ABSTRACT

This study aims to estimate the grade value of nickel using geostatistic method and calculate nickel ore resources in the study area, also analysis the effect of variogram models, variogram parameters and block size on the estimation of nickel ore in the Moronopo area, Maba District, East Halmahera Regency, North Maluku Province. The method used in this study is the ordinary kriging (OK).

Accuracy in estimating will be compared using cross validation and will produce root mean square error (RMSE) and linear regression values. In this study the data used are data from detailed exploration drill activities of 488 drill holes with 9662 composite levels per one meter.

Cross validation resulted RMSE value at 0.261 and R^2 value at 0.8345. Resource calculations were calculated based on the cut off grade (COG) 1.30% Ni, resulting measured and indicated resources at 3,595,577 tons and inferred resources at 4,605,679 tons with an average nickel grade content is 1.93% Ni.

The selection of the variogram model will affect the data sreening effect. Changing the sill value does not affect the estimation results. Increasing the nugget effect will cause narrower data distribution. Incorrect range choice will cause an estimated value of zero. Block size with the best estimated results is a block with size 12.5m x 12.5m x 6m.

Cut Off grade analysis results show that using a lower cut off grade obtained greater resources but lower average grade value while using higher cut off grade resulting lower resources but greater average grade value.