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Determine the optimal location of observation wells in an heterogeneous unconfined Aquifer

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Abstract

In a pumping test the drawdown of the Groundwater table has to be measured through observation wells to determine the hydraulics conductivity of the field . In a homogenous isotropy Aquifer two observation wells in one line might be enough to determine the hydraulic conductivity K-Value of the Aquifer .In this case ,the contour lines of the groundwater table are circulars and the well lies in the center of these circles . In the nature, the actual drawdowns of groundwater table are not circular .That means that the assumed Model of the homogenous Aquifer is practically non-existent in the nature.
The aim of this Research is to show the discrepancy between the assumed model and the reality. In this Paper the unconfined Aquifer will be here only investigated.
The influence of the heterogeneity on the Evaluation of pumping test will be studied. The heterogeneous field will be described by the geostatistical methods and the distribution of the K-values is assumed as log – normal distribution (sudcky,), from experience the most variogramm for the distribution of K-values is normal.
The geostatistical methods will be used to generate the spatial distribution of K-Value in the field .The spatial distribution of k-Values is generally log-normal distribution .From Experience the variogramm model for the spatial distribution of K-Values is often exponential variogramm , and will be assumed in this work .
The most important parameters of the Variogramm are the Sill and Rang.
These two parameters will be varied to investigate their influence on the evaluation on pumping test .