

Petroleum Constituents in Groundwater Public Health Fact Sheet

People can be exposed to chemicals in petroleum products (ex. gasoline or diesel fuel) in a number of different ways: through direct skin contact or by breathing, eating or drinking them.

Sources of these chemicals in groundwater can include underground gasoline storage tanks, home heating fuel storage tanks, and improper handling or disposal of gasoline or fuel oil on a property. Private well water can be affected. The Environmental Protection Agency (EPA) has set Maximum Contaminant Levels (MCL) in drinking water for many of these chemicals.

Information about some of the chemicals that have been found in groundwater is below:

Chemical Name	What is it?	MCL (ppb*)	How can it affect health?
1,2-Dichloroethane	It is a solvent used to remove lead from leaded gasoline. It has also been used to make plastics and vinyl. It has a pleasant smell and sweet taste.	5 ppb	If large amounts are inhaled or swallowed, it can cause nervous system, liver and kidney disease in humans. Longer-term exposure to lower amounts has caused kidney disease in animals. While it has not been shown to cause cancer in humans, animals fed large amounts have developed cancer. It has been determined to be a probable human carcinogen.
Benzene	It is a colorless liquid with a sweet smell. It is made from petroleum and can be found in gasoline. It is used to make other chemicals.	5 ppb	It is not known what health effects might happen after long-term exposure to low levels of benzene in food or water. In laboratory animals, exposure to benzene can cause anemia, depress the immune system and cause cancer. Eating or drinking very high levels of benzene can cause vomiting, stomach irritation, dizziness, sleepiness, seizures, coma or death. People who breathe in high levels of benzene over long periods of time can have problems with their blood and immune systems and are at higher risk for leukemia.
Methyl tertiary butyl ether (MTBE)	It is a gasoline additive intended to reduce gasoline emissions. It has an unpleasant taste and strong turpentine-like odor.	EPA action level is 20 ppb	The EPA has determined that MTBE has a potential to cause hazardous effects in humans. However, there is no scientific evidence to indicate MTBE is a human carcinogen or a serious health threat. Laboratory studies of animals exposed to high doses of MTBE showed stomach irritation, liver and kidney damage, and nervous system effects. Other studies involving rats and mice breathing high levels of MTBE showed an increased risk of kidney and liver cancer.
Naphthalene	It is a white solid found in mothballs, tobacco products, wood and petroleum. It is also used in making plastics.	MDE action level is 10 ppb	Eating large amounts can damage red blood cells, causing a severe anemia. Some people of Mediterranean or African origin may be at higher risk for anemia. In animals, cataracts have developed after exposure to high levels of naphthalene. Cancer developed in some laboratory animals that breathed naphthalene every day of their lives. The EPA has determined that it is a possible human carcinogen.
Tetrachloroethene	It is a solvent often used in dry cleaning or degreasing metals. It is also used to make other chemicals. It has a sweet odor.	5 ppb	It is not known what health effects might happen after long-term exposure to low levels of tetrachloroethene in food or water. In animals, exposure at high concentrations can damage the liver and kidney and cause liver and kidney cancers. It has been determined to be a probable human carcinogen. People who breathe in high levels of tetrachloroethene can get dizziness, headache, sleepiness, confusion, nausea, unconsciousness or death.

*ppb = parts per billion. The EPA has an action level for MTBE. The Maryland Department of the Environment has set an action level for naphthalene.

Source: Agency for Toxic Substances and Disease Registry, Centers for Disease Control and Prevention. Information available at <http://www.atsdr.cdc.gov/toxpro2.html>