ESTIMATION OF POROSITY WITH THE HELP OF SEISMIC PROCESSING VELOCITIES OF MEYAL FIELD, UPPER INDUS BASIN, PAKISTAN

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ABSTRACT

This thesis is based on 2D seismic reflection data and well logs to find the porosities from seismic velocities and correlate with total porosities from well data. The data is acquired from the area of Meyal, Upper Indus Basin (Punjab) of Pakistan, provided by the Landmark Resources (LMKR) with the permission of Directorate General of Petroleum Concession (DGPC). Five seismic sections having line numbers along with Base Map are 97-MYL-10, 97-MYL-11, 93-MYL-02, 97-MYL-06, and 97-MYL-12 lines. Out of these five seismic lines; 97-MYL-10, 97-MYL-11, 93-MYL-02 and 97-MYL-06 are dip lines. The remaining line, 97-MYL-12 is a strike line. Root mean square are also provided with the seismic section at selected Common Depth Points (CDPS) and are used for the calculation of velocities to convert the given time into depth. Five reflectors were marked due to their prominent reflection on the seismic sections. The two way travel time structural map for each reflector has been drawn and depth contour map of reservoirs has also been drawn by using velocity and one way travel time. Moreover, cross sections in time and depth domains have also been drawn.TheMeyalarea is dominated by compressional regime where the thrust faults are dominated. By using well log data of Meyal-08P, the petrophysical analysisshows the characteristics of hydrocarbon bearing zone which confirms the results of the 2D seismic interpretation. The porosities calculated from seismic velocities Vp using the relation of Gardner equation to find the density and then applying the Time- Average equation and confirming the result by comparing with the result of porosities from petrophysical analysis. The total porosities are preferred in comparing with seismic velocities because both seismic and total porosities give the overall pore voids in a rock.

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