



## Macondo Technical Note

Title: Depleted Pressure for Well Control Planning  
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### Question Addressed in this Technical Note

The team planning the relief well has requested a revised estimate of the pressures which they may encounter at the reservoir interval.

### Key Conclusions

The likely pressure in the M56B (main oil sand) is approximately 10,100 psia. This value is based on the pressure observed at the BOP, corrected for static head. This new estimate lies within the previously estimated range for this sand, 9,360 – 10,550 psia (ref. note: "Depleted Pressure for Relief Well Planning" vA, 2-July-2010, by Bob Merrill)

The following table provides a pressure uncertainty range, the initial pressure and the most likely pressure for the M57 and M56 horizons. The most likely values are calculated from the observed BOP pressure.

Calculated Reservoir Pressures on 20-July

	Most Likely Pressure	Initial P	Extreme Cases	
			w/Aquifer 35 mbd	No Aquifer 70 mbd
	(psia)	(psia)	(psia)	(psia)
M57B	11,091	12,847	11,181	10,014
M57C	11,261	13,017	12,832	12,702
M56A	10,282	12,038	9,139	5,619
M56B	10,282	12,038	10,447	8,390
M56C	10,282	12,038	11,401	8,901
M56D	10,082	11,838	11,374	10,302
	10,100			
M57F	10,119	11,875	11,323	10,015

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Exhibit No. \_\_\_\_\_  
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The most likely results and main oil sand are highlighted. Simulated pressures have been manually adjusted to reflect 20 days additional production.

#### Assumptions / Discussion

1. The most likely pressure is based on observations from the pressure gauge on the cap, adjusted to reservoir conditions assuming a static liquid head (3,300 psi).
2. Reservoir Parameters for simulation (unchanged from previous note):
  - Oil  $B_{oi}$ : 2.345 rb/stb
  - $c_f$ :  $6 \times 10^{-6}$  psia<sup>-1</sup>
  - $c_w$ :  $3 \times 10^{-6}$  psia<sup>-1</sup>
  - GOR: 2993 SCF/stb
  - OOIP: 109.9 mmstb
  - Reservoir Volumes: Oil: 257.8 mmrb,  $S_{wc}$ : 9.5% (in M56B varies in other zones), Aquifer: 991.6 mmrb (excludes connate water: 3.8x oil volume)
3. Average depletion for each case (psi/day) from 20-April to 1-July were calculated. This factor was applied to the simulation results (through 1-July) to update them to 20-July.
4. The model is a stylized representation of the reservoir, with each layer homogeneous, and no dip.
5. Reservoir sands properties and depths were modelled per spreadsheet "MC252 - 1 Sand Description v2.xls", (24-May, email Kelly McAughan, attached). The sands without permeability but calculated porosity were assigned a nominal permeability (see table).

