MTBE RISK TO DRINKING WATER WAS KNOWN FOR YEARS

Date: Mar 16, 1999
By Chris Bowman and Patrick Hoge
Sacramento Bee Staff Writer and Bee Capitol Bureau

America's fuel industry knew about the risk to drinking water from MTBE years before domestic refineries more than doubled the chemical's volume in gasoline, but manufacturers marketed the product as an environmental improvement anyway.

In technical papers and conference presentations, environmental engineers for refineries and government regulators alike predicted that MTBE could become a lingering groundwater menace as its usage increased.

Sixteen years before MTBE-rich gasoline was approved for statewide use in California to combat air pollution, oil companies knew from their first experience with the fuel additive in New England how quickly methyl tertiary butyl ether can migrate from leaking storage tanks to drinking water wells, company records and technical journals show.

At the time, the pollution specialists stressed that MTBE was in many ways more worrisome than gasoline's cancer-causing benzene.

"MTBE plumes are expected to move faster and further than benzene plumes emanating from a gasoline spill," three Shell researchers said in an internal 1992 paper. "Moreover, the solubility of MTBE is nearly 25 times that of benzene, and its concentration in gasoline will be approximately 10 times greater."

Increased use of MTBE and awareness of its effects

Rise of MTBE:

1979 -- Methyl tertiary butyl ether, an oxygen-bearing compound derived from natural gas, is blended into gasoline at 2-4 percent by volume to replace lead and prevent engine knocking. US producers make 215,000 tons.

1981 -- The U.S. Environmental Protection Agency grants Atlantic Richfield Company (ARCO) permission to use MTBE up to 7 percent by volume in unleaded gas.

1987 -- MTBE production in U.S. soars to 1.8 million tons.

1989: ARCO introduces its MTBE-rich EC-1 -- "the cleanest gas in the world" -- in smoggy Southern California.

1990: Congress amends the Clean Air Act. One provision requires that gasoline sold in smoggy regions contain certain levels of oxygenates -- ether compounds like MTBE that add oxygen in fuel, which cuts tailpipe pollutants.

1992: Refineries introduce a winter-time gasoline with oxygenates like

MTBE up to 11 percent by volume for Sacramento and other cities that need to reduce carbon monoxide emissions. Clean Air Act amendments spur oil industry to embark on a $4.5 billion investment to retool refineries for still greater volumes of oxygenated fuel. California producers favor MTBE over other oxygenates like ethanol. Domestic production of MTBE shoots up to 6.1 million tons.

1995: Year-round use of cleaner-burning fuel with 11 percent oxygenates begins in the nation's smoggiest cities.

Jan. 1996: MTBE-laden gasoline distributed statewide. More than than 4 million gallons of MTBE are pump and burn daily.

March 1999: MTBE is now ranks as the fourth biggest selling chemical in the U.S. by volume, more than 9 million tons annually. U.S. refineries import considerably more MTBE from overseas.

How MTBE's enivronmental and health threats came to be known:

1980 -- MTBE found in Rockaway, N.J., ground-water near a Shell service station.

1986 -- Maine environmental officials warn of MTBE's threat to drinking water at a Houston conference co-sponsored by the American Petroleum Institute. A federal scientific advisory committee urges the U.S. Environmental Protection Agency to give "priority consideration" to regulating MTBE as a drinking water pollutant.

1989 -- EPA lists MTBE as a "priority" candidate for regulation "because of the potential for widespread contamination" by the "high-risk chemical."

1990 -- MTBE above state safety level found in two drinking wells in San Francisco and the Presidio.

Spring 1995 -- The U.S. Geological Survey warns that MTBE from reformulated gasoline has been found in 210 shallow aquifers in eight states. California Air Resources Board urges State Deparment of Health Services to track MTBE, but the drinking water division chief declines.

Summer 1995 -- Santa Monica officials report high MTBE contamination in one of its wells. The city eventually is forced to abandon two well fields providing 71 percent of the city's water and import more water. City angry that it was not warned about MTBE dangers.

Fall 1995 -- State's Santa Ana Regional Water Quality Control Board reports that most water purification plants are not equipped to remove MTBE, which was found in 75 percent of local leaking tank sites.

January 1996 -- Officials in Orange County say MTBE in deep aquifers, from which most drinking water comes.

February 1996 -- State health officials relent and advise major water suppliers to begin voluntary MTBE testing.

Summer 1996 -- First reports of MTBE in California reservoirs surface.

Fall 1996 -- Pattern emerges of MTBE in reservoirs used by motorboats and personal watercraft. Orange County finds 15 million gallons of MTBE-tainted groundwater.

Spring 1997 -- State air pollution officials reveal to The Bee that refiners can make an economical gasoline with all the smog-cutting gas without MTBE or any oxygenates. State health officials order most water utilites to test for MTBE.

Fall 1997 -- Tosco Corp., the nation's largest independant refiner, says MTBE should be quickly phased out due to potential for drinking water contamination.

Summer 1998 -- Communities for a Better Environment sues 14 oil companies it says wantonly polluted California drinking water with MTBE and other toxins.

Fall 1998 -- University of California study commissioned by state Legislature says MTBE is not needed to clean air and should be eliminated from fuel. South Lake Tahoe's water agency sues oil companies over MTBE pollution.

Source: Bee research by Bowman and Hoge

These papers, recently obtained by The Bee, have renewed importance today in California where the spotlight on the fuel controversy is about to turn on the industry.

Later this month, Gov. Gray Davis is expected to announce that MTBE presents a public health threat and should be phased out of California, sources in his administration say. Such an action would not end the public debate, but rather shift it to the question of who will pay to clean up MTBE and how much cleanup should occur.

Even if the synthetic compound were banned overnight -- a highly unlikely prospect -- California would still have to guard its water supplies for many years against MTBE-laced groundwater from past fuel leaks.

MTBE is a key component of a "cleaner-burning gasoline" that has been used in most of California's 27 million vehicles for the past three years. While the gasoline has been credited for removing 300 hundred tons of tailpipe poisons every day in the state, it also has created a Pandora's box underground.

Increasingly, the compound has found its way into underground reservoirs, in storm-water runoff, in recreational lakes and in wells across the country. In California, MTBE has contaminated 10,000 groundwater sites and tainted Tahoe, Donner, Shasta and several other lakes. It also has knocked out wells in several communities. In South Lake Tahoe, more than a dozen wells have been shut down due to MTBE contamination.

While scientists are still studying MTBE's health effects -- the

federal government classifies it as a "possible" cancer-causing agent in humans -- minute amounts of the pollutant can spoil wells by imparting a bitter taste and solvent-like odor.

Already some marina-related businesses have taken an economic hit due to water utilities banning fuel-spitting power craft from reservoirs tapped for drinking water. Filtration plants can't remove MTBE without expensive treatment upgrades.

But the biggest MTBE bill is yet to come, and, one way or another, consumers will ultimately pay for it. That will be in the cleanup of MTBE-laden fuel that has spilled and leaked from pipelines and storage tanks. The restoration is expected to take many years, at a cost of tens of millions to hundreds of millions of dollars a year, a major University of California study recently concluded. Nationwide, the cost would likely climb into the billions of dollars.

Makers of gasoline and MTBE put the onus on tank owners and the environmental officials who regulate the tanks and the fuels.

Officials at Shell Oil Co. in Houston told The Bee that its 1992 paper describing the environmental downside of MTBE was hardly news.

"(It) was in the public domain and already accessible to regulators," the company said in a prepared statement. A spokeswoman said it was based on information disseminated at a 1986 pollution control conference co-sponsored by the American Petroleum Institute.

In the 1980s, the chemical properties making MTBE problematic in water "were widely known," said Charlie Drevna, chief spokesman for Oxygenated Fuels Association, which represents makers of MTBE and other oxygen-bearing fuel components. "What wasn't known was that the (underground storage tank) program in this country was in total shambles."

But the leaking tanks' problem has been widely reported for at least the past decade since the U.S. Environmental Protection Agency ordered the tanks replaced or upgraded. Most major brand gasoline stations in California complied by the federal deadline last December.

California motorists have been paying for a good part of the cleanups from leaking tanks since 1992. They pay about 1.2 cents per gallon at the pump toward a $180 million-a-year state cleanup fund that reimburses mostly small businesses.

The argument that industry should bear more responsibility for the MTBE pollution is beginning to grow. In the past few months, attorneys suing oil companies on behalf of individuals and utilities over MTBE pollution in California, South Carolina and Maine have joined forces. The common allegation is that the oil companies knew or should have known that adding more MTBE to gasoline posed a major threat to drinking water sources.

"It would have been astonishing for corporations of this size and complexity not to have known the risk that an additive to a product that would become so widespread would pose to the environment and to the public," said Victor Sher, a Sacramento attorney representing the

South Tahoe Public Utility District.

Sher said his lawsuit, filed in 1998, is the first in the nation by a public water supplier that goes after fuel makers on grounds of product liability.

While the environmentally troublesome properties of MTBE were noted in technical papers from the oil industry and federal regulators, Sher said he has yet to find evidence that the oil industry ever raised those problems before policy-makers as they deliberated the rules for the cleaner-burning gasoline.

"They should have been telling the regulators, and they should have been looking for alternatives," Sher said.

Shell Oil officials say EPA regulators had plenty of notice in the 1980s, well before 1992 when refiners began to substantially increase the chemical's use to meet the new federal cleaner-burning fuel rules.

"The literature then available indicated to government regulators, manufacturers of MTBE and to gasoline manufacturers, including Shell, that the then perceived benefits outweighed the then perceived risks," the company statement said.

Liability aside, the knowledge of MTBE's downside could have changed what ended up in the gas tanks of millions of motorists. The gasoline additive is now the fourth top selling chemical in the United States, with more than 9 million tons of it sold annually.

Water suppliers say they certainly would have raised a fuss.

"We would have fought like hell to keep it out of gasoline," said Bob Reeb,of the Association of California Water Agencies. "It appears to be a classic case of placing corporate profits above public health."

If that's the case, Assembly Speaker Antonio Villaraigosa, D-Los Angeles, said, "We can make the argument that this industry has a very high level of responsibility to provide the cleanup of this contamination."

MTBE's critics point out that the trail of responsibility can be traced back at least to 1986 when three researchers from Maine laid out the basic characteristics of MTBE in discussion today: that it moves farther and faster in groundwater, lasts longer, and is much more difficult to filter out than other gasoline compounds.

The presentation was at a Houston conference attended by many regulators and industry scientists on groundwater pollutants. It was sponsored by the American Petroleum Institute and the National Well Water Association.

Two of the Maine paper's authors said their presentation didn't seem to make much of an impact on regulators and industry.

"There just seemed to be a feeling that there wasn't anything that was necessary to do now, which puzzles me in retrospect," said Peter Garrett, one of the authors. "I think it was because MTBE was hailed

as being the chemical of the future because of its potential to cut down on air pollution."

Co-author Marcel Moreau, now an expert on underground tanks, said ARCO freely supplied information about the chemical's characteristics.

But as momentum was building on Capitol Hill toward requiring oxygenated compounds in gasoline to combat smog, no such environmental concerns surfaced in the public debate either from industry, environmentalists or regulators, according to interviews with key participants.

MTBE's many critics express amazement that government could have introduced a chemical into commercial use on such a massive scale with so little toxicology data or consideration of its behavior in the environment.

When first added to premium gasoline in 1979, scientists had produced no studies on MTBE's long-term health effects.

"It is astonishing that such a technological process could have been started without sufficient technological information that would have enabled us to expose possible adverse health effects of the compound," wrote Fiorella Belpoggi, lead researcher in a 1995 investigation of MTBE's cancer-causing potential.

The recent study of MTBE done by the University of California similarly found that regulators did not do enough to assess MTBE's potential environmental impacts before allowing its huge rise.

In California, health officials testified recently before the state Legislature that they did not realize that MTBE posed a major groundwater threat until 1995, when Santa Monica reported contamination of one of its wells.

Ironically, oil companies continued to spend lavishly in 1996 to promote MTBE as an environmentally friendly product that made gasoline burn cleaner.

The lack of toxicology data remains even today, more than three years after MTBE's introduction in California on a large scale.

Industry representatives insist that expensive upgrades of underground tanks already mandated under law will curtail the MTBE problem.

But others say evidence shows too many other ways that MTBE can get into water wells.

James Giannopoulos, principal engineer with the state Water Resources Control Board, made a similar point during a recent MTBE hearing in Sacramento.

"Even a small failure rate of the more than 50,000 upgraded tanks, we believe, constitutes a good water quality reason to eliminate MTBE from gasoline," he said.