Analytical Methods for Borehole Permeability Tests in Seepage Barrier Walls

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Borehole permeability tests that measure flow or head changes in boreholes located within seepage barrier walls provide one of the best ways to estimate the in situ permeabilities of those walls for quality control and assurance. Equations published by M. J. Hvorslev in 1951 have been the most common method for estimating permeabilities from these barrier wall borehole tests in the past. The Hvorslev equations model an infinite stratum of uniform permeability, which is not the actual condition for a test performed in a low permeability barrier wall located within a high permeability stratum. Line source analytical models more closely match barrier wall test conditions and should be used to estimate barrier wall permeabilities instead of the Hvorslev models. Permeability equations should also account for the differing water levels on each side of the wall by using an average of the two levels or by using the equilibrium level of water in the borehole.