

**Pemanfaatan *Tailing* Ekstraksi Galena Untuk Pembuatan Batako
Sebagai Aplikasi *Zero Waste Material* PT. Hargosari Golden Mining
Di Kabupaten Wonogiri**

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INTISARI

Proses ekstraksi galena (PbS) di PT. Hargosari Golden Mining menghasilkan limbah *tailing* dimana memiliki kandungan logam berat yang masuk dalam kategori limbah B3 dengan kandungan Zn dan Cu melebihi baku mutu. *Tailing* ekstraksi galena berpotensi mencemari tanah samping kolam penampungan *tailing*. Penelitian bertujuan menganalisis karakteristik *tailing*, kandungan Zn dan Cu dalam tanah terdampak, menganalisis variasi komposisi campuran *tailing* dengan solidifikasi/stabilisasi terhadap kualitas batako, serta memberikan rekomendasi pengelolaan berdasarkan konsep *zero waste material*.

Pengelolaan *tailing* dengan stabilisasi/solidifikasi. Pengambilan *tailing* menggunakan teknik *grab sampling*. Tanah diambil sampel untuk diujikan dengan teknik *purposive sampling*. Kedua sampel diujikan dengan XRF. Terhadap *tailing*, diolah untuk campuran batako sebagai substitusi pasir menggunakan variasi campuran A, B, C, D, E secara berturut-turut memiliki komposisi campuran *tailing* (0%, 10%, 15%, 20%, dan 25%). Analisis yang dilakukan terhadap hasil uji adalah analisis deskriptif untuk menganalisis campuran *tailing* terhadap hasil uji penyerapan air dan kuat tekan batako, dan *Toxicity Characteristic Leaching Procedure* (TCLP).

Hasil penelitian, *tailing* mengandung Zn dan Cu melebihi baku mutu, dengan nilai Zn (63.350 mg/kg) dan Cu (13.530 mg/kg). Tanah yang diuji memiliki kandungan serupa, mengindikasikan pencemaran oleh *tailing*. Berdasarkan SNI 03-0349-1989, variasi batako campuran *tailing* paling optimum adalah variasi C (10% semen, 35% pasir, 15% *tailing* 25, kerikil, dan 15% air) dengan nilai penyerapan air di kelas mutu I dan kuat tekan tidak masuk dalam mutu I-IV sehingga perlu memperhitungkan ulang W/C dengan nilai tidak lebih dari 0,6 dan melakukan perhitungan ulang komposisi batako untuk arahan pengelolaan. Pengujian TCLP batako sampel C didapati nilai parameter Zn dan Cu secara berturut-turut <0,023 dan <0,013 dan berada di bawah baku mutu.

Kata Kunci: *Tailing*, Stabilisasi/Solidifikasi, TCLP, Zn, Cu, *Zero Waste Material*

Utilization of Galena Extraction *Tailing* for Brick Production as a Zero Waste Material Application at PT. Hargosari Golden Mining in Wonogiri Regency

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ABSTRACT

Galena (PbS) extraction process at PT. Hargosari Golden Mining produces waste tailing which contains heavy metals which are included in the B3 waste category with Zn and Cu contents exceeding quality standards. Tailing Galena extraction has the potential to pollute the soil around the holding pond tailing. The research aims to analyze characteristics tailing, Zn and Cu content in the affected soil, analyzing variations in mixture composition tailing by solidifying/stabilizing the quality of the bricks, as well as providing management recommendations based on the concept zero waste material.

Management tailing with stabilization/solidification. Retrieval tailing using techniques grab sampling. Soil samples are taken to be tested using techniques purposive sampling. Both samples were tested with XRF. To tailing, processed into a mixture of bricks as a substitute for sand using a variety of mixtures A, B, C, D, E respectively having a mixed composition tailing (0%, 10%, 15%, 20%, and 25%). The analysis carried out on the test results is descriptive analysis to analyze the mixture tailing on the results of water absorption tests and compressive strength of bricks, and Toxicity Characteristic Leaching Procedure (TCLP).

Research result, tailing contains Zn and Cu exceeding quality standards, with values of Zn (63,350 mg/kg) and Cu (13,530 mg/kg). The soils tested had similar contents, indicating contamination by tailing. Based on SNI 03-0349-1989, mixed brick variations tailing The most optimum is variation C (10% cement, 35% sand, 15% tailing 25, gravel, and 15% water) with a water absorption value in quality class I and compressive strength not included in quality I-IV so it is necessary to recalculate the W/C with a value of no more than 0.6 and recalculate the composition of the brick for management guidance. TCLP testing of sample C bricks found that Zn and Cu parameter values were respectively <0.023 and <0.013 and were below the quality standards.

Keywords: *Tailing, Stabilization/Solidification, TCLP, Zn,Cu, Zero Waste Material*