

Research on the utilization of the advanced treatment system using media and pre-flocculant

Whole term

1998.12~2004.3

(Purpose)

It is necessary for Osaka Neyagawa Wastewater Treatment Plant to operate advanced treatment in order to prevent eutrophication. In the city, it was impossible to expand the existing site. Then we focused on the advanced wastewater treatment system using pre-flocculant and media with the same volume of activated sludge process.

In this study, we investigated the utilization of the system by means of a pilot plant of rebuilt water treatment utility 1 at Kounoike Treatment Plant. And this study was a joint research of Osaka Eastern Regional Sewerage Office and the Japan Institute of Wastewater Engineering Technology carried out from 1998 to 2003.

(Results)

The results were as follows:

(1) Pilot plant test

- ① Each of SS, COD_{M_n} , T-N and T-P concentration of the effluent of the secondary settling tank was half of the targeted quality. BOD concentration was a little higher than the target, however C-BOD concentration of the treated wastewater was half of the target that is 4mg/L. we could estimate whether it satisfied the practical organic removal. 2mg/L of S-BOD can be treated by the following sand filter process.
- ② In cold weather, effluent concentration of SS, T-N and T-P of the secondary settling tank was half of the target. Even though BOD and C-BOD and COD_{M_n} concentrations were beyond the target, it can be treated by the following sand filter process.
- ③ As per the results of the aerobic media test, the water quality of the aerobic media tank with 70 m/day filtration rate was similar to that of the secondary settling tank. However, in winter, it is necessary to improve it because the effect of SS on the other items is large.

(2) Sludge treatment test by utilization

- ① Organic acid generation rate of utilization was 15% of that of the pilot plant.
- ② In the utilization test, COD and S-BOD concentration of the organic acid decreased throughout the solid-liquid separation unit process. So, it is necessary to consider the collection rate of the organic acid.

(3) Application of this system

When the system was applied to the conventional wastewater treatment, the carbon/nitrogen ratio was set without additional methanol. If the targeted removal rate of nitrogen was 80%, influent T-BOD/T-N ratio would be 4.4. And it could cope with 125% of the internal return sludge.

(4) Investigation of the detailed design factor

The design factor of this system was established.

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Keywords

Advanced treatment, Preflocculation-precipitation, Nitrification media, Denitrification media, Fermentation of organic acid