Analisis Struktur Bawah Permukaan Daerah Prospek Panas Bumi Matalako, Kabupaten Ngada, Nusa Tenggara Timur Berdasarkan Data Gayaberat

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ABSTRAK

Daerah penelitian di sekitar Gunung Inerie, Bobo, dan Inelika dengan hasil berupa batuan piroklastik dan lava, patahan dan manifestasi panas bumi. Analisis struktur bawah permukaan menggunakan metode *Forward Modelling* dan analisis struktur patahan menggunakan metode *Second Vertical Derivative* (SVD) berdasarkan data gayaberat. Hasil pemisahan metode *Moving Average* menunjukkan nilai anomali Bouguer Regional yaitu 86 hingga 134 mGal, anomali Bouguer Residual yaitu 8 hingga -7 mGal. Sedangkan hasil metode *Second Vertical Derivative* (SVD) menunjukkan nilai anomali antara -7.5 hingga 7.5 mGal/m^2. Struktur sesar berarah barat daya menuju timur laut dan barat laut menuju tenggara. *Forward Modeling* ada 2 yakni lintasan E – F dan A – B dengan hasil satuan batuan Matalako Andesit (Mk) nilai densitas 2,4 gr/cm^3, Siuturo Andesit (Si) nilai densitas 2,4 gr/cm^3, Sasa Andesit (Ss) nilai densitas 2,4 gr/cm^3, Aimere Scoria Flow Andesit (As) nilai densitas 2,55 gr/cm^3, Waebela Basalt (Wa) nilai densitas 2,7 gr/cm^3, Maumbawa Basalt (Nb) nilai densitas 2,7 gr/cm^3, dan terakhir Formasi Nangapanda nilai densitas 2,45 gr/cm^3. Nilai anomali regional tinggi dan residual rendah ditunjukkan di daerah Matalako, Bobo, dan Kaldera Nage. Sehingga batuan dasar *green tuff* diperkirakan menjadi sumber panas (*heat source*), sementara *reservoir rock* diperkirakan tepat berada di atas *heat source* dengan ketebalan 1000 m.

Kata Kunci : Panasbumi, Gayaberat, Analisis Struktur, *Moving Average*, *Second Vertical Derivative* (*SVD*), *Forward Modeling.*

Structure Analysis Subsurface Area of Matalako Geothermal Prospects, Ngada Regency, East Nusa Tenggara Based on Gravity Data

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ABSTRACT

Research areas around Mount Inerie, Bobo, and Inelika with results in the form of pyroclastic rocks and lava, faults and manifestations of geothermal. Analysis of subsurface structures using the Forward Modeling method and fracture structure analysis using the Second Vertical Derivative (SVD) method based on gravity data. The results of the Moving Average method separation show the Regional Bouguer anomaly value is 86 to 134 mGal, the residual Bouguer anomaly is 8 to -7 mGal. While the results of the Second Vertical Derivative (SVD) method show anomaly values between -7.5 to 7.5 mGal/m^2. The fault structure trends southwest toward the northeast and northwest to the southeast. Forward Modeling there are 2 namely the path E - F and A - B with the results of rock units Matalako Andesite (Mk) density value of 2.4 gr/cm^3, Siuturo Andesite (Si) density value of 2.4 gr/cm^3, Sasa Andesite (Ss) density value of 2.4 gr/cm3, Aimere Scoria Flow Andesite (As) density value of 2.55 gr/cm^3, Waebela Basalt (Wa) density value of 2.7 gr/cm^3, Maumbawa Basalt (Nb) density value of 2.7 gr/cm^3, and finally the Nangapanda Formation has a density value of 2.45 gr/cm^3. High regional anomaly values and low residuals are shown in the Matalako, Bobo and Caldera Nage regions. So that the green tuff bedrock is estimated to be a heat source, while the reservoir rock is estimated to be directly above the heat source with a thickness of 1000 m.

Keywords: *Geothermal, gravity, Structure Analysis, Second Vertical Derivative (SVD), Forward Modeling*