



Case Study: Carthage, TN

August 2018



Staff from the Carthage, TN 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, and the Tennessee Department of Environment and Conservation. Representatives from those agencies, the University of Memphis and the University of Tennessee Municipal Technical Advisory Service conducted a site assessment in March 2017.

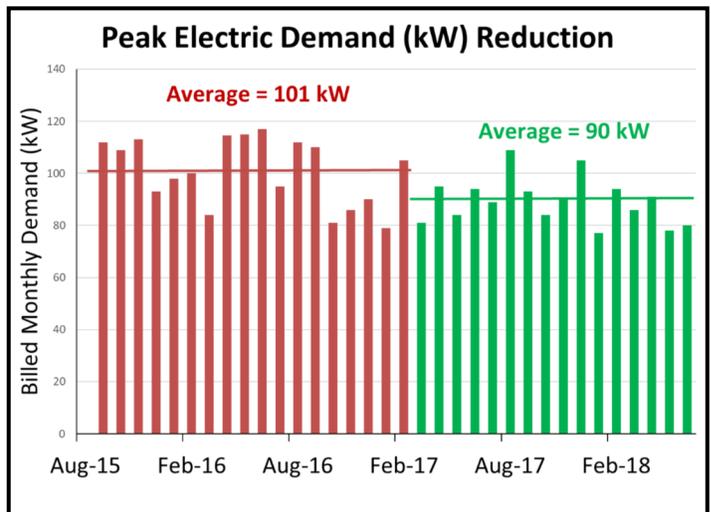
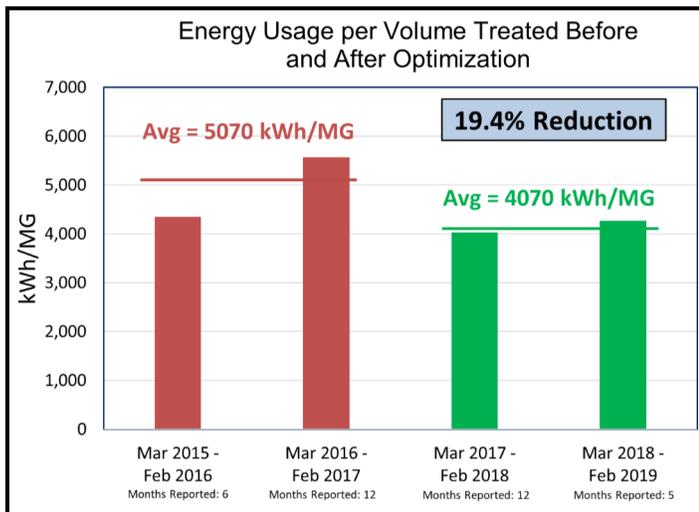
Carthage, a city of approximately 2,300, is nestled in a bend of the Cumberland River, about 50 miles east of Nashville. The WWTP has a design capacity of 625,000 gallons per day (gpd), and currently treats about 330,000 gpd of municipal wastewater. The plant has an annular aeration basin with a final clarifier in the center. Biosolids generated during treatment are further treated in two aerobic digesters, operated in series.



Carthage Wastewater Treatment Plant

Plant staff Steve Key and Ricky Brown met with the team to discuss ways to improve treatment efficiency. The team observed that the solids retention time in the aeration basin and first digester were sufficient to treat the solids, and the aeration to the second digester was redundant. Accordingly, the team recommended reducing the operating time of the aerator in the second digester from constant operation to only six hours per day. Beginning in April 2017, the plant staff has manually adjusted the aerator operation schedule as a part of routine duties. This single change reduced energy use by 14%, and saved over 7,000 kilowatt-hours (kWh) per month despite a 15% increase in wastewater loading. Staff expects to use some of the savings to purchase and install timers in the near future. The timers will automate this change and manage further reductions. The results achieved at the time of writing are summarized below.

Diligent operator oversight was necessary to implement this recommendation. The project team appreciates the continued efforts of the Carthage operators, and the valuable support of its Mayor and Town Council.



◆ Annual Energy Savings:	>85,000 kWh/year	◆ Annual Cost Savings:	>\$7,000/year
◆ Energy Reduction:	19% kWh/MG	◆ Cost Reduction:	19% \$/MG
◆ Peak Electrical Demand:	11% reduction	◆ Cost to Implement:	\$0

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



This material is based upon work supported by the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy (EERE), under Award Number DE-EE0007226.