



House Office Building, 9 South
Lansing, Michigan 48909
Phone: 517/373-6466

BAN MTBE FROM GASOLINE

House Bill 5570 as enrolled
Public Act 206 of 2000
Second Analysis (6-27-00)

Sponsor: Rep. Larry Julian
**House Committee: Agriculture and
Resource Management**
**Senate Committee: Farming, Agribusiness,
and Food Systems**

THE APPARENT PROBLEM:

Methyl tertiary butyl ether (MTBE) is volatile organic chemical (VOC) with a strong odor that has been used by gasoline producers as an octane enhancer since 1979, when lead was banned from gasoline. Following the 1990 enactment of the federal Clean Air Act, MTBE also has been used by gasoline producers to meet the federal government's requirement that "reformulated" gasoline ("RFG"), with a specified level of oxygen, be used in areas of the country with the worst smog (mainly the Northeastern states and California). Adding oxygen to fuel improves combustion and reduces potentially harmful tailpipe emissions, particularly carbon monoxide. Although there are other fuel oxygenates, including ethanol (which is made from corn and other grains), MTBE reportedly accounts for over 80 percent of the fuel oxygenates used by gasoline producers in reformulated gas.

While MTBE has been used to reduce air pollution, it has also resulted in a growing number of reports of drinking water pollution. MTBE readily dissolves in water, can move rapidly through soils and aquifers, is resistant to microbial decomposition, and is difficult to remove in water treatment. In addition, it has a foul odor and taste that can be easily detected at levels far below the levels of public health concern. Consequently, the EPA's classification of MTBE as a potential carcinogen, combined with the ease with which it can be detected in drinking water by the average person, has raised environmental and public health concerns.

A middle school class in Corunna studied MTBE and its potentially harmful effects, and legislation has been introduced at its request to ban MTBE from gasoline sold in Michigan.

THE CONTENT OF THE BILL:

The bill would amend the Motor Fuels Quality Act to ban, beginning June 1, 2003, the additive methyl tertiary butyl ether (MTBE), a gasoline additive, in the state. The bill also would require the director of the Department of Agriculture, in consultation with the director of the Department of Environmental Quality, to review the status and use of MTBE in the state and to determine if "the additive" were likely to cause harmful effects on the environment or public health within the state.

The review would have to be done by June 1, 2002, and would have to include the following:

- The amount of MTBE currently in use in gasoline in the state;
- An estimate of the amount of MTBE that was imported in gasoline transported into the state from other states or countries;
- Recommendations as to whether the June 1, 2003 prohibition could be achieved, and, if not, a determination of a more feasible date; and
- Any other information "considered appropriate."

MCL 290.643

BACKGROUND INFORMATION:

The 1990 federal Clean Air Act amendments. The federal Clean Air Act amendments created programs intended to reduce harmful emissions from automobiles. The Oxygenated Fuel ("Oxyfuel") program requires gasoline marketers in carbon monoxide "non-attainment" areas, beginning in 1992, to add 2.7 percent oxygen, by weight, to gasoline. Reportedly, ethanol blended gasoline is used in 85

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percent of the “oxyfuel” program, with the remaining 15 percent using MTBE. A second program, implemented in 1995, is the Reformulated Gasoline Program (RFG), which requires that reformulated gasoline contain 2 percent oxygen by weight. Over 85 percent of reformulated gasoline contains MTBE and approximately 8 percent contains ethanol.

MTBE. The Underground Storage Tank Division of the Department of Environmental Quality has issued a fact sheet on methyl tertiary-butyl ether (MTBE), dated March 2000. Among other things, the fact sheet describes MTBE as belonging to a class of chemical compounds known as ethers. It is a fuel additive made by combining isobutylene, a hydrocarbon refined from crude oil, with methanol, which is derived from natural gas. An August 1994 chemical fact sheet issued by the federal Office of Pollution Prevention and Toxics adds that MTBE is a colorless, flammable liquid with a strong odor. It does not occur naturally, but is produced in very large amounts (9.1 billion pounds in 1992) by 27 companies in the United States.

The 1998 federal EPA Blue Ribbon Panel. In November 1998, U.S. Environmental Protection Agency (EPA) Administrator Carol M. Browner appointed a Blue Ribbon Panel to investigate the air quality benefits and water quality concerns associated with oxygenates in gasoline, and to provide independent advice and recommendations on ways to maintain air quality while protecting water quality. The panel issued its findings and recommendations in July, 1999. The panel’s overall findings were that:

- the distribution, use, and combustion of gasoline poses risks to the environment and public health;
- reformulated gasoline (RFG) provides considerable air quality improvements and benefits for millions of U.S. citizens;
- the use of MTBE has raised the issue of the effects of MTBE alone and MTBE in gasoline, and though the panel was not constituted to perform an independent comprehensive health assessment (and chose to rely on recent reports by a number of state, national, and international health agencies) what did seem clear to the panel was that MTBE, due to its persistence and mobility in water, is more likely to contaminate ground and surface water than the other components of gasoline;
- MTBE has been found in a number of water supplies nationwide, primarily causing consumer odor and taste concerns that have led water suppliers to reduce use of

those supplies, and though incidents of MTBE in drinking water supplies at levels well above EPA and state guidelines and standards have rarely occurred, the panel concluded that the occurrence of MTBE in drinking water supplies can and should be substantially reduced;

- MTBE currently is an integral component of the U.S. gasoline supply both in terms of volume and octane, and so changes in its use, with the attendant capital construction and infrastructure modifications, must be implemented with sufficient time, certainty, and flexibility to maintain the stability of both the complex U.S. fuel supply system and gasoline prices.

The Blue Ribbon Panel issued recommendations to enhance, accelerate, and expand existing federal, state, and local programs (including federal and state underground storage tank programs, safe drinking water programs, programs to protect private well users, and public education programs on the proper handling and disposal of gasoline) to improve protection of drinking water supplies from contamination, as well as to develop and implement an integrated field research program into the groundwater behavior of gasoline and oxygenates (both MTBE and ethanol). The panel also recommended that the EPA work with states and localities to enhance their efforts to protect lakes and reservoirs that serve as drinking water supplies by restricting the use of recreational motorized watercraft, particularly those with old motors. The panel also issued recommendations regarding treatment and remediation of drinking water supplies contaminated with MTBE and other gasoline components, and concluded that changes need to be made to the reformulated gasoline (RFG) program to reduce the amount of MTBE being used, while still ensuring that the air quality benefits of RFG – as well as fuel supply and price stability – be maintained.

The panel also recommended an “integrated package” of actions be taken by both Congress and the EPA as quickly as possible. In recommending these actions, the panel took into consideration the complexity of the national fuel system, the advantages and disadvantages of three fuel blending options the panel considered (see below), and the need to maintain the air quality benefits of the current RFG program. These recommended actions included:

- Action to reduce the use of MTBE substantially (some panel members supported its complete phase out), and action by Congress to clarify federal and state authority to regulate or eliminate the use of gasoline additives that threaten drinking water supplies;

- Action by Congress to remove the current 2 percent oxygen requirements to ensure that adequate fuel supplies can be blended in a cost-effective manner while quickly reducing use of MTBE; and

- Action by the EPA to ensure that there is no loss of current air quality benefits.

Fuel blending options. In reviewing the reformulated gasoline program, the EPA Blue Ribbon Panel identified three main options for fuel blending components to meet air quality requirements (MTBE and other ethers; ethanol; and fuel blending components made from crude oil, specifically blends of alkylates and aromatics), and identified the strengths and weaknesses of each option. The strengths and weaknesses of MTBE (and other ethers) and ethanol were identified by the panel as follows:

(1) MTBE and other ethers:

- A cost-effective fuel-blending component that provides high octane, carbon monoxide and exhaust volatile organic chemical (VOC) emissions benefits, and appears to contribute to reduction of the use of aromatics with related toxics and other air quality benefits;
- has high solubility and low biodegradability in groundwater, leading to increased detection in drinking water, particularly in high MTBE areas.

(2) Ethanol:

- An effective fuel-blending component, made from domestic grain and potentially from recycled biomass, that provides high octane, carbon monoxide emission benefits, and appears to contribute to reduction of the use of aromatics with related toxics and other air quality benefits;
- can be blended to maintain low fuel volatility;
- could raise possibility of increased ozone precursor emission as a result of commingling in gas tanks if ethanol is not present in a majority of fuels;
- is produced currently primarily in Midwest, requiring enhancement of infrastructure to meet broader demand;
- because of high biodegradability, may retard biodegradation and increase movement of benzene and other hydrocarbons around leaking tanks.

FISCAL IMPLICATIONS:

According to the Senate Fiscal Agency, the bill would result in additional administrative costs for the Department of Agriculture. In addition, the state could realize additional revenue associated with fines for violations of the bill. Under the act, fine revenue would be deposited in the Gasoline Inspection and Testing Fund, to be used for the administration of the act. (6-8-00)

ARGUMENTS:

For:

As public knowledge of, and concern over, the potential health and environmental effects of MTBE has increased, more and more people have concluded that the fuel additive should be banned. Reportedly, governors or legislatures of other states have moved to ban MTBE from gasoline sold in their states, and President Clinton and Congress also have advocated such a ban (though federal legislation to ban MTBE has not been enacted at this time). Michigan, too, should ban this potentially carcinogenic chemical from its gasoline supply.

Moreover, the main alternative to MTBE in reformulated gasoline (RFG) is ethanol, a domestically-produced, renewable product that not only protects air quality and water resources, but also would provide a tremendous economic stimulus to the agricultural industry while maintaining stable consumer gasoline prices and supplies.

Currently the main source of ethanol is corn, though it can be produced from cellulose and biomass, including municipal wastes. In fact, while ethanol already is being produced in Washington state from wood and paper waste, the next generation of ethanol production facilities reportedly also will include, in addition, production from cellulose and other biomass feedstocks, such as rice hulls, rice straw, wood and paper waste, and municipal waste.

Thus, switching from MTBE (which comes from nonrenewable sources of crude oil and natural gas) to ethanol could be a particular economic boon to the Midwest, including Michigan, which is where most of the ethanol currently produced originates. As a representative from the ethanol industry testified, ethanol is a safe, biodegradable, renewable, high-octane fuel that will not negatively impact water resources. In addition, however, replacing MTBE with ethanol would have major, positive economic

implications for the agricultural industry. There currently are more than 55 ethanol producing facilities in 22 states in operation today, including a growing number of farmer-owned cooperatives that have begun production in just the past five years. The industry currently produces approximately 100,000 barrels of ethanol a day, for a total of 1.5 billion barrels annually, and uses more than 600 million bushels of grain per year. Replacing MTBE with ethanol reportedly would increase the demand for ethanol to nearly 3.2 billion gallons a year by 2004. This, on one estimate, would result in the creation of more than 47,000 new jobs throughout the country and \$1.9 billion in new investment to expand ethanol producing capacity, would increase household income by \$2.5 billion, and would add \$11.7 billion to the real gross domestic product (GDP) by 2004 through construction activity and increased commodity demand.

With overall conditions in the farm economy in 2000 expected to be similar to last year and with the nation facing record oil prices, the need for increased ethanol production and use has never been greater. Using ethanol to replace MTBE in gasoline would play a pivotal role in providing value-added processing for grain and would add to the price of a bushel of corn, which the U.S. Department of Agriculture reportedly recently estimated will average only \$1.90 this year, slightly below the 1998 crop. A USDA economist also reportedly predicted that in light of weak markets, substantial government payments will be made to farmers under current programs in 2000, so the use of corn for ethanol production not only would add to the price of a bushel of corn, but also would help to reduce government payments to farmers. Moreover, given the fact that oil prices have recently peaked at the highest levels since the Gulf War, and could continue to climb with increased gasoline demand this summer, substituting ethanol for MTBE in gasoline not only would provide an economically competitive source of octane, but also could help constrain the rise in gasoline prices.

Response:

The bill itself would not bring the economic benefits foreseen by replacing MTBE with ethanol in fuel blends, since Michigan is not required to use reformulated gasoline, and the bill would not affect the use of RFG in the other areas of the country under federal mandate. Banning MTBE in Michigan would not, therefore, result in an increased need for ethanol production. Congressional action banning MTBE could have this effect, but simply banning the chemical in Michigan would not. Moreover, as the EPA Blue Ribbon Panel emphasized, the national fuel system is extraordinarily complex, and any major proposed

changes to this system need to take into consideration a number of factors, including supply availability and price stability. Requiring a change in a federally mandated fuel oxygenate or even a voluntary fuel enhancer could be very disruptive if not enough time were given to develop alternative production facilities. Given that the current ethanol production in the country reportedly is 1.5 billion gallons annually and that this production would have to more than double by 2004 to meet the demand were MTBE replaced with ethanol, a major question would be whether enough ethanol could be produced – and, equally important, supplied – as needed. Finally, as the EPA Blue Ribbon Panel indicated, there are potential disadvantages to ethanol use in place of MTBE in addition to the current lack of ethanol production capacity. Apparently unlike MTBE, ethanol does not provide exhaust volatile organic chemical emissions benefits, though, like MTBE it is an effective fuel blending component that provides high octane and carbon monoxide emissions benefits and appears to contribute to reduction of the use of aromatics with related toxics and other air quality benefits. And while ethanol can be blended to maintain low fuel volatility, its high biodegradability could actually retard the biodegradation and increase the movement of gasoline components that are more toxic than MTBE, such as benzene, around leaking underground storage tanks. So substitution of ethanol for MTBE, without concurrent enhancement and expansion of underground storage tank programs, could actually result in more serious groundwater pollution problems than currently appear to exist with MTBE.

Against:

The bill, while a good first step, does not go far enough. While eliminating MTBE from Michigan gasoline will help preserve state water resources and protect the public health from this water-soluble, potentially carcinogenic chemical, what is to prevent an even more toxic additive from being substituted for MTBE in gasoline if MTBE is eliminated? As the EPA Blue Ribbon Panel (see BACKGROUND INFORMATION) concluded, the distribution, use, and combustion of gasoline poses risks to the environment and public health. Consequently, one of its recommendations for preventing future drinking water contamination was that federal and state environmental agencies develop and implement an integrated field research program into the groundwater behavior of gasoline and oxygenates, including conducting comparative studies of levels of MTBE, ethanol, benzene, and other gasoline compounds in drinking water supplies. What really is needed, in addition to banning MTBE, is a mechanism to ensure that any replacement additives are not as toxic, or more toxic,

than the chemical it replaces. Thus, for example, there should be some way to ensure that benzene, a known potent carcinogen that also can be used as an octane enhancer, is not substituted for MTBE, should the latter be banned. One possibility, suggested by the environmental community, could be some kind of notification to the state of proposed substitutes, which would allow the appropriate state departments to determine whether or not the proposed substitute posed a risk, or an acceptable risk, to the public health and to the environment. The bill as passed by the House in fact included a requirement that notification be made to the department of which additive or additives were used to replace MTBE, and would not have allowed the level of benzene to increase as a replacement for MTBE. Indeed, the bill as amended by the Senate kept the requirement that the director of the MDA, in consultation with the Department of Environmental Quality, determine if the additive used to replace MTBE (and which, on the House-passed version of the bill, would have to be reported to the department) were likely to cause harmful effects on the environment or public health. Without the preceding reference to the reporting requirement, which the Senate deleted, the bill's reference to "the additive" at best is unclear, and at worst could be taken to refer to MTBE, which, with the deletion of the reporting requirement, becomes the antecedent additive. Both the reporting requirement and the prohibition against increased benzene levels should be reinstated into the bill.

Against:

The bill would appear to be both unnecessary and redundant. According to a fact sheet issued by the Storage Tank Division of the Department of Environmental Quality, MTBE doesn't appear to be a health or environmental problem in Michigan. At the same time, moreover, the federal government appears to be on the brink of banning MTBE nationally, even as the petroleum industry is voluntarily moving to remove MTBE from gasoline production. And since Michigan is not required to use gasoline reformulated with MTBE, which is the only source of the chemical, MTBE is only an incidental additive to gasoline distributed in Michigan (primarily in the premium gasoline blends that use MTBE at low levels as an octane enhancer).

According to the DEQ, MTBE has not been detected in Michigan's surface water. (The source of most surface water contamination, which has occurred in states such as California, is from boat fuels and urban runoff.) And although MTBE has been detected in three percent of drinking water samples tested by the department, only three percent of that three percent sample testing

positive for MTBE tested greater than the department's health safety level of 240 parts per billion (ppb). The DEQ has identified MTBE as a contaminant at several gasoline release sites in the state, but other components of gasoline, such as benzene, are of greater concern because of their relatively high solubility and known carcinogenicity. (The EPA has classified MTBE as a suspected carcinogen, but benzene is a known potent carcinogen.) Whereas the health safety level for MTBE is 240 ppb, that for benzene is 5 ppb. However, because MTBE can be smelled and tasted in drinking water at 40 ppb (with a pungent, unpleasant smell), which is well below the 240 ppb safety level, people are aware of the presence of MTBE when it appears in drinking water well before there are any known health risks.

Michigan is not likely to develop environmental or health problems from MTBE, because it is not one of the states required by the EPA, under the federal Clean Air Act, to use reformulated gasoline (RFG), and therefore does not use RFG, which is the only environmental source of MTBE. (Though in 1996, Michigan did begin enforcing a summertime "low vapor pressure" fuel requirement to control ozone levels in seven southeastern Michigan counties during the summer months, refiners supplying Michigan opted to meet the fuel requirements by removing some of the more volatile compounds of gasoline rather than supplying reformulated gasoline containing MTBE.) The Department of Agriculture, which administers the Motor Fuels Quality Act, tests gasoline samples for purity, volume, and additives and has detected MTBE in gasoline samples it has tested. However, MTBE has shown up in only four to five percent of the samples tested by the department in last two years, and the very small fraction of that four to five percent tested above the amount of MTBE (11 percent by volume) needed to meet the RFG requirements was found primarily in the premium blends of gasoline as an octane enhancer. The majority of the four to five percent of the samples that tested positive for MTBE had low concentrations (below 2.2 percent by volume) of the chemical, which likely was the result of the fact that both reformulated gasoline and conventional gasoline is transported through the same pipelines, with the latter picking up trace amounts of MTBE from traces of RFG left in the pipeline.

MTBE is not an environmental or health problem in Michigan. However, groundwater contamination by gasoline – and its various toxic components, such as benzene, toluene, and other chemicals – has been and continues to be a problem, and one associated primarily with leaking underground (fuel) storage tanks (LUSTs).

Although Michigan had implemented an ambitious program to deal with underground storage tanks, lack of funding has slowed this program down. One way to truly address the groundwater contamination problems posed by gasoline and its various toxic chemical components would be to increase funding to the underground storage tank program, which would accord with some of the EPA Blue Ribbon Panel's recommendations (see BACKGROUND INFORMATION).

Response:

Even if MTBE currently is not a health or environmental problem in Michigan, it certainly wouldn't hurt to take preventive measures to ban it before it did become a problem. Moreover, even if Congress decides to ban MTBE, there is no reason why Michigan should wait do this now, instead of waiting for federal action on this issue.

Analyst: S. Ekstrom

■ This analysis was prepared by nonpartisan House staff for use by House members in their deliberations, and does not constitute an official statement of legislative intent.