A new approach to the step-drawdown test

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Abstract

In this paper a new approach to perform step-drawdown tests is presented. Step-drawdown tests known to date are performed strictly keeping the value of the pumping rates constant through all the steps of the test. Current technology allows one to let the submerged electric pumps work at a specific revolution per minute (r/min) and to suitably modify the rotation velocity at every step. The new approach presented in this paper is based on the idea of keeping the value of r/min fixed at every step of the test, instead of keeping constant the value of the discharge. This technique has been experimentally applied to a well and a description of the operations and results are presented in detail. This approach, in this unique case, made possible an understanding of how the discharge Q varies as a function of the drawdown s_w. It also enables one monitor the approaching of the equilibrium between Q and s_w, using both the variation of Q and s_w with time. Moreover, it was observed that for the well in question the ratio Q/s_w remains almost constant within each step.

Keywords: characteristic curve, pumping test, equipment/field techniques, hydraulic testing