

***ANALYSIS AND RECOMMENDATIONS
FOR
WHOLESALE WATER RATES***

MUHLENBERG COUNTY WATER DISTRICT

April 19, 2021

Prepared by
Alan H. Vilines, P.E.



Kentucky Rural Water Association

1151 Old Porter Pike ● Bowling Green, KY 42101 ● 270.843.2291 ● www.krwa.org

EXECUTIVE SUMMARY

Muhlenberg County Water District requested that Kentucky Rural Water Association perform a Cost of Service Study for wholesale water rates. The study is complete and the results are presented in this report.

MCWD currently sells water on a wholesale basis to the City of Drakesboro and to TVA at one meter location. Total gallons sold at the wholesale rate currently amount to approximately 6 percent of all water sold by the District.

In accordance with PSC regulations the study is based on the most recent Annual Report that is on file with the Commission; so, in this case the test period is calendar year 2019. The Schedule of Adjusted Operations (SAO) lists the revenues and expenses for 2019 and applies required adjustments. The adjustments are to recognize any changes in operations after the test year and certain other items that are commonly required by the PSC. The specific adjustments for MCWD are shown in the SAO with notes for each provided on the References pages. Total pro forma operating revenues for Muhlenberg County are \$4,150,441 and total operating expenses are \$3,705,625.

The SAO also shows the computations for Revenue Requirements. Using the Debt Service Coverage method results in total Revenue Required from all sources of \$3,920,739. The Cost of Service Study determined that \$137,653 in revenue should come from wholesale sales (a \$35,600 decrease) and \$3,506,648 from retail sales. The recommended wholesale water rate is \$5.27 per thousand gallons which is a decrease of \$1.36 from the existing rate.

With the recommended reduction in wholesale revenue, MCWD will still be in a sound financial condition. With required PSC adjustments and implementation of the recommended wholesale rate the SAO indicates MCWD will have a surplus of \$210,500. However, it should be noted that PSC adjustments include cash expenditures that the District will continue to incur. These expenditures amount to approximately \$161,000, therefore the actual surplus is estimated at about \$49,500.

Computations from this study are included in the Schedule of Adjusted Operations with details provided in the Reference pages and Tables A and B. The wholesale Cost of Service Study is presented in Tables C through F.

SCHEDULE OF ADJUSTED OPERATIONS

Edmonson County Water District

| | <u>2019 Test Year</u> | <u>Adjustments</u> | <u>Ref.</u> | <u>Proforma</u> |
|--|-----------------------|--------------------|-------------|---------------------|
| <u>Operating Revenues</u> | | | | |
| Total Metered Retail Sales | \$ 3,452,066 | \$ (49,118) | A | |
| | | 314,233 | B | 3,717,181 |
| Sales for Resale - Drakesboro | 103,960 | 13,858 | C | 117,818 |
| Wholesale Sales to TVA | | 49,118 | A | |
| | | 6,334 | C | 55,452 |
| Other Water Revenues: | | | | - |
| Forfeited Discounts | 63,230 | | | 63,230 |
| Misc. Service Revenues | 61,108 | | | 61,108 |
| Other Water Revenue | 135,652 | | | 135,652 |
| Total Operating Revenues | \$ 3,816,016 | | | \$ 4,150,441 |
| <u>Operating Expenses</u> | | | | |
| Operation and Maintenance | | | | |
| Salaries and Wages - Employees | 773,569 | (7,335) | D | |
| | | (79,096) | E | 687,138 |
| Salaries and Wages - Officers | 18,000 | | | 18,000 |
| Employee Pensions and Benefits | 748,568 | (228,764) | F | |
| | | (54,232) | G | 465,572 |
| Purchased Water | 1,155,507 | 259,026 | H | |
| | | (42,049) | I | 1,372,484 |
| Purchased Power | 103,733 | (3,084) | I | 100,649 |
| Chemicals | 4,443 | | | 4,443 |
| Materials and Supplies | 233,728 | (17,115) | D | 216,613 |
| Contractual Services - Engr. | 20,142 | | | 20,142 |
| Contr. Services - Acct., Legal & Other | 52,322 | | | 52,322 |
| Contractual Services - Water Testing | 12,218 | | | 12,218 |
| Rental of Bldg./Real Property | 482 | | | 482 |
| Transportation Expenses | 55,627 | | | 55,627 |
| Insurance - Workers Comp. | 17,571 | | | 17,571 |
| Insurance - Other | 48,589 | | | 48,589 |
| Advertising | 2,625 | | | 2,625 |
| Bad Debt | 15,555 | | | 15,555 |
| Miscellaneous Expenses | 144,331 | | | 144,331 |
| Total Operation and Mnt. Expenses | 3,407,010 | | | 3,234,362 |
| Depreciation Expense | 505,323 | (95,865) | J | 409,458 |
| Taxes Other Than Income | 70,222 | (8,417) | E | 61,805 |
| Total Operating Expenses | \$ 3,982,555 | | | \$ 3,705,625 |
| Gains from Disposition of Property | 29,225 | | | 29,225 |
| Net Utility Operating Income | \$ (137,314) | | | \$ 474,041 |

REVENUE REQUIREMENTS

| | |
|---|-------------------|
| Pro Forma Operating Expenses | \$ 3,705,625 |
| Plus: Average Annual Principal and Interest Payments | K 200,759 |
| Additional Working Capital | L 40,152 |
| Amortization of Premium on Debt | (25,796) |
| Overall Revenue Requirement | 3,920,739 |
| Less: Other Operating Revenue | 259,990 |
| Interest Income | 16,374 |
| Proposed Wholesale Sales Revenue | 137,227 |
| Revenue Required From Retail Rates | 3,506,648 |
| Revenue from Retail Sales at Present Retail Rates | 3,717,181 |
| Surplus Revenue with Required Adjustments & New Wholesale Rate | \$ 210,533 |

REFERENCES

- A. Certain sales to TVA are at a wholesale rate. In the test year that revenue was reported as part of Total Metered Sales. To provide more detail the wholesale sales to TVA are reclassified to a separate category.
- B. The Billing Analysis results in pro forma Retail Sales revenue of \$3,717,181 which indicates an addition to Metered Retail Sales of \$314,233 is required. This adjustment reflects a full year of sales at the new rates approved in late 2019.
- C. The wholesale rate for Drakesboro and TVA was also adjusted in late 2019. That increase results in additional revenue from these two customers of \$13,858 and \$6,334, respectively.
- D. Labor and materials for new meter installations are charged to operating expenses and costs for these capital improvements must be removed from operations. The amount of tap fees charged for these installations (\$24,450) can be substituted for the actual expenses. Thirty percent of total tap fees is deducted from Salaries and Wages and 70 percent is deducted from Materials and Supplies expense.
- E. Since the test year there have been several changes in employee wages and a reduction in the number of employees. These changes result in a net decrease in Salaries and Wages expense of \$79,096. This decrease in wages also results in a reduction in payroll taxes of \$8,417.
- F. The decrease in wages would suggest a decrease in pension expenses. However, an expected increase in the employer's contribution rate charged by CERS will result in higher payments for the retirement program. These payments are estimated to increase by \$19,418. Due to GASB reporting requirements for retirement liabilities, the expense reported for the District's pension plan is \$210,644 more than the actual contribution paid to CERS. Also, the 2019 pension expense includes a prior period payment of \$37,538 that will not be necessary in the future. The net adjustment for the increased contribution rate less the non-cash liability expense and the prior period payment is a deduction of \$228,764.
- G. The District pays 100 percent of health insurance premiums for employees and their families. The PSC typically requires that expenses associated with this level of employer-funded premiums be adjusted to be consistent with the Bureau of Labor Statistics' national average for an employer's share of health insurance premiums. Average employer shares from BLS are currently 79 percent for single coverage and 62 percent for families. Applying those percentages to premiums to be paid in the current year results in a deduction from 2019 benefits expense of \$54,232.

- H. In late 2019 the rate the District pays Central City for water purchases increased from \$2.63 to \$3.31 per thousand gallons. This will increase the District's purchased water expense by \$259,026.
- I. The District's test year water loss was 17.973 percent. The PSC's maximum allowable loss for rate-making purposes is 15.0 percent. Therefore, the expenses for Purchased Water and Purchased Power related to water purchased and pumped above the 15 percent limit are not allowed in the rate base and must be deducted.
- J. The PSC requires adjustments to a water utility's depreciation expense when asset lives fall outside the ranges recommended by NARUC in its publication titled "Depreciation Practices for Small Utilities". Therefore, adjustments are included to bring asset lives to the midpoint of the recommended ranges. See Table A.
- K. The annual debt service payments for the District's loans are shown in Table B. The five year average of these payments is added in the revenue requirement calculation.
- L. The amount shown in Table B for coverage on long term debt is required by the District's bond resolutions. This is included in the revenue requirement as Additional Working Capital.

Table A
DEPRECIATION EXPENSE ADJUSTMENTS

| <u>No.</u> | <u>Assets</u> <u>Description</u> | <u>Date in</u> <u>Service</u> | <u>Original</u> <u>Cost</u> | <u>Reported</u> | | <u>Proforma</u> | | <u>Depreciation</u> |
|---|-------------------------------------|----------------------------------|--------------------------------|-----------------|-------------------|-----------------|-------------------|-------------------------------------|
| | | | | <u>Life</u> | <u>Depr. Exp.</u> | <u>Life</u> | <u>Depr. Exp.</u> | <u>Expense</u> <u>Adjustment</u> |
| 304-1: Office Building & Garage | | | | | | | | |
| | Structures | various | 494,065 | varies | 11,693 | 37.5 | 13,175 | 1,482 |
| | Furnishings & Equipment | various | 80,905 | varies | 2,531 | 22.5 | 3,596 | 1,065 |
| 311: Pumping Plant | | | | | | | | |
| | Pump Stations | 2006 | 1,071,049 | 25.0 | 42,842 | 37.5 | 28,561 | (14,281) |
| | Pumping Equipment | various | 202,690 | varies | 5,019 | 20.0 | 10,135 | 5,116 |
| 330 - 333: Transmission & Distribution | | | | | | | | |
| | Reservoirs & Tanks | various | 910,468 | varies | 19,968 | 45.0 | 20,233 | 265 |
| | Transmission & Distribution Mains | various | 9,393,225 | varies | 200,949 | 62.5 | 150,292 | (50,657) |
| 334: Meters | | | | | | | | |
| | Radio Read Meters | various | 1,278,720 | 15.0 | 85,248 | 20.0 | 63,936 | (21,312) |
| 333 & 334-1: Services | | | | | | | | |
| | Entire Group | various | 176,490 | varies | 6,530 | 40.0 | 4,412 | (2,118) |
| 335: Hydrants | | | | | | | | |
| | Entire Group | various | 60,167 | varies | 1,684 | 50.0 | 1,203 | (481) |
| 340: General Plant | | | | | | | | |
| | Office Furniture | 1999 | 14,080 | 20.0 | 176 | 22.5 | 626 | 450 |
| | Computer Equipment | various | 10,842 | 5.0 | 1,057 | 10.0 | 1,084 | 27 |
| 341: Transportation Equipment | | | | | | | | |
| | Entire Group | various | 524,642 | 5.0 | 80,348 | 7.0 | 74,949 | (5,399) |
| 345: Power Operated Equipment | | | | | | | | |
| | Entire Group | various | 142,653 | varies | 14,538 | 12.5 | 11,412 | (3,126) |
| 346: Communications Equipment | | | | | | | | |
| | Entire Group | various | 180,092 | varies | 18,930 | 10.0 | 18,009 | (921) |
| 347: Tools, Shop and Garage Equipment | | | | | | | | |
| | Entire Group | various | 137,100 | varies | 13,810 | 17.5 | 7,834 | (5,976) |
| TOTALS | | | | | 505,322 | | 409,457 | (95,865) |

Table B
DEBT SERVICE SCHEDULE
Muhlenberg County Water District
 CY 2021 - 2025

| C.Y. | <u>Transmission & Distribution</u> | | <u>Radio Read Meters</u> | | TOTALS |
|--|--|---------------------------|--------------------------|------------------------|---------------------|
| | <u>KRWFC Series 2007</u> | | <u>KRWFC Series 2013</u> | | |
| | <u>Principal</u> | <u>Interest</u> | <u>Principal</u> | <u>Int. & Fees</u> | |
| 2021 | \$ 107,500 | \$ 36,286 | \$ 130,000 | \$ 12,070 | \$ 285,856 |
| 2022 | 112,500 | 31,395 | 135,000 | 6,480 | 285,375 |
| 2023 | 117,500 | 26,276 | - | - | 143,776 |
| 2024 | 122,500 | 20,930 | - | - | 143,430 |
| 2025 | 130,000 | 15,356 | - | - | 145,356 |
| TOTALS | \$ 590,000 | \$ 130,244 | \$ 265,000 | \$ 18,550 | \$ 1,003,794 |
| | | <u>Trans. & Dist.</u> | <u>Meters</u> | | |
| Average Annual Principal & Interest | | \$ 144,049 | \$ 56,710 | \$ 200,759 | |
| Average Coverage on Long Term Debt | | 28,810 | 11,342 | 40,152 | |

Table C
SYSTEM INFORMATION
Muhlenberg County Water District

Schedule of All Mains and Jointly Used Mains

| <u>Main Size</u> | <u>Total System</u> | | | <u>Joint Use</u> | |
|----------------------|--------------------------|---------------------------|-------------------------|---------------------------|-------------------------|
| | <u>Length (feet)</u> | <u>Miles of Mains</u> | <u>Inch - Miles</u> | <u>Miles of Mains</u> | <u>Inch - Miles</u> |
| 16 | 1,373 | 0.26 | 4.16 | 0.26 | 4.16 |
| 12 | 53,381 | 10.11 | 121.32 | 10.11 | 121.32 |
| 10 | 92,400 | 17.50 | 175.00 | 12.49 | 124.90 |
| 8 | 201,696 | 38.20 | 305.60 | 13.62 | 108.96 |
| 6 | 946,176 | 179.20 | 1,075.20 | 5.39 | 32.34 |
| 4 | 173,712 | 32.90 | 131.60 | | |
| 3 | 474,144 | 89.80 | 269.40 | | |
| 2 | 412,896 | 78.20 | 156.40 | | |
| Totals | 2,355,778 | 446.2 | 2,238.68 | 41.87 | 391.68 |

Water Purchased, Sold and Used

| | <u>Gallons x 1,000</u> | <u>Percent</u> |
|--------------------|----------------------------|----------------|
| Water Purchased | 426,810 | |
| Retail Sales | 308,251 | |
| Wholesale Sales | 26,134 | |
| Total Water Sold | 334,385 | |
| Water Used | 2,612 | |
| System Flushing | 12,407 | |
| Fire Dept. & Other | 688 | |
| Line Losses | 76,718 | 17.97% |

Table D
WHOLESALE ALLOCATION FACTORS
Muhlenberg County Water District

| | | <u>FACTOR</u> |
|---------------------------------------|---|----------------------|
| Line Loss Percentage | | 0.1797 |
| Joint Use Inch-miles | | 391.68 |
| Total Inch-Miles | | 2,238.68 |
| Water Sold - Wholesale | | 26,134 |
| Water Sold - Total | | 334,385 |
| | | |
| Water Supply Multiplier | $\frac{1}{1 - 0.1797}$ | = 1.2191 |
| Joint Use Pipeline Ratio | $\frac{391.68}{2,238.68}$ | = 0.1750 |
| Joint Share of Line Loss | 0.1797×0.1750 | = 0.0314 |
| Wholesale Supply Multiplier | $\frac{1}{1 - 0.0314}$ | = 1.0325 |
| Water Supply Allocation Factor | $\frac{1.0325}{1.2191} \times \frac{26,134.2}{334,385.3}$ | = 0.0662 |
| Transmission Factor | $\frac{26,134.2}{334,385.3} \times 0.1750$ | = 0.0137 |
| Use Factor | $\frac{26,134.2}{334,385.3}$ | = 0.0782 |

Table E
ALLOCATION OF DEPRECIATION EXPENSE
Muhlenberg County Water District

| | <u>Proforma</u> <u>Depr. Exp.</u> | | <u>Trans. &</u> <u>Distribution</u> | <u>Storage</u> <u>Tanks</u> | <u>General</u> <u>& Admin.</u> | <u>Customer</u> |
|---|--------------------------------------|---------------|--|--------------------------------|---------------------------------------|-----------------|
| | | <u>Supply</u> | | | | |
| 304-1: Office Building & Garage | | | | | | |
| Structures | 13,175 | | | | 5,518 | 7,657 |
| Furnishings & Equipment | 3,596 | | | | 1,506 | 2,090 |
| 311: Pumping Plant | | | | | | |
| Pump Stations | 28,561 | 5,712 | 22,849 | | | |
| Pumping Equipment | 10,135 | 2,027 | 8,108 | | | |
| 330 - 333: Trans. & Distribution | | | | | | |
| Reservoirs & Tanks | 20,233 | | | 20,233 | | |
| Transmission & Distribution Mains | 150,292 | 15,029 | 135,262 | | | |
| 334: Meters | | | | | | |
| Radio Read Meters | 63,936 | | | | | 63,936 |
| 333 & 334-1: Services | | | | | | |
| Entire Group | 4,412 | | | | | 4,412 |
| 335: Hydrants | | | | | | |
| Entire Group | 1,203 | | 1,203 | | | |
| 340: General Plant | | | | | | |
| Office Furniture | 626 | | | | 626 | |
| Computer Equipment | 1,084 | | | | 1,084 | |
| SUBTOTALS | 297,252 | 22,768 | 167,422 | 20,233 | 8,734 | 78,095 |
| SUBTOTAL PERCENTAGES | | 7.66% | 56.32% | 6.81% | 2.94% | 26.27% |
| 341: Transportation Equipment | | | | | | |
| Entire Group | 74,949 | | | | | |
| 345: Power Operated Equipment | | | | | | |
| Entire Group | 11,412 | | | | | |
| 346: Communications Equipment | | | | | | |
| Entire Group | 18,009 | | | | | |
| 347: Tools, Shop and Garage Eqmt. | | | | | | |
| Entire Group | 7,834 | | | | | |
| SUBTOTAL | 112,205 | | | | | |
| PERCENTAGE ALLOCATIONS | | 8,594 | 63,197 | 7,637 | 3,297 | 29,479 |
| TOTALS | 409,457 | 31,363 | 230,620 | 27,870 | 12,031 | 107,574 |

Table F
WHOLESALE RATE COMPUTATION
Muhlenberg County Water District

| | <u>Pro forma</u> <u>Expenses</u> | <u>Allocation</u> <u>Factor</u> | <u>Wholesale</u> <u>Allocation</u> | <u>Retail</u> <u>Allocation</u> |
|---------------------------------|-------------------------------------|------------------------------------|---------------------------------------|------------------------------------|
| Salaries & Wages | | | | |
| Supply | 42,546 | 0.0662 | 2,816 | 39,730 |
| Trans./Distribution | 382,914 | 0.0137 | 5,236 | 377,678 |
| Customer Accts. | 109,596 | | | 109,596 |
| Admin & General | 152,082 | 0.0137 | 2,080 | 150,003 |
| Employee Benefits + Payroll Tax | | | | |
| Supply | 32,117 | 0.0662 | 2,126 | 29,991 |
| Trans./Distribution | 289,050 | 0.0137 | 3,953 | 285,097 |
| Customer Accts. | 82,731 | | | 82,731 |
| Admin & General | 114,802 | 0.0137 | 1,570 | 113,232 |
| Salaries - Officers | 18,000 | 0.0137 | 246 | 17,754 |
| Purchased Water | 1,372,484 | 0.0662 | 90,844 | 1,281,641 |
| Purchased Power | | | | |
| Supply | 60,776 | 0.0662 | 4,023 | 56,753 |
| Trans./Distribution | 39,873 | | | 39,873 |
| Chemicals | 4,443 | 0.0662 | 294 | 4,149 |
| Materials & Supplies | | | | |
| Supply | 12,919 | 0.0662 | 855 | 12,064 |
| Trans./Distribution | 116,268 | 0.0137 | 1,590 | 114,679 |
| Tanks & Reservoirs | 56,679 | 0.0782 | 4,430 | 52,250 |
| Customer Accts. | 24,497 | | | 24,497 |
| Admin & General | 6,250 | 0.0137 | 85 | 6,164 |
| Contractual Services - Engr. | 20,142 | 0.0662 | 1,333 | 18,809 |
| Contr. Services - Acct. & Legal | 52,322 | 0.0137 | 715 | 51,607 |
| Contr. Services - Water Testing | 12,218 | 0.0662 | 809 | 11,409 |
| Rental of Bldg./Real Property | 482 | 0.0137 | 7 | 475 |
| Transportation Expense | | | | |
| Supply | 4,675 | 0.0662 | 309 | 4,366 |
| Trans./Distribution | 42,079 | 0.0137 | 575 | 41,504 |
| Customer Accts. | 8,872 | | | 8,872 |
| Insurance - Gen Liab & Other | 48,589 | 0.0137 | 664 | 47,925 |
| Insurance - Worker's Comp. | | | | |
| Supply | 1,088 | 0.0662 | 72 | 1,016 |
| Trans./Distribution | 9,792 | 0.0137 | 134 | 9,658 |
| Customer Accts. | 2,803 | | | 2,803 |
| Admin & General | 3,889 | 0.0137 | 53 | 3,836 |
| Advertising | 2,625 | 0.0137 | 36 | 2,589 |

| | | | | |
|---|---------------------|--------|-------------------|---------------------|
| Bad Debt | 15,555 | | - | 15,555 |
| Miscellaneous Expense | | | | |
| Trans./Distribution | 11,586 | 0.0137 | 158 | 11,427 |
| Customer Accts. | 23,366 | | - | 23,366 |
| Admin & General | 109,380 | 0.0137 | 1,496 | 107,884 |
| Other Taxes | 8,678 | 0.0137 | 119 | 8,559 |
| Total Operation & Mnt. Exp. | 3,296,167 | | 126,628 | 3,169,540 |
| Depreciation Expense | | | | |
| Supply | 31,363 | 0.0662 | 2,076 | 29,287 |
| Trans. / Distribution | 230,620 | 0.0137 | 3,154 | 227,466 |
| Tanks & Reservoirs | 27,870 | 0.0782 | 2,178 | 25,692 |
| Admin & General | 12,031 | 0.0137 | 165 | 11,866 |
| Customer | 107,574 | | - | 107,574 |
| Debt Service & Coverage | | | | |
| Supply | 20,743 | 0.0662 | 1,373 | 19,370 |
| Trans. / Distribution | 152,116 | 0.0137 | 2,080 | 150,035 |
| Radio Read Meters | 68,052 | | | 68,052 |
| Amort. of Premium on Debt | (25,796) | | | (25,796) |
| Total Revenue Required | \$ 3,920,739 | | \$ 137,653 | \$ 3,783,086 |
| Wholesale Gallons Sold (x 1,000) | | | 26,134 | |
| Wholesale Rate per 1,000 Gallons | | | \$ 5.27 | |