

Polluted ground water poured into a model

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Dutch researcher Phil Ham has developed mathematical models to calculate the natural degradation capacity of polluted groundwater. As a result of this, it can now be predicted whether a polluted area will become larger or smaller. In the latter case, expensive remediation methods can be avoided.

Groundwater under contaminated sites, such as waste disposal sites and industrial areas, is often polluted. Such a polluted groundwater plume can grow, shrink or remain stable due to an interplay between physical, chemical and biological processes.

Phil Ham has devised mathematical expressions to determine the size of a plume and to assess the natural degradation capacity of contaminated sites. His analytical models calculate the reactive transport of dissolved matter in water through porous soil and the characteristics of the mixing processes. Such a scientifically-supported method had not previously been available.

Within the world of engineering there is a high demand for mathematical models that allow accurate predictions to be made. If it can be calculated whether a plume will decrease in size or remain stable, invasive and expensive remediation methods can possibly be avoided.

The results of this study enable predictions to be made about the effectiveness of natural degradation as a responsible alternative to aquifer remediation.

Source: Netherlands Organization for Scientific Research

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