WATER & WASTEWATER UTILITY SOLUTIONS CASE STUDY

Public-private Partnership Pays Off — Literally — for Tennessee Community

A Tennessee community is enjoying a credit of $22,375.15 for the fiscal year 2011-2012, thanks to lower-than-expected maintenance fees for its 20-year-old water treatment plant.

La Vergne, Tenn., is a city of 32,500 residents about 20 miles southeast of Nashville. The city's drinking water is provided by the La Vergne Water Plant, a 9.8-mgd surface water treatment plant that uses multimedia filtration, on-site sodium hypochlorite generation for disinfection, sodium permanganate addition for manganese removal and polyphosphate injection for corrosion control. Anticipating the area's rapid growth after the 2000 census, the La Vergne Water Department doubled the treatment plant's capacity in 2005, adding on to the original plant built in 1992.

In 2007, after receiving an average of 20 customer complaints a month regarding water taste and odor, La Vergne entered into a public-private partnership with Severn Trent Services for operation of the plant. And while the partnership was initially formed to address concerns about the quality of the city's drinking water, Severn Trent also identified significant maintenance needs at the start of the relationship and took steps to implement a predictive and preventive maintenance program with the goal of normalizing maintenance costs and requirements.

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For the first few years of the partnership, work was primarily reactive, as Severn Trent and the city worked diligently to improve water quality and restore plant equipment to optimum condition. After a filter profile showed the plant's filters were frequently running low on granular activated carbon media — sometimes by as much as two feet — Severn Trent upgraded the filters and restored the proper media level, reducing backwashing and associated water usage.

Finding higher-than-expected levels of organic material in the water emerging from the plant's clarifiers, Severn Trent operations and maintenance staff drained, cleaned and inspected two of the four clarifiers, increasing the efficiency of the initial particle removal process and enabling the use of less chemical disinfectant. In another instance, Severn Trent was able to cut alum dosage in half without negatively impacting water quality, helping the city keep its chemical expenses stable during a year in which these costs increased.

While such process improvements and equipment upgrades helped the city virtually eliminate all water quality complaints by early 2009, Severn Trent continued its efforts toward upgrading the plant's existing maintenance software program. In 2011, Severn Trent installed Hach JOB Cal®, a predictive maintenance management software tool that has saved the city money by enabling operators and technicians to manage and track equipment maintenance and repairs.

The program helps to prolong equipment life by scheduling maintenance checks and preventive tasks on a weekly, monthly, semiannual or annual basis, depending upon the equipment. Much of the equipment in the La Vergne Water Plant was designed with redundancy to prolong the life of the machinery. So in these instances, the new software helps operators switch out machinery according to schedule to ensure that the equipment is rotated in a beneficial manner.

The predictive maintenance program implemented by Severn Trent enables the plant staff to look ahead rather than simply react to problems as they arise. As a result, operators are able to achieve savings by purchasing parts and equipment in advance at the best available price rather than being forced to replace them at any cost in reaction to an unforeseen equipment failure.

The predictive software also helps plant staff keep an inventory of parts on hand, allowing technicians to fix minor problems as they occur and stave off bigger, more expensive problems. The software can even help operators identify and diagnose repair needs by tracking metrics such as the equipment's time in service, hours of use and average flow rates.

In addition to enabling technicians to schedule and track routine maintenance, the program gives maintenance workers step-by-step instructions for each maintenance check and allows plant operators to track who performed a given task, providing accountability and ensuring that no critical steps are overlooked.

The $22,375 credited back to La Vergne for the fiscal year 2011-2012 represents a savings of nearly 25 percent of the $90,000 originally allocated for in-house maintenance costs. Through ongoing process improvements and predictive maintenance programs, Severn Trent and the city of La Vergne continue to create new models of efficiency, resulting in cost savings for the city and underscoring the success of this public-private partnership.

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