Modeling of contaminant transport resulting from dissolution of a coal tar pool in an experimental aquifer

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In this study, a two-dimensional numerical model for simulating the multicomponent
transport of dissolved contaminants originating from dissolution of a coal tar pool
in a stratified, saturated porous medium is developed. The model is solved numeri-
cally using a fully implicit finite-difference scheme. The model accounts for temporal
changes in equilibrium aqueous solubility and possible solidification of polycyclic
aromatic hydrocarbon (PAH) compounds. The model is used to simulate contaminant
transport from a rectangular-shaped coal tar pool dissolution experiment conducted in
a large-scale experimental aquifer. Model simulations show good agreement against
observed contaminant concentrations. Next, the model is used to simulate multicom-
ponent contaminant plume evolution within the experimental aquifer.