

Chlorinated Solvents in Groundwater of the United States

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Four chlorinated solvents—methylene chloride, perchloroethene (PCE), 1,1,1-trichloroethane, and trichloroethene (TCE)—were analyzed in samples of groundwater taken throughout the conterminous United States by the U.S. Geological Survey. The samples were collected between 1985 and 2002 from more than 5,000 wells. Of 55 volatile organic compounds (VOCs) analyzed in groundwater samples, solvents were among the most frequently detected. Mixtures of solvents in groundwater were common and may be the result of common usage of solvents or degradation of one solvent to another. Relative to other VOCs with Maximum Contaminant Levels (MCLs), PCE and TCE ranked high in terms of the frequencies of concentrations greater than or near MCLs. The probability of occurrence of solvents in groundwater was associated with dissolved oxygen content of groundwater, sources such as urban land use and population density, and hydraulic properties of the aquifer. The results reinforce the importance of understanding the redox conditions of aquifers and the hydraulic properties of the saturated and vadose zones in determining the intrinsic susceptibility of groundwater to contamination by solvents. The results also reinforce the importance of controlling sources of solvents to groundwater.

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