

Pemodelan dan Estimasi Endapan Nikel Laterit Menggunakan Metode Ordinary Kriging di Daerah Langgikima, Sulawesi Tenggara = Modeling and Estimation of Laterite Nickel Deposits Using Ordinary Kriging Method in Langgikima Area, Southeast Sulawesi

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Abstrak

Penelitian berlokasi di daerah Langgikima, Konawe Utara, Sulawesi Tenggara. Tujuan dari penelitian ini yaitu untuk memetakan zona profil laterit berdasarkan hasil domainning serta mengestimasi kadar dan tonase nikel laterit yang terdapat di daerah penelitian. Metode pengolahan dan analisis data meliputi analisis statistik univarian serta metode ordinary kriging. Unsur yang diestimasi meliputi Ni, Co, Fe, SiO₂, dan MgO dengan variogram model yang digunakan yaitu Ni sebagai variabel utama. Data yang digunakan berupa data sekunder yang mencakup collar, survey, dan assay serta menggunakan foto core sebagai data penunjang untuk validasi. Domain geologi pada penelitian ini terbagi menjadi 3, yaitu limonit, saprolit, dan bedrock. Limonit dan saprolit termasuk kedalam zona mineralisasi yang akan diestimasi. Densitas limonit sebesar 1.6 gr/cm³ dan saprolit 1.5 gr/cm³. Klasifikasi sumberdaya didasarkan pada jarak antar spasi bor dan parameter geostatistik slope of regression. Hasil klasifikasi dengan menggunakan cut off grade 1% menunjukkan daerah penelitian terdiri atas kelas terukur. Domain limonit menghasilkan volume sebesar 1,697,891 m³ dan tonase 2,716,625 ton dengan kandungan rata-rata Ni sebesar 1.31%, Co 0.1%, Fe 45.42%, SiO₂ 9.01%, dan MgO 1.13%. Domain saprolit menghasilkan volume sebesar 964,063 m³ dan tonase 1,446,094 ton dengan kandungan rata-rata Ni sebesar 1.69%, Co 0.04%, Fe 20.93%, SiO₂ 33.52%, dan MgO 14.92%. Kategori terukur menandakan pada daerah penelitian memiliki tingkat keyakinan geologi yang tinggi untuk membuktikan kemenerusan kadar dan kandungan mineral serta memiliki nilai yang ekonomis untuk ditambang.

.....The research is located in Langgikima, Nort Konawe, Southeast Sulawesi. The purpose of this study was to map the laterite profile zones based on the results of domainning and to estimate the grades and tonnage of laterite nickel found in the study area. Data processing and analysis methods include univariate statistical analysis and ordinary kriging methods. The estimated elements include Ni, Co, Fe, SiO₂, and MgO with the variogram model used, Ni as the main variable. The data used is in the form of secondary data which includes collars, surveys, and assays and uses core photos as supporting data for validation. The geological domain in this study is divided into 3, namely limonite, saprolite, and bedrock. Limonite and saprolite are included in the mineralized zone to be estimated. The density of limonite is 1.6 gr/cm³ and that of saprolite is 1.5 gr/cm³. Resource classification is based on the distance between drill spacing and the slope of regression geostatistical parameters. Classification results using 1% cut off grade show that the study area is composed of measurable classes. The limonite domain produces a volume 1,697,891 m³ and tonnage of 2,716,625 tons with an average content of 1.31% Ni, 0.1% Co, 45.42% Fe, 9.01% SiO₂, and 1.13% MgO. The saprolite domain produced a volume of 964,063 m³ and tonnage of 1,446,094 tons with average content of 1.69% Ni, 0.04% Co, 20.93% Fe, 33.52% SiO₂, and 14.92% MgO. The measured category indicates that the research area has a high level of geological confidence to prove the continuity of grades and mineral content and has economic value for mining.