# New Technology Utilizes The Collection System As An Active Part Of The Treatment Process

**The addition of naturally occurring bacteria to the collection system transforms miles of sewer pipe into a pre-treatment step — improving plant efficiency.**

BY RICH SCHICI

The collection system is often viewed as a means to transport the wastewater to the treatment facility. Many hours of retention time in the collection system have provided non-beneficial impacts to the wastewater treatment process. Growth of filamentous bacteria; sulfate reducing bacteria (SRB), which lead to the production of hydrogen sulfide; and odor causing bacteria dominate the microbiology of the collection system.

Microorganisms act to catalyze the oxidation of biodegradable organics and other contaminants generating by-products such as carbon dioxide, water, and biomass. Bacteria grow and divide, producing biosolids (sludge) and clean water. This metabolism occurs in wastewater treatment plants around the world. In an effort to utilize the miles of existing pipe and convert the passive sewer system into a meaningful treatment step, one company has developed a technology and service to utilize the collection system as an active part of the wastewater treatment process.

## Treating Wastewater at the Source

The technology involves the introduction of a proprietary formulation of high concentrations of select, facultative, symbiotic, spore-forming, naturally occurring, non-pathogenic bacteria at strategic locations throughout the sewer collection system. Continual addition 24/7 added to the outer reaches of the wastewater collection system transform miles of sewer pipe into an active part of the wastewater treatment process.

The bacteria grow throughout the surface of the sewer pipes and dominate the sewer biofilm through the biological principal of competitive exclusion. By out-competing the non-beneficial bacteria for nutrients, the high concentrations of microbes grow and populate within the sewer pipes and lift station wet wells, optimizing the entire infrastructure. With the collection system acting as a pre-treatment reactor, the technology improves the ability of the sewer biofilm to degrade the organic material and take advantage of the residence time of the wastewater within the sewer to degrade the waste.

Within a period of time, the added bacteria convert the biofilm on the surface area of the infrastructure into a controlled, beneficial biological population. They also metabolize fats, oil, and grease in the collection system and at the treatment plant. This collection system reactor provides beneficial treatment in the sewer by accelerating metabolic conversions that reduce organic solids and nitrogen loads entering the wastewater treatment plant.

The microbiological treatment for a system is carefully engineered and driven by such factors as organic loads, distribution, collection system layout, and treatment objectives, among others. Battery-powered dosing units consist of a panel slightly larger than a shoe box containing a solenoid pulse pump operated by a small circuit board. The dosing panel holds a one-liter replaceable reservoir with a 30 day supply that can provide time-controlled treatment for as long as 90 days.

Using the collection system as a pre-treatment step improves plant efficiency in a number of ways. The bacteria work with or without oxygen inside the sewer system, converting organic materials and nutrients into carbon dioxide and nitrogen gas. Each pound of organic material and nitrogen removed in the sewer during transit, without energy input, is a pound that does not require treatment in the wastewater treatment plant. This conversion involves two distinct operations, namely the conversion of TSS into a soluble format that bacteria can metabolize and the actual metabolism of the soluble material into carbon dioxide and nitrogen gas. ■

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