

Advanced disinfection control with OaSys iCT™



Results at a Glance

- ✓ Up to 54% reduction in hypochlorite use during 14-day simulation study
- ✓ Improved operational efficiency without compromising disinfection performance
- ✓ Higher consistency in achieving target CT dose with advanced dose control

The Challenge

Wastewater disinfection is critical for protecting public health and the environment. However, traditional disinfection control strategies—like flow-pacing—struggle to account for dynamic variability in wastewater conditions.

Factors that can influence how much disinfectant is actually needed at any given time include:

- Real-time hydraulics
- Operational fluctuations
- Background disinfectant chemical demand
- Disinfectant decay

Traditional flow-pacing applies a fixed dose of chemical disinfectant proportional to flow but ignores these other parameters. This often leads to **overdosing of disinfectant, overspending on chemicals, and inadequate disinfection performance**, especially when conditions change rapidly or frequently.

Because of these limitations, treatment plants have an opportunity to improve their disinfection processes while reducing chemical costs through more adaptive, data-driven dosing technologies.

Advanced dosing control with OaSys iCT™

Through a research project at a small wastewater facility in Ontario, Canada, USP Technologies was able to demonstrate the impact of adaptive model-based disinfection control with OaSys iCT™. **OaSys iCT™ is an advanced disinfection control technology designed to address the challenges that often limit traditional disinfection methods.** OaSys iCT™ normalizes disinfection performance by accounting for system variability, including:

- Hydraulics
- Background chemical demand
- Disinfection kinetics

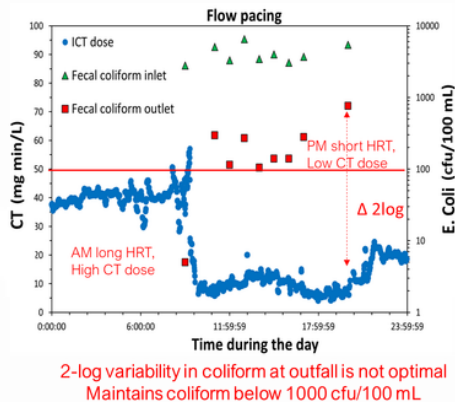
Instead of relying on a simple flow relationship, **OaSys iCT™ calculates the optimal disinfectant dose required to meet a target CT value, to prevent both over- and under-dosing.** In this study, USP Technologies and its partners performed computational fluid dynamics (CFD) modeling to characterize the site's chemical contact basin. Chlorine demand, decay, and disinfection kinetics were measured from secondary effluent samples, and OaSys iCT™ was tested at full scale against traditional flow-pacing methods.

This approach provided real-time adaptive dose control that better matched the plant's actual disinfection needs to improve efficiency and performance.

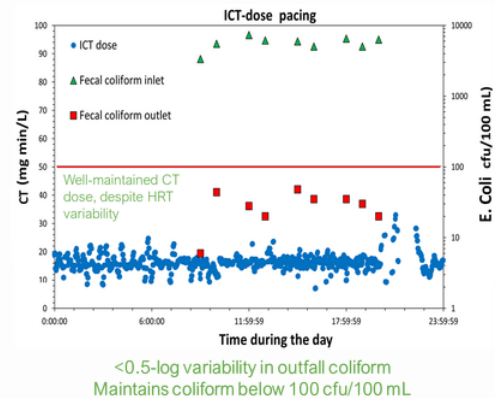
Key Results

Performance Improvements

Under flow-paced control, the CT dose varied widely throughout the day, with higher levels in the morning and lower levels in the afternoon due to flow variability, resulting in as much as 2-log variation in fecal coliform.



OaSys iCT™ maintains the delivered CT dose within a stable performance band and reduced fecal coliform to less than 0.5-log variability. In contrast to flow pacing, coliform level remained consistently well below the 100 CFU target.



Chemical Use Reductions

During the initial 14-day research study, the team tested two traditional flow-pacing approaches versus OaSys iCT™ advanced dosing control. These results showed that OaSys iCT™ provided a:

- A 54% reduction in disinfectant usage vs. a 2.5 mg/L flow-pacing approach
- A 36% reduction in disinfection usage vs. a 1.75 mg/L flow-pacing approach

During an extended 193-day simulation, the team showed that OaSys iCT™ would result in:

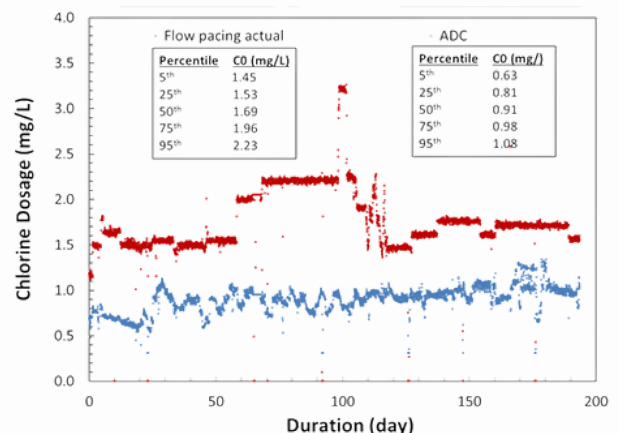
- A 48% reduction in hypochlorite use vs. traditional disinfection methods

As a result of using OaSys iCT™ in this study, the plant could achieve:

- ~50% less hypochlorite usage
- Lower and more stable residual chlorite in effluent
- Expected reduction in quenching chemical costs

OaSys iCT™ illustrates how an improved disinfection control strategy can lead to **both reduced chemical usage/costs and improved performance** - with OaSys iCT™, they go hand in hand.

Disinfection Approach	NaOCl Used (L)
Traditional flow pacing (2.5 mg/L)	7,860
Traditional flow pacing (1.75 mg/L)	5,500
OaSys iCT™	3,630



OaSys iCT™ is an intelligent disinfection control solution that helps deliver more consistent disinfection performance, minimizes the risk of disinfection byproduct formation, and optimizes chemical usage - helping to save you money and improve performance.