IDENTIFICATION OF GAS DISTRIBUTION, GAS RESERVE ESTIMATION AND PROPOSED WELL BY USING SIMULTANEOUS SEIMIC INVERSION AND 3D PROPERTY RESERVOIR MODELING IN INK FIELD, SOUTH SUMATERA BASIN

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ABSTRACT

The qualitative and quantitative interpretation of log data indicates that there are gas hydrocarbon in INK-2 well at depth 1532-1540 m, 1565-1580 m, 1610-1618 m, 1640-1648 m, in INK-3 well at depth 1534-1540 m, 1565 -1588 m, 1611-1619 m, 1641-1649 m, ain INK-4 well at depth 1543-1547 m, 1554-1575 m, 1605-1626 m, in INK-5 well at depth 1531-1538 m, 1550-1575 m, 1595-1605 m, in INK-6 well at a depth of 1468-1534 m. The inversion result show us that P-impedance value of porous carbonate is around 27000-40000 (ft/s)*(g/cc) and S-Impedance around 16000-26000 (ft/s)*(g/cc). Mu-Rho value of Porous carbonate is 27-80 (GPa*g/cc) and Lamda-Rho 20-34 (GPa*g/cc). Distribution map analysis of Mu-Rho parameters can be seen that porous carbonate lithology is shown with yellow-red color with Mu-Rho value 30-60 (GPa*g/cc). From Lamda-Rho map distribution can be seen that porous carbonate litology containing gas is indicated by yellow-red color with Lamda-Rho 25-29 (GPa*g/cc). Gas reserves by map algebra method is 3.66 TSCF and from 3D Property Reservoir modeling is 21.53 MSCF. The difference is due to the calculation of 2D maps netpay thickness is considered equal to 0.3199 of total thickness. This is not in accordance with the theory that the fluid will move to lower pressure which is to a higher place and because porosity and Sw map are the result of another map transformation, so less appropriate to the actual existence. Based on the reservoir distribution analysis, gas distribution analysis, and the reservoir geometry analysis, the proposed well locations is located in the lower south, the eastern part of the elevation closures around the fault and in the west near the INK-1 to INK-6 well site.

Keywords: Gas Distribution, Reserve, Proposed Well, Simultaneous Inversion, 3D Property Reservoir Modeling

IDENTIFIKASI PERSEBARAN DAN ESITIMASI CADANGAN GAS SERTA SUMUR USULAN MENGGUNAKAN INVERSI SEISMIK SIMULTAN DAN PEMODELAN 3D *PROPERTY RESERVOIR* DI LAPANGAN INK, CEKUNGAN SUMATERA SELATAN

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ABSTRAK

Interpretasi kualitaif dan kuantititif data *log* menunjukkan terdapat gas pada sumur INK-2 di kedalaman 1532-1540 m, 1565-1580 m, 1610-1618 m, 1640-1648 m, pada sumur INK-3 di kedalaman 1534-1540 m, 1565-1588 m, 1611-1619 m, 1641-1649 m, pada sumur INK-4 di keddalaman 1543-1547 m, 1554-1575 m, 1605-1626 m, pada sumur INK-5 di kedalaman 1531-1538 m, 1550-1575 m, 1595-1605 m, pada sumur INK-6 di kedalaman 1468-1534 m. Dari hasil inversi zona *porous* karbonat memiliki *range* P-*Impedance* antara 27000-40000 (ft/s)*(g/cc), S-*Impedance* antara 16000-26000 (ft/s)*(g/cc), *Mu-Rho antara* 27-80 (GPa*g/cc) dan *Lamda-Rho* 20-34 (GPa*g/cc). Litologi *porous* karbonat ditunjukkan dengan warna *Mu-Rho* kuning-merah dengan nilai *Mu-Rho* 30-60 (GPa*g/cc) dan litologi *porous* karbonat mengandung gas ditunjukkan dengan warna kuning-merah dengan nilai *Lamda-Rho* 25-29 (GPa*g/cc). Cadangan gas dengan metode perkalian peta hasil inversi sebesar 3.66 TSCF dan hasil pemodelan 3D *Property Reservoir* adalah 21.53 MSCF. Perbedaan kedua metode disebabkan karena pada perhitungan peta 2D ketebalan *netpay* dianggap sama yaitu 0.3199 dari ketebalan total. Selain itu peta persebaran porositas dan Sw merupakan hasil transformasi peta RHOB sehingga kurang sesuai dengan keaadaan sebenarnya. Berdasarkan analisis persebaran reservoar, analisis persebaran gas, dan analisis struktur geometri reservoar lokasi sumur usulan yang disarankan berada pada bagian selatan bawah, timur di klosur ketinggian sekitar patahan turun dan di sebalah barat dekat dengan lokasi sumur.

K**ata Kunci :** Persebaran Gas, Cadangan, Usulan Sumur, Inversi Simultan, Pemodelan 3D *Property Reservoir*