

# **INFLOW PERFORMANCE RELATIONSHIPS (IPR) FOR MULTI-LAYER WELLS**

**THESIS**

**Submitted to the Master Program of Institut Teknologi Bandung in  
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**By**

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Student ID: 22215702**

**Major Subject: Petroleum Engineering**



**INSTITUT TEKNOLOGI BANDUNG**

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## **ABSTRACT**

### **INFLOW PERFORMANCE RELATIONSHIPS (IPR) FOR MULTI-LAYER WELLS**

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The prime aim of oil and gas industry, during reservoir exploration is knowing the performance of wells. A method for calculating well performance is critical for achieving this aim. The Inflow Performance Relationship (IPR) describes the behavior of the well's flowing pressure and production rate, which is assumed to be proportional. In addition, the knowledge of Inflow Performance Relationship will provide essential information for well performance evaluation and optimization. Therefore, this study aims at establishing a technique for calculating the total composite inflow performance relationship (IPR) for multi-layer wells. For single phase oil flow, production rate is directly proportional to pressure drawdown and therefore the IPR curve is a straight line. Several empirical relations have been proposed in the literature to predict the performance of oil wells producing with two layers flow conditions. However, these relationships are empirical and limited in application.

The use of Vogel's model for computation of IPR curve has been widely used. Therefore, in this study, Vogel's model is employed to determine the inflow performance relationship of every layer of well. Well data are synthesized with discretion within reasonable well conditions constituting bottom hole pressure, as well as maximum flow rate. Sensitivity analysis was also conducted for optimum tubing diameter. Thereafter, those parameters were computed to generate drawdown and flowrate data, with which IPR curves were plotted using excel. The results show high consistency with Vogel's model.

**Keywords:** Multi-layer wells, IPR, Composite IPR.