Practical Use of Flexible Liner Transmissivity Profiling Results

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What is a FLUTE profile? Answer: A map of the transmissivity distribution in a borehole obtained with a liner.

The liner installation

The liner descent rate multiplied by the hole cross-section is the flow rate out of the hole. A change in the liner descent velocity occurs when a flow path is sealed. The change in flow rate is the flow into the flow path (a bed or fracture). That flow rate change over that interval of the hole determines that flow feature’s transmissivity.

Using the “total transmissivity” curve:

Transmissivity from 20-23.8 m = 4.47-3.0 cm/s = 1.47 cm/s

Conductivity = 1.47 cm/s/3800cm = 3.9e-04 cm/s

The transmissivity calculation

Flow rate into the fracture, \( \Delta Q = \Delta V(V_1 - V_2) \), where \( V_1 > V_2 \)

\[ T = \Delta Q \ln(r_2/r_1)/(2 \pi \Delta H_{\text{in}}) \text{ in the interval } Z_i \text{ to } Z_j \]

Total borehole transmissivity 5.06 cm/s

Fractured interval from 25.3-31.0 m

Only smaller fractures below 50 m.

Deepest large fracture at 86 m (Q/\( \Delta H \)=2.1e-06 m²/m/s)

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