

ABSTRAK

KARAKTERISTIK ENDAPAN NIKEL LATERIT DAN DISTRIBUSI KOBALT (Co) PADA BLOK CAHAYA SELATAN, SULAWESI TENGGARA

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Pulau Sulawesi memiliki kondisi geologi yang kompleks akibat interaksi Lempeng Indo - Australia, Pasifik, dan Eurasia yang menghasilkan sebaran luas batuan ofiolit, khususnya *East Sulawesi Ophiolite*. Pelapukan intensif batuan ultramafik di iklim tropis menghasilkan endapan nikel laterit. Selain nikel, terdapat unsur bernilai ekonomis seperti kobalt dan logam tanah jarang. Kobalt memiliki peran penting, terutama dalam industri kendaraan listrik. Berlandaskan hal tersebut, dilakukan penelitian untuk mengkaji karakteristik endapan nikel laterit, hubungan geokimia unsur kobalt, serta distribusi vertikal dan lateralnya pada blok Cahaya Selatan, Kecamatan Rounta, Kabupaten Konawe, Provinsi Sulawesi Tenggara.

Penelitian menggunakan data *assay* hasil dari analisis *X-Ray Fluorescence* (XRF) pada 648 titik bor, data inti batuan, peta geologi lokal PT SCM, dan data *Digital Elevation Model* (DEM). Berdasarkan analisis inti batuan dan geokimia XRF, profil endapan nikel laterit di daerah penelitian terbagi menjadi zona *transported limonite*, *limonite*, *soft saprolite*, *hard saprolite* dan *bedrock*. Zona limonit menunjukkan laterisasi kuat, sedangkan zona saprolit laterisasi lemah hingga sedang. Endapan nikel laterit daerah penelitian tergolong tipe *Hydrous Mg-Silicate (saprolite type)*, dengan kobalt terkonsentrasi pada zona limonit bawah berkorelasi positif kuat terhadap MnO dan negatif kuat terhadap SiO₂ serta Fe.

Pemodelan distribusi kobalt dibuat menggunakan metode *Inverse Distance Weighting* (IDW) pada 3 meter dari bagian bawah zona limonit. konsentrasi tertinggi rata-rata terkomposit (0,25 - 0,45%) dominan di bagian barat laut, barat, timur laut, dan sebagian timur daerah penelitian. Sebaliknya, konsentrasi terendah (0,03 - 0,09%) mendominasi bagian tengah hingga tenggara daerah penelitian.

Kata kunci: Kobalt, Konawe, Laterit, Limonit, Ultramafik

ABSTRACT

CHARACTERISTIC OF NICKEL LATERITE DEPOSITS AND COBALT (Co) DISTRIBUTION IN THE SOUTH CAHAYA BLOCK, SOUTHEAST SULAWESI

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Sulawesi Island has a complex geological setting resulting from the interaction of the Indo-Australian, Pacific, and Eurasian Plates, which has led to the widespread distribution of ophiolitic rocks, particularly the East Sulawesi Ophiolite. Intensive weathering of ultramafic rocks under tropical climatic conditions has resulted in the formation of nickel laterite deposits. In addition to nickel, these deposits contain economically valuable elements such as cobalt and rare earth elements. Cobalt plays an important role, particularly in the electric vehicle industry. Based on this, this study was conducted to investigate the characteristics of nickel laterite deposits, the geochemical relationships of cobalt, and its vertical and lateral distribution in the South Cahaya Block, Rounta District, Konawe Regency, Southeast Sulawesi Province.

The study utilized assay data obtained from X-Ray Fluorescence (XRF) analyses of 648 boreholes, drill core data, a local geological map from PT SCM, and Digital Elevation Model (DEM) data. Based on drill core observations and XRF geochemical analyses, the nickel laterite profile in the study area is divided into transported limonite, limonite, soft saprolite, hard saprolite, and bedrock zones. The limonite zone exhibits strong lateritization, whereas the saprolite zones display weak to moderate lateritization. The nickel laterite deposit is classified as the Hydrous Mg-Silicate (saprolite type), with cobalt concentrated in the lower limonite zone, showing a strong positive correlation with MnO and a strong negative correlation with SiO₂ and Fe.

Cobalt distribution modelling was created by Inverse Distance Weighting (IDW) method in 3 meter of the bottom limonite zone. The highest average composite concentration (0,25 - 0,45%) dominant at the north west, west, north east, and east part research area. Instead of, the lowest concentration (0,03 – 0,09%) dominant at the middle until south east research area.

Keywords: Cobalt, Konawe, Laterite, Limonite, Ultramafic