

Analysis of Source Rock and Hydrocarbon Filling Volcanic Reservoir in Indonesia

Benyamin¹

¹SKK Migas, Jakarta, Indonesia

ABSTRACT

Indonesia as a country that is located on the Ring of Fire consists of a series of islands that has a series of volcanic mountain outspread from West to East tip of the country. Attention to very active volcanic activities at the moment and by using the concept of The Present is the Key to the Past, it can be ascertained that in the past there is volcanic activity generating deposits pyroclastic currently buried and serves as not only water reservoir yet hydrocarbon reservoir is also proven by the discovery of volcanic reservoirs containing oil and gas in Indonesia. For more than four decades, pyroclastic rocks consisting of tuff, volcanic breccias and lava has proven to be oil reservoir with reserves and significant cumulative production and at the same time become one of the mainstay's reservoir in Indonesia. As the oil reservoir, pyroclastic rocks have unique characteristics, not only on the distribution pattern vertically and horizontally, but also the reading log response that is very different from conventional reservoirs.

The exploration activities to increase the discovery of reserves in the current volcanic reservoir are one of the greatest challenges faced by the oil company in Indonesia. Although it is believed that Indonesia is part of the "ring of fire" that produce a lot of volcanoes product and has been proven as an oil reservoir, but in fact that exploration in volcanic reservoir is not as easy as expected.

There are two main factors that cause difficulty in volcanic reservoir exploration in Indonesia that is the paradigm that the oil only trapped in the anticline structure and the hydrocarbon source rock that fill the reservoir must be derived from shale or carbonate rocks and it is impossible comes from the volcanic rocks itself. Nowadays, the first paradigm is starting to be abandoned when it was realized that not all the pyroclastic rocks serve as a reservoir rock. Pyroclastic rocks that serve as a reservoir in general is a crannied Tuff because it is less resistant it will generally be in anticline wing, meanwhile the height of anticline will consist of volcanic breccias and or lava.

This paper discusses about the analysis of source rock, qualitatively and quantitatively in volcanic rocks and its relation to the possibility of charging "in situ" reservoir in the oil field which is also composed of volcanic rocks. From qualitative and quantitative analysis performed on approximately 15 drilled wells that penetrate the volcanic reservoir showed positive results that the volcanic interval indication that volcanic rocks can serve as source rock. Thus, there is a possibility that the oil that fill volcanic reservoir derived from volcanic rocks itself and not from far located shale or carbonate rocks.

This analysis is expected to be able to change the concept of exploration in volcanic rocks which firstly use concept that the source rock only comes from shale and carbonate into their source rock concept which also comes from volcanic rocks.