

## HOW DO I INTERPRET MY WATER SAMPLE RESULTS?

On October 31, 2001, the United States Environmental Protection Agency (EPA) set a maximum contaminant level (MCL) of 0.01 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: 0.01 MG/L.*** Expressed in different units of measure, this level is the same as: 0.01 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, unintentional consumption of water containing arsenic between 0.01 ppm and 0.05 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, and the activated alumina device should be maintained by a reputable service contract and should not be a 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. Selection of a treatment unit which is certified by NSF International is recommended. Information is available at their Web site at [www.nsf.org](http://www.nsf.org).

### FOR MORE INFORMATION:

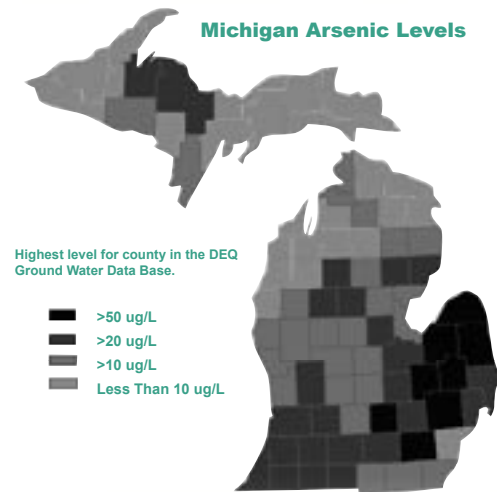
If you or your physician have questions, please contact your local health department or the following:

- Michigan Department of Community Health (DCH), Division of Environmental and Occupational Epidemiology, 3423 North Martin L. King Jr. Boulevard, P.O. Box 30195, Lansing, MI 48909.

- DEQ, Drinking Water and Radiological Protection Division, Constitution Hall, 525 West Allegan, P.O. Box 30630, Lansing, MI 48909-8130, or
- DCH can be reached toll free by calling 1-800-648-6942 or at 517-335-8350,
- DEQ can be reached by calling 517-241-1381.

The following Web sites may also be referenced to obtain more information about arsenic:

- U.S. EPA at [www.epa.gov/safewater/arsenic.html](http://www.epa.gov/safewater/arsenic.html)
- U.S. Geological Survey at [webserver.cr.usgs.gov/trace/arsenic/](http://webserver.cr.usgs.gov/trace/arsenic/)
- DEQ Arsenic Information at [www.michigan.gov/deq/1,1607,7-135-3313\\_3675\\_3691-9753--,00.html](http://www.michigan.gov/deq/1,1607,7-135-3313_3675_3691-9753--,00.html)



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MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY **DEQ**

John Engler, Governor • Russell J. Harding, Director

# Arsenic in Well Water



## Health Information for Water Well Users

This pamphlet provides answers to some of the questions about the potential problems related to arsenic in drinking water wells in Michigan. It tells you who to contact if you have questions or concerns or if you would like your well water tested for arsenic.

Michigan Department of Community Health

Michigan Department of Environmental Quality

[www.michigan.gov/deq](http://www.michigan.gov/deq)  
800-662-9278



**DEQ**



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## HOW CAN ARSENIC GET INTO MY WATER SUPPLY?

Earth materials such as bedrock, sand, and gravel may contain naturally occurring arsenic. This arsenic has been dissolved by and absorbed into the drinking water we withdraw from

the ground water. Ground water 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 at [www.malph.org/page.cfm/18](http://www.malph.org/page.cfm/18).**

## HOW CAN I BE EXPOSED TO ARSENIC?

Since arsenic is a natural part of our environment, most people are exposed to some amount of arsenic. A person could come in contact with arsenic in any of the following ways:

- The largest source of arsenic comes from the food we eat. Some fish and seafood contain high amounts of ORGANIC arsenic. This type of arsenic is much less harmful than INORGANIC arsenic from the ground water.
- 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. Only water used for

drinking and cooking is a health concern.

- Arsenic may be inhaled by breathing in dust or smoke that contains arsenic. Dust from industrial processes and the smoke from burning wood treated with preservatives may contain arsenic. Tobacco smoke contains very 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, NUTRITIONAL STATUS, AGE, and LIFESTYLE – 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 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 or visit their Web site [www.deq.state.mi.us/documents/deq-dwrpd-lab-cert\\_chem\\_lab.pdf](http://www.deq.state.mi.us/documents/deq-dwrpd-lab-cert_chem_lab.pdf). Your local health department can also help by providing you with a list of certified laboratories or by making arrangements for the water testing.

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.