



DMI Assists MWRA to Save >\$200K in Annual Utility Costs

The Problem

The MWRA (Massachusetts Water Resources Authority) wanted to decrease the energy consumption at the Carroll Water Treatment Plant in Marlborough, MA by performing a plant retrofit.

The Solution

DMI was contacted by the utility provider in 2007 to provide energy consulting services for the MWRA plant. The services included energy auditing, analysis of energy conservation measures, and utility incentive estimates. For this site, an innovative method to estimate plant performance using both demand (kW) data and water flow (MGD) was developed. DMI was able to obtain 15-minute interval flow data from the plant, compare it to kW data from the utility, and develop a plant performance (kW/MGD) chart. This analysis was then used to identify seasonal or time-of-day inefficiencies or any abnormalities that may have existed in plant operation.

DMI then performed a walkthrough of the facility to visually inspect the plant and recommend energy reduction measures. The recommendations included installing variable speed drives (VSDs) on the cooling tower fans, hot water pumps, and mixing paddles, installing a small boiler for summer demand, and demand-controlled ventilation for the offices and ozone room. The largest impact on energy use came from a change with the mixing paddle operation, which accounted for 12% of the plant's total energy use. DMI initially suggested experimenting with a 25% turn-down for these paddles, which led to discussions on potentially turning off the paddles altogether. The mixers were initially installed to provide the operators with flexibility in choice of chemicals added to meet treatment objectives. In the present mode of operation, the staff was able to determine that the mixers could be shut down completely without impacting process variables. An incentive could not be provided for this measure since the payback was almost immediate.

Project Background

The Carroll plant treats water flowing from the Quabbin and the Wachusett reservoirs for over 2.3 million people in Massachusetts. It averages about 275 million gallons of water treated per day.

The Result

The shutdown of the mixing paddles alone resulted in electric savings of over \$200,000 per year. All together, the energy conservation measures totaled \$286,672 in annual utility savings.

Articles

[John J. Carroll Water Treatment Plant](#)



Facility Overview

- Water treatment plant
- Treats ~275M gallons of water per day

Services Provided

- Energy auditing
- Energy conservation measure analysis
- Utility incentives

Results

- Shut-down of mixing paddles
- Total annual energy savings of ~\$287,000