

Demonstration of the Treatment Performance Improvement of Final Settling Tank (B-DASH)

(Research of FY 2017-2018)

1. Purpose

This study aims to practically apply the technology that qualitatively or quantitatively improves the performance of a final settling tank with low-cost and with no additional construction.

The demonstration is adopted as B-DASH Project*¹ 2017 of MLIT*². The consortium of Metawater Co., Ltd., Japan Sewage Works Agency, and Matsumoto City 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. Summary of demonstration

Figure 1 is the summary of the demonstration technology. In the demonstration, an inside filtration part is set in the downstream of the existing final settling tank. The tank has some partition boards between its settling part of upstream and its filtration part. After sedimentation and separation, solid materials which are hard to settle are removed during supernatant travels through the filtration part.

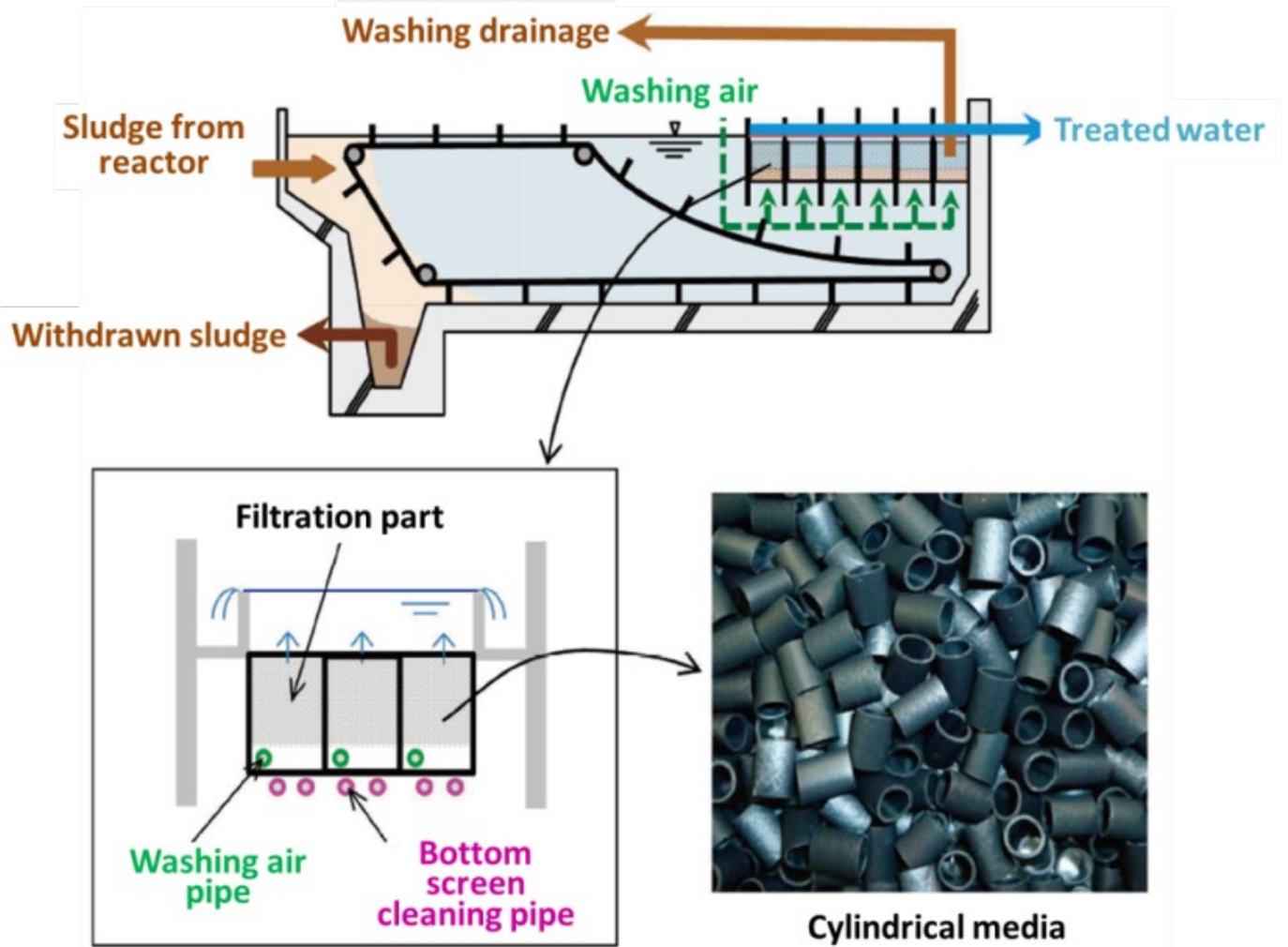


Figure 1. Overview of the technology

Since solid materials block the space of the filtration part after some periods, blowing air washes away solids matter inside the filtration part.

This technology enhances treatment capability more than its designed capacity while maintaining the quality of treated water, or improves effluent quality by the operation with less treatment capability than its designed capacity.

3. Outcomes of this year

Demonstration facilities were set up in Ryojima WWTP of Matsumoto city in 2017. This year, a demonstration for the qualitative and quantitative improvement was carried out through the year.

(1) Results of experiments relating to the quantitative improvement

In the condition that the demonstration train treats approximately twice of wastewater of the compared train, the demonstration one generated some better quality of effluent. Specifically, the demonstration series had 3.5mg/l of SS and 2.5mg/l of ATU-BOD while the compared train had 4.5mg/l and 2.9mg/l, respectively.

(2) Results of experiments relating to the qualitative improvement

In the condition that the demonstration and the compared trains treat the equivalent quantities of wastewater, the demonstration train generated better quality of effluent than the compared one. The demonstration train had 1.4mg/l of SS and 2.2mg/l of T-BOD, while the compared one had 4.0mg/l and 4.1mg/l, respectively. T-BOD of the demonstration train had never exceeded 10mg/l.

In comparison with compared series plus rapid filtration, the demonstration series had the equivalent effluent quality. It had 1.4mg/l of SS and 2.2mg/l of T-BOD, while the compared one plus rapid filtration had 1.5m/l and 1.9mg/l, respectively.

(3) Total costs (Equivalent annual value)

For double quantitative improvement, the demonstration technology reduces total costs by 50.6% compared to the expansion, including body construction. For qualitative improvement, it reduced the total annual costs by 67.5% compared to the new development of rapid filtration facilities.

4. Conclusion and future schedule

From now on, the study continues to verify countermeasures aiming the improvement of the maintainability and the optimization of washing filtration part as the independent collaborative research.

Keywords: Final settling tank, Filter media, Utilization of existing facilities, Enhancement of treatment capability