

INTISARI

IDENTIFIKASI SISTEM PANAS BUMI BERDASARKAN ANALISIS MEDAN MAGNETIK TOTAL DI DAERAH GUNUNG KAPUR, KABUPATEN KERINCI, SUMATERA BARAT

Oleh

Anastasia Sherliana Yuli Christianti

22/497836/PA/21457

Gunung Kapur, Kabupaten Kerinci, Sumatera Barat merupakan daerah yang berpotensi panas bumi akibat aktivitas vulkanik dan struktur geologi bawah permukaan. Penelitian ini bertujuan mengidentifikasi karakteristik anomali magnetik dan struktur geologi menggunakan metode magnetik. Data 300 titik pengukuran diolah melalui *Reduction to Pole* (RTP), pemisahan anomali regional-lokal, analisis spektrum, *Total Horizontal Derivative* (THD), *Tilt Derivative* (TDR), dan pemodelan 2,5D. Anomali regional berkisar -315,5 hingga 244,2 nT, dengan zona tinggi pada kisaran *Easting* 750.640–756.360 dan *Northing* 9.793.960–9.805.600, sedangkan zona rendah berada pada *Easting* 744.260–754.380 dan *Northing* 9.804.740–9.809.800. Anomali lokal berkisar -254,2 hingga 326,8 nT dan menunjukkan pola lebih kompleks akibat pengaruh sumber dangkal. Analisis THD dan TDR menunjukkan beberapa dugaan sesar atau kelurusan. Pemodelan 2,5D menunjukkan sembilan dugaan sesar pada sayatan B–B' dengan *Easting* 748.030–752.309, *Northing* 9.801.634–9.806.470, dan kedalaman $\pm 0,25$ –1,10 km. Pada sayatan D–D' terdapat delapan dugaan sesar dengan *Easting* 752.210–756.534, *Northing* 9.799.490–9.804.570, dan kedalaman $\pm 0,40$ –0,80 km. Model menunjukkan keberadaan granit, lava, batuan gunungapi tidak terpisahkan, Formasi Barisan, dan endapan danau. Sumber panas dan *reservoir* belum dapat ditentukan.

Kata kunci: sistem panas bumi, sesar, metode magnetik, Gunung Kapur

ABSTRACT

IDENTIFICATION OF GEOTHERMAL SYSTEMS BASED ON TOTAL MAGNETIC FIELD ANALYSIS IN THE GUNUNG KAPUR AREA, KERINCI REGENCY, WEST SUMATERA

By

Anastasia Sherliana Yuli Christiani

22/497836/PA/21457

Gunung Kapur, Kerinci Regency, West Sumatra, is a geothermal potential area influenced by volcanic activity and subsurface geological structures. This study aims to identify magnetic anomaly characteristics and subsurface geological structures using the magnetic method. A total of 300 magnetic measurement points were processed using *Reduction to the Pole* (RTP), regional–local anomaly separation, spectral analysis, *Total Horizontal Derivative* (THD), *Tilt Derivative* (TDR), and 2.5D modeling. The regional magnetic anomaly ranges from -315.5 to 244.2 nT. High-anomaly zones, ranging from 5.2 to 244.2 nT, occur at *Easting* 750,640–756,360 and *Northing* 9,793,960–9,805,600, while low-anomaly zones, ranging from -315.5 to -85.3 nT, occur at *Easting* 744,260–754,380 and *Northing* 9,804,740–9,809,800. The local anomaly ranges from -254.2 to 326.8 nT and shows a more complex pattern due to shallow sources. THD and TDR analyses indicate several suspected faults or lineaments. The 2.5D model identifies nine suspected faults along section B–B' at *Easting* 748,030–752,309, *Northing* 9,801,634–9,806,470, with depths of approximately ± 0.25 –1.10 km. Section D–D' contains eight suspected faults at *Easting* 752,210–756,534, *Northing* 9,799,490–9,804,570, with depths of approximately ± 0.40 –0.80 km. The model indicates granite, lava, undifferentiated volcanic rocks, Barisan Formation, and lake sediments. The undifferentiated volcanic rocks may be considered as a *cap rock*. The *heat source* and *reservoir* cannot be determined.

Keywords: geothermal system, fault, magnetic method, Gunung Kapur