

Modeling of OIIP Estimation

Credit to Mr. Ahmed Alher

Introduction

- The determination of the Original Hydrocarbon In Place (is typically the concluding phase of the **geological study** It is here that the reservoir description, in terms of internal and external architecture and rock properties characterization, is finally quantified in a number, which represents the amounts of oil and/or gas initially in place in the reservoir
- The OHIP figure is one of the most important parameters of any oil field Even though the **economic importance** of a project is obviously much more closely related to the reserves of a given field (i. e. the producible part of the OHIP), the OHIP is the parameter that gives the dearest view of the importance of the hydrocarbon accumulation and consequently of the foreseeable exploitation projects
- The calculations include the **pore volume**, originally hydrocarbon in place (**OHIP**), stock tank originally hydrocarbon in place (**STOHIP**) and reserve.

Equation

- The estimation of the hydrocarbons originally in place at reservoir conditions is based on the well-known equation (field units):

$$N_R = GBV N/G \phi (1 - S_w)$$

where:

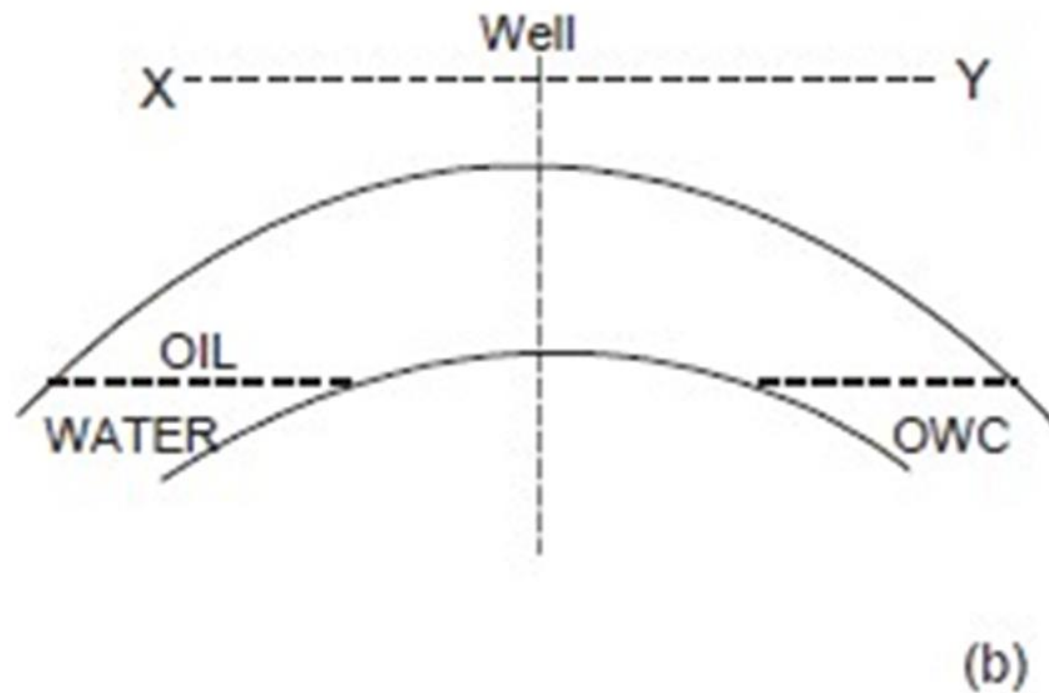
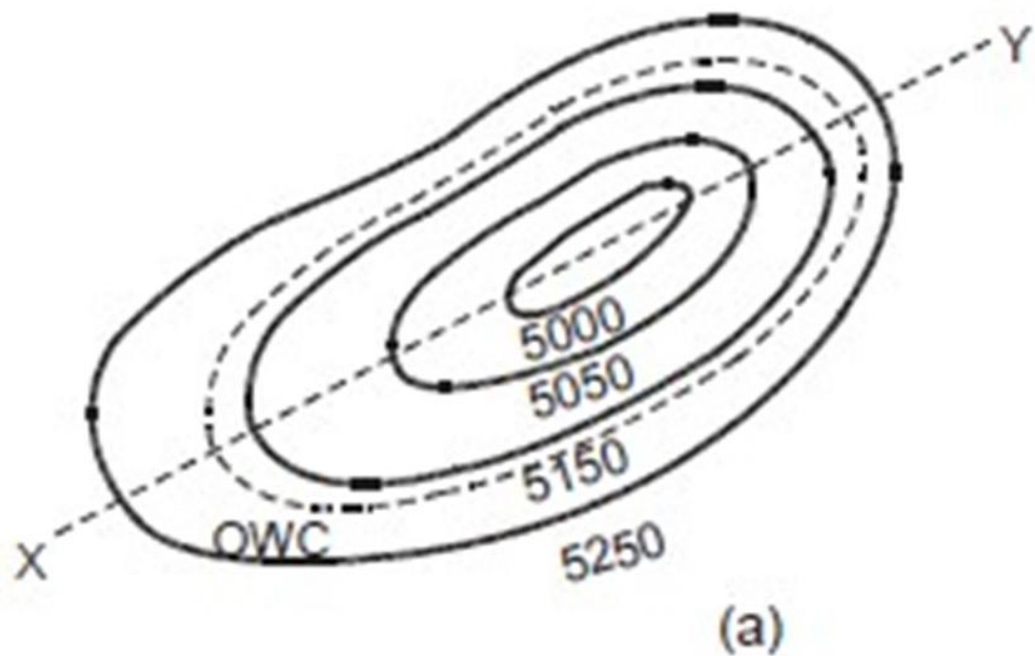
GBV Gross Bulk Volume of the reservoir (bbl)

N/G Net to Gross ratio

ϕ porosity, fraction

S_w water saturation, fraction

Method



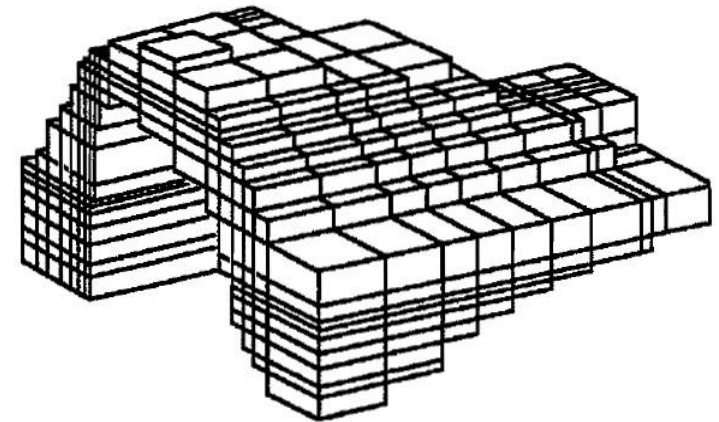
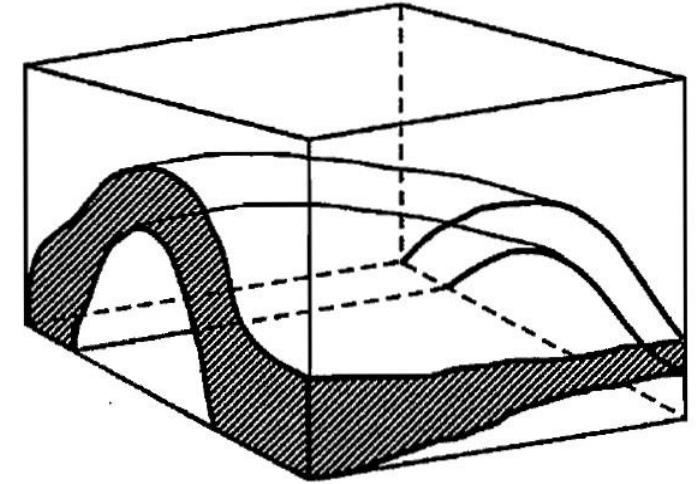
Calculation Method in Model

$$OII P_{total} = OII P_{C1} + OII P_{C2} + OII P_{C3} + OII P_{Cn}$$

$$OII P_c = BulkVolume * Porosity * (1 - WaterSaturation)$$

Cell Dimensions

Property Value at
each cell



- For reservoirs that described by 3D grids of the relevant geological parameters the equation should be applied to all the nodes of the support grid cells used to build the geologic model.
- As mentioned, the equation provides a value of OHIP at reservoir conditions. In the case of oil, the relationship that allows for the determination of the relevant figure at surface conditions
- (N) is the following:

$$N = \frac{N_R}{B_o}$$

What are you going to do in your report?

- Draw a reservoir model 3*3*6 in I, J, K consequently
- Reservoir dimensions 1200m*1200m
- You have nine wells in each grid
- The porosity data are taken from excel sheet
- The saturation data are taken from excel sheet
- Calculate the OOIP for each grid in STB
- Calculate the total oil in place for the entire reservoir in STB
- Use $B_o=1.2123$
- USE $(N/G) = 1$