

Well Intervention Pressure Control

Abbreviations Used in this Document

bbbl/ft	=	Barrels (US) per foot
bbbl/min	=	Barrels (US) per minute
bbbl/stroke	=	Barrels (US) per stroke
BHP	=	Bottom Hole Pressure
ft	=	Feet
MD	=	Measured Depth
ppg	=	Pounds per gallon
psi	=	Pounds per square inch
psi/ft	=	Pounds per square inch per foot
SIWHP	=	Shut in Well Head Pressure
TVD	=	True Vertical Depth
0.052	=	Constant factor

1. PRESSURE GRADIENT (psi/ft)

$$\text{Fluid Density (ppg)} \times 0.052$$

2. FLUID DENSITY (ppg)

$$\text{Pressure (psi)} \div \text{TVD (ft)} \div 0.052$$

or

$$\frac{\text{Pressure (psi)}}{\text{TVD (ft)} \times 0.052}$$

3. HYDROSTATIC PRESSURE (psi)

$$\text{Fluid Density (ppg)} \times 0.052 \times \text{TVD (ft)}$$

or

$$\text{Pressure Gradient (psi/ft)} \times \text{TVD (ft)}$$

4. FORMATION PRESSURE (psi)

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

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

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

6. TIME TO PUMP (minutes)

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

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

7. STROKES TO DISPLACE (Strokes)

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

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

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