

Ardiyanti, P. E., 2019. Pengaruh Arah Aliran *Roughing Filter* dan Kecepatan Filtrasi *Slow Sand Filter* dalam Menurunkan *Total Coliform* Air Sungai Amprong Kota Malang. Skripsi ini dibawah bimbingan Prof. Dr. Ir. Agoes Soegianto, DEA dan Dr. Ni'matuzahroh. Program Studi S-1 Teknik Lingkungan, Departemen Biologi, Fakultas Sains dan Teknologi, Universitas Airlangga.

ABSTRAK

Penelitian ini bertujuan untuk mengetahui konsentrasi dan efisiensi penyisihan *total coliform* hasil pengolahan air Sungai Amprong menggunakan unit *roughing filter* dan *slow sand filter*. Hasil tersebut dibandingkan dengan Peraturan Menteri Kesehatan Republik Indonesia Nomor 492/Menkes/Per/IV/2010 Tentang Persyaratan Kualitas Air Minum. Tujuan penelitian selanjutnya yaitu untuk mengetahui karakteristik bakteri lapisan *schmutzdecke*. Variasi jenis aliran *roughing filter* yang digunakan adalah *horizontal roughing filter* (HRF) dan *vertical roughing filter* (VRF) dengan kecepatan filtrasi 0,4 m/jam. Variasi kecepatan filtrasi *slow sand filter* (SSF) sebesar 0,2 m/jam dan 0,4 m/jam. Analisis *total coliform* menggunakan uji MPN. Karakteristik bakteri diamati secara makroskopis koloni dan mikroskopis sel bakteri. Konsentrasi dan penyisihan *total coliform* terbaik dihasilkan oleh unit HRF sebesar 72.700 per 100 ml sampel dan 93,39%. Konsentrasi dan penyisihan *total coliform* rangkaian unit pengolahan HRF-SSF 0,2 m/jam sebesar 4.386 koloni per 100 sampel dan 99,60%. Kualitas air olahan kombinasi reaktor *roughing filter* dan *slow sand filter* belum memenuhi baku mutu. Karakteristik bakteri lapisan *schmutzdecke* rata-rata berukuran *small*, berpigmentasi putih, berkonsistensi *opaque*, berbentuk *circular*, memiliki tepi *entire*, dan berelevasi *flat*. Bakteri tersebut terdiri dari bakteri Gram positif dan Gram negatif dengan bentuk sel terbanyak yaitu *rods*.

Kata Kunci: *Roughing filter, schmutzdecke, slow sand filter, total coliform*

Ardiyanti, P. E., 2019. *The Influence of Roughing Filter and The Filtration Rate of Slow Sand Filter to Remove Total Coliform in Amprong River, Malang City. This thesis is under the supervise of Prof. Dr. Ir. Agoes Soegianto, DEA and Dr. Ni'matuzahroh. Environmental Engineering undergraduate program, Department of Biology, Faculty of Science and Technology, Universitas Airlangga.*

ABSTRACT

This study aims to determine the concentration and efficiency allowance for total coliform results of Amprong River water treatment using the roughing filters unit and slow sand filters. The results are compared with the Regulation of the Ministry of Health of the Republic of Indonesia No. 492/Menkes/Per/IV/2010 about Regulation of Drinking Water Quality. The purpose of further research is to understand the characteristics of the bacteria in schmutzdecke. Variations from the type of roughing filter flow used was a horizontal roughing filter (HRF) and vertical roughing filter (VRF) with a filtration rate of 0,4 m/hour, respectively. The variation of filtration rate of slow sand filters (SSF) was 0,2 m/h and 0,4 m/h. Analysis of total coliform was using the MPN test. The characteristics of bacteria were observed in macroscopic colony ad microscopic cells of bacteria. The best concentration and total coliform removal was produced by the HRF unit of 72,700 per 100 ml sample and 93.39%. Concentration and removal of total coliform by HRF-SSF processing unit series 0.2 m/h amounts about 4,386 colonies per 100 samples and 99.60%, respectively. The processed water quality with the combination of roughing filters and slow sand filters did not reach the quality standard. The characteristics of bacteria in schmutzdecke were on small average size, white pigmented, opaque consistency, circular shape, had an entire edge and flat elevation. These bacteria were composed of positive-Gram and negative-Gram bacteria, mostly rods in shape.

Keywords: *Roughing filter, schmutzdecke, slow sand filter, total coliform*