Allegato E

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Allegati N.1

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OGGETTO: Valori di concentrazione limite accettabili nelle acque sotterranee per procedimenti ex DM 471/1999. Lettera circolare MTBE inviata con e-mail

MINISTERO DELL'AMBIENTE E DELLA TUTELA DEL TERRITORIO
DIREZIONE GENERALE PER LA QUALITÀ DELLA VITA –
19 SET. 2006
Protocollo n° 18318/QdV/DI

Oggetto: Richiesta chiarimenti sui valori di concentrazione limite accettabili nelle acque sotterranee per procedimenti ex DM 471/1999.

In relazione all'oggetto, e in particolare al valore di riferimento da assumere per l'MTBE nelle acque sotterranee, si evidenzia che ancorché la richiesta di codesto Comune sia stata inoltrata a questo Istituto solo per conoscenza, si ritiene importante esprimere un proprio parere, stante il dibattito in corso nell'ultimo anno su tale problematica.

9

Mod. 8101

Innanzitutto è d'uopo osservare che dal 29 aprile 2006 è in vigore il D.lgs 152/2006 che reca norme anche in materia di bonifiche dei siti contaminati, il quale, tuttavia, nulla riporta a proposito del valore limite da assumere per il parametro MTBE nelle acque sotterranee. In ogni caso il D.lgs 152/2006 introduce il criterio della valutazione del rischio sito specifica ai fini della individuazione della "concentrazione soglia di rischio" per i suoli e per le acque, la quale diviene il valore di intervento e il valore obiettivo da raggiungere con la bonifica per un determinato sito.

Ciò premesso, risulta importante, comunque, definire un valore di riferimento generico per il parametro MTBE nelle acque profonde, da assumere come "concentrazione soglia di contaminazione" secondo la nuova normativa (D.lgs 152/2006), e sia per i procedimenti di bonifica effettuati secondo i criteri ex DM 471/1999.

Questo Istituto con nota n. 57058/I.A.12 del 06/02/2001 ha proposto di assumere per l'MTBE nelle acque profonde un valore di riferimento di 10 µg/l, in analogia al criterio di potabilità adottato dal legislatore per individuare le varie concentrazioni limite riportate nella Tabella 2 - Allegato 1 del DM 471/1999, relativa alle acque sotterranee.

A tal proposito si sottolinea che l' "assimilazione" agli idrocarburi totali, ipotizzata da questo Istituto, era prevalentemente dettata da un potenziale simile comportamento ambientale di alcuni composti della famiglia degli idrocarburi in termini di mobilità, volatilità, ecc. e non da una affinità di tipo tossicologico. Peraltro l'MTBE è appartenente alla famiglia degli ETERI e non è definibile un IDROCARBURO (caratterizzati questi ultimi dalla sola presenza di Carbonio e Idrogeno).

Attualmente, a seguito dell'emanazione del D.lgs 152/2006, che riporta, contrariamente al DM 471/1999, nella Tabella 2 dell' All. 5 il parametro "Idrocarburi totali espressi come n-esano" con relativa concentrazione limite di 350 µg/l, da molti viene assunto tale valore limite anche per l'MTBE, in

considerazione dell'assimilazione effettuata a suo tempo da questo Istituto al parametro "Idrocarburi totali".

A tal proposito si rileva che, come prima detto, l'assimilazione era prevalentemente di tipo ambientale e che essa permetteva, tuttavia, la proposta di una concentrazione di riferimento sufficientemente bassa, e precisamente sotto la soglia olfattiva del MTBE.

Infatti, come noto, l'MBTE non è una sostanza dotata di elevata tossicità, bensì ha proprietà tali, però, da alterare profondamente dal punto di vista organolettico la qualità delle acque, in quanto fortemente odorigena. Pertanto, il valore di riferimento a suo tempo proposto da questo Istituto, va inteso nel senso di proteggere cautelativamente la risorsa acque profonde da tali potenziali alterazioni organolettiche.

In conclusione si ritiene che il valore di riferimento proposto da questo Istituto per il parametro MTBE nelle acque sotterranee non viene modificato dalle recenti novità normative.

In ogni caso si deve tenere in conto che una concentrazione di riferimento per l'MTBE non dovrebbe comunque superare il valore di concentrazione della soglia olfattiva, che è compreso, in un range tra 20 e 40 µg/l, in funzione della suscettibilità individuale, così come affermato dall'Agenzia di Protezione Ambientale statunitense (U.S.E.P.A.) in uno specifico documento sul MTBE, che si allega alla presente (All. 1). Peraltro nel medesimo documento l'U.S.E.P.A. pone lo stesso range di 20 e 40 µg/l di MTBE nelle acque potabili, come limite oltre il quale si potrebbero avere effetti avversi sulla salute umana.

Nel rimanere a disposizione per ogni ulteriore chiarimento, porgo distinti saluti.

Il Direttore del Dipartimento dell'Ambiente e
Connessa Prevenzione Primaria
(Dott.ssa Luciana Gramiccioni)

In

U.S. Environmental Protection Agency

All. 1

Methyl Tertiary Butyl Ether (MTBE)

Overview

The following list of Frequently Asked Questions is the inquiries we received on MTBE intended to provide basic background information on MTBE. If you want more detailed information, please see the last section, "Additional Information" which provides links to other EPA Web sites on MTBE and local information.

Note: Some terms in this document link to other EPA and non-EPA Web sites or documents on that topic. Links going to non-EPA sites are identified with an exit disclaimer symbol.

MTBE in Fuels

What is MTBE?

MTBE (methyl tertiary-butyl ether) is a chemical compound that is manufactured by the chemical reaction of methanol and isobutylene. MTBE is produced in very large quantities (over 200,000 barrels per day in the U.S. in 1999) and is almost exclusively used as a fuel additive in motor gasoline. It is one of a group of chemicals commonly known as "oxygenates" because they raise the oxygen content of gasoline. At room temperature, MTBE is a volatile, flammable and colorless liquid that dissolves rather easily in water.

Why is it used?

MTBE has been used in U.S. gasoline at low levels since 1979 to replace

lead as an octane enhancer (helps prevent the engine from "knocking"). Since 1992, MTBE has been used at higher concentrations in some gasoline to fulfill the oxygenate requirements set by Congress in the 1990 Clean Air Act Amendments. (A few cities, such as Denver, used oxygenates (MTBE) at higher concentrations during the wintertime in the late 1980's.)

Oxygen helps gasoline burn more completely, reducing harmful tailpipe emissions from motor vehicles. In one respect, the oxygen dilutes or displaces gasoline components such as aromatics (e.g., benzene) and sulfur. In another, oxygen optimizes the oxidation during combustion. Most refiners have chosen to use MTBE over other oxygenates primarily for its blending characteristics and for economic reasons.

What are the oxygenate requirements of the Clean Air Act?

The Clean Air Act Amendments of 1990 (CAA) require the use of oxygenated gasoline in areas with unhealthy levels of air pollution. The CAA does not specifically require MTBE. Refiners may choose to use other oxygenates, such as ethanol. The two oxygenated gasoline programs are:

> **Winter Oxyfuel Program**: Originally implemented in 1992, the CAA requires oxygenated fuel (gasoline containing 2.7 percent oxygen by weight) during the cold months in cities that have elevated levels of carbon monoxide. Ethanol is the primary oxygenate used in this program.
>
> **Year-round Reformulated Gasoline Program**: Since 1995, the CAA requires reformulated gasoline (RFG) year-round in cities with the worst ground-level ozone (smog). RFG is oxygenated gasoline (minimum of 2 percent oxygen by weight) that is specially blended to have fewer polluting compounds than conventional gasoline. At this time, about 30 percent of this country's gasoline is reformulated gasoline, of which about 87 percent contains MTBE. Refiners have chosen MTBE as the main oxygenate in RFG in cities outside of the Midwest primarily for economic reasons and its blending characteristics. Unlike ethanol, MTBE can be shipped through existing pipelines, and its volatility is lower, making it easier to meet the emission standards.

To address its unique air pollution problems, California has adopted similar, but more stringent requirements for its gasoline (California RFG).

What are the air quality benefits of using reformulated gasoline (RFG) that contains oxygenates?

RFG has been helping improve the air for millions of Americans since 1995. The use of RFG compared to conventional gasoline has resulted in annual reductions of smog-forming pollutants (volatile organic compounds and nitrogen oxides) and toxics (such as benzene). With the second phase of RFG program, which began January 2000, EPA estimates that smog-forming pollutants are being reduced annually by at least 105 thousand tons, and toxics by at least 24 thousand tons. Refiners are required to reduce the emissions of volatile organic compounds, toxics, and nitrogen oxides by 27, 22, and 7 percent, respectively, compared to the conventional gasoline they produced in 1990.

[top of page]

Concerns about MTBE

With these air quality benefits, why is there concern with the use of MTBE?

A growing number of studies have detected MTBE in ground water throughout the country; in some instances these contaminated waters are sources of drinking water. Low levels of MTBE can make drinking water supplies undrinkable due to its offensive taste and odor.

Is MTBE harmful to humans?

The majority of the human health-related research conducted to date on MTBE has focused on effects associated with the inhalation of the chemical. When research animals inhaled high concentrations of MTBE, some developed cancers or experienced other non-cancerous health effects To date, independent expert review groups who have assessed MTBE inhalation health risks (e.g., "Interagency Assessment of Oxygenated Fuels") have not concluded that the use of MTBE-oxygenated gasoline poses an imminent threat to public health. However, researchers have limited data about what the health effects may be if a person swallows (ingests) MTBE. EPA's Office of Water has concluded that available data are not adequate to estimate potential health risks of MTBE at low exposure levels in drinking water but that the data support the conclusion that MTBE is a potential human carcinogen at high doses. Recent work by EPA and other researchers is expected to help determine more precisely the potential for health effects from MTBE in drinking water.

EPA reviewed available health effects information on MTBE in its 1997 Drinking Water Advisory guidance and decided that there was insufficient information available to allow EPA to establish quantitative estimates for health risks and as such would not set health advisory limits. The drinking water advisory document indicates that there is little likelihood that MTBE in drinking water will cause adverse health effects at concentrations between 20 and 40 ppb or below.

[top of page]

Drinking Water Quality

Has EPA set a drinking water health standard for MTBE?

EPA has not set a national standard for MTBE, although some states have set their own limits. EPA will issue a secondary drinking water standard, based on taste and odor, by late Fall 2000. This taste and odor standard will serve as a guideline that states may adopt. In December 1997, EPA issued a Drinking Water Advisory that states concentrations of MTBE in the range of 20 to 40 ppb of water or below will probably not cause unpleasant taste and odor for most people, recognizing that human sensitivity to taste and odor varies widely. The advisory is a guidance document that recommends keeping concentrations below that range. EPA also reviewed the available information on health effects in the 1997 advisory and stated that there is little likelihood that MTBE concentrations between 20 and 40 ppb in drinking water would cause negative health effects.

EPA is continuing to study both the potential health effects and the occurrence of MTBE, and it is on a list of contaminants (Contaminant Candidate List) for which EPA is considering setting health standards. As a means of gatherlng occurrence information, beginning in 2001, EPA will require all large drinking water systems and a representative sample of small systems to monitor and report the presence of MTBE (Unregulated Contaminant Monitoring Regulation).

How do I know if I have MTBE in my water?

It is possible your water would taste and/or smell like turpentine if MTBE is

present at levels around or above 20-40 ppb (some people may detect it at even lower levels). Though you cannot currently purchase a home testing kit, you can determine if your water contains MTBE the following ways. If your drinking water is supplied by a public water system, you can contact the system directly and ask whether they monitor for MTBE and what levels, if any, have been detected. In 2001, most public water systems will be required to monitor for MTBE. If you have a private well, you may want to have your well water tested. Your local health department may be able to tell you if MTBE has been found in water in your area. If you want to get your water tested, call the Safe Drinking Water Hotline (800-426-4791) or go to http://www.epa.gov/safewater/faq/sco.html to get the phone number for the office in your state that certifies drinking water laboratories.

[top of page]

Occurrence of MTBE in Water

How does MTBE get in drinking water sources?

There are opportunities for MTBE to leak into the environment (and potentially get in drinking water sources) wherever gasoline is stored, and there are opportunities for it to be spilled whenever fuel is transported or transferred. While federal and state programs minimize the potential for leaks and spills, no system is foolproof.

Contamination of drinking water sources can occur from leaking underground and above ground fuel storage tanks, pipelinees, refueling spills, automobile accidents damaging the fuel tank, consumer disposal of "old" gasoline", emissions from older marine engines, and to a lesser degree, storm water runoff, and precipitation mixed with MTBE in the air (EPA's Office of Ground Water and Drinking Water) or (USGS report).

How widespread and at what levels is MTBE contamination in water supplies?

Although there are no nation-wide data sets from which to fully characterize MTBE contamination of water, a growing number of studies to-date have detected MTBE in drinking water supplies throughout the country. Current data on MTBE levels in ground and surface waters indicate widespread and numerous detections at low levels of MTBE, with a more limited number of detections at higher levels (only about 1 percent of concentrations are more than 20 parts per billion (ppb) as discussed in the 1999 Blue Ribbon Panel Report on Oxygenates in Gasoline). Studies have shown that MTBE is detected in water roughly five times more often and at higher concentrations in areas of the country where federal RFG is sold (i.e., where there is an oxygenate mandate).

When MTBE is detected, the levels are typically below 20 ppb which is lower than EPA's Drinking Water Advisory. However, releases from petroleum storage tanks, and pipeline breaks or other point sources can cause high concentrations of MTBE in water. When such releases occur, the resulting localized concentration can be much higher than the EPA's advised taste and odor acceptable range (EPA's Office of Ground Water and Drinking Water).

What is the status of the drinking water contamination in Santa Monica, CA, the city with the first significant incidence of MTBE contamination?

In 1996, the city of Santa Monica learned that two of its drinking water wellfields, Charnock and Arcadia, were contaminated with MTBE at levels as high as 610 ppb and 86 ppb respectively. In response, the two wellfields, representing 50 percent of the city's drinking water supply were shut down and the city began purchasing replacement water. This incident

was the first major water contamination which brought public attention to MTBE.

EPA's Region 9 and the Los Angeles Regional Water Quality Control Board (RWQCB) are pursuing a joint enforcement action at the Charnock wellfield in Santa Monica. Site-specific clean-up is underway. At the smaller Arcadia wellfield, the RWQCB has the lead while EPA provides technical support and field oversight of the clean-up.

[top of page]

Movement and Disposition of MTBE in the Environment

What happens when MTBE gets into the environment?

Because MTBE dissolves easily in water and does not "cling" to soil very well, it migrates faster and farther in the ground than other gasoline components, thus making it more likely to contaminate public water systems and private drinking water wells. MTBE does not degrade (breakdown) easily and is difficult and costly to remove from ground water.

How long will MTBE remain in water?

MTBE is generally more resistant to natural biodegradation than other gasoline components. Some monitoring wells have shown little overall reduction in MTBE concentration over several years which suggests that MTBE is relatively persistent in ground water. In contrast, studies of surface water (lakes and reservoirs [exit disclaimer]) have shown that MTBE volatilizes (evaporates) relatively quickly.

[top of page]

Cleaning Up MTBE

Can we clean up releases of MTBE in soil and water?

Although often difficult and time consuming, MTBE contamination can be cleaned up [r] in the soil and water using existing technologies such as air stripping, granular activated carbon (GAC), advanced oxidation, and soil vapor extraction (SVE). These technologies are discussed below. The latter three have been used successfully at individual homes with impacted drinking water wells. Some home treatment units can also remove MTBE in tap water. You can obtain a list of home treatment units that are certified by a non-profit agency, The National Sanitation Foundation. [exit disclaimer] The EPA does not certify home treatment units since it only regulates public water supplies.

When soil is contaminated with MTBE, treatment may be even easier than for other gasoline compounds since pure MTBE has a high vapor pressure and does not sorb ("stick") easily to organic carbon in soil. When MTBE is dissolved in water, MTBE treatment may be more difficult and time consuming than for other gasoline compounds.

The levels to which contaminated ground water is cleaned up can vary as well as the methods used. If the ground water is used for drinking, it is often times treated [exit disclaimer] more rigorously to avoid unpleasant tase and odor and to protect against potential health effects, thereby restoring it to potable condition.

Although MTBE does not readily degrade in soil and water under most natural conditions, some laboratory and field studies have shown promising results using bacterial cultures to degrade the MTBE.

How are the technologies used to remove MTBE from soil and/or water?

SVE technology pulls air through the soil to volatilize (vaporize) contaminants. MTBE vapors that are extracted or vacuumed from the soil must be collected, properly treated, and disposed of to prevent further contamination.

GAC treatment technique pumps contaminated water through a bed of activated carbon to remove organic compounds. Since MTBE does not sorb ("stick") well to organics such as carbon, high volumes of the contaminated water must repeatedly pass through a GAC system before MTBE is effectively removed. Though less effective for MTBE, many individual homeowners use small carbon canisters to remove a variety of contaminants, including MTBE, from impacted private wells.

Air stripping is a process in which contaminated water is passed through a column filled with packing material while upward-flowing air removes chemicals from the water. In general, these vapors should not be released directly into the air and therefore, should be appropriately treated. MTBE does not readily separate from water into the vapor phase, often necessitating high air to water ratios.

Activated oxidation technologies use appropriate combinations of ultraviolet light, chemical oxidants, and catalysts to transform contaminants. Oxidation technologies have been demonstrated to oxidize a wide range of organic chemicals, including MTBE.

Is it expensive to clean up MTBE?

MTBE can complicate remedial activities because of its greater water solubility and resistance to natural biodegradation. Thus, the costs can be higher than those associated with the treatment/remediation for benzene or other gasoline components.

[top of page]

Preventing MTBE Leaks

What is being done to prevent leaks from underground storage tanks (UST)?

The EPA believes that it is unacceptable to have any fuel component reach water sources. EPA's federal UST regulations are helping prevent contamination of water supplies from UST releases. However, no set of regulations can prevent all releases. Even with the most ideal regulations, there will continue to be some equipment failures and installation mistakes that result in releases. Nonetheless, EPA is working with states to improve the compliance rate with the leak detection requirements and the regulations that require all substandard UST's be upgraded (with spill, overfill, and corrosion protection), replaced, or properly closed. EPA is also undertaking a major multi-year effort with states to increase UST owners' and operators' compliance rates through technical assistance, inspections, and enforcement.

What is being done to prevent leaks from pipelines?

Regulation of gasoline pipelines, another potential source of leaks, is under the jurisdiction of the U.S. Department of Transportation (DOT). DOT oversees an extensive pipeline safety program [illegible] to minimize releases from pipelines.

[top of page]

Research and Testing

What MTBE research is underway or upcoming?

Though MTBE has been the subject of much research, substantial scientific uncertainties still exist. To facilitate the advancement of crucial scientific knowledge needed to assess and manage the potential health and environmental risks MTBE and other fuel oxygenates in the environment, EPA identified several key issues in "Oxyfuels Information Needs" (1996) and "Oxygenates in Water: Critical Information and Research Needs" (1998). Researchers at EPA and other governmental organizations industry, and academic institutions are conducting studies to learn more about MTBE. Many of these projects are listed in Appendix 2 of "Oxygenates in Water: Critical Information and Research Needs".

[top of page]

What the experts say about MTBE

What did the Blue Ribbon Panel conclude and recommend?

In response to the growing concerns regarding MTBE in water, EPA's Administrator Browner appointed an independent Blue Ribbon Panel of leading experts from the public health, environmental and scientific communities, fuels industry, water utilities, and local and state governments. They were charged 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. They concluded, among other things, that MTBE detections have primarily caused consumer odor and taste concerns, and that in rare instances MTBE has been found in drinking water supplies at levels well above EPA's drinking water advisory and some state standards.

The Panel recommended the following:

- Removing the current congressional CAA requirement for 2 percent oxygen in RFG
- Improving the nation's water protection programs, including over 20 specific actions to enhance Underground Storage Tank, Safe Drinking Water, and private well protection programs
- Reducing the use of MTBE substantially nationwide
- Maintaining current air quality benefits
- Accelerating research on MTBE and its substitutes

[top of page]

Actions to Address MTBE Concerns

What additional steps is EPA taking to address concerns with MTBE?

EPA has taken the following actions to significantly reduce or eliminate MTBE, and to address prevention and remediation concerns. EPA is working closely with Congress, the states, and the regulated community to accomplish these efforts.

Congressional:

EPA is providing technical assistance to Congress to work toward a targeted legislative solution that addresses the Panel's

recommendations. Specifically, EPA Administrator Browner and Agriculture Secretary Glickman released a legislative framework on March 20, 2000 to encourage immediate Congressional action to reduce or eliminate MTBE and promote consideration of renewable fuels like ethanol.

Regulatory:

Also on March 20, 2000, EPA Administrator Browner announced the beginning of regulatory action under the Toxic Substances Control Act (TSCA) to significantly reduce or eliminate use of MTBE in gasoline while preserving clean air benefits.

Drinking Water Protection Programs:

- EPA will issue a secondary drinking water standard, based on taste and odor, by late Fall 2000. This taste and odor standard will serve as a guideline that states may adopt.
- A new rule requires all large and a representative sample of small public water systems to monitor for MTBE in ground water and surface water beginning in 2001. EPA is encouraging water systems to begin monitoring prior to the 2001 implementation date.

Underground Storage Tanks (USTs) and Other Management Strategies:

- EPA is working with states to increase the compliance rate with the spill, overfill, and corrosion portion of the UST regulations continue improving the quality of USTs.
- EPA is working with states on a multi-year effort to improve the compliance rate with the leak detection requirements.
- EPA and states are conducting an evaluation of UST systems performance to verify and validate how effectively leak detection and other UST systems are working; by 2002 EPA will have valuable data to decide whether the UST regulations need to be revised.
- EPA recommended that State UST/LUST officials [ ] monitor and report MTBE and other ethers in ground water at all leaking UST sites. Where MTBE is detected, states are advised to take immediate and aggressive remedial action.
- EPA and states are developing a UST system operation and maintenance manual, available in late 2000, to help UST owners and operators understand and carry out good UST management practices to better prevent and detect leaks.

Remediation:

EPA is funding demonstration projects to determine the most effective approach to MTBE remediation. MTBE remediation research efforts are also currently underway by other organizations such as the American Petroleum Institute and U.C. Davis.

Research:

Numerous research projects are underway by government organizations, universities, and industry. Information about research projects regarding oxygenates (including MTBE) in water is discussed in Oxygenates in Water: Critical Information and Research Needs". Among the topics covered in this document are

source characterization, transport, transformation, occurrence, exposure, aquatic toxicity, health effects, release prevention, and contaminant removal. Appendix 2 of the document lists several current or recent research projects in these topic areas.

[top of page]

Additional Information

MTBE:

You can access additional documents related to MTBE from the following EPA Web sites:

Office of Transportation and Air Quality
This Web site contains documents related to MTBE in gasoline and its air quality benefits.

Office of Underground Storage Tanks
This Web site contains documents and links to information related to the storage of gasoline with MTBE in underground storage tanks.

Office of Ground Water and Drinking Water
This Web site contains documents related to MTBE in ground water and drinking water.

Blue Ribbon Panel:

You can access additional documents related to the Blue Ribbon Panel from the following EPA Web sites:

Clean Air Act Committee, Office of Air and Radiation
This Web site provides background information on the formation, purpose, and members of the Blue Ribbon Panel.

Office of Transportation and Air Quality
This Web site contains documents produced by or for the panel, including its Final Report.

Research:

You can access additional documents related to research of MTBE from the following EPA Web sites:

EPA's Office of Research and Development (ORD) conducts research in support of the Agency's mission to help ensure that efforts to reduce environmental risk are based on the best available scientific information. ORD has several national labs and centers that are active in dealing with various aspects of oxygenates and oxygenated fuels:

Risk assessment and research strategies
EPA's National Center for Environmental Assessment (NCEA) has prepared health risk assessments and research strategies on MTBE and fuel oxygenates.

Exposure research
EPA's National Exposure Research Laboratory (NERL) has been conducting research on MTBE exposure issues utilizing a wide variety of measurement methods and exposure scenarios for several years.

Health and environmental effects research
EPA's National Health and Environmental Effects Research Laboratory (NHEERL) conducts research on the uptake, metabolism, and elimination of MTBE in humans.

Risk management research
EPA's National Risk Management Research Laboratory (NRMRL) conducts research on the treatment of sites and drinking water contaminated with MTBE.

Extramural environmental research grants
EPA's National Center for Environmental Research (NCER) administers EPA's Science to Achieve Results (STAR) Program, including funding on MTBE research under different competitive solicitations.

You can also call the Safe Drinking Water Hotline at 800-426-4791 for information and assistance about EPA's drinking water regulations, the wellhead protection program, source water protection and related guidance, and public education materials.

Local Information will tell you whom to contact in your area for more information on MTBE in drinking water.

[top of page]