

### What is arsenic?

Arsenic (As) is a common element found in the Earth's rocks and soils. Arsenic has no smell or taste.

### Where is arsenic found in nature?

Arsenic is found in certain types of rocks and soils. Different parts of Ohio have different rock formations. Ohio's soils typically contain concentrations of arsenic between 0.5 and 56 parts per million (0.5 – 56 ppm), with an average value of 5.72 ppm.

Certain types of arsenic can dissolve in water. Ohio's groundwater contains naturally-occurring arsenic levels between 5 and 50 parts per billion (5-50 ppb).

### Types of arsenic (both types occur naturally):

- Organic arsenic: This type can be found in many foods, especially seafood, and is less likely to cause health problems than inorganic arsenic.
- Inorganic arsenic: This type can be found in the drinking water and can cause health problems at high levels of exposure.

Very high levels of inorganic arsenic in food or water can cause serious, sudden health problems or even death.

### How do higher levels of arsenic get in the environment and your body?

#### Soils:

Most arsenic in Ohio soils is naturally-occurring.

- Children can come into dermal (skin) contact with arsenic when playing outside in contaminated soils. Young

children will often engage in hand-to-mouth actions where they can ingest the arsenic.

- People who have gardens or flower beds can also come in contact with arsenic contaminated soils through dust inhalation or ingestion.
- People who eat (ingest) food that was grown in arsenic contaminated soils can also come into contact with arsenic.
- Although people can breathe arsenic in dust, there are not significant airborne sources of arsenic in Ohio (i.e. arsenic smelters).

Water: Arsenic can dissolve into the groundwater (underground drinking water) and can contaminate and impact drinking water sources. Humans then drink (ingest) the contaminated water.

Air: Arsenic can be released into the air when arsenic-containing materials are burned. People can then breathe the arsenic contaminated smoke and vapors (inhalation).

### Can arsenic make you sick?

Yes, you can get sick from arsenic. But getting sick will depend on the type of arsenic and the contact (exposure) you had with this chemical.

Getting sick from exposure (contact) with arsenic depends upon the following:

- How much you were exposed to (dose).
- How long you were exposed (duration).
- How often you were exposed (frequency).
- General Health, Age, Lifestyle  
Young children, the elderly and people with chronic (on-going) health problems are more at risk to chemical

exposures.

#### Routes of exposure:

- Eating and drinking (ingestion) – Main route.
- Breathing (inhalation) – Lesser route of exposure.
- Skin contact (dermal contact) – Not readily absorbed through skin, unlikely route of exposure.

If you were to drink water with arsenic levels of 300+ parts per billion (300+ ppb) every day, and over many years, you may experience some of the following health problems:

- Long-term contact with inorganic arsenic may cause the skin to darken and the growth of small "corns" or "warts" on the palms of the hand, bottom of the feet (soles), and on the trunk of the body (torso).
- A feeling of "pins and needles" on the hands and feet.
- Nausea (upset stomach), vomiting, and diarrhea.
- The body will make less red and white blood cells which help fight disease.
- Make note a deadly dose of arsenic would be 60,000 ppb or more.

#### **Does arsenic cause cancer (carcinogen)?**

Yes. The U.S. Department of Health and Human Services 13<sup>th</sup> Report on Carcinogens states arsenic is known to be a human carcinogen (causes cancer).

Eating or drinking (ingesting) high levels of inorganic arsenic (300+ ppb, daily for decades) increases the risk of getting skin cancer. It also increases the risk of developing tumors of the bladder, kidney, liver and lungs.

In 2001 the United States Environmental Protection Agency (U.S. EPA) lowered the Maximum Contaminant Level (MCL) of arsenic allowed in public water systems from 50 ppb down to 10 ppb. The new MCL of 10 ppb is set at a **very** low level to be sure the risk of getting a cancer from

arsenic is very, very small.

Make note that many drinking water wells in Ohio may have natural levels of arsenic that go above the new MCL. Although the U.S. EPA said there is no extreme risk to health by drinking water with arsenic levels between 10-50 ppb, people with private wells above 10 ppb may wish to drink bottled water or consider a water treatment system.

Contact the ODH, Residential Water and Sewage Program to learn about treatment systems that remove arsenic, or for a list of registered water treatment dealers call (614) 466-1390 or visit <http://www.odh.ohio.gov/en/odhprograms/eh/water/PrivateWaterSystems/main.aspx>

#### **Is there a medical test to show whether you have been exposed to arsenic?**

Yes, but since arsenic stays in the body a short time, you must get the test soon after an exposure. Also note these tests only look for high levels of arsenic (150+ ppb) and are not useful for low-level exposures.

#### Types of tests:

- Urine test. This the most trusted test for arsenic exposure.
- Testing hair or fingernails. This can measure your exposure to high levels of arsenic over the past 6-12 months. It is not good for testing low levels.

**Note:** These tests will show the amount of arsenic in your body but cannot tell you whether you will have any harmful health problems. These tests also do not determine where the arsenic came from.

#### **References:**

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Ohio Department of Health, Health  
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<http://www.odh.ohio.gov/~media/ODH/ASSETS/Files/eh/HAS/ArsenicinGardening.ashx>

### **Where Can I Get More Information?**

Ohio Department of Health  
Bureau of Environmental Health and  
Radiation Protection  
Radiological Health and Safety Section  
246 N. High Street  
Columbus, Ohio 43215  
Phone: (614) 644-2727

This fact sheet was developed in  
cooperation with the Agency for Toxic  
Substances and Disease Registry