

Well Intervention Pressure Control

Abbreviations Used in this Document

bar	=	Bar (pressure)
bar/m	=	Bar per metre
BHP	=	Bottom Hole Pressure
kg/l	=	Kilograms per litre
l/m	=	Litre per metre
l/min	=	Litre per minute
l/stroke	=	Litre per stroke
m	=	Metre
MD	=	Measured Depth
SIWHP	=	Shut in Well Head Pressure
TVD	=	True Vertical Depth
0.0981	=	Constant factor

1. PRESSURE GRADIENT (bar/m)

$$\text{Fluid Density (kg/l)} \times 0.0981$$

2. FLUID DENSITY (kg/l)

$$\text{Pressure (bar)} \div \text{TVD (m)} \div 0.0981$$

or

$$\frac{\text{Pressure (bar)}}{\text{TVD (m)} \times 0.0981}$$

3. HYDROSTATIC PRESSURE (bar)

$$\text{Fluid Density (kg/l)} \times 0.0981 \times \text{TVD (m)}$$

or

$$\text{Pressure Gradient (bar/m)} \times \text{TVD (m)}$$

4. FORMATION PRESSURE (bar)

$$\text{Hydrostatic Pressure (bar)} + \text{SIWHP (bar)}$$

**5. TOTAL PRESSURE AT A GIVEN DEPTH IN A SHUT IN WELLBORE (bar)
(WHERE BHP = FORMATION PRESSURE)**

$$\text{Hydrostatic Pressure of Gas (bar)} + \text{Hydrostatic Pressure of Oil (bar)} + \text{SIWHP (bar)}$$

6. TIME TO PUMP (minutes)

a. Tubing
$$\frac{\text{Tubing Capacity (l/m)} \times \text{MD (m)}}{\text{Pump Rate (l/min)}}$$

b. Annulus
$$\frac{\text{Annulus Capacity (l/m)} \times \text{MD (m)}}{\text{Pump Rate (l/min)}}$$

7. STROKES TO DISPLACE (Strokes)

a. Tubing
$$\frac{\text{Tubing Capacity (l/m)} \times \text{MD (m)}}{\text{Pump Displacement (l/stroke)}}$$

b. Annulus
$$\frac{\text{Annulus Capacity (l/m)} \times \text{MD (m)}}{\text{Pump Displacement (l/stroke)}}$$

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