EVALUASI LIMBAH CAIR INDUSTRI TEKSTIL SEBAGAI USAHA PENGENDALIAN PENCEMARAN DI KECAMATAN PRINGSURAT, KABUPATEN TEMANGGUNG, JAWA TENGAH

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INTISARI

Industri tekstil yang terletak di Kecamatan Pringsurat, Kabupaten Temanggung, Provinsi Jawa Tengah merupakan pabrik tekstil yang telah berdiri pada tahun 2015, melakukan produksi kain tekstil dari bahan polos hingga menjadi kain tekstil siap jual. Limbah industri tekstil yang dihasilkan berasal dari beberapa proses kegiatan seperti stenter (proses presisi), pencelupan, *printing* (pemberian motif), *Steamer* (mematangkan warna), *Washing* (pencucian kembali) dan *finishing* (pengemasan dan distribusi). Limbah cair yang dihasilkan oleh industri tekstil berpotensi mencemari lingkungan apabila tidak dilakukan pengolahan lebih lanjut. Tujuan dilakukan penelitian ini untuk mengidentifikasi karakteristik limbah cair, air sungai dan airtanah, mengetahui tingkat pencemaran di lokasi penelitian, dan merancang model unit pengolahan limbah cair dengan menggunakan unit *constructed wetland*

Metode pengumpulan data primer dan sekunder dilakukan dengan metode survey dan pemetaan. Metode *purposive sampling* dilakukan untuk pengambilan sampel air sungai dan airtanah, serta metode *grab sampling* untuk pengambilan sampel limbah cair. Metode uji laboratorium dilakukan digunakan untuk mengetahui kualitas limbah cair, airtanah, dan air sungai. Metode matematis digunakan untuk menghitung daya tampung beban pencemaran sungai, status mutu air, debit air sungai, serta efisiensi pengolahan limbah cair skala laboratorium menggunakan unit *construced wetland.*. Metode evaluasi deskriptif digunakan untuk mengevaluasi hasil analisis seluruh data yang didapatkan dari survei lapangan, uji laboratorium, uji coba pengolahan, dan hasil perhitungan matermatis.

Hasil penelitian menunjukan kualitas limbah cair tekstil memiliki parameter BOD, COD, TSS, Fenol total, dan Sulfida. Kualitas sungai memiliki nilai indeks pencemaran sebesar yang seluruhnya termasuk kategori tercemar sedang, sedangkan kualitas airtanah memiliki nilai indeks pencemaran yang terbagi atas 2 kelas yaitu kelas tercemar sedang dan tercemar ringan. Hasil pengolahan limbah cair tekstil menggunakan unit *constructed wetland* skala laboratorium dengan variasi terbaik tanaman *Typha angustifolia* menunjukan penurunan kadar BOD sebesar 88,98%, COD 80,82%, TSS 89,51%, Fenol total 89,81%, Amonia 79,95% dan Sulfida 96,71%. Arahan pengolahan yang disarankan pada lokasi penelitian adalah penambahan unit operasi *constructed wetland* dengan sistem *sub-surface flow*

Kata Kunci : ***Sungai, Pengendalian Pencemaran, Industri Tekstil, Pencemaran Air, and Evaluasi Limbah Cair***

Evaluation of Textile Industry Wastewater Treatment as an Effort to Control River Water Pollution in Pringsurat District, Magelang Regency, Central Java

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ABSTRACT

— The textile industry located in Pringsurat Subdistrict, Temanggung Regency, Central Java Province is a textile factory that has been established in 2015, conducting textile fabric production from plain materials to become ready-to-sell textile fabrics. The resulting textile industry waste comes from several activity processes such as stenter (precision process), dyeing, printing (motif giving), Steamer (ripening colors), Washing (re-washing) and finishing (packaging and distribution). Liquid waste produced by the textile industry has the potential to pollute the environment if no further processing is carried out. The purpose of this study is to identify the characteristics of liquid waste, river water and water, find out the level of pollution at the research site, and design a model of liquid waste treatment unit using constructed wetland units.

Primary and secondary data collection methods are carried out by survey and mapping methods. Purposive sampling method is carried out for sampling of river water and water, as well as grab sampling method for sampling liquid waste. Laboratory test methods are used to determine the quality of liquid waste, water, and river water. Mathematical methods are used to calculate the capacity of river pollution load, water quality status, river water discharge, and laboratory-scale liquid waste treatment efficiency using construced wetland units. Descriptive evaluation methods are used to evaluate the results of analysis of all data obtained from field surveys, laboratory tests, processing trials, and matermatis calculation results.

The results showed the quality of textile liquid waste has parameters BOD, COD, TSS, Total Phenol, and Sulfide. River quality has a pollution index value of all that belongs to the category of moderately polluted, while the water quality has a pollution index value that is divided into 2 classes, namely the moderately polluted and lightly polluted class. The results of textile liquid waste treatment using laboratory-scale constructed wetland units with the best variation of Typha angustifolia plants showed a decrease in BOD levels by 88.98%, COD 80.82%, TSS 89.51%, Total Phenol 89.81%, Ammonia 79.95% and Sulfide 96.71%. The recommended processing directive at the research site is the addition of a constructed wetland operating unit with a sub-surface flow system.

Keywords— River, Pollution Control, Textile Industry, Water Pollution, and Wastewater Evaluation