

**EVALUASI KINERJA *SEDIMENT POND* PENAMBANGAN BATUBARA PT.
TANJUNG ALAM JAYA DI DESA BATANG BANYU, KECAMATAN
SAMBUNG MAKMUR, KABUPATEN BANJAR, PROVINSI KALIMANTAN
SELATAN**

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ABSTRAK

Kegiatan penambangan batubara di PT Tanjung Alam Jaya menghasilkan air limpasan dengan kandungan sedimen tinggi yang berpotensi menurunkan kualitas lingkungan. Untuk mengendalikan dampak tersebut, perusahaan membangun *sediment pond* sebagai sarana pengelolaan air limpasan. Namun, kondisi eksisting menunjukkan kapasitas *sediment pond* tidak sebanding dengan debit limpasan sehingga mengakibatkan konsentrasi TSS tinggi dan indikasi pencemaran lingkungan. Penelitian ini bertujuan untuk menganalisis kondisi eksisting *sediment pond* di PT Tanjung Alam Jaya berupa debit air masuk dan kualitas air dengan parameter TSS dan pH, mengevaluasi kesesuaian daya tampung *sediment pond* berdasarkan SNI 6774:2008 terhadap debit limpasan, mengevaluasi kinerja *sediment pond* berdasarkan waktu detensi, beban permukaan, dan efisiensi penurunan TSS, serta memberikan rekomendasi pengelolaan berdasarkan hasil evaluasi kinerja *sediment pond*.

Metode penelitian yang digunakan berupa metode kuantitatif deskriptif. Metode penentuan titik sampling dengan *purposive sampling*. Metode pengambilan sampel air pada tahap lapangan dengan metode *grab sampling*, serta tahap laboratorium untuk mengetahui konsentrasi TSS dan pH. Analisis matematis dilakukan untuk menentukan debit limpasan menggunakan metode rasional modifikasi, distribusi Gumbel, dan metode Mononobe. Selain itu, dilakukan evaluasi teknik berdasarkan SNI 6774:2008 untuk menilai kesesuaian daya tampung dan kinerja pengendapan.

Hasil evaluasi menunjukkan debit air tambang yang masuk sebesar 1,1642 m³/s. Konsentrasi TSS pada *sediment pond* selama rata-rata tujuh hari sebesar 1.511,43 mg/L, melampaui baku mutu Peraturan Pemerintah No. 22 Tahun 2021 lampiran 6 kelas 4 sebesar 400mg/L. Waktu detensi pada kompartemen 1 dan 2 masing-masing sebesar 18,6 menit dan 4,12 menit, beban permukaan sebesar 9,70 m³/jam dan 29,11 m³/jam. Kecepatan aliran pada kompartemen 1 dan 2 tercatat sebesar 58,21 m/jam dan 174,6 m/jam, bilangan reynolds sebesar 35.834,3 dan 65.173,6 yang mengindikasikan kondisi aliran tidak ideal untuk proses sedimentasi. Beban ambang pada outlet masing-masing kompartemen sebesar 174,60 m³/jam dan 349,30 m³/jam menunjukkan potensi pelepasan sedimen yang masih tinggi dan belum memenuhi kriteria SNI 6774:2008. Oleh karena itu, redesain *sediment pond* dilakukan untuk menyesuaikan daya tampung kolam sesuai kriteria SNI 6774:2008, serta penambahan tawas 0,4 gram/L dan kapur tohor 20 gram/L dengan dosis optimal sesuai *jarrest* yang sudah dilakukan untuk meningkatkan efisiensi pengolahan sedimentasi pada *sediment pond*.

Kata kunci: kolam sedimen, air limpasan, TSS, pH, SNI 6774:2008.

**PERFORMANCE EVALUATION COAL MINING SEDIMENT POND OF PT.
TANJUNG ALAM JAYA IN BATANG BANYU VILLAGE, SAMBUNG MAKMUR
DISTRICT, BANJAR DISTRICT, SOUTH KALIMANTAN PROVINCE**

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ABSTRACT

Coal mining activities at PT Tanjung Alam Jaya produce runoff water with high sediment content which has the potential to reduce environmental quality. To control this impact, the company built a sediment pond as a means of managing runoff water. However, existing conditions show that the sediment pond capacity is not comparable to runoff discharge, resulting in high TSS concentrations and indications of environmental pollution. This research aims to analyze the existing condition of the sediment pond at PT Tanjung Alam Jaya in the form of incoming water discharge and water quality with TSS and pH parameters, evaluate the suitability of the sediment pond capacity based on SNI 6774:2008 to runoff discharge, evaluate the performance of the sediment pond based on detention time, surface load and TSS reduction efficiency, and provide management recommendations based on the results of the sediment pond performance evaluation.

The research method used is a descriptive quantitative method. The method for determining sampling points is purposive sampling. The water sampling method is at the field stage using the grab sampling method, as well as at the laboratory stage to determine the TSS and pH concentrations. Mathematical analysis was carried out to determine runoff discharge using the modified rational method, Gumbel distribution, and Mononobe method. In addition, a technical evaluation was carried out based on SNI 6774:2008 to assess the suitability of carrying capacity and settling performance.

The evaluation results show that the incoming mine water discharge is 1.1642 m³/s. The TSS concentration at the sediment pond outlet for an average of seven days was 1,511.43 mg/L, exceeding the quality standard of Government Regulation no. 22 of 2021 attachment 6 class 4 of 400mg/L. Detention times in compartments 1 and 2 were 18.6 minutes and 4.12 minutes respectively, with surface loads of 9.70 m³/hour and 29.11 m³/hour. The flow velocity in compartments 1 and 2 was recorded at 58.21 m/hour and 174.6 m/hour, and the Reynolds number was 35,834.3 and 65,173.6, which indicated that the flow conditions were not ideal for the sedimentation process. The threshold load at the outlet of each compartment is 174.60 m³/hour and 349.30 m³/hour, indicating that the potential for sediment release is still high and does not meet the SNI 6774:2008 criteria. Therefore, a redesign of the sediment pond was carried out to adjust the capacity of the pond according to the criteria of SNI 6774:2008, as well as adding 0.4 gram/L alum and 20 gram/L quicklime with optimal doses according to the jar test that had been carried out to increase the efficiency of sedimentation processing in the sediment pond.

Keywords: *sediment pond, runoff, TSS, pH, SNI 6774:2008.*