



INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Methyl Tertiary-Butyl Ether (MTBE)

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Description:

- Methyl tertiary-butyl ether (MTBE) is a chemical compound that is manufactured by the chemical reaction of methanol and isobutylene.
- MTBE is a chemical compound which contains oxygen. When added to gasoline, it boosts octane ratings to meet clean fuel oxygen requirements (i.e. reformulated gasoline and winter oxygenate gasoline) and reduces air pollution and smog related issues.
- In the Clean Air Act, Congress required that reformulated gasoline (RFG) contain oxygen, 2% by weight. Oil companies had a choice between two (2) oxygenates, MTBE and ethanol, to meet the law's requirements.
- MTBE was used in U.S. gasoline at low levels starting in 1979 to replace lead as an octane enhancer (helps prevent the engine from "knocking").
- Due to growing health and environmental concerns, Indiana adopted a partial ban on MTBE use on March 14, 2002, which allowed no more than 0.5% (vol.) MTBE in gasoline.
- Some MTBE is found in most petroleum products because of the cross mixing of petroleum in transportation, storage and distribution tanks and pipelines.
- Now most U.S. gasoline is blended with 10% ethanol as a cost-effective and more environmentally-friendly replacement for MTBE.

Environmental Impacts:

- Small individual fuel spills and storm water runoff contribute to detections of MTBE in water supplies. MTBE detections at high concentrations usually result from leaking underground or above ground fuel storage tanks and pipelines.
- Since MTBE is very soluble in water and does not "cling" to soil well, it has a tendency to migrate much more quickly into water than other components of gasoline.
- MTBE is not expected to concentrate in fish or plants found in lakes, ponds and rivers.
- Recent testing by the U.S. Geological Survey show detections of MTBE in approximately 20% of the groundwater in RFG areas, while there is only a 2% detection rate in non-RFG areas.
- However, most of these detections are below the levels of public health concern and are within the range the U.S. Environmental Protection Agency (USEPA) has set for a taste and odor water advisory (which is currently set at 20 to 40 parts per billion).
- Most people are exposed to MTBE from auto exhaust when driving or from gasoline while fueling their cars.
- People can also be exposed to MTBE from groundwater pollution.
- Some people who were exposed to MTBE while pumping gasoline, driving their cars, or working as attendants or mechanics at gas stations complained of headaches, nausea, dizziness, irritation of the nose or throat, and feelings of confusion.
- There is no evidence that MTBE causes cancer in humans. More information is known about how MTBE affects the health of animals than the health of humans. Please visit the Agency for Toxic Substances and Disease Registry (ATSDR) for more information regarding MTBE and animal studies.

IDEM's Role:

- The Indiana Department of Environmental Management (IDEM) is responsible for protecting human health and the environment while providing for safe industrial, agricultural, commercial, and governmental operations vital to a prosperous economy.
- IDEM's Office of Land Quality regulates underground storage tanks (USTs) and manages remediation of contamination from leaking USTs.
- IDEM works with the USEPA to enforce the rules and regulations governing MTBE use and provides monitoring data related to drinking water and ongoing cleanups.

Additional Information:

- For questions and concerns, please call IDEM's Office of Land Quality at 1-800-451-6027 Ext. 2-8900.
- For more information on the effects of exposure to MTBE, please visit the Agency for Toxic Substances and Disease Registry's (ATSDR) Web site at <http://www.atsdr.cdc.gov/toxprofiles/phs91.html>.
- For more information on ethanol, please refer to IDEM's Fact Sheet: Ethanol at <http://www.in.gov/idem/files/phs91.html>.
- For more information on MTBE in gasoline and other fuels, please visit USEPA's Web site at <http://www.epa.gov/mtbe/gas.htm>.
- For more information on emissions from reformulated gasoline, please visit USEPA's Web site at <http://www.epa.gov/otaq/f99040.pdf>.
- For more information on the Control of MTBE in Gasoline, please visit USEPA's Web site at <http://www.epa.gov/otaq/consumer/fuels/mtbe/f00010.htm>.