

Initial Findings: National Survey of MTBE, Other Ether Oxygenates, and Other VOCs in Community Drinking-Water Sources

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Survey's Main Purpose and Scope

- Determine the occurrence, concentration, and seasonal variation of methyl *tert*-butyl ether (MTBE), other ether oxygenates, and other volatile organic compounds (VOCs) in community water system (CWS) source water prior to treatment.
- Randomly select and sample 954 source-water sites in the United States and Puerto Rico (fig. 1) considering:
 - two source-water categories (surface water and ground water);
 - five CWS-size categories based on population served; and
 - number of CWSs and population served by each source-size category.
- Analyze for MTBE, 3 other ether oxygenates, and 62 additional VOCs.

Frequency of Occurrence of MTBE (reporting level of 0.2 micrograms per liter)

- MTBE was detected:
 - in 24 States;
 - in about 9 percent of all source-water sites sampled;
 - five times more frequently in MTBE high-use areas than in other areas;
 - generally more frequently in surface-water sources (about 14 percent) than in ground-water sources (about 5 percent); and
 - more frequently in large and very large CWSs (fig. 2).

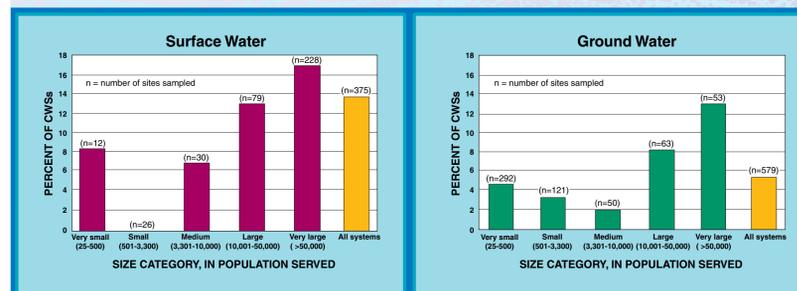


Figure 2. Detection frequency of MTBE by CWS-size categories for surface- and ground-water sources.



Figure 1. Map showing source-water sampling sites in the United States and Puerto Rico.

Concentrations of MTBE and Other VOCs

- MTBE concentrations were almost always less than the U.S. Environmental Protection Agency's (USEPA) taste and odor advisory of 20-40 micrograms per liter ($\mu\text{g/L}$) and the lowest taste and odor-advisory level set by a State (California, 5 $\mu\text{g/L}$) (fig. 3).
- Other VOCs also were found at low levels. Less than 1 percent of the source-water sites had a concentration that exceeded USEPA's Maximum Contaminant Levels or Health Advisories.

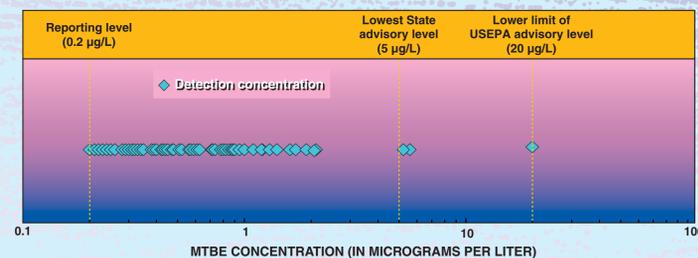


Figure 3. Concentration of MTBE detections and the lowest State and USEPA taste and odor advisories.

Frequency of Occurrence of MTBE Compared to Other VOCs (reporting level of 0.2 micrograms per liter)

- One or more VOCs were detected at about one-fourth of the CWS source-water sites sampled.
- The most frequently detected VOCs in surface-water sources were chloroform and MTBE (about 14 percent each) (fig. 4).
- Chloroform was detected about two times more frequently than MTBE in ground-water sources (fig. 4).
- MTBE accounted for two-thirds of all detections of gasoline compounds; however, MTBE seldom was detected with gasoline hydrocarbons.
- Other ether oxygenates, including *tert*-amyl methyl ether (TAME), diisopropyl ether (DIPE), and ethyl *tert*-butyl ether (ETBE), rarely were detected.

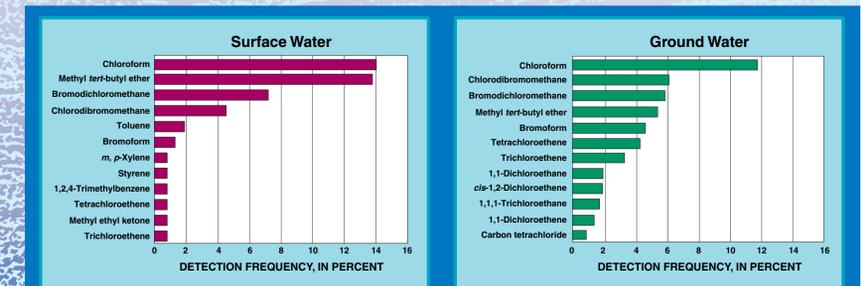


Figure 4. Detection frequency of MTBE and other commonly detected VOCs in CWS surface- and ground-water sources.



U.S. Geological Survey employee sampling surface water at Lake Rampart, Colorado.



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For relevant publications and additional information, visit the USGS VOC National Synthesis web site at URL: <http://water.usgs.gov/nawqa/vocs>