

Research on the technology of reusing the treated wastewater of Ushioe Sewage Treatment Plant

Whole term

1997. 9 ~ 2000. 3

(Purpose)

The contamination of the artificially-made lake in “ Wanpark Kouchi” in Kouchi City due to its closed water is a growing environmental problem in this region. To solve this, Kouchi City established plans to use treated wastewater for purification of the lake water, thus promoted the advanced treatment technology for treated wastewater.

This technology making use of self-purification was developed in Kouchi Prefecture and used on small-scale wastewater treatment and this joint research by Kouchi City and the Japan Institute of Wastewater Engineering Technology was performed for 3 years from 1997. The objective of this research was to verify the capacity and the applicability of this technology through pilot plant experiments.

(Results)

In 1999, the tank structure for stable performances in treatment was investigated by analyzing subsequent pilot and column experiments and then the treatment capacity of this technology was evaluated. Eventually, a comparative economic analysis with the other advanced treatment technologies was performed and summarized.

1. Aiming at the verification of the applicability of this process, which was the media packed type using the natural purification for reusing the treated wastewater for the aquaculture by the advanced treatment, operational experiments using a pilot plant and column experiments were performed and the following results were achieved.

1) The packed tank structure and the operational conditions of each media to satisfy the discharge water quality of T-N and T-P equal to 3.0 mg/L and 0.5 mg/L, respectively were obtained.

2) The removal efficiency and the water quality standards for a water-friendly space were also satisfied by BOD, turbidity and number of coliforms of the pilot plant.

2. The basic plan of the real-sized structure based on the experimental results was applied to Ushioe Treatment Plant and the results are as follows:

1) The overall design and planning of the treatment capacity of 4,000 m³/day were made and the possibility to be constructed within the existing treatment plant was verified.

2) In accordance with the comparative economic analysis with the other advanced treatment process, the construction cost of this process was less; however the maintenance cost for the complement of packing was higher. Overall, it was estimated that it would be possible to construct and maintain the technology either at the same cost as the other methods or less cost than that of the other methods.

However, more accurate analysis on each packed media and explanation on the unclear mechanisms are still left for utilization. The hydraulic structure has to be improved, and the method of management and maintenance should also be investigated.

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Keywords

Reuse of treated water, Advanced treatment, Self-purification, A kind of wooden packed media