

HOW CAN ARSENIC GET INTO MY WATER SUPPLY?

Earth materials such as bedrock, sand, and gravel may contain arsenic bearing minerals. Arsenic may be dissolved by, and absorbed into, the drinking water we withdraw from the ground. Groundwater is water that collects and flows within the earth. Some areas in Michigan have levels of arsenic in drinking water that are above the recommended health level. Arsenic has no smell or taste in water, so you cannot sense if arsenic is present. The best way to determine if your well water is impacted is to have it tested for arsenic. Check with your local health department about the need to have your drinking water tested for arsenic. You can find your local health department location and phone number in the governmental pages of your local phone book or at www.malph.org.

HOW CAN I BE EXPOSED TO ARSENIC?

The most common and significant exposure to arsenic is from groundwater used for drinking and cooking. However, since arsenic is a natural part of our environment, we may be exposed to some amount of arsenic in any of the following ways:

- The largest source of total arsenic comes from the food we eat. Some fish and seafood contain high amounts of **organic** arsenic. Organic arsenic is much less harmful than **inorganic** arsenic from the groundwater.
- Fortunately, arsenic at levels found in well water is not readily absorbed by the skin, so contact with water (showering, laundering, etc.) is not a significant risk. Arsenic from a water supply does not readily disperse into the air, so inhalation during a shower or while washing dishes is not significant.

- Arsenic may be inhaled by breathing in dust from industrial processes or smoke from burning arsenic treated wood. Tobacco smoke contains small amounts of arsenic.

- Direct contact exposure to concentrated arsenic compounds can be absorbed through the skin. These types of exposures would be more likely to result from occupational related contacts.

WHAT FACTORS DETERMINE MY HEALTH RISK?

If you drink water containing arsenic, several factors will determine the health risk. These factors are:

- DOSE – What is my level of exposure to arsenic?
- DURATION – How long and how often have I been exposed?
- TYPE of ARSENIC – Have I been exposed to **inorganic** or **organic** arsenic?
- GENERAL HEALTH, AGE, LIFESTYLE and NUTRITIONAL STATUS, – Some people may be affected by lower levels of arsenic while others remain unaffected. Young children, the elderly, people with long-term illnesses, and unborn babies are at greater risk. They can be more sensitive to chemical exposures. Babies are not exposed to arsenic through breast milk at levels of concern even when their mothers have been exposed.

WHAT ARE THE HEALTH EFFECTS ASSOCIATED WITH ARSENIC EXPOSURE?

The way arsenic affects our bodies is not fully understood. Studies of exposed populations in the United States have not shown clear proof of health problems caused by drinking contaminated water at levels similar to those found in Michigan well water.

Based on studies in other countries, long-term exposure to high arsenic levels (generally greater than 0.30 milligrams per liter [mg/L]) in drinking water has caused the following effects:

- THICKENING and DISCOLORATION of the SKIN. Sometimes these changes can lead to skin cancers. These cancers can be cured if discovered early.
- STOMACH PAIN, NAUSEA, VOMITING, and DIARRHEA.
- NUMBNESS in the HANDS and FEET.

Many of the symptoms of exposure to high levels of arsenic are also seen with other common illnesses, which makes it difficult for a doctor to recognize. If you or your family members are concerned about health problems that may be related to arsenic in your well water, you should discuss them with your doctor. You should also consider having your well water tested for arsenic.

CAN A MEDICAL TEST TELL ME HOW MUCH ARSENIC IS IN MY BODY?

Yes, there are several ways you can be tested for arsenic exposure. A urine test is a simple way to tell if you are currently being exposed to arsenic at levels of concern. However, this test will not tell you what type of arsenic is in your body. **To get the most accurate urine test results, do not eat any fish or seafood for at least three days before your test.** If needed, your doctor has additional tests that can be performed to check arsenic levels in your body.

I AM INTERESTED IN HAVING MY WELL WATER TESTED FOR ARSENIC?

Arsenic testing is not routinely performed Statewide on private wells. For a fee, the Michigan Department of Environmental Quality (DEQ), Laboratory Services Section (517-335-8184), or a commercial laboratory, certified by the DEQ to test for arsenic, may be contacted to arrange for arsenic testing of your water supply. The DEQ fee for arsenic testing is \$16. For a listing of certified commercial analytical laboratories, you may contact the DEQ at the telephone number listed above. Your local health department can also help by providing you with a list of certified laboratories or by making arrangements for the water testing by the DEQ Laboratory.

You may wish to have one or more additional water samples tested to confirm the arsenic level. Generally, samples taken weeks or months apart have not shown a significant change in arsenic levels. However, samples taken after a long inactive water use period, such as following a vacation, will sometimes be higher than those taken after extensive water use, such as lawn watering or doing laundry. You should collect a sample at a time that reflects your typical household water use.

HOW DO I INTERPRET MY WATER SAMPLE RESULTS?

Environmental Protection Agency (EPA) set a maximum contaminant level (MCL) of 0.010 mg/L for arsenic in drinking water. The new MCL replaces the previous MCL of 0.05 mg/L. **The recommended arsenic drinking water health advisory is: 0.010 mg/l.** Expressed in different units of measure, this level is the same as: 0.010 parts per million (ppm), or 10 micrograms/liter (µg/L), or 10 parts per billion (ppb).

The MCL serves as an advisory or recommendation for a safe drinking water level in private single family residential water wells. However, certain public drinking water supplies are required by law to meet the new standard by January 23, 2006.

WHAT SHOULD I DO TO REDUCE MY ARSENIC EXPOSURE?

If the arsenic level in your well water exceeds the health advisory, we recommend that you stop using your well water for drinking and cooking. Bottled water can serve as an alternative for these purposes. Since the MCL for arsenic is a long-term exposure standard protective against cancer and is based on consuming two liters of water per day for a 70-year period, incidental consumption of water containing arsenic above 0.010 ppm and under 0.300 ppm is not a significant exposure.

- Connection to a community water supply system may be the most cost-effective solution. If not already in compliance with the MCL, community water supplies will be required to initiate corrective action by January 23, 2006. When connection to a community water system is not possible, water well replacement or modification may be options. However, well modification may not always result in arsenic reduction. Contact your local health department before replacing or modifying your water well.
- If a water source meeting the recommended health advisory is not available, water treatment may be an alternative. Reverse osmosis (RO), distillation, and activated alumina water treatment devices may be the most effective and practical arsenic treatment methods for residential water supplies. Distillation and RO are best suited as point-of-use treatment devices while activated

alumina may be best for treatment of the entire household system. Water softeners and activated carbon filters do not reduce arsenic levels effectively.

- All treatment devices need regular maintenance. Failure to properly maintain a water treatment system may result in exposure to higher levels of arsenic than that coming from the well. An RO unit requires periodic filter replacement. Activated alumina devices should be maintained through a service contract and should not be the type of unit that requires in-home filter media regeneration.
- Private water supply treatment is not regulated nor considered a preferred permanent solution to water quality problems. Before installing a water treatment system, you should carefully research the treatment method's effectiveness for contaminant reduction and the system's operational and maintenance requirements. A treatment unit certified by NSF International and installed to their specifications is recommended. Information is available at www.nsf.org or at 800-673-6275.

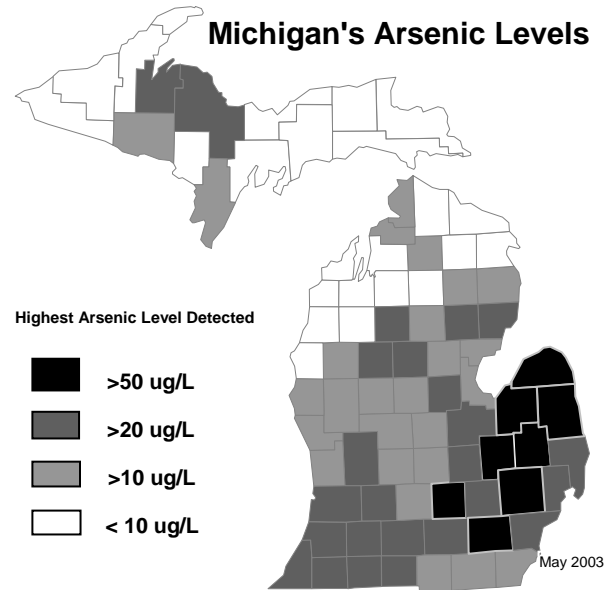
FOR MORE INFORMATION:

If you or your physician has questions, please contact your local health department or the following:

DEQ, ODWMA
P.O. Box 30273
Lansing, MI 48909-7773
Phone 517-284-6542
Fax 517-241-1328

Arsenic links:

- * U.S. EPA at www.epa.gov/safewater/arsenic.html
- * U.S. Geological Survey at webserver.cr.usgs.gov/trace/arsenic/
- * Arsenic Information at www.michigan.gov/deq



The Michigan Department of Environmental Quality (MDEQ) will not discriminate against any individual or group on the basis of race, sex, religion, age, national origin, color, marital status, disability, or political beliefs. Questions or concerns should be directed to the Quality of Life Human Resources, PO Box 30473, Lansing, MI 48909.

The DEQ Environmental Assistance Center toll free number (800) 662-9278 or DEQ homepage at: www.michigan.gov/deq

Arsenic in Well Water



Health Information for Water Well Users



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OF ENVIRONMENTAL QUALITY**

REV. 09/2013

EQC2106