

Additional Demonstration Facility for B-DASH Project Starts Running: "Demonstration of Wastewater Treatment Technology Using Special Fiber Carrier for Excess Sludge Reduction"

Japan Sewage Works Agency (JS) has been joining a collaborative research, "Demonstration of Wastewater Treatment Technology Using Special Fiber Carrier for Excess Sludge Reduction." ("The Process") The demonstration is adopted for B-DASH Project*¹ 2017 as a joint research project of IHI Enviro Corporation; Teijin Limited; JS; and Tatsuno Town.

The Process is an alternative wastewater treatment to Oxidation Ditch (OD) Process. "Multi-stage reactor" and "Special fiber carrier" reduce excess sludge substantially and reduce LCC by reduction of footprints of sludge treatment facilities and equipment, and O&M costs.

The demonstration of *The Process* started with the construction of facilities in July 2016 in Tatsuno WWTP (Tatsuno Town in Nagano Prefecture)

**1: B-DASH Project (Breakthrough by Dynamic Approach in Sewage High Technology Project) has been conducted by Ministry of Land, Infrastructure, Transport, and Tourism (MLIT) of Japan. The Project aims to accelerate R&D of new technologies and their practical applications, enhance costs reduction in sewage works and the production of renewable energy, and facilitate the global presence of Japanese companies in their water business. In B-DASH Project, all demonstrations are carried out as a contract research of National Institute for Land and Infrastructure Management (NILIM.)*

Summary of Demonstration

1. Purpose of the demonstration

Using a multi-stage reactor and a special fiber carrier enables drastic reduction of excess sludge that reduces footprints of sludge treatment facilities. The research aims to demonstrate the effect of reduction in sludge generation and LCC.

2. Joint research group

The consortium of IHI Enviro Corporation; Teijin Limited; JS; and Tatsuno Town

3. Site of demonstration

Tatsuno WWTP in Tatsuno Town, Nagano Prefecture

Table 1. Outline of Tatsuno WWTP

Wastewater treatment method	OD process (Separate collection system)
Sludge treatment method	Gravity thickening → Dewatering → Discharge to outside
Design treatment capacity	Maximum 6,270m ³ /day
Average amount of wastewater treated per day	4,930 m ³ /day
Start of operation	March 1992



Figure 1. Location of Tatsuno Town

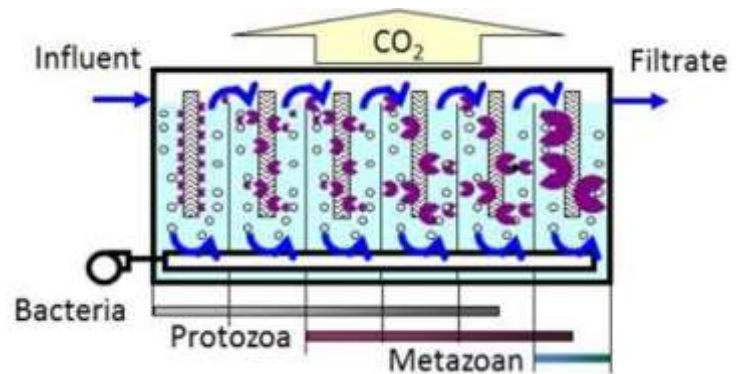
4. Features of *The Process*

- ① Reduction of excess sludge
Compared to the conventional OD Process, the combination of a multi-stage reactor and special fiber carriers reduces much excess sludge generation.
- ② Special fiber carrier
Has creative structure and placement to prevent sludge from enlargement and cloggings between carriers.
- ③ Easy and flexible
A reactor of the Process has almost the same hydrologic retention time as the conventional OD process. Existing facilities can be transferred to the Process.

A reactor has special fiber carriers in each



Self-oxidation and food chain reduce excess



Conceptual diagram of the inside of a reactor (Actual reactor has 12 stages)

Figure 2. Feature of the demonstration technology

5. Advantages of the technology

- Reduction in sludge disposal costs
- Reduction in costs of chemical and electricity for sludge treatment
- Reduction in footprint of sludge treatment facilities ⇒ Reduction in retrofit costs

Our goal: Reduce LCC of wastewater treatment facilities and commit to improve and continue sewage works management.

6. Summary of demonstration facilities

The demonstration facilities were constructed using the existing OD tank. The OD tank body was partly retrofitted for the special fiber carrier unit. The outset of the construction work was July 2016. The demonstration facilities got started running for the initial operation in December 2016 at the completion of building works.

Table 2. The specifications of demonstration facilities

Amounts of treated water	1,700m ³ /day
The volume of the reactor	Approx.2,200 m ³
HRT of the reactor	31 hours
BOD volumetric loading	0.2kg-BOD/m ³ ·day
Final settling tank surface loading	Approx.8 m ³ /m ² ·day



Photo 1. Full view of demonstration facilities



Photo2. Special fiber carrier

(Left: full view, Top-right: filter media, Bottom-right: cross section of filter media)



Photo 3. Setting condition of special fiber carrier
(Inside of reactor)