NUMBER DESIGNATION, DETAIL NUMBER DESIGNATION

CONTRACT INFORMATION: MURPHY'S SANITARY DISTRICT, 12 5th STREET, SUITE A, CALDWELL, IDAHO 83417

DESIGNED BY: BLACK WATER CONSULTING ENGINEERS, INC., 605 STARBUCK AVENUE, SUITE 14, MODESTO, CA 95350

PERFORMANCE OF THIS CONTRACT, ANY REPAIRS NECESSARY TO DAMAGED UTILITIES SHALL BE PAID FOR BY THE CONTRACTOR...

CONCRETE NOTES: 1. CONCRETE SHALL BE PLACED, CURED IN ACCORDANCE WITH A11.8, LATEST EDITION...

GENERAL NOTES: 1. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF EXISTING UTILITIES SHOWN ON THESE DRAWINGS...

GENERAL NOTES: 2. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF EXISTING UTILITIES SHOWN ON THESE DRAWINGS...

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SCALE 1" = 10'

KEY

- 8" S — EX S1
- 8" S — EX S3
- PROPOSED S1

| | | |
|---------------|-----|-----|
| NOVEMBER 2016 | JRP | KWC |
| NOVEMBER 2016 | JRP | KWC |
| NOVEMBER 2016 | JRP | KWC |
| NOVEMBER 2016 | JRP | KWC |
| NOVEMBER 2016 | JRP | KWC |

**INFLUENT PUMP STATION
SITE PLAN**

**MURPHYS SANITARY DISTRICT INFLUENT PUMP
STATION AND WASTEWATER TREATMENT
FACILITIES IMPROVEMENT PROJECT**

BLACKWATER
CONSULTING ENGINEERS, INC.
605 STANDIFORD AVE., SUITE N, MODESTO, CA 95350 PH: 209.222.1817

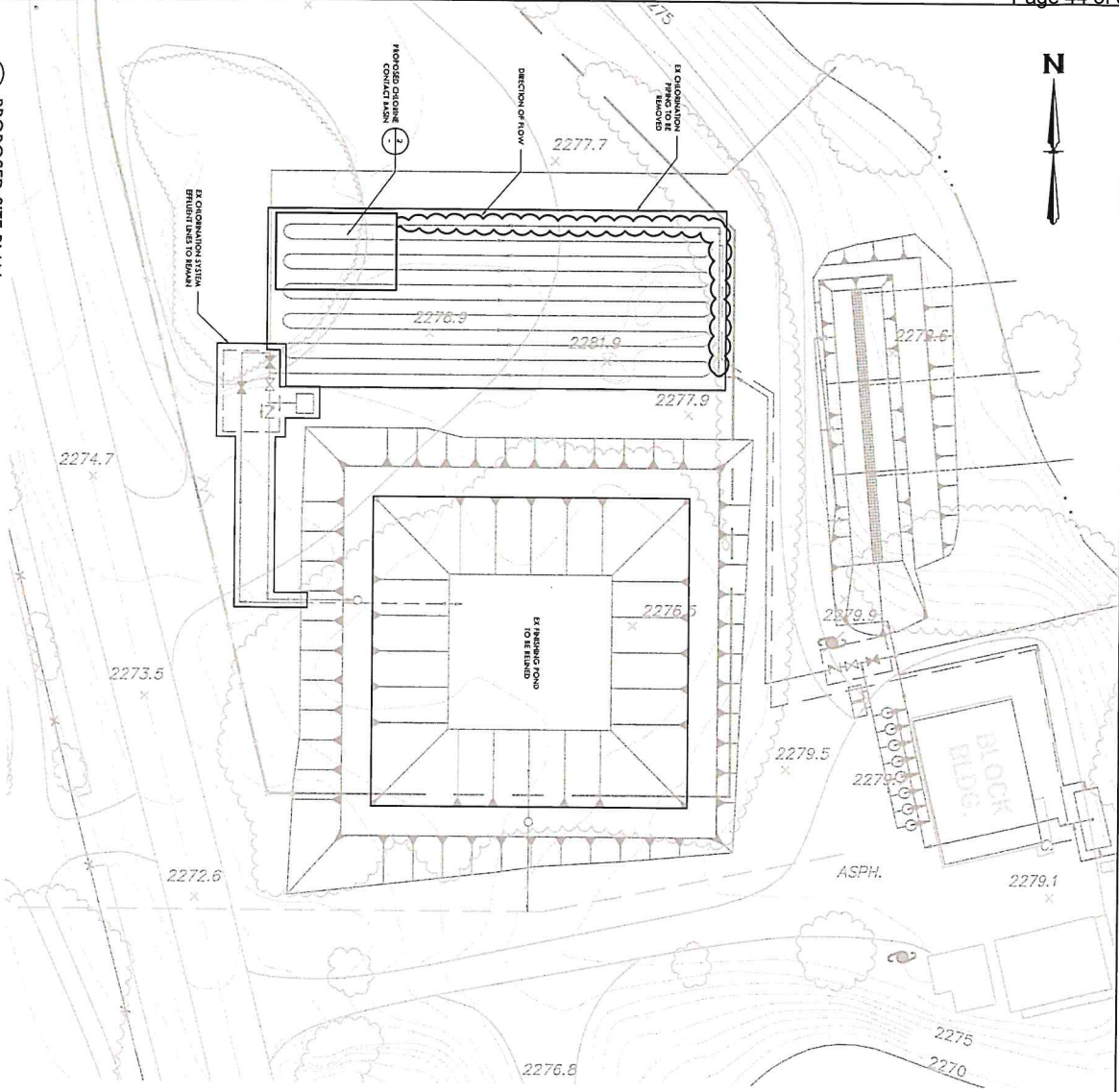
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PRELIMINARY

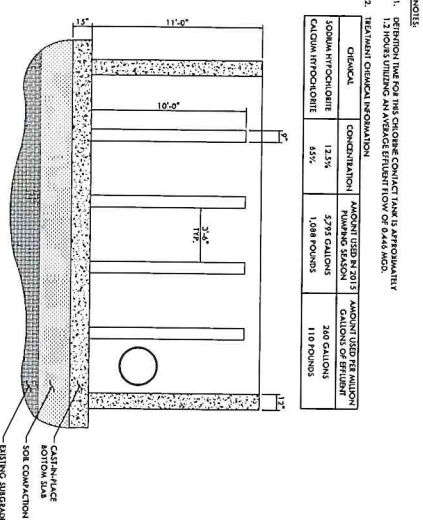
1:1 (NON-SCALE) SANITARY DISTRICT (SUD) PUMP STATION AND WASTEWATER TREATMENT FACILITIES IMPROVEMENT PROJECT

1 PROPOSED SITE PLAN
PLAN



Scale: 1" = 20'

2 PROPOSED DETAIL
SECTION



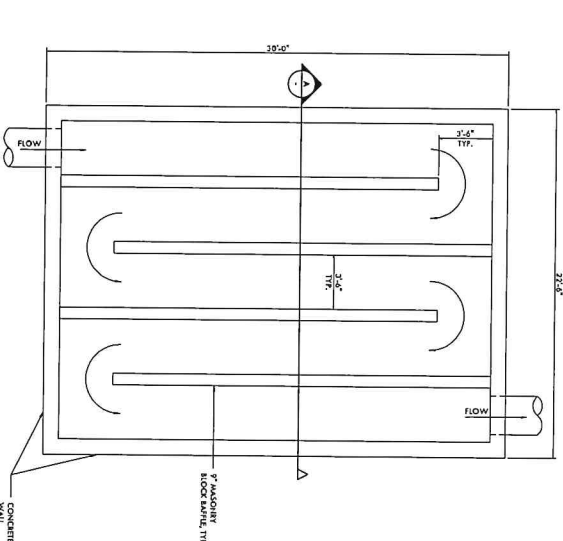
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NOTES

1. DETENTION TIME FOR THIS CHLORINE CONTACT TANK IS APPROXIMATELY 1.5 HOURS (BASED ON A FLOW RATE OF 0.44 MGDS).
2. TREATMENT CHEMICAL INFORMATION

| CHEMICAL | CONCENTRATION | APPROXIMATE MONTHLY REAGENT USAGE (GALLONS OF BRINE) | APPROXIMATE MONTHLY REAGENT USAGE (POUNDS) |
|----------------------|---------------|--|--|
| SODIUM HYPOCHLORITE | 12.5% | 5795 GALLONS | 1,688 POUNDS |
| CALCIUM HYPOCHLORITE | 65% | 280 GALLONS | 110 POUNDS |

2 PROPOSED DETAIL
PLAN



Scale: 1" = 4'

| <p>WWTP CHLORINE CONTACT BASIN SITE PLAN AND DETAILS</p> <p>MURPHYS SANITARY DISTRICT INFLUENT PUMP STATION AND WASTEWATER TREATMENT FACILITIES IMPROVEMENT PROJECT</p> | <p>BLACKWATER CONSULTING ENGINEERS, INC. 605 STANFORD AVE., SUITE N, MODesto, CA 95350 PH: 209.322.1817</p> | | <p>PRELIMINARY</p> | | | | | | | | |
|---|--|-------------|---------------------------|-------------|-----|--|--|--|--|--|--|
| <p>DATE: NOVEMBER, 2016 BY: J15084 CHECKED BY: J15084 SCALE: 1" = 20' SHEET: 4 OF 6</p> | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>REV</th> <th>DATE</th> <th>DESCRIPTION</th> <th>APP</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table> | REV | DATE | DESCRIPTION | APP | | | | | | |
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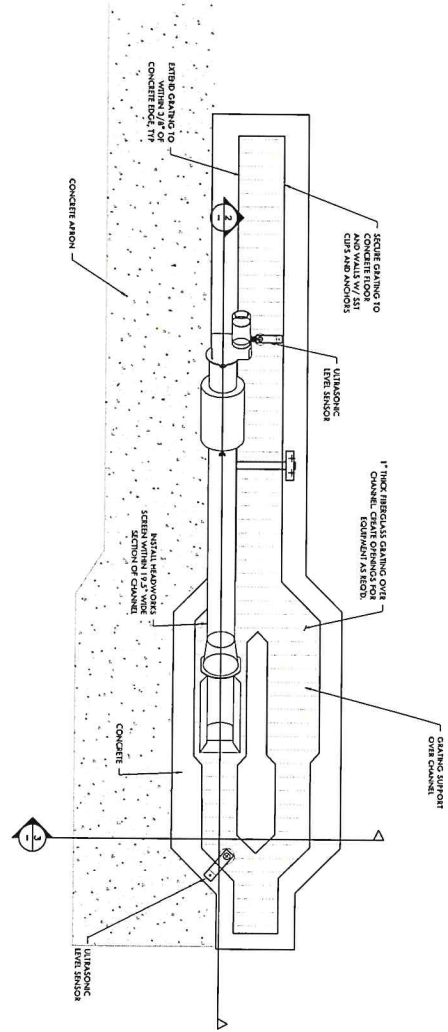


- NOTES**
- 1. CONSTRUCTION LAYOUT, LANE STRIPS, AND CURBS SHALL BE CONFORMANT WITH DISTRICT TO DENIER ACCESS POINTS AND STAKEOUTS WITHIN NEED TO LOCAL EXISTING ABANDON SYSTEM.
 - 2. WASTEWATER TREATMENT PLANT TO BE ABANDONED THROUGHOUT POND 1 AND CONSTRUCTION OF DISTRIBUTION POND OF NEW RELAYWORKS, AND CONSTRUCTION OF DISTRIBUTION POND IN POND 1.
 - 3. TRENCHING FOR EXISTING ACCESS ROAD IN POND 3 FOR OPERATION WHILE POND 1 IS NOT IN SERVICE.

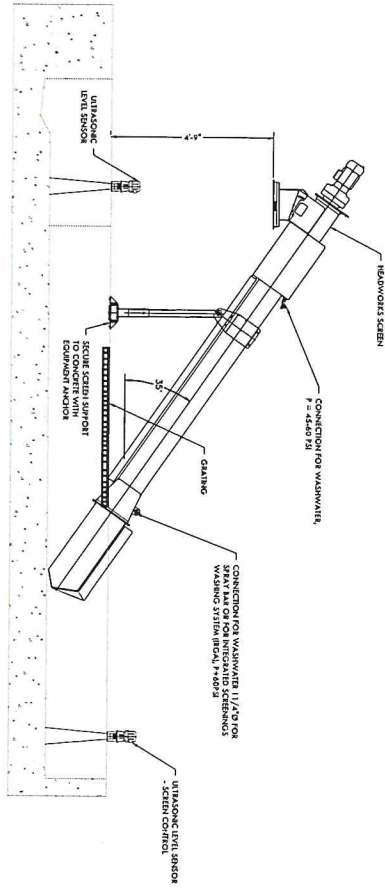


| | | | | |
|---|------------------|--|---------------------------|-------------|
| WWTP PONDS MURPHYS SANITARY DISTRICT INFLUENT PUMP STATION AND WASTEWATER TREATMENT FACILITIES IMPROVEMENT PROJECT | | BLACKWATER CONSULTING ENGINEERS, INC. 605 STANDFORD AVE, SUITE N, MODESTO, CA 95350 PH. 209.222.1817 | | PRELIMINARY |
| DATE: NOVEMBER, 2016 DRAWN BY: JRP CHECKED BY: KVK SCALE: 1" = 30' SHEET NO: 5 OF 6 | PROJECT NO: C-03 | | REV. DATE DESCRIPTION APP | |

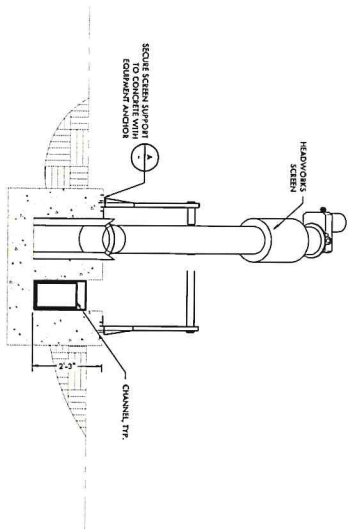
UTLIFAMA WIRRTPE SANITARY DISTRICT/BLACKWATER CONSULTING ENGINEERS/HEADWORKS SCREEN DETAILS/NOT TO SCALE/11/20/2016 4:13:46 AM BY KARISA BERRY



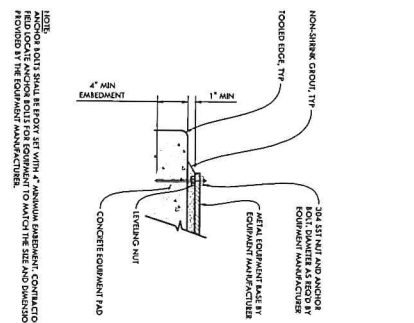
1 PROPOSED PLAN
SCALE: 1" = 2'



2 PROPOSED SECTION
SCALE: 1" = 2'



3 PROPOSED SECTION
SCALE: 1" = 2'



NOTE: ANCHOR BOLT SHALL BE EPOXY SET WITH 4" ANCHORAGE, CONTRACTOR SHALL PROVIDE ALL MATERIALS AND EQUIPMENT TO MATCH THE SIZE AND DIMENSIONS PROVIDED BY THE EQUIPMENT MANUFACTURER.

A PROPOSED EQUIPMENT ANCHORAGE
SCALE: 1" = 2'

| | | | | | | | | | | | | | | | | | | | | |
|--|-------|--|-----------|-------------|-------------|--------|-----|--|--|--|--|--|--|--|--|--|--|--|--|--|
| <p>BLACKWATER CONSULTING ENGINEERS, INC. 605 STANFORD AVE., SUITE N, MODESTO, CA 95350 PH. 209.222.1817</p> | | <p style="font-size: 24px; font-weight: bold; color: red;">PRELIMINARY</p> | | | | | | | | | | | | | | | | | | |
| <p>HEADWORKS SCREEN DETAILS</p> <p>MURPHYS SANITARY DISTRICT INFLUENT PUMP STATION AND WASTEWATER TREATMENT FACILITIES IMPROVEMENT PROJECT</p> | | | | | | | | | | | | | | | | | | | | |
| <p>REV DATE DESCRIPTION APP</p> | | | | | | | | | | | | | | | | | | | | |
| <table border="0" style="width: 100%;"> <tr> <td style="width: 15%;">DRP</td> <td style="width: 15%;">DATE:</td> <td style="width: 15%;">REVISED:</td> <td style="width: 15%;">DRAWN BY:</td> <td style="width: 15%;">CHECKED BY:</td> <td style="width: 20%;">SCALE:</td> </tr> <tr> <td>ALH</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> | DRP | DATE: | REVISED: | DRAWN BY: | CHECKED BY: | SCALE: | ALH | | | | | | | | | | | | | |
| DRP | DATE: | REVISED: | DRAWN BY: | CHECKED BY: | SCALE: | | | | | | | | | | | | | | | |
| ALH | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| <p>NOVEMBER 2016</p> <p>C-04</p> <p>6 OF 6</p> | | | | | | | | | | | | | | | | | | | | |

APPENDIX B

INVENTORY OF EXISTING CRITICAL ASSETS
AND
BUSINESS RISK EXPOSURE RATINGS

Table B-1 Existing Asset Inventory

Murphys Sanitary District Wastewater Treatment Facilities
2017

Facility Name:
Current Plan Year:

| Treatment Assets | Capacity / Size | Material | Manufacturer & Model | Est. Original Cost | Est. Replacement Cost | Est. Year Installed | Expected Useful Life in Years | Remaining Useful Life in Years | Condition | Probability of Failure | Consequence of Failure | Criticality |
|--|--------------------------------|---------------|---------------------------------------|--------------------|-----------------------|---------------------|-------------------------------|--------------------------------|-----------|------------------------|------------------------|-------------|
| Murphys Sanitary District Site (Existing Facilities) | | | | | | | | | | | | |
| Influent Pump Station/Headworks | | | | | | | | | | | | |
| Bar screen | 1" spacing | - | - | \$45,000.00 | \$60,000 | 1982 | 100 | 45 | 2 | 1 | 5 | 5 |
| Comminuter 1 | 0.6 hp | - | Bar Screen - Manual | \$1,000.00 | \$5,000 | 1984 | 50 | 17 | 1 | 1 | 3 | 3 |
| Comminuter 2 | 0.6 hp | - | Chicago Pump Model SK35m3bc | \$3,000.00 | \$10,000 | 1984 | 25 | -8 | 5 | 4 | 2 | 8 |
| Comminuter motor | 0.6 hp | - | Chicago Pump Model SK35m3bc | \$3,000.00 | \$10,000 | 1984 | 25 | -8 | 5 | 4 | 2 | 8 |
| Overflow Pond Synthetic Liner | 132,300 gal | polyethylene | Reliance Gear Motor Model X93183 | \$1,000.00 | \$3,000 | 1984 | 25 | -8 | 5 | 4 | 2 | 8 |
| Pump 1 | 50 hp/350 gpm | - | Cornell 441AT-VC BDB | \$20,000.00 | \$30,000 | 2006 | 14 | 14 | 1 | 3 | 1 | 3 |
| Pump 2 | 51 hp/350 gpm | - | Cornell 441AT-VC BDB | \$11,890.00 | \$80,000 | 2007 | 30 | 14 | 4 | 4 | 4 | 16 |
| Influent pipeline Force Main 1 | 8 inch | ACP | - | \$45,000.00 | \$80,000 | 1984 | 30 | -3 | 4 | 4 | 4 | 16 |
| Influent pipeline Force Main 2 | 8 inch | PVC | - | \$45,000.00 | \$475,000 | 1982 | 75 | 20 | 5 | 2 | 1 | 2 |
| Gravity Pipeline | 8 inch | PVC | - | \$7,000.00 | \$475,000 | 1984 | 75 | 42 | 1 | 2 | 5 | 10 |
| | 8 inch | PVC | - | \$95,000.00 | \$175,000 | 1984 | 75 | 42 | 1 | 2 | 5 | 10 |
| Aeration System | | | | | | | | | | | | |
| Blower cabinet | - | - | - | \$8,000.00 | \$15,000 | 1985 | 50 | 18 | 2 | 2 | 2 | 4 |
| Blower | 20 hp/962 ft ³ /min | - | Sutorbill Model GAFDLA, Serial 330485 | \$15,000.00 | \$50,000 | 1985 | 30 | 9 | 2 | 3 | 4 | 10 |
| Air distribution piping | 3 in | PVC | - | \$9,000.00 | \$65,000 | 1985 | 75 | 19 | 2 | 2 | 4 | 8 |
| Diffusers | 69 ea | polypropylene | - | \$2,000.00 | \$4,500 | 2006 | 10 | -8 | 5 | 4 | 2 | 12 |
| Pond 4 Pumping System | | | | | | | | | | | | |
| Pump 1 | 15 hp | - | Hiachi VCT-HKK | \$8,000.00 | \$15,000 | 1986 | 20 | -1 | 3 | 4 | 2 | 8 |
| Pump 2 | 15 hp | - | Hiachi VCT-HKK | \$8,000.00 | \$15,000 | 1986 | 20 | -1 | 3 | 4 | 2 | 8 |
| Filler tank and components (7 tanks) | 48" diameter | - | Lakos Irrigation | \$25,000.00 | \$60,000 | 1996 | 30 | 9 | 2 | 3 | 1 | 3 |
| Chlorination Treatment System | | | | | | | | | | | | |
| Sodium hypochlorite tank | 400 gal | - | - | \$8,000.00 | \$15,000 | 1986 | 25 | 4 | 1 | 2 | 3 | 6 |
| Dosing pump and system | - | - | Slenner | \$12,056.00 | \$15,000 | 1966 | 20 | -29 | 2 | 3 | 3 | 9 |
| Contact chamber | 48 in | HDPE | - | \$450,000.00 | \$750,000 | 1986 | 50 | 29 | 3 | 2 | 4 | 6 |
| Finishing Basin | | | | | | | | | | | | |
| Synthetic Liner | - | polyethylene | - | Not Available | \$400,000 | 1990 | 25 | -2 | 5 | 3 | 3 | 9 |
| Administration & Laboratory Building | | | | | | | | | | | | |
| Structure | - | - | - | \$57,855.00 | \$100,000 | 1963 | 100 | 46 | 2 | 1 | 3 | 3 |
| Structure | - | - | - | \$5,000.00 | \$10,000 | 1986 | 30 | 9 | 3 | 1 | 1 | 1 |
| Laboratory equipment | - | - | - | \$5,000.00 | \$10,000 | 2005 | 20 | 8 | 3 | 3 | 2 | 6 |
| Computer | - | - | - | \$1,160.00 | \$1,500 | 2000 | 10 | -7 | 2 | 2 | 3 | 6 |
| | | | | | \$2,889,000 | | | | | | | |

APPENDIX C

**INVENTORY OF PROJECTED FUTURE CRITICAL ASSETS
AND
BUSINESS RISK EXPOSURE RATINGS**

Table C-1 Recommended Improvement Project Asset Inventory

Facility Name: **Murphys Sanitary District Wastewater Treatment Facilities**
 Current Plan Year: **2017**
 Projected Completion Year: **2020**

| Treatment Assets | Capacity / Size | Material | Manufacturer & Model | Est. Original Cost | Est. Replacement Cost | Est. Year Installed | Expected Useful Life in Years | Remaining Useful Life in Years | Condition | Probability of Failure | Consequence of Failure | Criticality |
|---|-----------------|------------------|--|--------------------|-----------------------|---------------------|-------------------------------|--------------------------------|-----------|------------------------|------------------------|-------------|
| Murphys Sanitary District WWTP, Recommended Project | | | | | | | | | | | | |
| Influent Pump Station | | | | | | | | | | | | |
| Structure | - | - | - | \$45,000.00 | \$60,000 | 1982 | 100 | 45 | 2 | 1 | 5 | 5 |
| Bar screen | 1" spacing | - | Bar Screen - Manual | \$1,000.00 | \$75,000 | 1984 | 50 | 17 | 1 | 1 | 3 | 3 |
| Comminuter 1 | 0.5 hp | - | Chicago Pump Model 5K35mm48c | \$1,000.00 | \$10,000 | 1984 | 25 | 8 | 5 | 4 | 2 | 8 |
| Comminuter 2 | 0.5 hp | - | Chicago Pump Model 5K35mm48c | \$1,000.00 | \$10,000 | 1984 | 25 | 8 | 5 | 4 | 2 | 8 |
| Comminuter motor | 0.5 hp | - | Reliance Gear Motor Model R53183 | \$1,000.00 | \$3,000 | 1984 | 25 | 8 | 5 | 4 | 2 | 8 |
| Overflow Pond Synthetic Liner | 132,300 gal | polyethylene | - | \$20,000.00 | \$30,000 | 2006 | 25 | 3 | 1 | 3 | 2 | 3 |
| Pump 1 | 50 hp/350 gpm | - | Cornell 44141-VC18DB | \$11,890.00 | \$60,000 | 2001 | 30 | 14 | 4 | 4 | 4 | 16 |
| Pump 2 | 51 hp/350 gpm | - | Cornell 44141-VC18DB | \$10,000.00 | \$60,000 | 1984 | 30 | 3 | 4 | 4 | 4 | 16 |
| Influent pipeline Force Main 1 | 8 inch | ACP | - | \$45,000.00 | \$475,000 | 1962 | 75 | 20 | 5 | 2 | 1 | 2 |
| Influent pipeline Force Main 2 | 8 inch | PVC | - | \$37,000.00 | \$475,000 | 1984 | 75 | 42 | 1 | 2 | 5 | 10 |
| Gravily Pipeline | 8 inch | PVC | - | \$50,000.00 | \$175,000 | 1984 | 75 | 42 | 1 | 2 | 5 | 10 |
| Pump Station Structure (wet well, valve vault, appurtenances) | | | | \$350,000 | \$350,000.00 | 2020 | 75 | 78 | 1 | 1 | 4 | 4 |
| Pump Station Piping and valves | | | | \$100,000 | \$100,000.00 | 2020 | 50 | 53 | 1 | 2 | 3 | 6 |
| Pump 3 | 50 hp/400 gpm | | | \$50,000 | \$50,000.00 | 2020 | 30 | 33 | 1 | 2 | 4 | 8 |
| Pump 4 | 50 hp/400 gpm | | | \$50,000 | \$50,000.00 | 2020 | 30 | 33 | 1 | 2 | 4 | 8 |
| Electrical | | | | \$75,000 | \$75,000.00 | 2020 | 30 | 33 | 1 | 2 | 4 | 8 |
| Paved entrance | | | | \$22,000 | \$22,000 | 2020 | 50 | 53 | 1 | 1 | 1 | 1 |
| Headworks | | | | | | | | | | | | |
| Structure | | | | \$235,000 | \$235,000 | 2020 | 75 | 78 | 1 | 1 | 3 | 3 |
| Screen/washer/compressor | | | | \$125,000 | \$125,000 | 2020 | 30 | 33 | 1 | 2 | 3 | 8 |
| Bar screen | | galvanized steel | Bar Screen - custom | \$5,000 | \$5,000 | 2020 | 50 | 53 | 1 | 1 | 2 | 2 |
| Electrical | | | | \$120,000 | \$12,000 | 2020 | 30 | 33 | 1 | 1 | 3 | 3 |
| Aeration System | | | | | | | | | | | | |
| Blower cabinet | | | | \$6,000 | \$15,000 | 1985 | 50 | 18 | 2 | 2 | 2 | 4 |
| Blower | 20 hp | | Sutorbilt Model GAFLD.A, Serial 330485 | \$40,000 | \$40,000 | 2020 | 30 | 33 | 1 | 3 | 4 | 12 |
| Air distribution piping | | PVC | | \$75,000 | \$75,000 | 2020 | 75 | 78 | 1 | 1 | 4 | 4 |
| Diffusers | 69 ea | polypropylene | | \$25,000 | \$25,000 | 2020 | 10 | 13 | 1 | 3 | 2 | 6 |
| Pond 4 Pumping System | | | | | | | | | | | | |
| Pump 1 w/vid | 30 hp | | Hiloch | \$25,000 | \$25,000 | 2020 | 20 | 23 | 1 | 3 | 3 | 9 |
| Pump 2 w/vid | 30 hp | | Hiloch | \$25,000 | \$25,000 | 2020 | 20 | 23 | 1 | 3 | 3 | 9 |
| Solar mixer 1 | solar | | Solar Bee | \$60,000 | \$60,000 | 2020 | 30 | 33 | 1 | 2 | 2 | 4 |
| Solar mixer 2 | solar | | Solar Bee | \$60,000 | \$60,000 | 2020 | 30 | 33 | 1 | 2 | 2 | 4 |
| Filtration System | | | | | | | | | | | | |
| Filter tank and components | 48" diameter | | Lakes Irrigation | \$25,000.00 | \$80,000 | 1996 | 30 | 9 | 2 | 2 | 1 | 2 |
| Chlorination Treatment System | | | | | | | | | | | | |
| Sodium hypochlorite tank | 400 gal | | | \$15,000 | \$15,000 | 2020 | 25 | 28 | 1 | 1 | 3 | 3 |
| Dosing pump and system | | | Siemmer | \$12,058 | \$15,000 | 2020 | 20 | 23 | 1 | 2 | 3 | 6 |
| Contact chamber structure | | Concrete | | \$300,000.00 | \$300,000 | 2020 | 50 | 53 | 1 | 3 | 4 | 12 |
| Finishing Basin | | | | | | | | | | | | |
| Synthetic Liner | | polyethylene | | \$400,000.00 | \$65,000 | 2020 | 25 | 28 | 1 | 1 | 3 | 3 |
| Administration & Laboratory Building | | | | | | | | | | | | |
| Structure | | | | \$57,855.00 | \$100,000 | 1963 | 100 | 46 | 2 | 1 | 3 | 3 |
| Furniture | | | | \$5,000.00 | \$10,000 | 1996 | 30 | 9 | 3 | 1 | 1 | 1 |
| Laboratory equipment | | | | \$5,000.00 | \$10,000 | 2005 | 20 | 8 | 3 | 3 | 2 | 6 |
| Computer | | | | \$1,160.00 | \$1,500 | 2000 | 10 | -7 | 2 | 2 | 3 | 6 |
| | | | | | \$3,406,500 | | | | | | | |

APPENDIX D

FUTURE IMPROVEMENT PROJECT EXPENSES

Table D-1 Future Improvement Expenses

Directions:
 A. List projects to be completed
 B. Determine how long before the project must begin
 C. Enter the total projected cost of the project
 D. Enter "C" in column D for large replacement expenses that would be funded as a capital project
 E. To add more improvement expenses, use Insert function and add rows then copy first row to new rows to transfer formulas
 F. Enter information in yellow cells
 G. Remaining cells will calculate automatically.

Guidance Note:
 Include improvements here which are related to:
 1. Future/upcoming regulations
 2. Major asset replacement, such as structures, tanks, or interceptors
 3. System expansion to provide additional capacity or service area
 4. System consolidation or regionalization
 5. Improved technology to replace obsolete technology
 6. Climate resiliency
 Include only projects expected to occur within the next 20 years.

| Area | A | B | C | D | E | F | F |
|--------------------------------------|---|--------------------------------|------------|---|----------------------------|-------------------------------|-------------------------------|
| | Projects | Years Until Project Must Begin | Cost | R = Use Reserve C = Capital Expense | Reserve Required Each Year | Future Capital Funds Required | Future Revenue Funds Required |
| Influent PS | Pump Station Structure (wet well, valve vault, appurtenances) | 78 | \$ 350,000 | R | \$ 4,487 | \$ - | \$ 350,000 |
| | Pump Station Piping and valves | 53 | \$ 100,000 | R | \$ 1,887 | \$ - | \$ 100,000 |
| | Pump 3 | 33 | \$ 50,000 | R | \$ 1,515 | \$ - | \$ 50,000 |
| | Pump 4 | 33 | \$ 50,000 | R | \$ 1,515 | \$ - | \$ 50,000 |
| Headworks | Electrical | 33 | \$ 75,000 | R | \$ 2,273 | \$ - | \$ 75,000 |
| | Paved entrance | 53 | \$ 22,000 | R | \$ 415 | \$ - | \$ 22,000 |
| | Structure | 78 | \$ 235,000 | R | \$ 3,013 | \$ - | \$ 235,000 |
| | Screenwasher/compactor | 33 | \$ 125,000 | R | \$ 3,788 | \$ - | \$ 125,000 |
| Aeration System | Bar screen | 53 | \$ 5,000 | R | \$ 94 | \$ - | \$ 5,000 |
| | Blower cabinet | 18 | \$ 12,000 | R | \$ 364 | \$ - | \$ 12,000 |
| | Blower cabinet | 33 | \$ 15,000 | R | \$ 833 | \$ - | \$ 15,000 |
| | Air distribution piping | 78 | \$ 40,000 | R | \$ 1,212 | \$ - | \$ 40,000 |
| Pond 4 Pumping System | Diffusers | 78 | \$ 75,000 | R | \$ 962 | \$ - | \$ 75,000 |
| | Pump 1 w/vald | 13 | \$ 25,000 | R | \$ 1,923 | \$ - | \$ 25,000 |
| | Pump 2 w/vald | 23 | \$ 25,000 | R | \$ 1,923 | \$ - | \$ 25,000 |
| | Solar mixer 1 | 33 | \$ 25,000 | R | \$ 1,087 | \$ - | \$ 25,000 |
| Filtration System | Solar mixer 2 | 33 | \$ 60,000 | R | \$ 1,818 | \$ - | \$ 60,000 |
| | Filler tank and components | 78 | \$ 60,000 | R | \$ 1,818 | \$ - | \$ 60,000 |
| | Sodium hypochlorite tank | 28 | \$ 15,000 | R | \$ 536 | \$ - | \$ 15,000 |
| | Dosing pump and system | 28 | \$ 15,000 | R | \$ 536 | \$ - | \$ 15,000 |
| Chlorination Treatment System | Structure | 23 | \$ 35,000 | R | \$ 5,660 | \$ - | \$ 35,000 |
| | Contact chamber structure | 63 | \$ 35,000 | R | \$ 2,321 | \$ - | \$ 35,000 |
| | Synthetic Liner | 28 | \$ 10,000 | R | \$ 2,174 | \$ - | \$ 10,000 |
| | Furniture | 46 | \$ 10,000 | R | \$ 1,111 | \$ - | \$ 10,000 |
| Administration & Laboratory Building | Laboratory equipment | 8 | \$ 10,000 | R | \$ 1,250 | \$ - | \$ 10,000 |
| | Furniture | 8 | \$ 10,000 | R | \$ 1,250 | \$ - | \$ 10,000 |
| | Computer | 1 | \$ 1,500 | R | \$ 1,500 | \$ - | \$ 1,500 |
| | Total Improvement Expense Required in the Current Year | | | | \$ 94,185 | \$ - | \$ 1,945,500 |

Note: Order of completion of improvements subject to change based on funding availability, project priority, and potential for failure of asset.

| Area | A | B | C | D | E | F | F |
|-------------------|--|--------------------------------|-----------|---|----------------------------|-------------------------------|-------------------------------|
| | Projects | Years Until Project Must Begin | Cost | R = Use Reserve C = Capital Expense | Reserve Required Each Year | Future Capital Funds Required | Future Revenue Funds Required |
| Aeration System | Blower cabinet | 18 | \$ 15,000 | R | \$ 833 | \$ - | \$ 15,000 |
| | Diffusers | 13 | \$ 25,000 | R | \$ 1,923 | \$ - | \$ 25,000 |
| | Pump 1 w/vald | 23 | \$ 25,000 | R | \$ 1,923 | \$ - | \$ 25,000 |
| | Pump 2 w/vald | 23 | \$ 25,000 | R | \$ 1,923 | \$ - | \$ 25,000 |
| Filtration System | Filler tank and components | 78 | \$ 60,000 | R | \$ 1,818 | \$ - | \$ 60,000 |
| | Sodium hypochlorite tank | 28 | \$ 15,000 | R | \$ 536 | \$ - | \$ 15,000 |
| | Dosing pump and system | 28 | \$ 15,000 | R | \$ 536 | \$ - | \$ 15,000 |
| | Synthetic Liner | 23 | \$ 10,000 | R | \$ 2,321 | \$ - | \$ 10,000 |
| Finishing Basin | Furniture | 28 | \$ 65,000 | R | \$ 1,111 | \$ - | \$ 65,000 |
| | Laboratory equipment | 8 | \$ 10,000 | R | \$ 1,250 | \$ - | \$ 10,000 |
| | Computer | 1 | \$ 1,500 | R | \$ 1,500 | \$ - | \$ 1,500 |
| | Total Improvement Expense Required in the Current Year | | | | \$ 21,190 | \$ - | \$ 266,500 |

Note: Order of completion of improvements subject to change based on funding availability, project priority, and potential for failure of asset.