# Gas Reservoir Engineering Data

**JOHNSTON**

Instrument No. ___J-069___

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|---|---|---|---|---|---|---|
| Damage Ratio | DR | 8.61 | | Effective Transmissibility GAS | $\frac{Kh}{\mu Z}$ | 4773.4 | $\frac{Md\text{-}ft.}{Cp.}$ |
| Maximum Reservoir Pressure INITIAL SHUT-IN | $P_o$ | 3800 | P.S.I.G. | Flow Rate GAS | $Q_g$ | 1320 | MCF day |
| Slope of Shut-in Curve FINAL SHUT-IN | $M_g$ | 279,757 | PSI²/log cycle | Flow Rate | Q | - | |
| Potentiometric Surface (Datum Plane, Sea Level) | PS | - | ft. | Pressure Gradient | | .413 | PSI/ft. |
| Radius of Investigation | | 161 | ft. | K (Effective to GAS ) | | 4.11 | Md. |

SLOPE $M_G = (3799)^2 - (3762)^2 = 279,757$

## Assumptions made for Calculations for Gas Recoveries

1. $Q_g$ is taken as steady state flow and unless stated otherwise at standard conditions 14.7 P.S.I. and 60°F.

2. $P_f$ is final formation flowing pressure at steady state flow.

3. Formation flow is taken as single phase flow. If liquid (condensate) is produced at surface, condensation is assumed to have occurred in drill pipe.

4. Radial flow is assumed.

5. Unless given, gas specific gravity is assumed to be 0.7 (air 1.0) and having pseudo critical temperature at 385 Rankin and pseudo critical pressure of 666 P.S.I.A.

6. Other standard radial flow, steady state assumptions.

Empirical Equations:

1. $EDR - \dfrac{P_o^2 - P_f^2}{M_g(\log T + 2.65)}$ where $M_g = \dfrac{P_1^2 - P_{io}^2}{\text{Log Cycle}}$

2. Transmissibility $\dfrac{Kh}{\mu Z} = \dfrac{1637°T_f Q_g}{M_g}$

3. P.S. $\left[ P_o \times 2.309 \text{ ft./PSI} \right] - \left[ \text{Recorder depth to sea level.} \right]$

4. Radius of Investigation, $r_{i,} = \sqrt{\dfrac{Kt}{40\phi(1 - S_w)\mu c}}$ where $t$ = time in days