



Chemicals in Private Drinking Water Wells Fact Sheet Florida Department of Health, Bureau of Environmental Health

This fact sheet discusses possible health risks from exposure to low levels of benzene typically found in 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 also forms 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, as well as plastics, resins, and nylon and synthetic fibers. Some types of rubbers, lubricants, and dyes also use benzene. Detergents, drugs, and pesticides also use it. Natural sources include volcanoes and forest fires. It is also a natural part of crude oil, gasoline, and cigarette smoke.

How might exposure to benzene in drinking water occur?

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

What is the standard for benzene in drinking water?

The Florida Department of Environmental Protection's 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 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?)

How chemical exposures may affect someone can range widely from one person to the next. A number of personal factors also determine health effects. 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 chemical exposures to effect someone, in general?

Drinking water with levels of benzene well above the drinking water standard for a long time 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 U.S. Department of Health and Human Services has determined that benzene can cause cancer in humans. 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 for benzene exposures?

Several tests can show exposure to benzene. There is a test for measuring benzene in the breath, but it must occur shortly after exposure. Blood tests can also detect benzene. However, since benzene disappears rapidly from the blood, measurements are accurate only for recent exposures.

In the body, benzene converts to products called metabolites. Urine tests can show levels of this product. However, this test must occur shortly after exposure. It is not a reliable way to determine how much benzene the exposure was to because the metabolites in urine could have other sources.

Is it safe to keep drinking water with benzene in it?

Levels of benzene less than the drinking water standard are not likely to cause illness. Drinking water with levels slightly above the standard for a short time does not significantly increase the risk of illness. However, because health risks increase as the levels of a chemical (or how long a person drinks it) increases, it is best to drink water that meets standards.

For additional health information, please call the Florida Department of Health at 850-245-4240 or visit us online at:
<http://www.floridahealth.gov/environmental-health/drinking-water/Chemicals-HALs.html>

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: <http://www.atsdr.cdc.gov/toxfaqs/tfacts3.pdf>