Determination of Tanggamus Geothermal Prospect Area, Lampung Province, South Sumatra Based on Remote Sensing and 3D Micromine Software

Dewi Gentana, Emi Sukiyah, M. Lobo Balia, Nana Sulaksana and Euis Tintin Yuningsih (Indonesia)

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SUMMARY

Geothermal has big potential in Indonesia because it is in the Ring of Fire. Indonesia has around 40% of global geothermal potential, however, only ±7% of identified potential being utilized. The research was conducted in one of the geothermal prospect areas in Indonesia which entered Tanggamus District of Lampung Province in South Sumatera. This research carried out using studio and field observation methods. In studio, remote sensing interpretation by using topography and landsat imaginary maps and application of 3D micromine software and also doing field observation to provide valid data information.

The purpose of this study is to evaluate the relation between structure geology and the distribution of geothermal surface manifestation based on landsat image and topographic maps with application of 3D micromine software. Interpretation of landsat and topography maps indicated that the Tanggamus geothermal prospect area controlled by a regional structure showing the trend direction of the surface temperature calculated from the landsat image 8 has range of > 50°C.

Based on landsat image analysis in the study area found a phenomenon that supports the remnants of volcanic eruption which shows that in this research area located in the depression area and shows the crater phenomenon with the appearance of circular structures.

The geothermal potential indication can be observed in field from geothermal manifestation on the surface, such as altered rock, hot spring, sulfates, and fumarole express the evidence of geothermal activity, indicating that the hydrothermal fluid originating from the reservoir has come out through the opening of structures or units of permeability rocks. In this geothermal prospect area the surficial thermal manifestations are indicated by the presence of fumaroles, mud pools and steam-heated water which are controlled by a NW-SE graben inside the semi-circular depression.

The Micromine software is used to process all data both of landsat and topographical map to delineate the geothermal prospective areas. The trend of of high temperature inline with the lineament trend whereas based on the surface temperature maps produced, the average temperature for both samples around 25o-29oC, with 99.86 % in some locations have temperatures reaching 74oC.This can be assumed that the source of the heat related to the geological structure. From field observations encounter hot springs have temperatures in ranges 40o-97.2oC and temperature of steaming ground in ranged between 74o-91oC which are encountered along the fault line