

ABSTRAK

KARAKTERISASI ENDAPAN NIKEL LATERIT BERDASARKAN HASIL KORELASI DATA *ELECTRICAL RESISTIVITY TOMOGRAPHY*, BOR & GEOKIMIA DI AREA PROSPEK “AR”, KECAMATAN POMALAA, KABUPATEN KOLAKA, SULAWESI TENGGARA

Arya Raihan Nugroho Ruslan
115.190.029

Sistem energi dunia sedang berada di masa transisi, dari energi berbasis fosil menjadi energi terbarukan (*renewable energy*), sehingga memungkinkan terjadinya peningkatan dalam penggunaan energi terbarukan, seperti kendaraan listrik yang menggunakan sumber energi utama berupa baterai, dimana salah satu unsur penyusunnya adalah nikel laterit. Kegiatan eksplorasi nikel laterit telah dilakukan di IUP Eksplorasi PT. Aneka Tambang Tbk. yang terletak di Kecamatan Pomalaa, Kabupaten Kolaka, Sulawesi Tenggara. Metode yang digunakan dalam eksplorasi nikel laterit salah satunya adalah metode *Electrical Resistivity Tomography* yang diintegrasikan dengan data bor dan geokimia, sehingga diharapkan dapat memetakan dan menentukan batasan ideal dari setiap zona, serta melakukan karakterisasi berdasarkan setiap unsur kimia dan nilai resistivitas pada setiap kedalamannya untuk kemudian dapat ditentukan karakteristik dari endapan nikel laterit pada daerah penelitian. Penelitian ini menggunakan metode ERT konfigurasi *Wenner* yang dilengkapi dengan data bor eksplorasi dan geokimia, dengan total luas area pengukuran sebesar $\pm 110,47 \text{ km}^2$. Profil endapan nikel laterit di daerah penelitian terbagi menjadi 3 (tiga) klasifikasi, yaitu zona *saprolite* dengan nilai resistivitas *low* (di bawah $35 \Omega\text{m}$), zona *saprolite rock* hingga (dan/atau memiliki kandungan) *boulder* dengan nilai resistivitas *medium* (dengan *range* $35 - 65 \Omega\text{m}$), serta zona *bedrock* berupa batuan *peridotite* dengan tingkat serpentinisasi, rekahan (*fracture*) dan pelapukan yang relatif tinggi, dengan nilai resistivitas *high* (di atas $65 \Omega\text{m}$). Area penelitian terbagi menjadi 3 (tiga) karakteristik, yaitu *West dan East Block* dengan kadar unsur Ni rendah (di bawah 1,3%) dan tinggi (di atas 1,3%), serta *Central Block* dengan dominasi kadar unsur Ni relatif rendah (di bawah 1,3%). Pemodelan bawah permukaan (*geo-electrical layer model*) yang dihasilkan terbagi menjadi *upper (very conductive) layer* ($0 - 35 \Omega\text{m}$) yang diinterpretasikan sebagai lapisan *saprolite*, *lower (conductive to semi-resistive) layer* ($35 - 65 \Omega\text{m}$) yang diinterpretasikan sebagai lapisan *saprolite rock to boulders*, dan *resistivite layer* ($>65 \Omega\text{m}$) yang diinterpretasikan sebagai zona *fractured bedrock* berupa batuan *peridotite*.

Kata Kunci: Endapan Nikel Laterit, *Electrical Resistivity Tomography* (ERT), Konfigurasi *Wenner*, *Geo-electrical Layer Model*, Resistivitas, Pomalaa

ABSTRACT

NICKEL LATERITE DEPOSITS CHARACTERIZATION BASED ON ELECTRICAL RESISTIVITY TOMOGRAPHY, DRILLING & GEOCHEMISTRY DATA CORRELATIONS IN THE "AR" PROSPECT AREA, POMALAA DISTRICT, KOLAKA REGENCY, SOUTHEAST SULAWESI

**Arya Raihan Nugroho Ruslan
115.190.029**

The world energy system is in a transition period, from fossil-based energy to renewable energy, making it possible to increase the use of renewable energy, such as electric vehicles which use the main energy source in the form of batteries, where one of the constituent elements is nickel laterite. Nickel laterite explorations have been carried out at the IUP Exploration of PT. Aneka Tambang Tbk. which is located in Pomalaa District, Kolaka Regency, Southeast Sulawesi. One of the methods used in laterite nickel exploration is the Electrical Resistivity Tomography method which was integrated with drill and geochemical data, so it was hoped that it could map and determine the ideal boundaries of each zone, as well as carry out characterization based on each chemical element and resistivity value at each depth so that the characteristics of nickel laterite deposits in the research area could then be determined. This research used the Wenner configuration of ERT method which was equipped with exploration and geochemical drill data, with a total measurement area of $\pm 110.47 \text{ km}^2$. The profile of nickel laterite deposits in the research area is divided into 3 (three) classifications, namely the saprolite zone with low resistivity values (below $35 \Omega\text{m}$), the saprolite rock zone to (and/or containing) boulders with medium resistivity values (in the range $35 - 65 \Omega\text{m}$), as well as the bedrock zone in the form of peridotite rocks with relatively high levels of serpentinization, fracture and weathering, with high resistivity values (above $65 \Omega\text{m}$). The research area is also divided into 3 (three) characteristics, namely West and East Block with low (below 1.3%) and high (above 1.3%) Ni element levels, as well as the Central Block with relatively low levels of Ni content (under 1.3%). The subsurface modeling (geo-electrical layer model) is divided into upper (very conductive) layer ($0 - 35 \Omega\text{m}$) which is interpreted as the saprolite layer, lower (conductive to semi-resistive) layer ($35 - 65 \Omega\text{m}$) which is interpreted as the saprolite rock to boulders layer, and resistivite layer ($>65 \Omega\text{m}$) which is interpreted as the fractured bedrock zone in the form of peridotite rocks.

Keyword: *Nickel Laterite Deposits, Electrical Resistivity Tomography (ERT), Wenner Configuration, Geo-electrical Layer Model, Resistivity, Pomalaa*