Charts for Estimating Probabilities of Backward Erosion Piping Progression in Deep, Pervious Foundations

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Backward erosion piping refers to an internal erosion process by which shallow erosion channels progress backwards through foundation sands beneath levees and embankment dams. The potential for backward erosion piping to progress to failure is often assessed by comparing the average horizontal gradients in a foundation to critical values measured in the laboratory. Because measured critical gradients are influenced by scale, the laboratory values must be corrected to field scale before being applied to a project. This study presents probabilistic charts of horizontal gradients that have been corrected for scale, soil density, and anisotropy to apply to deep, pervious aquifers. The charts can be used directly during screening-level risk assessments to estimate probabilities of backward erosion piping progression.