

# Perbandingan Pengolahan Senyawa Amonia dan nitrat Pada Air Danau Mahoni dengan Menggunakan Sistem Aerasi Tipe Diffuser dan Sistem Floating Wetland Skala Pilot Plant = Comparison of the Processing of Ammonia and Nitrate Compounds on Lake Mahoni Water Using Diffuser Type Aeration System and Floating Wetland System Pilot Plant Scale

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## Abstrak

Pencemaran terhadap air danau semakin marak terjadi saat ini. Dua senyawa pencemar yang umum ditemui di danau adalah amonia dan nitrat. Penerapan metode pengolahan air menjadi salah satu solusi dari masalah pencemaran air permukaan. Dua metode yang dapat digunakan adalah floating constructed wetland (FCW) dan aerasi. Tujuan penelitian ini adalah membandingkan kinerja dua metode tersebut dalam menyisihkan amonia dan nitrat serta pengaruhnya terhadap suhu, pH dan Dissolved Oxygen (DO). Dengan menggunakan skala pilot berupa dua buah reaktor yang berisi air danau Mahoni dan menerapkan dua metode berbeda yaitu aerasi dan FCW dilakukan pengamatan selama tujuh hari. Hasilnya diperoleh kemampuan dua metode tersebut dalam menyisihkan amonia tidak jauh berbeda. FCW memiliki efisiensi penyisihan amonia sebesar 85% sedangkan efisiensi aerasi sebesar 99%. Kemampuan penyisihan nitrat di kedua reaktor sangat berbeda karena reaktor FCW mampu menyisihkan 55% nitrat dalam air sedangkan aerasi justru memiliki efisiensi -41% (meningkat). Sementara itu kondisi suhu di kedua reaktor mengalami fluktuasi yang hampir sama, sedangkan untuk pH berbeda karena reaktor FCW cenderung mengalami penurunan dan reaktor aerasi justru meningkat. Konsentrasi DO di kedua reaktor juga berbeda karena pada reaktor FCW secara perlahan mengalami penurunan, sedangkan reaktor aerasi mengalami fluktuasi namun konsentrasinya cenderung meningkat.

.....Pollution of lake water is increasingly prevalent at this time. Two common pollutant compounds found in lakes are ammonia and nitrate. The application of water treatment methods is one solution to the problem of surface water pollution. Two methods that can be used are floating constructed wetlands (FCW) and aeration. The purpose of this study was to compare the performance of the two methods in removing ammonia and nitrate and their effects on temperature, pH and Dissolved Oxygen (DO). By using a pilot scale in the form of two reactors filled with Lake Mahoni water and applying two different methods, namely aeration and FCW, observations were made for seven days. As a result, the ability of the two methods to remove ammonia is not much different. FCW has an ammonia removal efficiency of 85% while an aeration efficiency of 99%. The ability to remove nitrate in the two reactors was very different because the FCW reactor was able to remove 55% of nitrate in water, while aeration had an efficiency of -41% (increased). Meanwhile, the temperature conditions in the two reactors experienced almost the same fluctuations, while the pH was different because the FCW reactor tended to decrease and the aeration reactor actually increased. The concentration of DO in the two reactors is also different because in the FCW reactor it slowly decreases, while in the aeration reactor it fluctuates but its concentration tends to increase.