

A Probabilistic Assessment of Household Exposures to MTBE from Drinking Water

Pamela R. D. Williams,* Paul K. Scott, Patrick J. Sheehan, and Dennis J.

Paustenbach

Exponent, 149 Commonwealth Drive, Menlo Park, CA 94025

ABSTRACT

The oxygenate methyl tertiary butyl ether (MTBE) has been added to reformulated gasoline in the U.S. to meet national ambient air quality standards. Although MTBE has provided significant health benefits in terms of reduced criteria and toxic air pollutants, detections of MTBE in some groundwater and drinking water sources have raised concerns about potential environmental contamination and human exposures. In this paper, we examine the frequency and concentration of MTBE detections in drinking water sources in California from 1995 to 1999, and provide a preliminary analysis of the distribution of household exposures to MTBE from water-related activities. Using published data on the toxicity and possible cancer hazard posed by MTBE, we estimate the likely cancer and non-cancer risks for the general population in California from past and potential future MTBE exposures. More highly exposed subgroups were also addressed. Our findings indicate that less than 2% of all sampled drinking water sources in California had detectable levels of MTBE in 1999, with average MTBE drinking water concentrations ranging from 0.09 to 4.9 ppb for this year. Both the detection rate for MTBE and average MTBE concentrations have remained relatively stable since 1995, despite increased sampling of drinking water sources in California. The probabilistic exposure analysis suggests that drinking water exposures to MTBE are unlikely to pose a significant health risk for the general population or more highly exposed individuals in California.

Key Words: MTBE, drinking water, human exposure, probabilistic analysis, risk assessment