

Wedeco UV disinfection system in Carmel, Indiana

Award-winning treatment plant utilizes Wedeco UV disinfection to exceed environmental regulations

Background

The city of Carmel, IN, located north of Indianapolis, owns and operates Carmel Wastewater Treatment Plant (WWTP) that treats sanitary waste from Carmel, Clay Waste District, and Westfield Utilities. When the plant became unable to meet the growing demands of the 70,000 person population area, the city decided to increase Carmel WWTP's capacity to meet current and future water treatment demands.

Solution

One of the plant's major upgrades was the disinfection system. Prior to the expansion, Carmel WWTP utilized large quantities of chlorine and sulfur dioxide chemicals for primary disinfection. The city carefully evaluated the implications of expanding the existing chemical treatment system and in unison looked into alternative technologies to completely replace chemical disinfection. The city decided to completely replace their existing chemical system with a UV disinfection system after taking into consideration using chemicals for wastewater treatment can result in harmful environmental side-effects and also create hazardous working conditions for site operations.

UV disinfection would not only meet the plant's effluent quality standards but also eliminate the formation of disinfection byproducts.

Wedeco, a Xylem brand, was chosen to supply a horizontal TAK 55 UV disinfection system designed for a future flow of 36 MGD. Equipped with 288 low-pressure, high-output Ecoray® UV lamps and a chemical-free automatic wiping system, the UV system operates using intensity-based control to ensure disinfection limits are met or exceeded at all times. The intensity-based control uses an intensity sensor, located in each bank, to measure real-time lamp aging,



Aerial view of Carmel WWTP

END USER: City of Carmel, IN
CLIENT: Carmel WWTP
ORDER DATE: 2013
COMPLETION: 2013

fouling, and water quality parameters to vary the lamp output. This guarantees the appropriate dose while providing the lowest possible amount of power consumption.

Result

Replacing chemical treatment with Wedeco's UV technology for primary disinfection has eliminated the risk of discharging toxic chemicals into nearby lakes and rivers, and the environmentally-friendly upgrades at Carmel WWTP did not go unrecognized.

The 12 MGD facility has earned a string of environmental awards and has been ranked one of the nation's best managed facilities. The Environmental Protection Agency added Carmel WWTP to the "Best Practices" database for the National League of Cities in process operations.

Additionally, the Wedeco UV system has dramatically improved effluent coliform counts and has far exceeded the state's regulation of 235 maximum E.Coli per 100 ml. Once ranging from 100 to 235 coliform forming units (cfu) per 100 ml using chemical disinfection, the UV system averages single-digit cfu readings, producing a high of 54 cfu per 100 ml.

By using innovative technologies, the Carmel WWTP continues to demonstrate a safe and effective method for wastewater disinfection.



Wedeco UV system divides UV lamps between two channels



Disinfected UV water flowing out from two channels

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