

Title: Volatile Organic Compounds (VOCs) in Small Community Wastewater Disposal Systems Using Soil Absorption (Study No. 6)

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Objectives: To identify volatile organic compounds (VOCs) in septic tank effluent, septage and groundwater at sites using septic tank soil absorption systems and to estimate potential loading of VOCs to the environment from small community septic tank soil absorption systems.

Background/Need: VOCs have been identified as a priority pollutant in septic tank soil absorption systems. There is evidence of carcinogenicity to humans in relation to VOCs.

- Methods:** This study was conducted at six communities serving populations ranging from 10 to 346 persons over a one-year period. Concentrations of 45 screened VOCs were quantified for effluent from six septic tanks, from septage at two sites and from soil absorption systems. Groundwater monitoring wells were adjacent to four of the sites.
- Results:** The frequency of occurrence of 45 screened VOCs present in septic tank effluent and septage is presented along with their concentrations. 10 VOCs were detected in effluent samples and 6 were detected in septage. 8 of the 10 VOCs detected in effluent samples and 5 of the 6 VOCs detected in septage were considered priority pollutants. 2 of the compounds, p-dichlorobenzene and toluene were detected in at least 50% of the samples collected from these two sources. 3 VOCs were detected in 2 of the groundwater monitoring wells.
- Conclusions:** The concentrations of VOCs found in septic tanks effluent were below preventive action limits (PALs) set by the Wisconsin Department of Natural Resources (DNR), with one exception, toluene. Septage samples did not appear to concentrate VOCs with the exception of toluene. Larger communities generally produced more VOCs than smaller ones, perhaps due to a larger commercial component. VOCs were detected in groundwater below sites underlain by sandy soils and from relatively new sites (less than two years old). Concentrations of VOCs found in groundwater samples were below DNR PALs.
- Recommendations/
Implications:** Investigators recommend evaluating the presence of priority pollutants other than VOCs in wastewater from small communities, as well as assessing the migration of VOCs in soil with a column study and assessing the chemical composition and flow of commercial industrial wastewater at larger community sites.
- Availability of Report:** This report is available for viewing and loan at:

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- Key Words:** p-dichlorobenzene, septic systems, soil absorption, toluene, volatile organic compounds, wastewater
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