

PENGOLAHAN AIR OVERFLOW ACRO (ASH COAL RUN OFF) POND MENGUNAKAN FILTRASI MEDIA PASIR SILIKA DAN ZEOLIT TERHADAP TSS DAN PH DI PT. X KALIMANTAN SELATAN

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INTISARI

PT. X Kalimantan Selatan merupakan perusahaan yang bergerak dibidang pembangkit listrik yang memanfaatkan batubara sebagai energi utamanya. Air *overflow Ash Coal Run Off (ACRO) Pond* di PT. X Kalimantan Selatan merupakan air limpasan berlebih dari *ash pond* dan *coal pond* yang perlu dilakukan pengolahan karena langsung dibuang ke drainase menuju sungai Asam Asam. Berfokus pada peningkatan pH dan penurunan Total Suspended Solid (TSS) menggunakan metode filtrasi *downflow* media pasir silika dan zeolit agar sesuai baku mutu berdasarkan Permen LH No. 8 Tahun 2009. Tujuan Penelitian ini adalah untuk menganalisis kualitas air *overflow ACRO pond*, mengkaji keefektifitas metode filtrasi media pasir silika dan zeolit, serta memberikan rekomendasi arahan pengolahan.

Penelitian ini menggunakan metode kuantitatif dengan tahap yaitu perolehan data, pengolahan data, dan analisis data. Metode perolehan data yaitu di dapatnya jenis data sekunder dan primer dari hasil survey lapangan, pemetaan, dan pendekatan institusi. Selain itu data juga dideroleh dari pengambilan sampel dengan metode *grab sampling* dan *purposive sampling* serta hasil dari percobaan laoratorium mengenai kualitas air *overflow ACRO pond*. Pengolahan data berupa perhitungan efektivitas, perhitungan perubahan pH, perhitungan kurva *breakthrough*, perhitungan kapasitas adsoprsi model Thomas dan perhitungan LUB (*Length of Unused Bed*). Analisis data menggunakan analisis deskriptif, komparatif, dan interpretasi kineja media.

Hasil penelitian yaitu kualitas awal air *overflow ACRO pond* pada parameter pH yaitu 6,02 dan TSS bernilai 560 mg/l. Air tersebut lalu dilakukan percobaan pengolahan dengan menggunakan filtrasi *downflow* media pasir silika dan zeolit dan menunjukkan hasil maksimal di waktu ke 60-300 menit dengan efektifitas sebesar 68,04%-88,57% yang baik dalam penurunan TSS dan meningkatkan pH paling tinggi dengan nilai efektivitas 16,45% pada menit ke 60 sesuai baku mutu air yang telah ditetapkan. Arahan pengelolaan yang direkomendasikan adalah rangkaian desain unit pengolahan berupa bak koagulasi flokulasi, bak sedimentasi, dan filtrasi. Pendekatan isnstitusi dilakukan dengan penyampain hasil penelitian kepada divisi lingkungan PT. X Kalimantan Selatan

Kata Kunci: Overflow ACRO Pond, Filtrasi, pH, TSS, Pasir Silika, Zeolit

**FILTRATION TREATMENT OF ACRO (ASH COAL RUN OFF) POND
OVERFLOW WATER USING SILICA SAND AND ZEOLITE MEDIA FOR TSS
AND PH CONTROL AT PT. X, SOUTH KALIMANTAN**

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ABSTRACT

PT. X South Kalimantan is a company engaged in the field of power generation that utilizes coal as its main energy. Ash Coal Run Off (ACRO) Pond overflow water at PT. X South Kalimantan is excess runoff water from ash and coal ponds that needs to be processed because it is directly discharged into the drainage towards the Asam Asam river. Focusing on increasing pH and reducing Total Suspended Solid (TSS) using the downflow filtration method of silica sand and zeolite media to meet the quality standards based on Permen LH No. 8 of 2009. The purpose of this study was to analyze the quality of ACRO pond overflow water, examine the effectiveness of the silica sand and zeolite media filtration method, and provide recommendations for processing directions.

This study uses a quantitative method with stages, namely data acquisition, data processing, and data analysis. The data acquisition method is to obtain secondary and primary data types from field survey results, mapping, and institutional approaches. In addition, data is also obtained from sampling using grab sampling and purposive sampling methods as well as the results of laboratory experiments on the quality of ACRO pond overflow water. Data processing is in the form of effectiveness calculations, pH change calculations, breakthrough curve calculations, Thomas model adsorption capacity calculations and LUB (Length of Unused Bed) calculations. Data analysis uses descriptive, comparative analysis, and media performance interpretation.

The results of the study are the initial quality of ACRO pond overflow water at pH parameters of 6.02 and TSS of 560 mg/l. The water was then subjected to a processing experiment using downflow filtration of silica sand and zeolite media and showed maximum results at 60-300 minutes with an effectiveness of 68.04% -88.57% which was good in reducing TSS and increasing the highest pH with an effectiveness value of 16.45% at 60 minutes according to the established water quality standards. The recommended processing direction is a series of processing unit designs in the form of coagulation flocculation tanks, sedimentation tanks, and filtration. The institutional approach was carried out by submitting the research results to the environmental division of PT. X South Kalimantan

Keywords: *Overflow ACRO Pond, Filtration, PH TSS, Silica Sand, Zeolite*