

MTBE and Gasoline Hydrocarbons in Ground Water of the United States

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The occurrence of methyl tert-butyl ether (MTBE) and gasoline hydrocarbons was examined in three types of studies of ground water conducted by the U.S. Geological Survey: major aquifer surveys, urban land-use studies, and agricultural land-use studies. The detection frequency of MTBE was dependent on the study type, with the highest detection frequency in urban land-use studies. Only 13 ground water samples from all study types, or 0.3% , had concentrations of MTBE that exceeded the lower limit of the U.S. EPA's Drinking-Water Advisory. The detection frequency of MTBE was highest in monitoring wells located in urban areas and in public supply wells. The detection frequency of any gasoline hydrocarbon also was dependent on study type and generally was less than the detection frequency of MTBE. The probability of detecting MTBE in ground water was strongly associated with population density, use of MTBE in gasoline, and recharge. Ground water in areas with high population density, in areas where MTBE is used as a gasoline oxygenate, and in areas with high recharge rates had a greater probability of MTBE occurrence. Also, ground water from public supply wells and shallow ground water underlying urban land-use areas had a greater probability of MTBE occurrence compared to ground water from domestic wells and ground water underlying rural land-use areas. The probability of detecting MTBE in ground water was weakly associated with the density of leaking underground storage tanks, soil permeability, and aquifer consolidation, and only concentrations of MTBE >0.5 µg/ L were associated with dissolved oxygen.

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