THE HAWORTH WATER TREATMENT PLANT UPGRADE

Seeing Clearly: Water Quality Redefined

A commitment to customers. State-of-the-art technology. Environmental protection. Since 1869, United Water has been supplying exceptional drinking water to northern New Jersey. Today, the utility is delivering even cleaner, more reliable water to 800,000 people in Bergen and Hudson counties—thanks to the Haworth water treatment plant upgrade.

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At $100 million, the project is the largest capital investment and boldest undertaking in United Water's history. The new 200-million-gallon-per-day (mgd) Haworth water treatment plant addresses growing customer needs and more stringent regulations. The

result: improved water quality, enhanced service reliability, reduced chemical and energy usage, and the protection of sensitive ecosystems.

Design-Build Delivers

United Water partnered with CDM Smith to implement the upgrade through design-build delivery to expedite project completion and meet pending regulatory deadlines. By performing multiple project components simultaneously, the team successfully met drinking water regulations and saved money, minimizing customer rate increases.

Based on successful collaboration between United Water, CDM Smith and the New Jersey Department of Environmental Protection, major process treatment units were designed, permitted and constructed in only 21 months—half the time it would take with a conventional design and construction approach. Perhaps even more impressive, the existing water treatment plant remained in full operation with no unplanned outages during the entire upgrade. Anthony Delescinskis, United Water senior project manager, emphasizes that this is a tremendous feat. “The construction process didn’t interrupt operation of the existing facility, so our customers never lost a day of service. Considering the level of activity taking place, this is unprecedented.”

New Technology, Big Results

High-rate dissolved air flotation (DAF), an innovative sedimentation clarification process, is at the heart of the plant upgrade. A pretreatment stage occurring prior to filtration, DAF removes more than 90 percent of particles and algae from source water before it is filtered. Haworth’s DAF system is the largest of its kind in the United States.

According to Steve Rafferty, CDM Smith vice president and engineering manager for the Haworth upgrade, DAF allows the plant to produce higher quality water more efficiently. “Not only does high-rate DAF make cleaner water, but this technology requires only one-eighth of the process tank volume needed for conventional systems. By choosing DAF instead of a traditional sedimentation clarification process, we were able to conserve 12 acres of woodland.” DAF also reduces the required volume of backwash water from 8 mgd to 1.4 mgd, saving potable water and energy.

In 1989, Haworth became one of the nation’s first plants to use ozone in the water treatment process. A new ozone system—which pretreats the water for effective removal of particles and unwanted tastes and odors—was incorporated into the recent plant upgrade. The environment-friendly ozone disinfection process eliminates the use of dangerous chemicals and recycles oxygen back into the atmosphere.

Conservation and Community

Pete Tunnicliffe, CDM Smith senior vice president, explains that preserving the environment and protecting species in the area were priorities during the project's design and construction. "Routine meetings were held to make sure the project embraced all environmental regulations and that extra steps were taken to reduce energy and eliminate waste," says Tunnicliffe. Materials recycling included the use of fly ash in the building's concrete and recycled steel for reinforcement.

The DAF process and high-efficiency ozone generators were integral to Haworth's energy conservation measures. In addition, energy-efficient lighting was used throughout the new facility. During construction, the DAF building was heated only for freeze protection, with spot-heated areas for operator comfort—saving significant energy over heating the entire 25,000-square-foot facility with open water surfaces.

The team worked hard to maintain quality of life for the surrounding community during all phases of the project. "It was important that construction did not disrupt the neighborhood or surrounding environment," notes Delescinskis. Considerations were taken to minimize project impacts, including modifications to traffic routes, as well as visual and sound buffers in construction areas. The plant upgrade also stimulated the local economy by employing more than 400 carpenters, laborers, ironworkers, pipe fitters, electricians and other construction tradespeople.

Clean Water Exceeds Goals

The Haworth water treatment plant upgrade was completed ahead of schedule and under budget, allowing the plant to deliver great-tasting, exceptional-quality water to customers ahead of New Jersey regulatory milestone dates. "This is a significant project for United Water and CDM Smith," says Tunnicliffe. "We beat our deadlines and employed an innovative technology on a grand scale, all while maintaining a commitment to the environment and community."