

Trend Report on MTBE in Public Water Supplies

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Division of Environmental Health & Division of Health Planning and Education

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Purpose:

To describe trends in methyl tertiary butyl ether (MTBE) levels in Dutchess County public water supplies over the past decade.

Background:

Between 1979 and 2005, methyl tertiary butyl ether (MTBE) was added to reformulated gasoline in place of lead to promote oxygenation and reduce pollution from combustion. MTBE dissolves easily in water, and historically appeared as a contaminant in water supplies primarily as the result of gasoline spills and leakage from gasoline tanks. In 2004, New York State joined California and several other states in issuing a complete ban on MTBE. By 2005, twenty-five states signed onto the ban and refiners across the United States rapidly switched from MTBE to ethanol, which in addition to promoting oxygenation also met new renewable fuel standards passed by Congress that same year. The United States Environmental Protection Agency's (EPA) reformulated gasoline survey indicates that very little MTBE has been used in gasoline since 2005 (<http://www.epa.gov/mtbe>).

To date, the EPA concludes that there is insufficient research to quantify human health risks of low-level exposure to MTBE in drinking water, but recognizes it as a potential carcinogen at very high levels of exposure on the basis of animal studies. Since 2004, the New York State Department of Health has required testing for MTBE, setting the maximum contaminant level at 0.01 mg/L, or 10 parts per billion.

The Dutchess County Department of Health regulates and monitors nearly 700 county public water supplies in compliance with County and State Sanitary Codes and the Federal regulations. Drinking water is regulated on many levels to protect health; such regulations apply to the source location, system construction, treatment (e.g., clarification, filtration, disinfection, and aeration), sampling frequency, water quality, and public notification. The following report summarizes sample results for MTBE in public water supply sources in Dutchess County since 2000. The samples reflect MTBE levels occurring in the supply source *prior to* the processes of treatment and filtration, which are designed to significantly reduce exposure to all potential contaminants including MTBE and ensure water is safe for consumption. The findings therefore represent a highly conservative estimate of potential exposure.

Analysis of MTBE Sample Data:

MTBE has *not* been found in detectable levels in any *surface* water sources (e.g., reservoir intakes) ever sampled in Dutchess County. On the other hand, detectable but declining levels of MTBE have been found in a portion of samples taken from public water supply wells fed by *groundwater*. The data presented in this report show that

the **average concentration** of MTBE detected in public water supply wells sampled in Dutchess County (Figure 1) decreased by 96%, from a high of 0.024 mg/L in 2000 to a low of 0.001 mg/L in 2013. Likewise, the **maximum** MTBE concentration declined by 98%, from 3.80 mg/L in 2003 to 0.09 mg/L in 2013 (Table 1). The data also indicate that since 2005 no **new** public water supplies have been found to have MTBE contamination above the MCL and that by 2013, only 7 out of 109 supplies sampled had MTBE concentrations above 0.01 mg/L.

Figure 1.

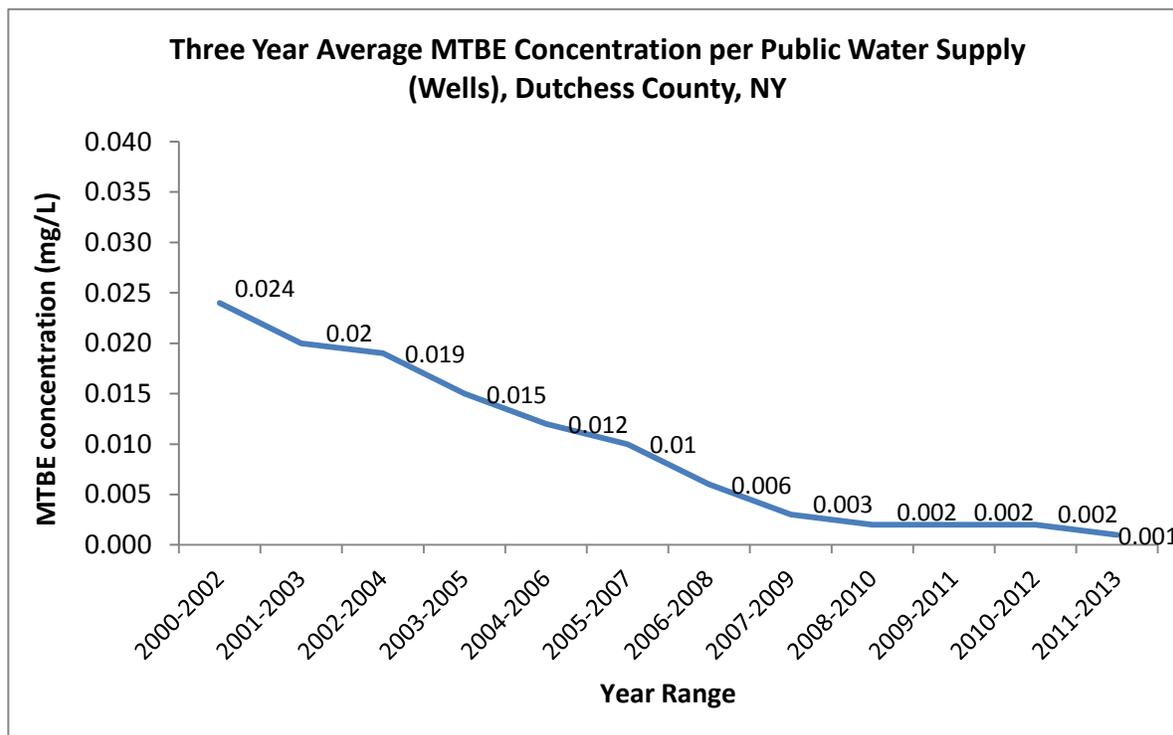


Table 1. Public Water Supply Sampling Results for MTBE in Dutchess County, NY (Wells)

Year	Total number of wells sampled	No. of samples with detectable level of MTBE > 0 mg/L	No. of samples above the MCL (0.01 mg/L)	Maximum MTBE concentration detected (mg/L)
2003	191	69	27	3.80
2004	158	56	24	0.69
2005	194	50	18	2.20
2006	123	40	14	2.50
2007	130	43	13	0.70
2008	155	34	11	0.36
2009	151	38	12	0.27
2010	140	35	12	0.18
2011	139	30	9	0.11
2012	154	29	6	0.11
2013	109	24	7	0.09

Geospatial Analysis:

The two maps in Appendix 1 illustrate the localized occurrence of MTBE contamination and widespread decline in MTBE measured in public wells in Dutchess County, comparing the early 2000s to the present day.

Private Well Water Sampling:

The Dutchess County Comprehensive Private Well Testing Initiative was conducted in 2007-2009 to collect information about private well water quality. Of 250 sites sampled throughout the county, *no* private wells were found to have MTBE above the maximum contaminant level. Detailed sampling data are available online:

<http://www.dutchessny.gov/CountyGov/Departments/Health/14361.htm>.

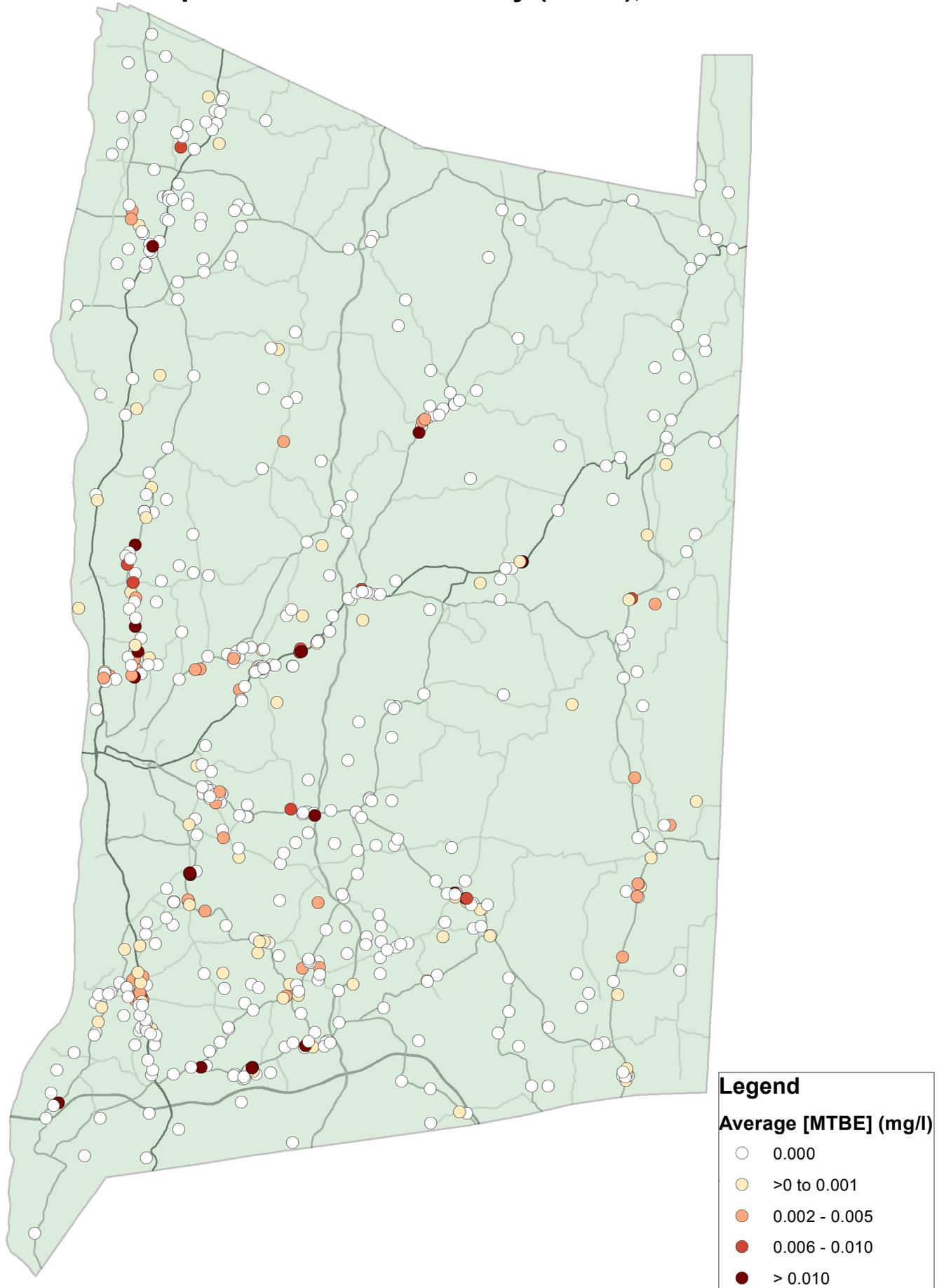
Conclusions and Limitations:

Ongoing sampling of public water supplies in Dutchess County shows very significant reductions in groundwater contamination with MTBE over the past decade. As previously stated, public water supply samples taken prior to filtration and treatment do not reflect exposure levels at the tap and provide an extremely conservative (high end) estimate of potential exposure. Because contaminated public water supplies are required to be sampled more frequently per New York State regulations, the number of supplies sampled each year decreased as levels of contamination decreased (Table 1). Similarly, historically uncontaminated public water supplies were not sampled in all three-year periods listed in Figure 1. As a result, the estimated three-year averages are likely to be slightly higher than they would have been had all uncontaminated sites been included in the measurements recorded for each time period. Finally, for those supplies from which multiple samples were taken per time period, results were averaged such that each supply was given an equal weight in the overall average.

The long-term downward trends in groundwater contamination by MTBE illustrate the substantial impact of New York State gasoline and drinking water regulations, as well as improvements in gasoline storage and handling practices (<http://www.dec.ny.gov/chemical/287.html>) on the protection of groundwater. For comprehensive information about water sampling in Dutchess County, visit:

<http://www.co.dutchess.ny.us/CountyGov/Departments/Health/22609.htm>.

Average MTBE Concentration per Public Water Supply Sampled in Dutchess County (Wells), 2002-2004



Average MTBE Concentration per Public Water Supply Sampled in Dutchess County (Wells), 2011-2013

