

ANALYTICAL SOLUTIONS FOR WELL DRAWDOWN WITH WELL LOSSES

1. MULTIPLE WELL SYSTEM NEAR A BOUNDARY

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ABSTRACT

This paper deals with two cases. The first case concerns a solution for the drawdown in a given well which makes it possible to monitor and/or model the drawdown in other wells in the system and determine whether a critical well depth and, consequently, a critical groundwater flow velocity at the well has not been exceeded. Excessive velocity at the well results in the rinsing of fine soil particles, the impairment of filtration stability and subsequently in the clogging of the well filter pack. Significant additional resistance to flow into the well, often referred to as "skin effect", will follow this clogging and result well losses. In a final phase, high flow velocities can result in complete clogging of the filter pack and the breakdown of the well. The second case concerns the drawdown in a system of wells including boundary conditions and changes in water levels due to different pump start times and discharge rates. The solution is based on the assumptions of additional resistance in the well, any number of discharge and injection wells, and a constrained water level.

Reference: *Pech, P., and R. Novotny. 2005. Analytical Solutions for Well Drawdown with Well Losses 1. Multiple Well System Near a Boundary, Journal of Environmental Hydrology, Vol. 13, Paper 27.*

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