

**PERANCANGAN DESAIN INSTALASI PENGOLAHAN AIR LIMBAH
(IPAL) TEKSTIL DI KALURAHAN TRIHARJO, KAPANEWON SLEMAN,
KABUPATEN SLEMAN, DAERAH ISTIMEWA YOGYAKARTA**

Oleh:

Muhammad Rizky Yunianto

114190051

INTISARI

Salah satu industri di Indonesia merupakan industri tekstil. Keberadaan industri tekstil di Desa Triharjo, Kapanewon Sleman, Kabupaten Sleman, Daerah Istimewa Yogyakarta selain menyerap tenaga kerja juga menyebabkan masyarakat sekitar menerima dampak negatif akibat pembuangan limbah cair seperti sungai berbau dan air sumur tercemar. Penelitian dilakukan untuk menganalisis kualitas dan status mutu air sungai dan airtanah di sekitar industri tekstil, mengevaluasi kualitas limbah cair industri tekstil, serta membuat arahan pengolahan untuk mengolah limbah cair industri tekstil di daerah penelitian.

Metode yang digunakan dalam penentuan titik pengambilan sampel merupakan *purposive sampling* karena untuk mengetahui kondisi air sungai dan airtanah sebelum, saat, dan sesudah outlet limbah. Penentuan titik dan pengambilan sampel air didasarkan pada kondisi penggunaan lahan serta arah aliran airtanah dan didapatkan 2 sampel air limbah, 3 sampel air sungai, dan 6 sampel airtanah. Parameter yang diuji ditentukan berdasarkan beban pencemar yang terkandung dalam limbah cair industri tekstil seperti TSS, BOD, COD, Fenol, Krom, Amonia, dan Sulfida. Airtanah dan air sungai menggunakan baku mutu air kelas I dan II pada Peraturan Pemerintah Republik Indonesia Nomor 22 Tahun 2021 yang merupakan peraturan terbaru serta pada beberapa parameter memiliki nilai yang lebih ketat. Baku mutu untuk air limbah bersumber dari Peraturan Daerah Daerah Istimewa Yogyakarta Nomor 7 Tahun 2016. Metode yang digunakan seperti Indeks Pencemaran untuk menentukan status mutu air sungai dan airtanah, Standar *Stream* untuk menentukan konsentrasi pencampuran air limbah dengan air sungai, serta Standar *Effluent* untuk menentukan target penurunan yang perlu dicapai dan unit yang diperlukan dalam IPAL.

Hasil analisis kualitas dan status mutu air sungai dan airtanah menunjukkan terdapat 1 sampel air sungai dan 3 sampel airtanah tercemar pada parameter BOD dengan status mutu masuk ke dalam kategori tercemar ringan. Hasil evaluasi kualitas limbah cair industri tekstil menggunakan standar *stream* dan standar *effluent* menunjukkan terdapat 2 parameter yang perlu dilakukan pengolahan yaitu BOD dan COD dengan target penurunan sebesar 81,1321% dan 76,3221%. Berdasarkan hasil evaluasi tersebut arahan pengolahan yang disarankan berupa pembuatan IPAL terdiri dari unit bak ekualisasi, unit koagulasi/flokulasi, unit sedimentasi, unit *constructed wetlands*, dan unit *sludge drying bed*.

Kata Kunci: Limbah Tekstil, Indeks Pencemaran, Standar *Stream*, Standar *Effluent*, IPAL

**DESIGN OF A TEXTILE WASTEWATER TREATMENT PLANT (WWTP) IN
KALURAHAN TRIHARJO, KAPANEWON SLEMAN, SLEMAN DISTRICT,
YOGYAKARTA SPECIAL REGION**

By:

Muhammad Rizky Yuniarto

114190051

ABSTRACT

One of the industries in Indonesia is the textile industry. The existence of the textile industry in Triharjo Village, Kapanewon Sleman, Sleman Regency, Yogyakarta Special Region in addition to absorbing labor also causes the surrounding community to receive negative impacts due to liquid waste disposal such as smelly rivers and polluted well water. The research was conducted to analyze the quality and quality status of river water and groundwater around the textile industry, evaluate the quality of textile industry wastewater, and make treatment directions for treating textile industry wastewater in the study area.

The method used in determining the sampling point is purposive sampling because it is to determine the condition of river water and groundwater before, during and after the waste outlet. Determination of points and water sampling is based on land use conditions and groundwater flow directions and obtained 2 wastewater samples, 3 river water samples, and 6 groundwater samples. The parameters tested were determined based on the pollutant load contained in textile industry wastewater such as TSS, BOD, COD, Phenol, Chromium, Ammonia, and Sulfide. Groundwater and river water use class I and II water quality standards in Government Regulation of the Republic of Indonesia Number 22 of 2021 which is the latest regulation and some parameters have stricter values. The quality standard for wastewater comes from the Yogyakarta Special Region Regulation Number 7 of 2016. Methods used include Pollution Index to determine the quality status of river water and groundwater, Stream Standard to determine the concentration of wastewater mixing with river water, and Effluent Standard to determine the reduction target that needs to be achieved and the units required in the WWTP.

The results of the analysis of the quality and quality status of river water and groundwater show that there are 1 river water sample and 3 groundwater samples polluted in the BOD parameter with quality status in the lightly polluted category. The results of evaluating the quality of textile industry liquid waste using stream standards and effluent standards show that there are 2 parameters that need to be treated, namely BOD and COD with a reduction target of 81.1321% and 76.3221%. Based on the results of this evaluation, the recommended treatment direction is the construction of a WWTP consisting of an equalization basin unit, coagulation/flocculation unit, sedimentation unit, constructed wetlands unit, and sludge drying bed unit.

Keywords: *Textile Waste, Pollution Index, Stream Standard, Effluent Standard, WWTP*