DETERMINING THE SKIN EFFECT BASED ON THE PRESSURE RECOVERY CURVE

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A B S T R A C T	K E Y W O R D S
This article presents some conclusions based on the results of studies in the well and the use of bottomhole conductivity, hydraulic conductivity and other properties of the reservoir to find the value of the skin effect, and at the same time taking into account the indicators of well No. 19 at the Shurchi field.	Orizon, wells, bottom hole, testing, pressure, skin effect. oil, coefficient.

Introduction

The right and left sides of the equation are equivalent when there are no additional resistances in the near-wellbore zone, and their inequality indicates the difference between the hydraulic conductivity of the near-wellbore and remote zones, which, in the case of deterioration in the hydraulic conductivity of the near-wellbore zone, necessitates the cost of additional depression Δp_z with a constant volume of product fil

$$\Delta p_z = \Delta p_t - i \left(\lg t + \lg \frac{2.25x.}{r_c} \right),$$

где Δp_t − pressure increase during time t after the well is closed. Entering $\frac{\Delta P_s}{i} = S$, we obtain the equation for determining the skin effect: $S = \frac{\Delta p}{i_t} - \lg t - c$,

c - correction for pressure loss on the well wall, which is calculated for known values of χ and rc using the formula C=lg$[\![f_0]\!]$135x/(r_c^2) or taken from the table. 1.1; t - duration of well shutdown, min.

A positive value of the skin effect indicates the presence of additional filtration resistance in the bottomhole zone of the well, to overcome which a certain part of the depression $\Delta p\_s=iS$ is spent, which is used to estimate the productivity ratio $O\Pi = \frac{\Delta p_t - \Delta p_z}{\Delta P_t}$

However, depending on the condition of the bottomhole zone, the following options are possible.

Condition of the bottomhole zone.........	$k_z < k$	$k_z > k$	$k_z = k$
Skin effect...	S>0	S<0	S=0
Productivity ratios....................	ОП<1	ОП>1	ОП=1
Hydraulic conductivity ratio..............	ОГ>1	ОГ<1	ОГ=1

Definition of skin effect and productivity relationship

Determination of the state of the bottomhole zone and the quality of formation opening on the development of test results during the drilling of a well.

Wells 19 Shurchi. Test interval 798-795 m. On December 10, 1967, using a formation tester, an influx of oil and gas mixture with a volume of 3 m3 was obtained in 80 minutes, which corresponds to a flow rate of 60 tons/day with a change in bottomhole pressure from 2 MPa to 5 MPa to a depth of 810 m. Additional data: oil density 875 kg/m3; volume factor 1.38; effective thickness of layers in the testing interval is 15 m; wellbore radius in the test interval is 0.140 m.
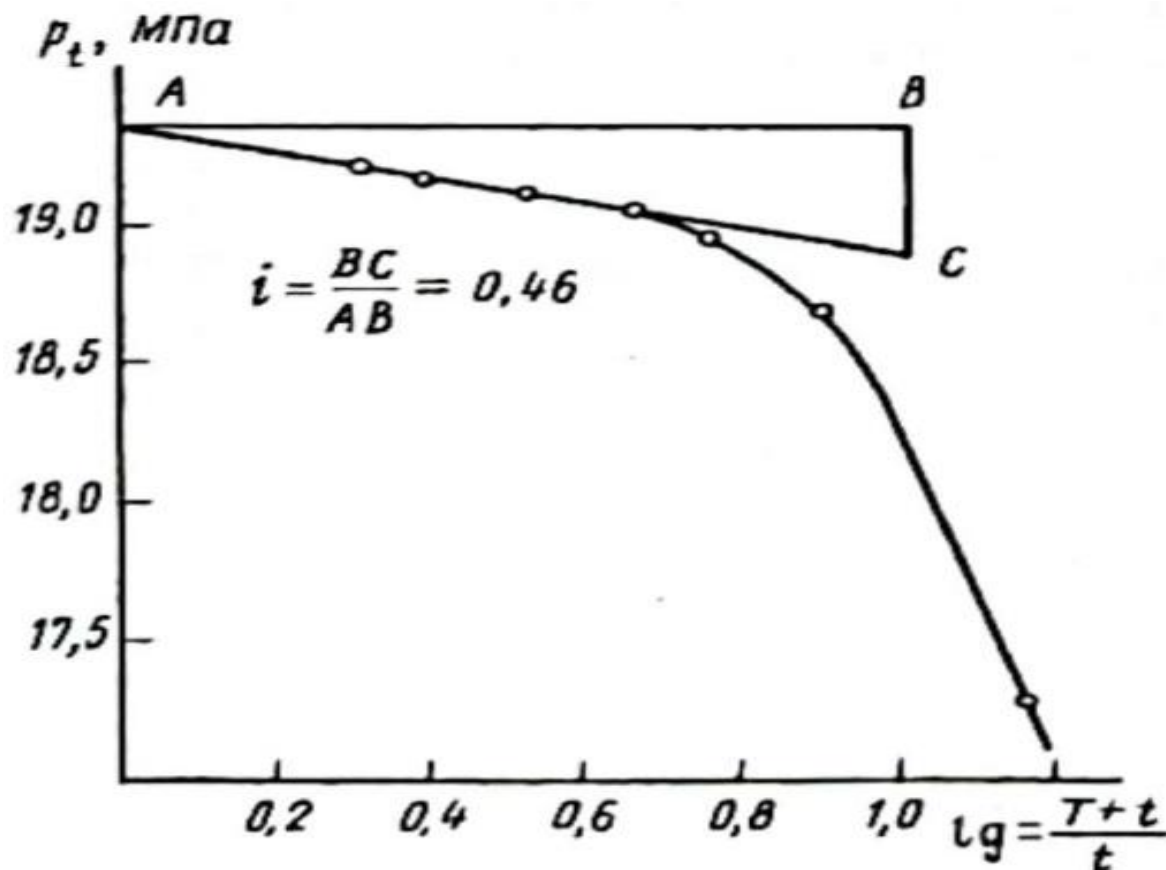
Recovery schedule

pressure in skB. 19 Shurchinskaya, built according to the Horner method (interval and tests 798-795 m)

Since the volume of inflow of oil, oil and gas is determined based on the increase in the liquid level in the well before closing to restore pressure, the volumetric coefficient is considered to be zero. The formula determines the skin effect.

$$S = \frac{p_{пл} - p_3}{i} - \lg T - c,$$

where rpl is reservoir pressure, MPa; p_3 - bottomhole pressure at the end of the inflow period, MPa; T - duration of inflow (open period) before closing to restore pressure min.

The correction factor c is determined from the table. 1.1, the value of which for $\frac{kh}{\mu} = 24{,}9 \cdot 10^{-11} M^3/(\prod a \cdot c)$, $r_c = 0{,}098$ м и $h_{эф} = 15$ м equals 2,6.

Then

$$S = \frac{19.3 - 15.7}{0.46} - 1.8 - 1.6 = 3.4.$$

Additional depression losses for skin effect value

$$\Delta p_z == iS = 0{,}46 \times 3{,}4 = 1{,}56 MIIa$$

Productivity ratio

$$W = \frac{19.3 - 15.7 - 1.6}{19.3 - 15.7} = 0.55.$$

The results obtained indicate that the presence of skin effect in the near-wellbore zone leads to a decrease in its productivity by 45%

Conclusion

Above is the calculation of the skin effect of the productivity of the Shurchi field using indicators between the pressure recovery curve and the permeability of the well bottom. The results showed that the presence of the skin effect caused a significant decrease in the productivity of well No. 19 at the Shurchi field.

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