

Penambangan batuan bersekala kecil di Indonesia umumnya dikelola oleh penambang tradisional. Salah satunya ialah tambang andesit di Bulu Alakkuang yang telah dieksploitasi kurang lebih seratus tahun. Limbah hasil tambang dialirkan langsung ke Sungai Panreng di sisi utara wilayah tambang. Limbah hasil tambang batuan mengandung partikel sedimen dimana sedimen memegang peranan penting dalam pergerakan dan akumulasi logam berat yang berpotensi menimbulkan dampak toksisitas terhadap biota. Penelitian ini bertujuan mengetahui pola penyebaran logam berat dan juga faktor-faktor yang menyebabkan penyebaran logam berat pada sedimen Sungai Panreng. Logam berat yang diteliti adalah logam Ti, Al, Fe, Mn, Cu dan Zn pada sedimen Sungai Panreng Kabupaten Sidenreng Rappang, Provinsi Sulawesi Selatan. Metode geokimia yang digunakan ialah analisis *Inductively Coupled Plasma-Atomic Emission Spectroscopy* (ICP-AES) untuk logam Cu dan Zn serta metode *X-Ray Fluorescence* (XRF) untuk logam Ti, Al, Fe, dan Mn pada 24 sampel sedimen yang diambil secara sistematis di sepanjang Sungai Panreng. Data hasil analisis geokimia kemudian dianalisis Faktor Pengkayaan (EF), Indeks Geoakumulasi ( $I_{geo}$ ), analisis statistik uji normalitas, uji korelasi, dan analisis cluster. Hasil penelitian menunjukkan bahwa kandungan logam Ti, Al, Fe, Mn, Cu dan Zn umumnya mendekati nilai kandungan logam tersebut pada Andesit. Sedangkan penyebaran logam berat pada sedimen Sungai Panreng cenderung menunjukkan tren meningkat secara tidak signifikan ke arah hilir. Hasil perhitungan Faktor Pengkayaan menunjukkan logam Ti, Cu, dan Zn mengalami pengkayaan kecil sedangkan logam Fe dan Mn tidak mengalami pengkayaan. Adapun hasil perhitungan Indeks Geoakumulasi menunjukkan bahwa keenam logam yang dianalisis termasuk ke dalam kelas sedimen tidak tercemar. Hal ini diinterpretasi sebagai akibat dari dominasi faktor geogenik dan juga adanya faktor antropogenik pada daerah penelitian.

Kata Kunci : Sungai Panreng, ICP-AES, XRF, Faktor Pengkayaan, Indeks Geoakumulasi

**ABSTRACT**

*Small-scale rock mining in Indonesia is generally managed by traditional miners. One of them is the andesite mine in Bulu Alakkuang which has been exploited for approximately one hundred years. Mining waste is channeled directly into the Panreng River on the north side of the mining area. Rock mining waste contains sediment particles where sediment plays an important role in the movement and accumulation of heavy metals that have the potential to cause toxic effects on biota. This study aims to determine the distribution pattern of heavy metals and the factors that cause the distribution of heavy metals in the sediments of the Panreng River. The heavy metals studied were Ti, Al, Fe, Mn, Cu and Zn in the sediments of the Panreng River, Sidenreng Rappang Regency, South Sulawesi Province. The geochemical method used is the Inductively Coupled Plasma-Atomic Emission Spectroscopy (ICP-AES) analysis for Cu and Zn metals and the X-Ray Fluorescence (XRF) method for Ti, Al, Fe, and Mn metals in 24 sediment samples taken systematically. along the Panreng River. The data from the geochemical analysis was then analyzed by the Enrichment Factor (EF), Geoaccumulation Index ( $I_{geo}$ ), statistical analysis of normality test, correlation test, and cluster analysis. The results showed that the metal content of Ti, Al, Fe, Mn, Cu and Zn generally approached the value of these metals in Andesite. Meanwhile, the distribution of heavy metals in the Panreng River sediments tends to show an insignificant increasing trend towards the downstream. The results of the calculation of the Enrichment Factor showed that Ti, Cu, and Zn metals were minor enrichment, while Fe and Mn metals were no enrichment. The results of the calculation of the Geoaccumulation Index show that the six metals analyzed belong to the uncontaminated sediment class. This is interpreted as a result of the dominance of geogenic factors and also the presence of anthropogenic factors in the study area.*

*Keywords: Panreng River, ICP-AES, XRF, Enrichment Factor, Geoaccumulation Index*