

INDONESIAN MINING JOURNAL

ISSN 0854 - 9931

Volume 17, No. 2, June 2014

Abstract Index

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A Geophysical Prospecting Using Induced Polarization Method on Gold-Bearing Sulfide Deposits at Pasawahan Area, Simpunan Sub-District, Sukabumi District, West Java

Penyelidikan Geolistrik Polarisasi Terimbas pada Sebaran Emas Daerah Pasawahan, Kecamatan Simpunan, Kabupaten Sukabumi, Jawa Barat

**IMJ, Vol. 17, No. 2, June 2014,
P. 53 - 62**

Induced polarization (IP) is a geophysical imaging technique used to identify sulfidized sedimentary rocks in the form of quartz veins in Pasawahan, Sukabumi District, West Java. The voltage is then monitored through two other electrodes. The sulfide is a lense shape with resistivity of 1 – 10 Ω and induced polarization of 130 – 150 m sec. It is included in a 300,000-ton quartz vein.

Keywords: resistivity, induced polarization, sulfide, lenses, resource

with SF = 1,523. Slope stability simulation at the high-wall shows that the previous design with the overall slope 450 is stable for SF = 2.418. It is not necessary to change previous design. However, to guaranty safety condition along mining area, it is recommended to make safety-berm to prevent the rocks enter the area.

Keywords: coal mining, slope stability

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The Behaviour of Heavy Metals Content in Coal Combustion Products (CCPs) and Its Leachate from Indonesia Coal Power Plants

Sifat Kandungan Logam Berat pada Limbah Pembakaran Batubara dan Air Lindiannya dari Pembangkit Listrik Tenaga Uap (PLTU) di Indonesia

**IMJ, Vol. 17, No. 2, June 2014,
P. 75 - 86**

The development of many coal power plants in Indonesia has been creating Coal Combustion Products (CCPs) in a huge amount. The generating coal power plant will increase dramatically from 50 to 320 TWh in 2020. It is predicted that the total CCPs will be nearly 10.8 million tons in the same year. The large quantity of Indonesia CCPs will likely increase drastically and potentially will be a serious problem in the future. This research aims to measure heavy metals content in coal and CCPs, to assess their distribution in leachate and investigate the concentration level of heavy metals in leachate using TCLP method, and also to analyze the correlation between heavy metals content in coal, CCPs, and CCPs leachate using Pearson analysis.

The analysis results show that the dominant element content in coal was boron. Moreover, the distribution of heavy metals tended to enrich fly ash. The concentration level of heavy metals fly ash and bottom ash leachates from all the power plants generally was much lower than the standard threshold. The significant level of concentration on fly ash and bottom ash was shown by boron. The concentration levels of heavy metals of coal ash leachates from two power plants were also much lower than the standard limit. The correlation between the heavy metals content of parent coal and CCPs pointed to no correlation between the variables. The heavy metals content of coal had no correlation with the concentration of heavy metals in CCPs leachate excluding nickel and chromium in bottom ash. Finally, it is recommended to assess other heavy metals concen-

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Geotechnical Investigation for Evaluating Coal Mining Design of Pit A at Kutai Kertanegara, East Kalimantan

Penyelidikan Geoteknik untuk Mengevaluasi Disain Penambangan Batubara Pit A di Kabupaten Kutai Kertanegara, Provinsi Kalimantan Timur

**IMJ, Vol. 17, No. 2, June 2014,
P. 63 - 74**

Due to the occurrence of slope failure at Pit A, on both side-wall and low-wall geotechnical study had been conducted to evaluate the slope stability whether the mining can be continued through the end of mine life or not. Slope stability modeling using Limit Equilibrium method shows that coal mining is feasible to reach the depth of $\pm$ 50m as stated in a previous plan. The previous design for sidewall has the overall slope of 400. This is not a stable condition with Safety Factor (SF) = 1.050. As a result, evaluation of slope design must be conducted. The simulation shows that the slope must be changed to 300 in terms of reaching stable condition with SF = 1.539. Previous design of the low wall that has the overall slope of 300 is stable with the SF = 1.359 however, as the area is near settlements and Mahakam River, the pit slope must be reduced to 250

tration such as arsenic, mangan and selenium in CCPs leachate and further conduct a long-term study about the characteristics, leaching behavior of heavy metal leachate and, their effects on the environment.

Keywords: heavy metals, coal combustion products, leachate, heavy metals distribution

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Improving Tapin Kaolin Quality for White Ware Ceramic

Peningkatan Kualitas Kaolin Tapin untuk Barang Keramik Putih

**IMJ, Vol. 17, No. 2, June 2014,
P. 87 - 97**

Tapin kaolin cannot directly be utilized as raw material for white ware ceramics due to its high Fe_2O_3 content. It needs upgrading its quality in terms of fulfilling the specification of white ware ceramics. Such the material requires a series of process including washing, wet sieving in magnetic ferro-filter equipment and then dissolving by H_2SO_4 10%. Based on several parameters such as Al_2O_3 , SiO_2 and Fe_2O_3 contents, 2- μm particle size density, whiteness and plasticity; Tapin kaolin quality develops significantly. XRD analysis shows that the material does not have maghemite anymore. Quartz is relatively low and mafic minerals are unavailable. Referring to such quality, Tapin kaolin can be used for Parian porcelain.

Keywords: Tapin kaolin, upgrading, white ware ceramics, and Parian porcelain

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Kinetics Analysis for Aluminum Dissolution of West Kalimantan Bauxite Through Digestion Process

Analisis Laju Reaksi Pelarutan Aluminum dari Bauksit Kalimantan Barat

**IMJ, Vol. 17, No. 2, June 2014,
P. 98 - 112**

Kinetics model was developed for aluminum dissolution of West Kalimantan bauxite based on shrinking core model. A series of digestion tests was carried out to study aluminum dissolution from the ore sample with particles size distribution of 100% passing 60 mesh in 129 g/L of NaOH. The digestion tests were conducted at 140; 150 and 160°C under stirring speed of 500 rpm. The experimental result shows that after a certain period of digestion time, thus aluminum dissolution was fluctuated due to the formation of DSP as a result of the reaction of sodium aluminate solution with reactive silica in the ore. Aluminum dissolution data were analyzed and treated with Matlab software to predict time required for complete dissolution (τ). By using the obtained τ , hence fittings experimental data using 3 different rate-determining steps of kinetics models (i.e. interface reaction, film diffusion and diffusion through solid product layer) and dummy data were performed. Prediction of the rate-determining step of aluminum dissolution was then made by evaluating the value of square correlation coefficient (R^2) from the regression equation of the models and then obtained the activation energy. The kinetics study which considers aluminum precipitation during digestion reveals that alumina dissolution mechanism is altered from interface chemical reaction with energy activation (E_a) of 29.57 kcal/mole to diffusion through reaction product (ash) layer ($E_a = 2.77$ kcal/mole).

Keywords: bauxite, aluminum, kinetics model, activation energy, desilication product (DSP)