

CHAPTER 5

CONCLUSION

The combination of multilateral wells and intelligent completion has demonstrated many advantages and disadvantages. Many investigators have studied and investigated this combination in many manners. In this study, the thesis emphasizes on the efficiency of three multilateral well geometries with two kinds of completion: openhole and intelligent completion. Moreover, the reliability of the results was presented by running simulation on a number of reservoir models. Also, the effect of vertical permeability which is a very important parameter in the case of bottom water drive reservoirs was also studied.

The conclusion is divided into two parts. The first part concerns with the efficiency of three types of multilateral wells with openhole and intelligent completion under water production constraint and no water production constraint. In the second part, the conclusion emphasizes on the effect of vertical permeability and the rationale to install intelligent completion.

5.1 Well efficiency

Important remarks can be made about the study of well efficiency as follows:

1. The results show that fishbone well geometry is the most suited for the kind of reservoir selected for the study which is a fluvial environment reservoir. Considering oil production, the fishbone well gives higher oil production comparing with other well geometry. Considering cost, horizontal or bilateral wells which provide less oil production have more advantage in terms of cost-saving. Therefore, in order to exploit a fluvial environment reservoir, the increase in oil production needs to justify the cost of investment since the cost of multilateral well is very expensive.

2. Intelligent completion to control water production may be disadvantages. The first disadvantage obtained from this application is the reduction of oil production. This is caused by the closing of inflow control valves which have the main function to keep water cut lower than a prescribed value. Among the three well geometries

investigated in this study, the fishbone well has the least amount of reduction in oil production by retarding the water cresting phenomenon. Anyway, the water production which also decreases becomes an advantage for this application comparing with openhole case.

3. Comparing between openhole and intelligent completion when there is a water production constraint, intelligent completion is better than openhole well for all the three well geometries. This is due to the fact that water production in openhole case reaches the limiting value of water cut within a short period of time. After that, the wells are permanently closed. On the other hand, intelligent completion can be reopened automatically when water cut.

5.2 Vertical permeability study

In this study, the vertical permeability on both openhole and intelligent completion was investigated. The fishbone well which provides the best result due to its longest productive length was chosen for this study. Some conclusions are summarized as follows.

1. Water cresting phenomenon has the least effect on oil production when the vertical permeability is low.

2. Although there is a slight decrease in oil production when the well is intelligently completed comparing with openhole completion, the water production drastically decreases, allowing a better management in terms of production facilities.

3. In the reservoir with extremely low vertical permeability, the addition of intelligent completion does not provide any advantage since the valves will not operate to control water entering due to small water cut. In this case, the exploitation with openhole multilateral well is adequate.