

Large Drawdown Slug Tests

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Abstract

Large drawdown slug tests (LDST) are defined as those slug tests with initial drawdown (H_0) > 5 m. LDST up to 18 m were conducted in discrete intervals at four wells completed in fractured bedrock. Water level responses were recorded in the test well and at monitoring wells located up to 70 m from the test well. When discrete intervals were isolated in monitoring wells, the measured monitoring well responses were above 30 cm, allowing quantitative estimation of hydraulic parameters by a finite difference, radial heterogeneous model. Transmissivity and storage coefficient estimates from LDST with monitoring wells were compatible with those estimates from pumping tests. LDST are a valuable hydraulic test to: a) study well interconnectivity in heterogeneous formations, b) alleviate the need to pump large quantities of groundwater and attendant associated disposal and logistical requirements, especially at contaminated sites, c) quantify the storage coefficient from monitoring well field data, and d) assess well interconnectivity of tight fractures.

Topic:

Aquifer testing –well testing

Biographical sketches

Gonzalo Pulido, PhD, is a civil engineer with over 18 years of academic and consulting experience. He has been teaching several college courses related with hydraulic resources, in his home country (Colombia) over 6 years. As a groundwater consultant engineer he has been responsible for well drilling oversight, design, and installation, including hydraulic testing and pumps selection. He has a wide experience in mathematical modeling, including object-oriented programming, computer graphics, and groundwater software development. During his doctoral research he was responsible for the hydraulic characterization of a fractured bedrock aquifer. Currently, he is retained by HydroQual, Inc. and he is participating in several Superfund Sites involving fractured bedrock formations. *Email: gpulido@hydroqual.com. Phone: (201)529.5151 ext. 7148 Fax: (201)529.5728.*

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Nancy E. Kinner, PhD, is a Professor at the University of New Hampshire. Her main areas of research interest are bioremediation of contaminated subsurface environments and more generally, environmental microbiology. She is a member of the Environmental Research Group (ERG) at UNH and has conducted research on wastewater biofilm microbiology, the role of protists in subsurface contaminant degradation, and petroleum and chlorinated solvent bioremediation. *Email: nancy.kinner@unh.edu .Phone: (603)862.1422. Fax:(603).862.3967.*