Well Intervention Pressure Control

Abbreviations used in this document

bar	=	Bar (Pressure)
bar/m	=	Bar per metre
BHP	=	Bottom hole pressure
kg/l	=	Kilogram per litre
l/m	=	Litre per metre
l/stroke	=	Litre per stoke
m	=	Metre
MD	=	Measured depth
TVD	=	True vertical depth
SIWHP	=	Shut-in well head pressure
0.0981	=	Constant factor

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1. **PRESSURE GRADIENT (bar/m)**

   Fluid density (kg/l) × 0.0981

2. **FLUID DENSITY (kg/l)**

   Pressure (bar) ÷ TVD (m) ÷ 0.0981

   or

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

3. **HYDROSTATIC PRESSURE (bar)**

   Fluid density (kg/l) × 0.0981 × TVD (m)

   or

   Pressure gradient (bar/m) × TVD (m)

4. **FORMATION PRESSURE (bar)**

   Hydrostatic pressure (bar) + SIWHP (bar)

5. **TOTAL PRESSURE AT GIVEN DEPTH IN A SHUT IN WELLBORE (bar) (Where BHP = Formation pressure)**

   Hydrostatic pressure of gas (bar) + Hydrostatic pressure of oil (bar) + 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

$$\frac{\text{Annulus capacity (l/m)} \times \text{MD (m)}}{\text{Pump displacement (l/stroke)}}$$