

INTISARI

IDENTIFIKASI STRUKTUR GEOLOGI BAWAH PERMUKAAN PADA ZONA MINERALISASI BERDASARKAN DATA GRAVITASI DI DAERAH TIRTOMOYO, WONOGIRI, JAWA TENGAH

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Potensi sumber daya mineral di Pulau Jawa sangat besar dan beragam. Salah satunya adalah di daerah Tirtomoyo, Wonogiri, Jawa Tengah. Penelitian metode gravitasi dilakukan di daerah tersebut untuk mengidentifikasi struktur bawah permukaan sebagai jalur fluida alterasi dan keberadaan tubuh intrusi sebagai pengontrol sumber panas. Data gravitasi yang digunakan berjumlah 99 titik dengan luas area 5 x 5 km².

Beberapa langkah reduksi data gravitasi dilakukan untuk mendapatkan anomali Bouguer lengkap di topografi. Selanjutnya dilakukan reduksi ke bidang datar menggunakan metode Dampney. Ketinggian bidang datar yang digunakan adalah 900 meter dan kedalaman sumber massa ekuivalen yang dipilih adalah 1300 meter di bawah bidang sferoida (msl). Selanjutnya dilakukan pemisahan anomali lokal dan regional menggunakan metode kontinuitas ke atas sebesar 500 meter. Hasil dari analisis *first horizontal derivatif* dan *second horizontal derivatif* tidak ditemukan adanya sesar, melainkan batas kontrol litologi yang diduga sebagai batas tubuh intrusi.

Hasil pemodelan maju 2,5D pada anomali lokal di daerah penelitian menunjukkan terdapat lima satuan litologi yaitu aluvium ($\rho=1,2$ gr/cm³), lava breksi ($\rho=2,61$ gr/cm³), dasit teralterasi rendah ($\rho=2,55$ gr/cm³), dasit teralterasi tinggi ($\rho=2,65$ gr/cm³), dan intrusi dasit-andesit ($\rho=2,92$ gr/cm³). Intrusi dasit-andesit ini menyebabkan proses alterasi pada batuan dasit di daerah penelitian.

Kata kunci: metode gravitasi, alterasi, intrusi, analisis derivatif, Tirtomoyo

ABSTRACT

IDENTIFICATION OF SUBSURFACE GEOLOGICAL STRUCTURES IN MINERALIZATION ZONE BASED ON GRAVITY DATA IN TIRTOMOYO AREA, WONOGIRI, CENTRAL JAVA

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The potential for mineral resources in Java Island is abundant and diverse. One of them is located in the Tirtomoyo area, Wonogiri, Central Java. Gravity survey was conducted in the area to identify subsurface structures as pathways for alteration fluids and the presence of intrusive bodies as heat sources controllers. The gravity data used consisted of 99 points covering an area of 5 x 5 km².

Several steps of gravity data reduction were performed to obtain complete Bouguer anomalies over the topography. Subsequently, a reduction to a flat plane was carried out using the Dampney method. The height of the flat plane used was at an elevation of 900 meters, and the selected depth of the equivalent mass source was 1300 meters below the spheroid field (msl). Furthermore, the local and regional anomaly separation was performed using the upward continuation method of 500 meters. The analysis of the first horizontal derivative and second horizontal derivative did not reveal any faults. Instead, they indicated the presence of lithological control boundaries, which are suspected to be the boundaries of intrusive bodies.

The advanced 2.5D modeling of local anomalies in the research area revealed the presence of five lithological units: alluvium ($\rho=1.2$ g/cm³), lava breccia ($\rho=2.61$ g/cm³), low-altered dacite ($\rho=2.55$ g/cm³), highly altered dacite ($\rho=2.65$ g/cm³), and dacite-andesite intrusion ($\rho=2.92$ g/cm³). This dacite-andesite intrusion has caused alteration processes in the dacite rocks in the research area.

Keywords: *gravity method, alteration, intrusion, derivative analysis, Tirtomoyo*