



Chemicals in Private Drinking Water Wells Fact Sheet

Florida Department of Health, Division of Environmental Health

This fact sheet discusses possible health risk from exposure to low levels of benzene typically found in private drinking water wells.

Benzene

What is benzene?

Benzene is a colorless liquid. It has a sweet odor. Benzene evaporates quickly into the air. In water, it dissolves slightly. It is highly flammable. Benzene occurs in nature. It is also formed through human activities.

Benzene is widely used in the United States. In fact, it ranks in the top 20 chemicals for the volume produced. Some industries use benzene to make other chemicals. In turn, these are used to make plastics, resins, and nylon and synthetic fibers. Benzene is also used to make some types of rubbers, lubricants, and dyes. Detergents, drugs, and pesticides are also made with benzene. Natural sources include volcanoes and forest fires. It is also a natural part of crude oil, gasoline, and cigarette smoke.

How might I be exposed to benzene in my drinking water?

- Gasoline spills and leakage from underground gasoline storage tanks or from hazardous waste sites containing benzene can result in contamination of well water.

What is the standard for benzene in drinking water?

The Florida Department of Environmental Protection's (DEP) drinking water standard for benzene is 1 microgram per liter (1 ug/L). There is no required sampling of private drinking water wells.

How can benzene affect my health?

Drinking water standards are set at very low levels. Drinking water every day at or below the standard for your entire lifetime is unlikely to cause illness.

To set drinking water standards, scientists study reports of people exposed to chemicals at work. They also study reports of experiments with animals. From these reports, they determine a "no-effect level" or level that doesn't cause illness. Then, to be on the safe side, scientists set drinking water standards hundreds or thousands of times less than the "no-effect level." Therefore, drinking water with levels slightly above the standard for a short time period does not significantly increase the risk of illness. The risk of illness, however, increases as the level of chemical increases and the length of time you drink the water increases.

The type and severity of health effects associated with exposure to a particular chemical depends on a number of factors:

- How much of the chemical was someone exposed to each time?
- How long did the exposure last?
- How often did the exposure occur?
- What was the route of exposure? (Did someone eat, drink or breathe the chemical into their body?)

Health effects are also determined by a number of personal factors. From person to person, how someone is affected by a chemical exposure ranges widely. The drinking water standard is set to protect the most sensitive individuals. Health effects are also determined by a number of personal factors. These include:

- How old are they?
- What gender are they?
- Is the person generally healthy or do they already have other health problems?
- What are their health habits? (For instance, do they drink alcohol or smoke tobacco?)
- How likely are they to be affected by exposure to a chemical, in general?

Drinking water with levels of benzene well above the drinking water standard for an extended period increases the risk of affecting the blood. Benzene can affect the bone marrow that makes blood cells. It can cause a decrease in red blood cells. This can lead to anemia. It can also cause excessive bleeding. In some cases, benzene can affect the immune system. That can increase the chance of infection.

How likely is benzene to cause cancer?

The US Department of Health and Human Services (DHHS) has determined that benzene is a known human carcinogen. Long-term exposure to high levels of benzene can cause leukemia. Leukemia is cancer of the blood-forming white blood cells. The drinking water standard is set to protect against the risk of leukemia.

Is there a medical test to see if you have been exposed to benzene?

Several tests can show if you have been exposed to benzene. There is a test for measuring benzene in the breath; this test must be done shortly after exposure. Benzene can also be measured in the blood. However, since benzene disappears rapidly from the blood, measurements are accurate only for recent exposures.

In the body, benzene is converted to products called metabolites. Certain metabolites can be measured in the urine. However, this test must be done shortly after exposure and is not a reliable way to determine how much benzene you have been exposed to, since the metabolites may be present in urine from other sources.

Should you continue to use your drinking water if benzene is found?

Levels of benzene less than the drinking water standard are not likely to cause illness. Drinking water with levels slightly above the drinking water standard for a short time period does not significantly increase the risk of illness. Because the risk of illness does, however, increase as the level of chemical increases and the length of time you drink the water increases, you should seek drinking water that meets the drinking water standard.

For additional health information: Please call the Florida Department of Health toll-free help line 877-798-2772 weekdays from 10:00 a.m. to 7:00 pm. Outside of Florida, please call 850-245-4299 between 8:00 a.m. and 5:00 p.m. Or visit us online at: www.myfloridaeh.com

For more information about the health effects from exposure to this chemical in different situations and at higher levels than those usually found in drinking water wells, please see the ATSDR ToxFAQs for benzene at: www.atsdr.cdc.gov/tfacts3.pdf