Determination of Optimal Well Spacing for an Oil Reservoir to Maximize Recovery Factor

ABSTRACT
The average recovery factor calculated for the whole reservoir is higher than the average recovery factor calculated from averaging the individual well recovery factor. The integrated recovery factor calculated from each well should be compared with recovery factor calculated for the reservoir as a whole using the material balance equation or the volumetric methods as a basis for the calculations. The difference between the two values is an indication of an inadequate well spacing for the reservoir if \( \frac{N_p}{N} \text{ each} \approx \frac{N_p}{N} \text{whole} \), the distribution of the wells for the reservoir is adequate. If \( \frac{N_p}{N} \text{ each} < \frac{N_p}{N} \text{whole} \), the distribution of the wells in the reservoir is inadequate. This indication of excess in number of wells. If \( \frac{N_p}{N} \text{ each} > \frac{N_p}{N} \text{whole} \), the distribution of the wells in the reservoir is inadequate. This indication of the reservoir needs infill wells to be drilled. The number of infill wells depends on the relationship between recovery factor and number of wells. The infill wells location in the reservoir should be at high hydrocarbon pore volume and also it should be located in the trend of the easiest permeability path of oil movement. It was concluded that the number of wells existing in the Sharara field is not adequate therefore we recommend to increase the number of the wells as per the method enclosed in this study. The results of this study indicate that the calculated oil production decline rate constant is different from well to another which is an indication of variations of water influx into the reservoir.