

## ABSTRAK

PT J Resources Bolaang Mongondow merupakan perusahaan yang bergerak dalam bidang pengolahan emas dengan proses *heap leach* menggunakan metode *dynamic cell*. Namun saat ini akan dilakukan perubahan menjadi metoda *static cell* sehingga akan berpengaruh terhadap strategi operasional diantaranya *application rate*. Oleh karena itu pada penelitian ini dilakukan *testwork* untuk mengetahui *application rate* yang terbaik untuk dapat digunakan dalam proses *static cell*, mempelajari pengaruh *application rate* terhadap kinetika pelindian, nilai persen ekstraksi emas, serta konsumsi sianida. Tahapan penelitian meliputi preparasi dan pengujian sampel *head assay*, *leaching*, dan preparasi serta pengujian sampel *tailing* menggunakan metode *column test*. Adapun kadar rata-rata bijih 0,52 g/t termasuk dalam tipe *low grade*. Variasi *application rate* yang digunakan yaitu 20 L/m<sup>2</sup>/h, kombinasi 20 & 10 L/m<sup>2</sup>/h, dan 10 L/m<sup>2</sup>/h. *Pregnant leach solution* yang diperoleh perharinya dilakukan pengecekan pH, sianida bebas, dan analisis kandungan logam untuk perhitungan persen ekstraksi secara *back calculated*. Dari hasil penelitian didapatkan *application rate* 20 L/m<sup>2</sup>/h dan *application rate* kombinasi 20 & 10 L/m<sup>2</sup>/h memiliki kinetika pelindian *primary leaching* yang lebih cepat dibandingkan dengan *application rate* 10 L/m<sup>2</sup>/h. Analisis persen ekstraksi *application rate* 10 L/m<sup>2</sup>/h memiliki persen ekstraksi paling tinggi yaitu 89% (0,2081 mg/L emas). Sedangkan secara berturut-turut *application rate* kombinasi 20 & 10 L/m<sup>2</sup>/h sebesar 88% (0,1889 mg/L) dan *application rate* 20 L/m<sup>2</sup>/h sebesar 87% (0,1204 mg/L). *Application rate* juga diketahui berdampak terhadap konsumsi sianida, dimana *application rate* 20 L/m<sup>2</sup>/h memiliki konsumsi sianida yang lebih tinggi yaitu 0,13 g/t. Sedangkan untuk *application rate* kombinasi 20 & 10 L/m<sup>2</sup>/h dan 10 L/m<sup>2</sup>/h memiliki konsumsi sianida masing-masing sebesar 0,081 g/t dan 0,067 g/t. Dari hasil penelitian dapat disimpulkan *application rate* terbaik adalah kombinasi 20 & 10 L/m<sup>2</sup>/h, dilihat dari faktor kinetika pelindian maupun persen ekstraksi yang diperoleh. Disisi lain, volume larutan yang dihasilkan juga lebih sedikit sehingga dapat meminimalisir terjadinya longsor pada *leach pad*.

**Kata kunci:** *Application Rate*, Ekstraksi Emas, *Column Test*.

## **ABSTRACT**

*PT J Resouces Bolaang Mongondow is a company engaged in gold processing with the heap leach process using the dynamic cell method. However, currently there will be a change to the static cell method so that it will affect the operational strategy including the application rate. Therefore, in this research, testwork was carried out to determine the best application rate to be used in the static cell process, studying the effect of application rate on leaching kinetics, percent gold extraction value, and cyanide consumption. The research stages include preparation and testing of head assay samples, leaching, and preparation and testing of tailings samples using the column test method. The average ore grade of 0.52 g/t is included in the low grade type. The application rate variations used were 20 L/m<sup>2</sup>/h, a combination of 20 & 10 L/m<sup>2</sup>/h, and 10 L/m<sup>2</sup>/h. Pregnant leach solution obtained per day is checked for pH, free cyanide, and metal content analysis for back calculated extraction percent. The results showed that the application rate of 20 L/m<sup>2</sup>/h and the combined application rate of 20 & 10 L/m<sup>2</sup>/h have faster primary leaching kinetics compared to the application rate of 10 L/m<sup>2</sup>/h. Analysis of the percent extraction of application rate 10 L/m<sup>2</sup>/h has the highest percent extraction of 89% (0.2081 mg/L gold). While successively the application rate combination of 20 & 10 L/m<sup>2</sup>/h was 88% (0.1889 mg/L) and the application rate of 20 L/m<sup>2</sup>/h was 87% (0.1204 mg/L). Application rate is also known to have an impact on cyanide consumption, where the application rate of 20 L/m<sup>2</sup>/h has a higher cyanide consumption of 0.13 g/t. Meanwhile, the application rate combination of 20 & 10 L/m<sup>2</sup>/h and 10 L/m<sup>2</sup>/h had cyanide consumption of 0.081 g/t and 0.067 g/t, respectively. From the results, it can be concluded that the best application rate is the combination of 20 & 10 L/m<sup>2</sup>/h, judging from the leaching kinetics factor and the percent extraction obtained. On the other hand, the volume of solution produced is also less so that it can minimize the occurrence of landslides on the leach pad.*

**Keywords :** *Application Rate, Gold Extraction, Column Test.*