

ABSTRACT

Hydrogeology conditions of a mining area should be well known to support the continuity of the next phase of activity. Therefore, in anticipation to do an open pit mine planning for nickel ore in Pakal Island, District of Buli, Regency of East Halmahera, Province of North Maluku, PT.Aneka Tambang Tbk, take a research study of hydrogeology. Research area in geography located at $00^{\circ}45' - 01^{\circ}00'$ LU and $128^{\circ}15' - 128^{\circ}21'$ BT.

Hydrogeology studies were conducted to determine the condition hydrology and hydrogeology in Pakal Island, District of Buli, Regency of East Halmahera, Province of North Maluku. Hydrology conditions known by the processing of rainfall data from PT.Aneka Tambang Tbk, determination of plans rainfall, determination of Rain Catchment Area (DTH), and discharge water runoff. Hydrogeology characteristics in Grizzly 1 and North Mine Plan done by testing with *slugtest* method, quality and quantity analysis samples of river water and ground water. Where results of hydrology and hydrogeology recommendation to use for the system draining of mine.

Data of the rainfall got from PT.Aneka Tambang Tbk, East Halmahera for ten years since 2000-2009 with an average of highest rainfall in 2001 is 593,20 mm/month and the lowest average rainfall in 2004 is 6,00 mm/month. From the data of rainfall, plans of rainfall are in three years period is 38,564 mm with intensity 8,42 mm/hour and five years period is 52,126 mm with intensity 11,38 mm/year. Researched area including in normal rainfall. The research area located in Grizzly 1 and North mine Plan with the value of water discharge runoff range $0,65 \text{ m}^3/\text{hour}$ and $0,80 \text{ m}^3/\text{hour}$.

Aquifer parameters getting by drilling to test the *slugtest*. Based on the results of the aquifer test on two drill holes in the ground with the *slugtest* method get the value of permeability or hydraulic of conductivity (K) in Grizzly 1 are $2,95 \times 10^{-6} \text{ m/s}$ and $7,52 \times 10^{-6} \text{ m/s}$ and North Mine Plan are is $2,00 \times 10^{-6} \text{ m/s}$ its include in moderate class from table of classification conductivity hydrolic. Potential groundwater in aquifers around the area of the drill holes Grizzly 1 are $0,04 \text{ m}^3/\text{sec}$ and $0,16 \text{ m}^3/\text{sec}$, in North Mine Plan is $0,04 \text{ m}^3/\text{sec}$, also Potential ground water on each of drill holes are 0,0207 liter/second, 0,053 liter/second, dan 0,0204 liter/second. The quality of rivers water and groundwater are general relatively well because overall water samples were below the threshold limit by Peraturan Menteri Lingkungan Hidup No.34 tahun 2009.