

Rekonstruksi Model Konseptual Sistem Geotermal Daerah "NI" Menggunakan Data Magnetotellurik = Conceptual Model Reconstruction of "NI" Geothermal Field Using Magnetotelluric Data

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Abstrak

Daerah “NI” yang terletak di Kabupaten Konawe Selatan, Sulawesi Tenggara memiliki sistem geotermal yang berpotensi untuk dieksploitasi. Hal ini ditandai dengan keberadaan manifestasi panas berupa chloride hot springs. Dari manifestasi tersebut dibuat perkiraan temperatur reservoir sebesar 149oC (moderate temperature geothermal system). Berdasarkan data geologi, terdapat patahan besar yang membentang dari Barat Daya hingga Timur Laut lapangan penelitian yang diperkirakan menjadi tempat keluar masuknya fluida. Investigasi lebih lanjut mengenai kenampakan bawah tanah dari sistem geotermal daerah “NI” dilakukan dengan melakukan pengolahan data Magnetotellurik (MT) yang kemudian dilanjutkan dengan inversi 2-dimensi. Hasil inversi 2-dimensi menunjukkan zona reservoir pada kedalaman 500-1000 m dengan resistivitas 20-80 ohm.m. Hasil inversi diintegrasikan dengan data gravitasi, data geologi, dan data geokimia untuk mendapatkan model konseptual dan perkiraan luas area prospek dari sistem geotermal daerah “NI”. Berdasarkan data tersebut, sistem geotermal daerah “NI” diperkirakan memiliki potensi sekitar 11,6 MWe dan titik pemboran yang direkomendasikan adalah di dekat zona patahan dan zona manifestasi karena daerah tersebut merupakan zona upflow reservoir serta memiliki permeabilitas dan suhu yang tinggi.

.....The “NI” area which is located in South Konawe Regency, Southeast Sulawesi has a geothermal system that has the potential to be exploited. It is characterized by the presence of heat manifestations in the form of chloride hot springs. From these manifestations, an estimate of the reservoir temperature is 149oC (moderate temperature geothermal system). Based on geological data, there is a large fault stretching from the Southwest to the Northeast of the research field which is estimated to be the entry and exit point for fluids. Further investigation of the underground features of the “NI” regional geothermal system was carried out by processing Magnetotelluric (MT) data followed by 2-dimensional inversion. The 2-dimensional inversion results show the reservoir zone at a depth of 500-1000 m with a resistivity of 20-80 ohm.m. The inversion results are integrated with gravity data, geological data, and geochemical data to obtain a conceptual model and an estimate of the prospect area of the “NI” regional geothermal system. Based on these data, the geothermal system in the “NI” area is estimated to have a potential of about 11.6 MWe and the recommended drilling point is near the fault zone and manifestation zone because this area is an upflow reservoir zone and has high permeability and temperature