

Finished Water

A PHOTOGRAPHIC PROFILE

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The Taylorville Water Treatment Plant's ClariCone clarifier requires no internal moving parts and provides mixing, flocculation, and sedimentation in a hydraulically driven system (inset top). The plant also features a UV disinfection system (inset middle) for *Cryptosporidium* inactivation and a well water biological nitrate removal system (inset bottom).

TAYLORVILLE, ILL., LAUNCHES INNOVATIVE WATER TREATMENT PLANT

The Taylorville, Ill., water system serves city customers, neighboring communities, and rural water systems. Changing regulations related to *Cryptosporidium*, increasing well water nitrate levels, and the age of the existing treatment plant required a fresh look at the future of the city's water system. After reviewing the options and costs, a new treatment plant was constructed across the street from the existing facility and put into operation in August 2019.

Improved source water and process redundancy were top goals for future operations, and this facility can treat well water, surface water, or any combination of both sources. Conventional treatment is achieved with helical upflow solids contact clarifiers (lime softening), pH adjustment with carbonic acid, and dual media gravity filtration with air scour. Additional features include a post-filtration ultraviolet (UV) disinfection system for *Cryptosporidium* inactivation and an innovative well water biological nitrate removal system.

PROJECT SPECIFICS

Project Name: Taylorville Water Treatment Plant

Operator: City of Taylorville, Ill.

Contractor: Plocher Construction

Engineer: Benton & Associates

Architect/Mechanical, Electrical, and

Plumbing: Oates Associates/Clark-Dietz

Completion Date: August 2019

Water Sources: Well water from the Macon-Christian strip aquifer and surface water from Lake Taylorville

Technology: Helical upflow solids contact clarification (lime softening), recarbonation, gravity filtration, biological nitrate removal, UV disinfection

Components: Two head tanks, two ClariCone solids contact clarifiers, one HeliCarb carbon dioxide recarbonation vessel, six dual-media gravity sand filters with air scour, two ETS UV generators, two clearwells, three horizontal split case high-service

pumps, two backwash pumps, eight lime sludge/backwash lagoons

Project Cost: \$24.9 million (construction)

Service: The new facility is rated at 5.2 mgd using surface water, groundwater, or a blend of each source.

Staff Size: Seven (full time)

Number of Operators: Three (full time), four (part time)

Special Features: To combat rising nitrate levels in its wells, the city selected the biottra process by AdEdge Water Technologies for biological nitrate removal. The plant is the first drinking water biological nitrate removal facility in Illinois and one of only a few in the nation. Because of the low nitrogen load in the backwash water, the city can discharge into a nearby stream and maintain compliance with National Pollutant Discharge Elimination System permit discharge permitting requirements with no waste treatment needed.