



Health Information about Arsenic in Drinking Water

In parts of Maryland, arsenic occurs in groundwater (drinking water) at levels that are higher than recommended for long-term use. If you own a private well, the Maryland Department of the Environment (MDE) recommends that you contact your local health department for advice about testing your well and treating your drinking water to remove arsenic.

What is arsenic and where does it come from?

Arsenic is a naturally occurring element widely distributed in the earth's crust. From where it exists in rocks and soil, it can move into groundwater and end up in your well or public water supply. Arsenic has been used in rodent poisons and other pesticides, dyes and paints, wood preservatives, medicines, and various manufacturing processes. Arsenic is odorless and tasteless, so you cannot tell if it is in your food, water, or the air you breathe.

What is new about arsenic in drinking water?

In 2002, the U.S. Environmental Protection Agency (EPA) decreased the Maximum Contaminant Level (MCL) in drinking water from 50 parts per billion (ppb)¹ *to a more protective value of 10 ppb based on new information about the effects of arsenic in drinking water.* Both EPA and MDE are requiring all public water supplies to be at or below the MCL by 2006. The MCL is the highest level of a contaminant that EPA allows in public drinking water supplies. It is based on health concerns, as well as costs and the feasibility of treatment.

What other sources of arsenic should I be aware of?

In addition to drinking water, people can be exposed to arsenic from food and various lifestyle activities. For example, most fish and shellfish contain arsenic, but unlike tap water most of this arsenic is in a non-toxic form that is readily eliminated from the body. Arsenic is also present in plants (including vegetables), because plants can absorb arsenic as they absorb other minerals and nutrients from the soil. While the most common source of arsenic exposure is usually food, drinking water may be the largest source in some areas.

What happens to arsenic in my body?

Arsenic compounds are easily absorbed from the food we eat and the water we drink, but most (75-90 percent) of the arsenic is eliminated within a week. Arsenic in soil or dissolved in water does not easily penetrate the skin, so skin exposures (from showering or bathing, for example) are not usually of concern.

What types of health effects should I be concerned with from arsenic in drinking water?

Long-term exposure to arsenic in drinking water has been shown to *increase the risk of cancer* of the skin, lungs, and urinary bladder, and possibly cancer of the kidney, liver, and prostate. Other types of health

¹ Parts per billion is the same as micrograms per liter (ug/L).

effects are also associated with long-term exposure. Arsenic can cause a pattern of skin changes that may include unusual skin thickening accompanied by light and dark spots. Arsenic can also affect the peripheral nervous system and the blood count. Studies suggest that arsenic may also contribute to poor circulation, high blood pressure, heart disease, diabetes, and reproductive effects, however, its role in these illnesses is not clearly defined.

Are there groups or individuals that are more sensitive or more “heavily exposed” to arsenic?

It is generally assumed that young children are more sensitive than adults to the effects of environmental contaminants, medicines, and other substances. In the case of arsenic, the National Research Council (NRC) concluded there are no reliable data to indicate that children are more susceptible than adults. Children can be at greater risk from arsenic in tap water because they drink more water per pound of body weight than adults. Age, diet, heredity, health status and smoking habits may affect how the body handles arsenic, but more research is needed to understand these effects.

How large are the health risks at the recommended level?

There are still some questions about the most appropriate MCL and level of protection provided at 10 ppb arsenic. Experts agree, however, that the MCL of 50 ppb that was used since the 1940s prevented many human health effects. A level of 10 ppb is expected to be at least 5 times more protective of health. According to EPA, drinking water with 10 ppb arsenic may cause 1-6 additional cancer deaths over the lifetime exposure of a group of 10,000 people. The NRC estimates that risks are about 10 times higher. The overall cancer death rate from all causes in the U.S. is about 20 percent or 2,000 cases in a population of 10,000 people.

How do I know if I am being exposed to unacceptable levels of arsenic?

There are tests that can measure arsenic in your blood, urine, hair and nails. The urine test is the most reliable test for arsenic exposures occurring within the last few days. The results can be misleading if seafood or ocean-derived vitamins or supplements were eaten in the past 48 hours. Hair and nails may be a clue to arsenic exposure however these tests can be misleading due to surface contamination with arsenic.

I am on a public water supply. How can I find out the levels of arsenic in my drinking water?

Drinking water utilities are required to inform customers of the current arsenic levels in their drinking water. Utilities usually do this by including a Consumer Confidence Report in the billing statement. You can also get a copy of the Consumer Confidence Report by contacting your water utility.

I am on a private well. How can I find out the levels of arsenic in my drinking water?

First, check with your local County Health Department (phone numbers are below). They can provide information on the levels of arsenic in the drinking water supply in your area. If you live in an area with elevated arsenic in the groundwater, or if there is no information for your specific area, you should consider having your well water tested. A test will tell you the arsenic level in your well water and the types of arsenic that are present. Knowing the type of arsenic can be helpful in deciding what treatment system to use.

The most affected counties in Maryland are:

Queen Anne's	(410) 758-0721	Talbot	(410) 819-5600	St. Mary's	(301) 475-4330
Worcester	(410) 632-1100	Caroline	(410) 479-8030	Dorchester	(410) 228-3223

What can I do to reduce the arsenic in my well water?

If the arsenic in your well is over the 10 ppb MCL, you should consider installing a treatment system to reduce the long-term exposure risks to you and your family. Arsenic can be reduced or removed entirely from drinking water, but it can be expensive and require careful maintenance and monitoring. Currently available treatment processes include adsorption, reverse osmosis, distillation, and ion exchange. Please refer to the MDE fact sheet on arsenic removal systems (<http://www.mde.state.md.us>, or contact the Water Supply Program at MDE 410-537-3589). Other alternatives may include installing a new well, using bottled water, or connecting to a public water source in your area. Before deciding on treatment equipment you can obtain additional information and advice from MDE or the local County Health Department.

More information:

EPA "CCA" Factsheet: www.epa.gov/pesticides/factsheets/chemicals/cca_consumer_safety.htm

USGS Factsheet and Map: co.water.usgs.gov/trace/arsenic/

EPA Drinking Water Factsheet: www.epa.gov/safewater/ars/ars_rule_factsheet.html

ATSDR Factsheet: www.atsdr.cdc.gov/tfacts2.html

[Dec. 2004]

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