

## **ABSTRACT**

*PT. Stargate Pasific Resources is located in the Sub-district Langgikima, District North-Konawe, Southeast Sulawesi. One of the running site is located in A7. The selected mining system for Nickel excavation is surface mining with Open Cash method.*

*Surface mining is likely affected by local weather condition, particularly rainfall. When the extreme weather condition occurs, such as heavy rainfall, the runoff can potentially flood the mining area and flow into the ramp, as well to the lower area nearby. Therefore, it is necessary to make an adequate design for mine drainage system which suits the mining condition, so that the mining operations can be run properly. The planning drainage system design is a combination of mine drainage system and mine dewatering system.*

*Based on the analysis of rainfall data from 2007 – 2016, the researcher is able to calculate the scheduled precipitation value by 98,37mm/day. The intensity of rainfall has been calculated into 34,10mm/hour during 2-years rainfall period and the percentage of hydrological risk is 93,75%. Catchment area of the research are divided into two catchments (DTH) as follows : DTH I = 0,0784Km<sup>2</sup>, DTH II = 0,0510Km<sup>2</sup> and DTH III = 0,0176Km<sup>2</sup>. The calculation of discharge runoff in each catchment areas are presented as follows : DTH I = 0,44m<sup>3</sup>/sec, DTH II = 0,33m<sup>3</sup>/sec and DTH III = 0,11m<sup>3</sup>/sec .*

*In order to restrain rainwater from entering the mining area and canalize the runoff to settling pond, it is necessary to develop open channels all around the perimeter mine site. There are 3 open channels with the same dimensions:*

*Open Channel 1 :  $b = 2,17m$ ;  $B = 1,09m$ ;  $d = 1,14m$ ;  $h = 0,95m$ ;  $a = 1,31m$*

*Open Channel 2 :  $b = 2,17m$ ;  $B = 1,09m$ ;  $d = 1,14m$ ;  $h = 0,95m$ ;  $a = 1,31m$*

*Open Channel 3 :  $b = 2,17m$ ;  $B = 1,09m$ ;  $d = 1,14m$ ;  $h = 0,95m$ ;  $a = 1,31m$*

*The canalized runoff from the open channel must be treated in the settling pond first before being discharged into river. Settling pond design consists of three spaces of compartments. The area of each compartment is 325m<sup>2</sup> with the total volume of 2.685m<sup>3</sup>. The settling pond maintenance should be done periodically every 7 months.*