

# Identifikasi sistem panas bumi dengan menggunakan metode AMT dan MT di daerah Simisuh, Pasaman, Sumatera Barat = Identification of geothermal system using AMT and MT methods in Simisuh, Pasaman, West Sumatera

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## Abstrak

Daerah Simisuh, Kabupaten Pasaman, Provinsi Sumatera Barat memiliki potensi sumber panasbumi yang dibuktikan dengan adanya manifestasi yang muncul di permukaan berupa hot spring dan batuan alterasi. Data yang didapat dari kegiatan pengukuran, diolah untuk dapat mengidentifikasi sistem panasbumi di daerah Simisuh dalam memetakan lapisan overburden, clay cap, reservoir, dan heat source.

Metode geofisika yang digunakan pada penelitian ini adalah metode Audio-frequency Magnetotelluric (AMT) dan Magnetotelluric (MT) yang mampu memetakan komponen-komponen sistem panasbumi berdasarkan tahanan jenisnya.

Hasil inversi 2-dimensi yang divisualisasikan secara 2-dimensi maupun 3-dimensi memperlihatkan batuan alterasi yang berperan sebagai clay cap berada di bagian barat laut dari daerah penelitian, sedangkan reservoir terdapat pada kedalaman sekitar 1 km.

Berdasarkan hasil survei pengolahan data AMT dan MT yang didukung oleh data geologi, geokimia, gravitasi, dan magnetic, sistem panasbumi Simisuh merupakan sistem vulkanik-tektonik dengan suhu reservoir diperkirakan sekitar 150oC (moderate temperature system) dengan potensi listrik sekitar 36 MWe.

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Simisuh area, Pasaman, West Sumatera Province has potency of geothermal resource which is proven by surface manifestation in the form of hot springs and altered rocks. Observed data were processed to identify the geothermal system in Simisuh area including mapping of overburden layer, clay cap, reservoir, and heat source.

Geophysical methods used for this investigation are Audio-frequency Magnetotelluric (AMT) and Magnetotelluric (MT) that can delineate components of the geothermal system based on resistivity distribution.

The result of 2 dimensional inversion which was visualized in 2 dimension or 3 dimension showed altered rocks as clay cap which is located at north-west direction of investigation area, and reservoir which is located 1 km beneath the surface.

Based on the result of AMT and MT data which were supported by geology, geochemistry, gravity and magnetic data, the Simisuh geothermal system was concluded as volcanic-tectonic system with reservoir temperatur around 150oC (moderate temperatur system), associate with 36 MWe.