

# Delineasi hydrothermal demagnetization rock dan pemodelan reservoir geothermal dengan inversi 3d magnetik dan magnetotellurik pada lapangan e = Delineation of hydrothermal demagnetization rock and reservoir modelling with 3d inversion of magnetic and magnetotelluric at e field

Fadhli Yusuf, author

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## Abstrak

Permasalahan delineasi sistem geothermal adalah hal yang penting untuk dikaji, karena akan menentukan seberapa besar prospek panas bumi yang berada di subsurface. Metode magnetik bisa menentukan zonasi daerah di subsurface yang mengalami demagnetisasi akibat thermal. Batuan yang menjadi penyusun reservoir mengalami perubahan suseptibilitas dari tinggi ke rendah akibat pengaruh fluida dan panas dari heat source yang berada pada sistem tersebut.

Penelitian ini telah membuktikan keberadaan delineasi sistem panas bumi Lapangan "E" dengan metode Magnetik dan Magnetotellurik, data magnetik sebanyak 674 titik dikoreksi dengan diurnal variation dan undistributed earth magnetic field atau lebih dikenal dengan IGRF. Setelah itu telah dilakukan kontinuitas hingga ketinggian 700 m asl, dan terlihat bodi yang berorientasi dipole dengan arah NE-SW pada inklinasi intermediet. Dilakukan Reduction to Pole pada hasil pengangkatan keatas dan didapatkan anomali low negatif yang mengindikasikan keberadaan hydrothermally demagnetization rock.

Hasil RTP juga dikorelasikan dengan kurva apparent resistivity MT, didapatkan nilai anomali low negatif cenderung berasosiasi dengan kurva MT tipe H. Kontur RTP dimodelkan dengan inversi 3D magnetik dan didapatkan zonasi reservoir berada dikedalaman mean sea level s/d 1900 m bsl. Cross korelasi pun dilakukan antara hasil Inversi 3D magnetik dan 2D Forward Modelling Magnetik serta inversi MT, bahwa zona batuan reservoir memiliki suseptibilitas sebesar 0.04-0.06 Cgs dan dengan resistivitas 20-80 ohm.m, Keberadaan reservoir panas bumi diduga berada di zona upflow hingga ke arah SW yang berada di sekitar sesar utama di daerah lapangan " E" yang berasosiasi dengan anomali low negatif sebesar -300 s.d -550 nT.

The delineation problem of the geothermal system is important to examine, as it will determine how big the geothermal prospects are in the subsurface. Magnetic methods can zonate the subsurface region undergoing thermal demagnetization processes. The rocks that make up the reservoir have changed the susceptibility from high to low due to the influence of fluid and heat from the heat source in the system.

This research has proved the existence of Geothermal Field 39 s delineation of Field E with Magnetic and Magnetotelluric method, 674 points magnetic data corrected by diurnal variation and undistributed earth magnetic field or better known as IGRF. After that continuity has been carried out to a height of 700 m asl, and visible dipole oriented body with NE SW direction in intermediate inclination. Reduction to Pole was performed on uplift and obtained a low negative anomaly indicating the presence of hydrothermally demagnetization rock.

The RTP results are also correlated with the apparent resistivity MT curve, and the low negative anomaly values tend to be associated with the Type H MT curve. The RTP contour is modeled by a 3D magnetic. And the reservoir zonation is in the mean sea level to 1900 m bsl. Cross correlation was performed between magnetic 3D Inversion and 2D Forward Modeling Magnetic and MT inversion, that reservoir rock zone has

a susceptibility of 0.04 0.06 Cgs and with resistivity of 20 80 ohm.m The existence of geothermal reservoir is suspected to be in the upflow zone up to SW direction is in the vicinity of the main fault in the E field area associated with a negative low anomaly 300 s d 550 nT.</i>