



Macondo Technical Note

Title: Depleted Pressure
 Contributors:
 Issued by:
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Question Addressed in this Technical Note:

Discussions with the National Laboratories and other teams has resulted in a request for an estimated reservoir pressures for the Macondo field. This note provides the reservoir pressures calculated for the case in which the reservoir has produced at constant 35,000 stb/d from 20-April to 1-July.

Key Conclusions

Well Block Pressures at shut-in on 1-July-2010
 Depletion 35mbd from 4/20/2010 (cumulative prodn: 2.52 mmstb total production)

Reservoir Section	Top Depth ftTVDSS	Near Well Pressure psia	Reservoir Pressure psia	Comment
M110	8,969	4,730	4,730	gas sand at 18" shoe (depth of 18" shoe)
M57B	17,381	10,875	11,567	gas sand (cross flow)
M57C	17,614	11,397	12,875	gas sand (cross flow)
M56A	17,718	10,248	9,895	gas sand (cross flow)
M56B	17,890	10,846	10,878	water sand (little flow)
M56C	17,944	11,059	11,771	water sand (little flow)
M56D	17,981	10,921	11,539	oil sand
M56E	18,034	10,842	11,258	Main Oil Sand (on which 11,850 psia is based)
M56F	18,132	10,939	11,524	oil sand

Note: all pressures hydrocarbon pore volume weighted at mid-point of reservoir layer

Assumptions

- The calculation was performed using a VIP simulation model with the following parameters:
 - Oil B_{oi} : 2.345 rb/stb
 - c_f : 6×10^{-6} psia⁻¹

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- c_w : 3×10^{-6} psia⁻¹
 - GOR: 2993 SCF/stb
 - OOIP: 109.9 mmstb
 - Reservoir Volumes: Oil: 257.8 mmb, S_{wc} : 9.7% (in M56E, varies in other zones), Aquifer: 991.6 mmb (excludes connate water, 3.8x oil volume)
2. The model is a stylized representation of the reservoir, with each layer homogeneous, and no dip.
- The “near well pressure” is taken from the well’s gridblock, with dimensions of 100 x 100 ft.
 - The model includes the M57(B, C) and M56(B, C, D, E, F) sands, and was originally created to address whether the wellbore could become gas filled during shut-in at the “topkill.”
 - The M57 gas sands have a higher initial pressure than the main oil sands; they are modelled with a limited areal extent. These sands contribute some flow for the first 10 days of production, during which time the predicted GOR drops from 4,600 SCF/stb to 3030 SCF/stb.
 - For depletion with only the M56D-F open, depletion at a constant 35 mbd would yield a near well pressure in the M56E of 10,889 psia, and there would be no change in the sand’s average pressure.
3. Reservoir sands’ properties and depths were modelled per spreadsheet “MC252 – 1 Sand Description v2.xls”, (24-May, email Kelly McAughan)

Draft for Discussion