Case Study: Lawrenceburg, TN

September 2018

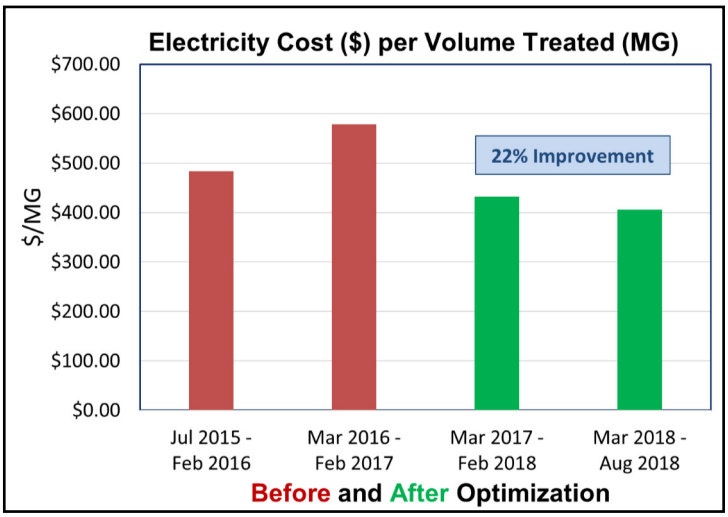
Staff from the Lawrenceburg Utility Systems (LUS) Wastewater Treatment Plant (WWTP) were invited to participate in the Energy Management Initiative of the Tennessee Water and Wastewater Energy Efficiency Partnership, a joint technical assistance program through the U.S. EPA Southeast Regional Office, U.S. Department of Energy, TVA, and the Tennessee Department of Environment and Conservation. A team of representatives from those agencies, the University of Memphis and the University of Tennessee Municipal Technical Advisory Service conducted a site assessment in March 2017. Plant superintendent Lisa Porter met with the team to discuss ways to optimize treatment.

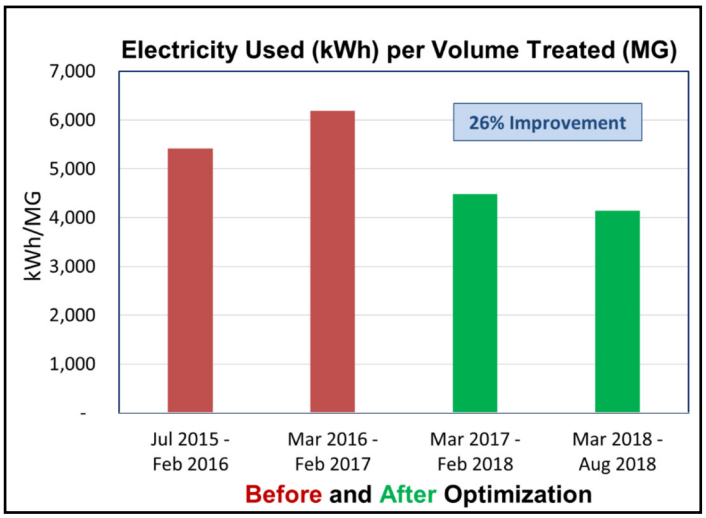
Lawrenceburg, a city of approximately 10,000, is set on Shoal Creek, just 15 miles north of the Alabama state line. The plant is designed to treat 4.5 million gallons per day (mgd), and currently treats about 1.5 mgd of municipal wastewater. It uses three sequencing batch reactors (SBR) aerated with up to two 350-HP centrifugal blowers. Biosolids generated during treatment are processed in aerobic digesters fed by two 40-HP blowers.

Lawrenceburg Wastewater Treatment Plant

The team analyzed the loading to the plant and observed the SBR blowers provided excess aeration but that design constraints of the blowers prohibited full optimization. Additionally, solids loading to the digester indicated that the aerator runtime could be reduced by up to 75%. Following the team's recommendation, the WWTP staff reduced the aeration to the SBRs and digesters. This no-cost change reduced total electric use by 13% and saved 30,000 kilowatt-hours (kWh) per month. During the "after optimization" phase highlighted in the graphs below, the plant's wastewater loading increased 13%, which would have resulted in higher electrical usage without the optimized operation. The results achieved at the time of writing are summarized below.

While no capital was required, diligent operator oversight was necessary to implement this recommendation, and the team appreciates Lisa and her team's continued efforts to optimize their processes.





♦ **Annual Energy Savings:**	**>360,000 kWh/year**	♦ **Energy Usage and Cost Reduction:**	**13% and 8%**
♦ **Annual Cost Savings:**	**>$21,000/year**	♦ **Influent Loading:**	**13% Increase**
♦ **Cost to Implement:**	**$0**	♦ **Peak Electrical Demand:**	**3.5% Reduction**

For more information, please contact Ben Bolton at TDEC Office of Energy Programs (ben.bolton@tn.gov)

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