

ABSTRACT

The Ngrayong Formation is a formation dominated by clean sand lithology, this formation is the main reservoir in the Rembang zone, especially the Cepu area. The research area is in the "REZ" Field, Ngrayong Formation, North East Java Basin. The Middle Miocene Ngrayong Formation is one of the important formations in the oil and gas industry in the North East Java Basin because of its potential to store hydrocarbons. Therefore, it is interesting to carry out research so that production fields can be found through the reservoir zone identification stage by knowing the petrophysical parameters.

This research was carried out by carrying out 2 analyses, namely qualitative analysis and quantitative analysis. Qualitative analysis was carried out by analyzing the lithology found in the Ngrayong Formation, then analyzing the stratigraphic sequence and also determining the facies and depositional environment found in the Ngrayong Formation. Meanwhile, quantitative analysis was carried out using petrophysical analysis which aims to determine the hydrocarbon prospect zone which was carried out at 2 well points, namely REZ - 001, and REZ - 025 which are spread across the "REZ" Field. Determination of hydrocarbon prospect zones is carried out to obtain the main reservoir potential which is carried out by identifying research zones based on system tracts, calculating the values of petrophysical parameters, and knowing the cut-off values of these petrophysical parameters.

Based on qualitative analysis, it was found that the facies formed in the research area were Calcareous Sandstone Channels, Laminated Shale, and Interlaminated Shale & Sand facies. The depositional environment of the research area is Tidal Flat (Transitional). Then the research zones in the "REZ" field are based on the tract system, namely zones L2, L4, B-2/B.NGR and SB-2/B.NGR. Meanwhile, for quantitative analysis, the petrophysical value was obtained, namely shale volume of 3%, effective porosity with a value of 25.1%, water saturation of 47% and permeability of 7023,373 mD, which is in the very good category according to Koesoemadinata, 1980.

Keywords : *North East Java Basin, Ngrayong Formation, Petrophysical Calculations, Hydrocarbon Prospect Zone.*