INTISARI

ANALISIS DATA MEDAN MAGNET TOTAL DAERAH LAVA BANTAL WATUADEG, KECAMATAN BERBAH, KABUPATEN SLEMAN, DAERAH ISTIMEWA YOGYAKARTA

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Lava bantal Watuadeg adalah tempat pariwisata warisan geologi yang terletak di Berbah, Sleman, Yogyakarta. Studi geologi telah dilakukan oleh puluhan peneliti dan menimbulkan 2 hipotesis, yaitu struktur yang mengontrol lava bantal berarah barat laut tenggara, dan arah aliran lava bantal didominasi ke tenggara. Satu permasalahan yang belum pernah dibahas oleh para peneliti sebelumnya adalah hubungan antara singkapan lava bantal di barat dan timur Sungai Opak. Penelitian geofisika dengan metode magnetik dilakukan untuk meninjau hasil penelitian terdahulu tersebut.

Data penelitian diperoleh dari survei yang dilakukan selama 15 hari dengan luas area 705 kali 785 meter persegi. Spasi antar titik bervariasi antara 20 meter hingga 40 meter. Alat yang digunakan untuk mengambil data antara lain *Proton Precession Magnetometer* Geotron G5, *Proton Precession Magnetometer* Geometric G856, dan *Fluxgate Magnetometer* FGM3D.

Pengolahan data dimulai dengan mengoreksi data medan magnet total dari efek medan magnet utama bumi dan variasi harian sehingga didapatkan anomali total. Lalu dilakukan pengolahan menggunakan filter reduksi ke kutub dan kontinuasi ke atas. Anomali medan magnet tereduksi kutub kemudian dikurangkan dengan anomali hasil kontinuasi ke atas pada ketinggian 200 meter sehingga diperoleh anomali residual. Hasil pemodelan dua dimensi menunjukkan bahwa nilai suseptibilitas endapan aluvium berkisar antara 0,050 hingga 0,060 SI, lava bantal 0,120 hingga 0,175 SI, dan batupasir tuffan 0,002 hingga 0,004 SI. Hasil interpretasi kualitatif dan kuantitatif menunjukkan bahwa terdapat struktur geologi berarah barat laut tenggara, arah aliran lava didominasi ke tenggara, serta lava bantal sebelah timur dan barat Sungai Opak merupakan satu tubuh yang terpotong oleh sesar geser.

Kata kunci: Lava Bantal Watuadeg, metode magnetik, suseptibilitas, struktur geologi, model dua dimensi

ABSTRACT

TOTAL MAGNETIC FIELD DATA ANALYSIS OF WATUADEG PILLOW LAVA AREA IN BERBAH DISTRICT, SLEMAN REGENCY, YOGYAKARTA SPECIAL REGION

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Watuadeg Pillow Lava is one of geological heritage which is located in Berbah, Sleman, Yogyakarta. Geological studies has been conducted by researchers and raises several hypothesis, either due to structure that control the pillow lava area is trending northwest southeast, and pillow lava flows is dominated in southeast direction. There is one problem that has not been discussed by previous researchers, the relationship between pillow lava that exposed in the west and east of Opak River. Therefore, to prove those hypotheses, magnetic survey was conducted in this area.

Magnetic data were obtained from a survey carried out for 15 days with an area of about 705 meters x 785 meters. Spacing between points varies between 20 meters till 40 meters. The data were collected by using *Proton Precession Magnetometer* Geotron G5, *Proton Precession Magnetometer* Geometric G856, and *Fluxgate Magnetometer* FGM3D.

Data processing began by correcting the total magnetic field data to the main magnetic field of the earth and daily variations to obtain magnetic field anomaly. Then, the reduce to magnetic pole filter and upward continuation filter were performed. After that, the pole reduced magnetic field anomaly were subtracted by 200 meters upward continuation anomaly to obtain residual magnetic field anomaly. The 2 Dimensional models show that the susceptibility of alluvium deposits ranges from 0,050 till 0,060 SI, pillow lava ranges from 0,120 till 0,175 SI, and sandstone ranges from 0,002 till 0,004 SI. The results of qualitative and quantitative interpretation indicate that there are geological structures trending northwest southeast, the lava flow direction is dominated in southeast direction, and the pillow lava that revealed in the west and east of the Opak River is the same body which is truncated by a strike slip fault.

Keywords: Watuadeg Pillow Lava, magnetic method, susceptibility, geological structure, two dimensional modelling