

Demonstration of Wastewater Treatment Using Special Fiber Carrier for Excess Sludge Reduction (B-DASH)

(Research for FY 2016-17)

1. Purpose

This study demonstrates the treatment performance and benefits of “Wastewater Treatment Technology Using Special Fiber Carrier for Excess Sludge Reduction” using real scale demonstration facilities. The new technology aims to reduce Lifecycle cost (LCC) by the significant reduction of excess sludge generation.

The demonstration is adopted as B-DASH Project^{*1} 2016 of MLIT^{*2}. The consortium of IHI Enviro Corporation; Teijin Limited; JS and Tatsuno Town conduct the demonstration as an entrusted research project of NILIM^{*3}.

*1.B-DASH Project: Breakthrough by Dynamic Approach in Sewage High Technology Project

*2.MLIT: Ministry of Land, Infrastructure, Transportation, and Tourism

*3.NILIM: National Institute for Land and Infrastructure Management

2. Outline of the demonstration

The demonstration technology that is a kind of contact aeration (oxidation) has a feature of multiple stages with special fiber carriers. Its reactor has series multiple stages (twelve stages in this demonstration) and each of them has a submerged special fiber carrier unit. This structure creates different microbial floras on the carrier surfaces from the upstream to the downstream of the reactor. Here, advanced microorganisms including protozoa and metazoan that dominate downstream stages help to reduce the generation of excess sludge, significantly. This demonstration aims to

reduce the massive amount of excess sludge and reduce the LCC including sludge treatment and disposal at the retrofit of municipal WWTPs when they adopt this technology as an alternative to their OD process.

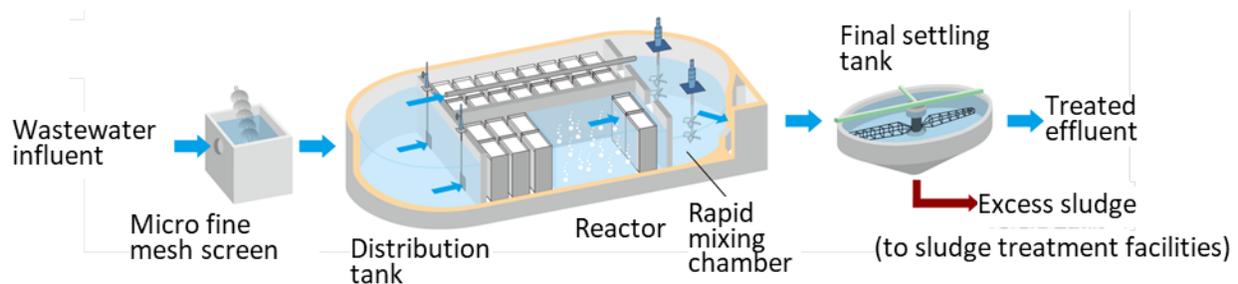


Figure 1: Image of the demonstration technology

3. Achievements of this year

The demonstration continued from the previous year was carried out at Tatsuno WWTP (Tatsuno Town, Nagano Prefecture.) The existing tank of OD process with a treatment capacity of 2,030m³/day is retrofitted for the demonstration. A neighbor reactor of OD process is operated in parallel for contrast.

Researchers verified the effects of excess sludge reduction and made a case study retrofitting virtual OD process to predict the impact of LCC reduction.

- BOD of treated water from the demonstration facilities was 15 mg/L maximum that meets the target of 15 mg/L or less.
- In a comparison of two systems, the annual average of excess sludge reduction ratio in the demonstration facilities to that of the OD process was estimated at 55%, which is below the target value of 60%; however, researchers figured that the percentage had enough excess sludge reduction effect practically.
- The case study assuming retrofit of an existing OD process with a treatment capacity of 1,000-2,500 m³ per day/tank resulted that the

demonstration technology reduced LCC including sludge treatment/disposal by 3.7-16.9% compared to retrofitting to OD process.

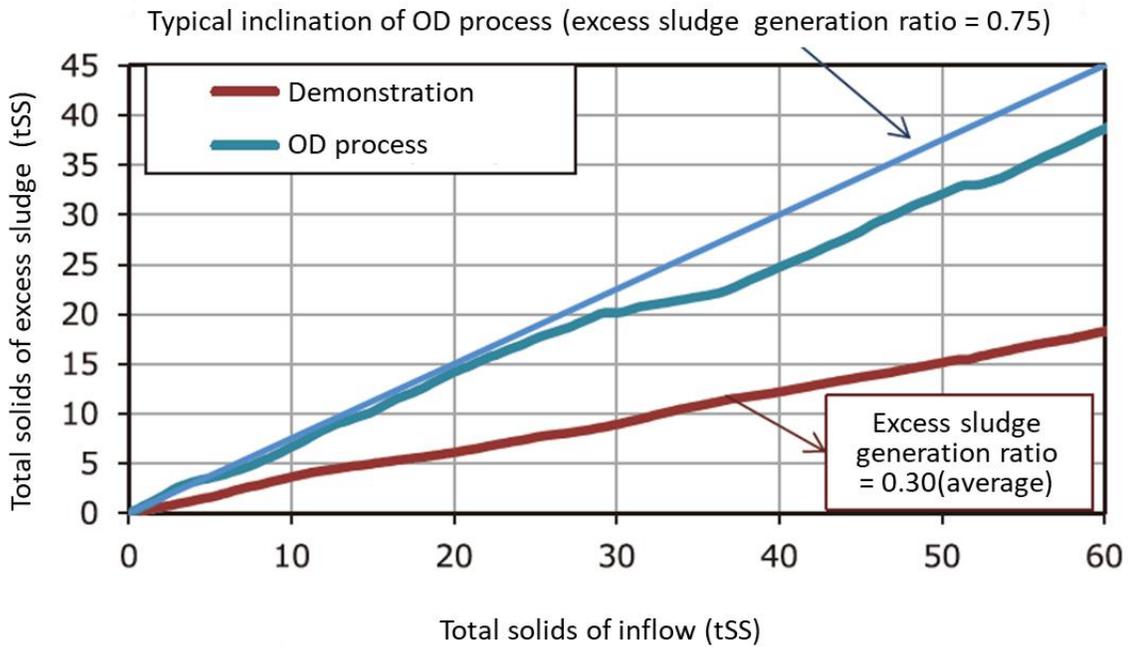


Figure 2: Comparison of total solids of excess sludge between demonstration and OD process

4. Future issues

The demonstration continues as independent joint research after 2018 to verify the reduction effect of excess sludge and the treatment performance including the stability of treated water quality, further cost reduction such as the optimization of the volume of supplied air flow.

Keywords: Special fiber carrier, Contact aeration, Excess sludge reduction, Downsizing