Reduction of phosphorous at WWTP combined with DAF and A2/O

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\textbf{ABSTRACT}

Regulation of the phosphorous (P) concentration in effluent from the Jinju wastewater treatment plant (WWTP) in southern part of Korea has recently been strengthened, with a reduction in the acceptable P limit from 2.0 to 0.2 mg/L. Various treatment processes have been introduced and applied to meet the regulation, after use of biological treatments such as conventional activated sludge, anoxic–oxic (A/O), and anaerobic–anoxic–oxic (A2/O) treatments. The present work introduces a hybrid system of A2/O and dissolved air flotation (DAF) treatment to remove P from the effluent. The total capacity of the WWTP is 190,000 m\textsuperscript{3}/d. The dimensions of the DAF basins are 8 m (width), 16 m (length), 4.2 m (height), 6 basins, and the capacity is 2,995 m\textsuperscript{3}/d. The retention time and recycling ratio are 19 min and 15\%, respectively. The surface loading rate is 240 m/d. Operation of the system with A2/O+DAF has already commenced and total P was reduced from 2.18 to 0.03 mg/L. A2/O+DAF treatment improved the mean effluent concentrations of total phosphorus, chemical oxygen demand, and suspended solids by approximately 70, 29, and 27\%, respectively, compared with the corresponding levels in effluent after A2/O treatment alone.

\textbf{Keywords:} Coagulation; Dissolved air flotation; Phosphorous removal

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