Evaluasi Konseptual Model Menggunakan Inversi 3D MT, Geologi, Geokimia dan Data Sumur pada Lapangan Salak = Evaluation of Conceptual Model Using 3D Inversion MT, Geology, Geochemistry, and Well Data at Salak Geothermal Field

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Abstrak

Seperti hal nya lapangan geotermal yang sudah diekstraksi lebih dari 25 tahun, Salak juga mengalami penurunan produksi akibat cooling atau penurunan suhu pada reservoir. Analisis 3G, yaitu Geofisika, Geokimia, dan Geologi yang dilakukan seringkali tidak sesuai dengan data sumur, karena kesalahan mendasar dari interpretasi zona resistivitas rendah, barrier sesar atau marjin reservoir terutama pada reservoir di bawah sumur produksi dan injeksi lapangan Salak. Semua data yang dianalisis adalah data yang diperoleh pada waktu sumur awal diproduksi. Analisis penyebaran zona resisitivitas dengan metode seleksi dan re-prosessing yang tepat menjadi hal dasar dari penentuan batas area prospek dan zona uplow dan outflow. Sebaran dan kedalaman zona konduktif mendeskripsikan penyebaran mineral alterasi, kontak litologi, barrier patahan, batas TOR dan BOC (updome shape), perubahan suhu karena perbedaan kontras dari jalur permeabilitas dan arah aliran fluida. Pola ketebalan resistivitas yang relatif sama di atas reservoir atau batas low resistivity anomaly mungkin menghasilkan kesalahan interpretasi dari noise yang perlu dikoreksi. Penelitian ini diharapkan dapat memberikan informasi model konseptual yang lebih konsisten, representatif dan terintegrasi serta menunjukkan kesesuaian dengan data pendukung lainnya, sehingga dapat mengidentifikasi masalah yang dihadapi, dan selanjutnya memberikan hipotesis untuk menjaga keberlangsungan performa reservoir.

.....Like most geothermal field which has been extracted for more than 25 years, Salak has been also experienced the production decline, which is quite likely caused by change of well pressure and cooling in reservoir. The existing 3G analysis was frequently contradicted with well data, especially caused by misinterpretation of noisy and low deep resistivity. Furthermore, all corrected 3D inversion MT data is compared with well data, geology , and geochemical data, to produce updated and integrated conceptual model, which can be expexted to re-evaluate analysis of changes in the distribution of resistive zones at initial reservoir conditions that give indication of distribution of alteration minerals, TOR and BOC (updome shape) boundary, lithology contacts, variation of pressure and temperature, and give identification of permeability zone contrasting and fluid pathway, fault orientation corresponds to good aggrement of interpetation of low resistivity zone and well data. The powerfull and developed 3D MT Inversion and observation of anomalous resistivity feature interpreted as clay alteration, fault barrier, upflow and or the expansion of neutral spring water in ouflow zone near Awi 20 and 15. This anomaly is strongly correlated to the temperature changes in hydrothermal mineral. This variation shows the deep and shallow up-dome shaped of geothermal system below Awi 9, 10 and 14, confirmed by Parabakti and Cibeureum fumarol analysis, thin clay cap, fault intersection map and especially high temperature in well data. To test this hypothesis, writer recast all supporting data with revised resistivity model. This research is expected to provide information on a representative conceptual model and accurate analysis to the current problems respectively, hence improved approachs can be taken to implement further recommendation on how to

hypothesize a strategic solution to maintain reservoir performance.