

DELIVERING SAFE DRINKING WATER

WHEN THE COOKIE-CUTTER APPROACH TO TREATMENT ISN'T SO SWEET

Have you ever considered the source of the water you drink? What about the processes it goes through for public distribution? For most people, the thought never crosses their mind. But for many in the water industry, there's not a day that goes by when they don't think about the importance of safe drinking water and the treatment involved.

When it comes to water treatment plants (WTPs) and their ability to consistently deliver reliable, safe drinking water, it's not as simple as implementing a one-size-fits-all technology approach.

"We need to move away from the cookie-cutter approach of assuming that a treatment technology is going to work for this problem, for this location, at this time," says Nathan Dunahee, a lead process engineer at Burns & McDonnell. "We need to look at the water quality and specific problem, then find an opportunity to come up with a treatment strategy that will give the most benefit for that location and problem.

"For example, based on our experience with physical and chemical processes, we will provide

an evaluation for the WTP client, then pass along operational constraints and reasons why the current solution may not work. We'll work together to devise a different treatment strategy that will provide better end results and may be more cost-effective."

Furthermore, changing ecosystems create a range of dynamic challenges for WTP operators. Because of the vast differences in treatment requirements for each location, based on varying water quality supplies, applying a generic treatment process will not always produce successful results. This is especially true when it comes to a natural disaster situation, such as flooding or drought.

"Weather is a big deal for WTPs," says Rachel Drain, a process engineer at Burns & McDonnell. "If you have a reservoir with an established water quality and treatment protocol, flooding or drought can significantly impact the presence of organic and inorganic compounds, which in turn affects the type of treatment protocol needed. For facilities utilizing river or stream sources, extreme weather events can cause both quantity and quality issues. These types

A PROCESS EVALUATION INCLUDES



CURRENT PERFORMANCE

Each unit process will be analyzed based upon historical data and discussions with staff.



HANDS-ON TESTING

Conduct field, bench scale and jar testing to improve plant performance and accomplish process goals.




PHYSICAL/CHEMICAL IMPROVEMENTS

Modifications to the physical and chemical processes could improve treatment performance — the chemicals added, dosage, location and mixing energy.



OPERATIONAL IMPROVEMENTS

Modifications to current operational practices would improve treatment performance, reliability and redundancy.



of changes to source water supplies can cause the WTP to struggle with meeting treatment goals and satisfying customers.”

So how do WTPs go about treating water when nature strikes? They must make an adjustment that is physical, chemical or operational. This includes the possibility of adding a new technology or improving an existing process to make it more robust. This will allow WTPs to optimally use what they have, a strategy that can increase capacity, improve treatment and save money. But to know which route is right for them in the given situation is difficult to determine without a proper process evaluation.

That’s just what one Missouri utility did when it was faced with drought conditions. Due to the high concentration of algae brought on by drought, and with harmful toxins in the reservoir, it was critical to find an effective mitigation strategy through proper process evaluation. During the evaluation, the Burns & McDonnell team found that optimizing existing treatment and implementing a new technology would be the best solution out of the five alternatives that were assessed.

While effectively integrating a new technology can lead to success in the water industry, ideal improvements in water treatment optimization for safe drinking water boil down to evaluating the situation at hand. Understanding the process goals and operational methods helps identify the appropriate innovative approaches, and these factors can’t be determined until a proper process evaluation is performed. ●

Want a more technical take on process optimization and advanced technologies for WTPs? Check out our white paper at burnsmcd.com/WTPChallenges