Reservoir Engineering Data

JOHNSTON

Recorder No. J-1321 Field Report No. 19486 D

Damage Ratio	DR	0.44		Effective Transmissibility TO OIL	$\frac{Kh}{\mu B}$	3.8	$\frac{Md\text{-}ft.}{Cp.}$
Maximum Reservoir Pressure INITIAL SHUT-IN	P_o	3054	P.S.I.G.	Effective Transmissability	$\frac{Kh}{\mu B}$	–	$\frac{Md\text{-}ft.}{Cp.}$
Slope of Shut-in Curve CALCULATED	M	1882	PSI/log cycle	Flow Rate OIL	Q	39	Bbl./day
Potentiometric Surface (Datum Plane, Sea Level)	PS	1251	ft.	Pressure Gradient		0.309	PSI ft.
Productivity Index	PI	0.014	Bbl./day/PSI	Gas Oil Ratio "MFE" SAMPLER	GOR	216	CF/Bbl.
Radius of Investigation		22	ft.	K (Effective to OIL)		0.19	Md.

Assumptions made for Calculations for Liquid Recoveries

1. Q is averaged at a constant rate.
2. P_f is formation flowing pressure at a constant rate.
3. Formation flow is taken as single phase flow.
   If gas is produced at surface, phase separation is assumed to have occurred in drill pipe.
4. Radial flow is assumed.
5. For the purpose of calculating EDR where specific reservoir parameters are not available it is assumed that:

Effective permeability, K, will fall between	1 to 200 md
Formation porosity, ϕ, will fall between	0.1 to 0.3
Fluid compressibility, c, will fall between	10^{-5} to 10^{-4}
Fluid viscosity, μ, will fall between	0.05 to 50 cp.
Well bore radius, r_w, will fall between	$3\frac{7}{8}$" to $4\frac{3}{8}$"
Which gives an average value for the function log $\frac{K}{\phi\mu c r_w^2}$ of	5.5

6. Other standard radial flow, equilibrium assumptions.

Empirical Equations:

1. EDR $\frac{P_o - P_f}{M(\log T + 2.65)}$ where M $\frac{P_1 - P_{10}}{\text{Log Cycle}}$
2. Transmissibility $\frac{Kh}{\mu\beta} = \frac{162.6\,Q}{M}$
3. DST J $\frac{Q}{P_o - P_f}$ Theoretical J $\frac{7.08 \times 10^{-3}\,Kh}{\mu\beta \ln (r_e/r_w)}$ Assumed $\ln (r_e/r_w) = 7.60$
4. P.S. = [$P_o \times 2.309$ ft./PSI] – [Recorder depth to sea level.]
5. Radius of investigation, r_i $\sqrt{\frac{Kt}{40\phi\mu c}}$ where t = time in days

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