



Recorder No. T-146

Field Report No. 22260 B

|                            |       |                    |                            |                    |       |                      |
|----------------------------|-------|--------------------|----------------------------|--------------------|-------|----------------------|
| Estimated Damage Ratio     | EDR   | 0.84               | Effective Transmissibility | $\frac{Kh}{\mu B}$ | 463.6 | $\frac{Md-ft.}{Cp.}$ |
| Maximum Reservoir Pressure | $P_o$ | 3931 P.S.I.G.      | Effective Transmissability | $\frac{Kh}{\mu B}$ |       | $\frac{Md-ft.}{Cp.}$ |
| INITIAL SHUT-IN            |       |                    |                            |                    |       |                      |
| Slope of Shut-in Curve     | M     | 349 PSI/log cycle  | Flow Rate                  | Q                  | 995   | Bbl./day             |
| FINAL SHUT-IN              |       |                    |                            |                    |       |                      |
| Potentiometric Surface     | PS    | - ft.              | Pressure Gradient          |                    | .3360 | PSI/ft.              |
| (Datum Plane, Sea Level)   |       |                    |                            |                    |       |                      |
| Productivity Index         | PI    | .7179 Bbl./day/PSI | Gas Oil Ratio              | GOR                | 1643  | CF/Bbl.              |
|                            |       |                    | FROM "MFE" SAMPLER         |                    |       |                      |
| Radius of Investigation    |       | 244 ft.            | K (Effective to            |                    | 14.73 | Md.                  |
|                            |       |                    | OIL                        |                    |       |                      |

$$SLOPE M = 3931 - 3582 = 349$$

## Assumptions made for Calculations for Liquid Recoveries

1. Q is averaged at a constant rate.
2.  $P_r$  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, $\phi$ , will fall between ..... | 0.1 to 0.3             |
| Fluid compressibility, c, will fall between .....    | $10^{-4}$ to $10^{-4}$ |
| Fluid viscosity, $\mu$ , will fall between .....     | 0.05 to 50 cp.         |
| Well bore radius, $r_w$ , will fall between .....    | 3' " to 4' "           |

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:

$$1. EDR = \frac{P_o - P_f}{M(\log T + 2.65)} \text{ where } M = \frac{P_i - P_{10}}{\log \text{ Cycle}}$$

$$2. \text{ Transmissibility } \frac{Kh}{\mu B} = \frac{162.6 Q}{M}$$

$$3. DST J = \frac{Q}{P_o - P_f} \quad \text{Theoretical } J = \frac{7.08 \times 10^{-3} Kh}{\mu B \ln(r_e/r_w)} \quad \text{Assumed } \ln(r_e/r_w) = 7.60$$

$$4. P.S. = [P_o \times 2.309 \text{ ft./PSI}] - [\text{Recorder depth to sea level.}]$$

$$5. \text{ Radius of investigation, } r_i = \sqrt{\frac{Kt}{40\phi\mu c}} \quad \text{where } t = \text{time in days}$$

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