Analisis rekahan pada reservoar batupasir untuk mencegah produksi pasir dengan menggunakan data log image dan atribut seismik = Fracture analysis on sandstone reservoirs to prevent sand production using image log data and seismic attributes

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Abstrak

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Lapangan Y memiliki permasalahan kepasiran saat memproduksi hidrokarbon dan hal ini mengakibatkan penurunan effesiensi pompa secara drastis. Permasalahan kepasiran dapat diatasi dengan beberapa cara, seperti mekanikal (sand cat, gravel pack), kimia (Sand Aid) dan cara perforasi selektif (seleksi perforasi interval dan perforasi berarah). Pemecahan permasalahan kepasiran dengan cara mekanik dan kimia memerlukan biaya yang mahal. Pada tesis ini dilakukan pemecahan permasalahan kepasiran dengan cara perforasi selektif ke arah tegasan horizontal maksimum dan menghasilkan penurunan produksi pasir yang hampir sama dengan cara mekanikal dan kimia serta dapat menekan biaya. Pada study ini digunakan 3 data log image dan atribut seismik 3D untuk menentukan arah tegasan horizontal maksimum.
Pada 3 data log image dilakukan interpretasi arah rekahan, breakout, dan induced fracture. Dari tiga data log image, dapat dilihat bahwa rekahan insitu stress memiliki arah tegasan horizontal maksimum yang hampir sama dengan tektonik stress. Arah tegasan horizontal maksimum yang dihasilkan log image adalah N 040o E ? N 220o E. Arah perforasi dapat dilakukan ke arah N 040o E ? N 220o E secara lokal area sekitar sumur yang memiliki data log image. Untuk melihat penyebaran arah rekahan lapangan Y dilakukan analisis atribut seismik. Metode analisis atribut seismik yang digunakan adalah variance, ant track dan curvature. Metode atribut seismik variance dan ant track yang dianalogikan pola rekahan memiliki arah yang sama dengan rekahan log image yaitu N 055o E ? N 095o E dan pola tidak berubah dari Utara hingga Selatan Lapangan Y, namun pola atribut curvature tidak memiliki kecendrungan yang sama dengan arah lipatan hasil analisis rekahan log image. Karena kesamaan arah umum rekahan log image dengan kecendrungan rekahan pada atribut variance dan ant track, maka tegasan horizontal maksimum dari analisis log image dapat digunakan dalam menentukan perforasi berarah sumur-sumur di Lapangan Y yaitu N 040o E ? N 220o E.
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ABSTRACT
Y field has sanding problems when producing hydrocarbons and as it results in a drastic efficiency decrease in pump. Sanding problems can be solved in several ways, such as mechanical (sand cat, gravel pack), chemical (Sand Aid) and selective

perforation way (perforation interval selection and oriented perforation). Sanding problems solved by means of mechanical and chemical but it costly. This thesis has done by using selectively perforating in the direction of maximum horizontal stress to solves the sanding problems and the result make production of sand decreased that is almost the same as the mechanical and chemical way to reduce the cost. In this study used 3 images data log and 3D seismic attributes to determine the direction of maximum horizontal stress.

At 3 image log data has interpretated the direction of fracture, breakout and induced fracture. At three image log data, the insitu stress fracture have a horizontal maximum stress direction which direction same to tectonic stress. The direction of horizontal maximum stress from image data was N 040o E - N 220o E. The orient perforation can be used towards N 040o E - N 220o E which applied the local area around the image data only. To know fractures direction deployment in Y field by using seismic attribute analysis. Seismic attribute analysis method was used variance, ant track and curvature. Method of seismic attribute variance and ant tracks were analogued to the pattern of fractures in the same direction with a fracture log image was N 055o E - N 095o E and the pattern has not changed from the North to the South Y Field, but the pattern attribute curvature did not similar to the folds image log fracture analyst. Due to the similarity direction of the image log fracture with the attribute variance and ant track, so that the maximum horizontal stress of the image log analysis can be used in determining the perforation directional in the Y Field that was N 040o E - N 220o E., Y field has sanding problems when producing hydrocarbons and as it results in a drastic efficiency decrease in pump. Sanding problems can be solved in several ways, such as mechanical (sand cat, gravel pack), chemical (Sand Aid) and selective

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