

ABSTRAK

GEOLOGI DAN STUDI PROBABILITAS TIPE LONGSORAN BERDASARKAN ANALISIS KINEMATIK PADA PIT Z DAERAH TAPIN SELATAN DAN SEKITARNYA, KABUPATEN TAPIN, PROVINSI KALIMANTAN SELATAN

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Daerah penelitian secara administratif terletak di Daerah Tapin Selatan dan sekitarnya, Kabupaten Tapin, Provinsi Kalimantan Selatan dengan lokasi secara geografis pada koordinat X: 294607 – 296075 dan Y: 9663699 – 9665172 zona 50S. Daerah penelitian merupakan konsesi tambang batubara dengan sistem penambang terbuka. Aktivitas penambangan terbuka melibatkan penggalian dan penimbunan yang akan menghadapi permasalahan mengenai kestabilan lereng. Maka dari itu, lereng tersebut perlu di analisis nilai, arah dan tipe probabilitas ketidakstabilan lereng sebab hal ini menyangkut keselamatan kerja.

Tujuan dilakukan penelitian ini untuk mengetahui kondisi geologi yang mencakup geomorfologi, stratigrafi, struktur geologi, sejarah geologi, dan mengetahui probabilitas tipe longsor lereng daerah penelitian. Metode penelitian yang digunakan berupa pemetaan geologi permukaan (*surface mapping*) dan pengambilan data *cleat* dengan metode *scanline* secara langsung di lapangan, meliputi orientasi lereng, orientasi bidang diskontinu (*cleat*), *slope*, dan sudut gesek dalam.

Berdasarkan aspek geomorfologi, daerah penelitian dibagi menjadi dua bentuk asal dan 3 bentuk lahan yaitu *sump* (A1), lahan aktivitas penambangan (A2), dan dataran denudasional (D1). Stratigrafi penyusun daerah penelitian yaitu Formasi Warukin yang dikelompokkan menjadi 2 satuan batuan dari tua ke muda, satuan batulempung Warukin dan satuan batupasir Warukin yang terendapkan pada Miosen Awal – Miosen Tengah yang terendapkan di lingkungan pengendapan *Transitional Lower Delta Plain*. Struktur geologi yang berkembang di daerah penelitian terbentuk akibat tegasan utama yang memiliki arah relatif NW-SE menghasilkan struktur kekar.

Berdasarkan hasil pengukuran *scanline* didapatkan probabilitas tipe longsor yang berpotensi pada kelima lereng daerah penelitian yaitu tipe longsor *wedge*/baji. Potensi longsor *wedge*/baji dapat terjadi dengan persentase 3,65% hingga 61,99% dan hanya lereng *scanline* 5 yang memiliki probabilitas longsor tipe *planar*/bidang sebesar 36,36% dengan arah probabilitasnya relatif N – W. Persentase probabilitas longsor tipe *wedge*/baji tertinggi pada lereng *scanline* 5 (*seam D*) dan terendah pada lereng *scanline* 3 (*seam CU*).

Kata kunci: Batubara, Formasi Warukin, Geologi, Kinematik, Scanline

ABSTRACT

GEOLOGY AND PROBABILITY STUDY OF LANDSLIDE TYPES BASED ON KINEMATIC ANALYSIS AT PIT Z IN SOUTH TAPIN AREA AND SURROUNDING AREAS, TAPIN REGENCY, SOUTH KALIMANTAN PROVINCE

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The research area is administratively located in and around South Tapin, Tapin Regency, South Kalimantan Province, geographically at coordinates X: 294607–296075 and Y: 9663699–9665172, zone 50S. The research area is a coal mining concession with an open-pit mining system. Open-pit mining activities involve excavation and backfilling, which can pose problems with slope stability. Therefore, the slope requires an analysis of the value, direction, and type of slope instability probability, as this concerns occupational safety.

The purpose of this research is to determine the geological conditions including geomorphology, stratigraphy, geological structure, geological history, and determine the probability of slope landslide types in the research area. The research method used is surface geological mapping and cleat data collection using the scanline method directly in the field, including slope orientation, discontinuous plane (cleat) orientation, slope, and internal friction angle.

Based on geomorphological aspects, the research area is divided into two original landforms and three landforms: sump (A1), mining activity area (A2), and denudational plain (D1). The stratigraphy of the study area is the Warukin Formation, which is grouped into two rock units, from oldest to youngest: the Warukin mudstone unit and the Warukin sandstone unit, deposited in the Early Miocene to Middle Miocene, within the Transitional Lower Delta Plain depositional environment. The geological structures developing in the study area were formed by major stresses trending NW-SE, resulting in a fractured structure.

Based on scanline measurements of the coal cleats, a kinematic analysis was conducted using parameters such as the general direction of the discontinuous plane (coal cleat), slope orientation, slope, and friction angle. The probability of potential landslide types on the five slopes in the study area was determined, namely wedge landslides. The potential for wedge landslides can occur with a percentage of 3.65% to 61.99% and only the scanline 5 slope has a plane-type landslide probability of 36.36% with a relatively N – W direction of probability. The highest percentage of wedge type landslide probability is on the scanline 5 slope (seam D) and the lowest is on the scanline 3 slope (seam CU).

Keywords: Coal, Warukin Formation, Geology, Kinematic, Scanline