

Naturally Occurring Arsenic in Alaska Groundwater

Alaska Division of Geological & Geophysical Surveys



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As

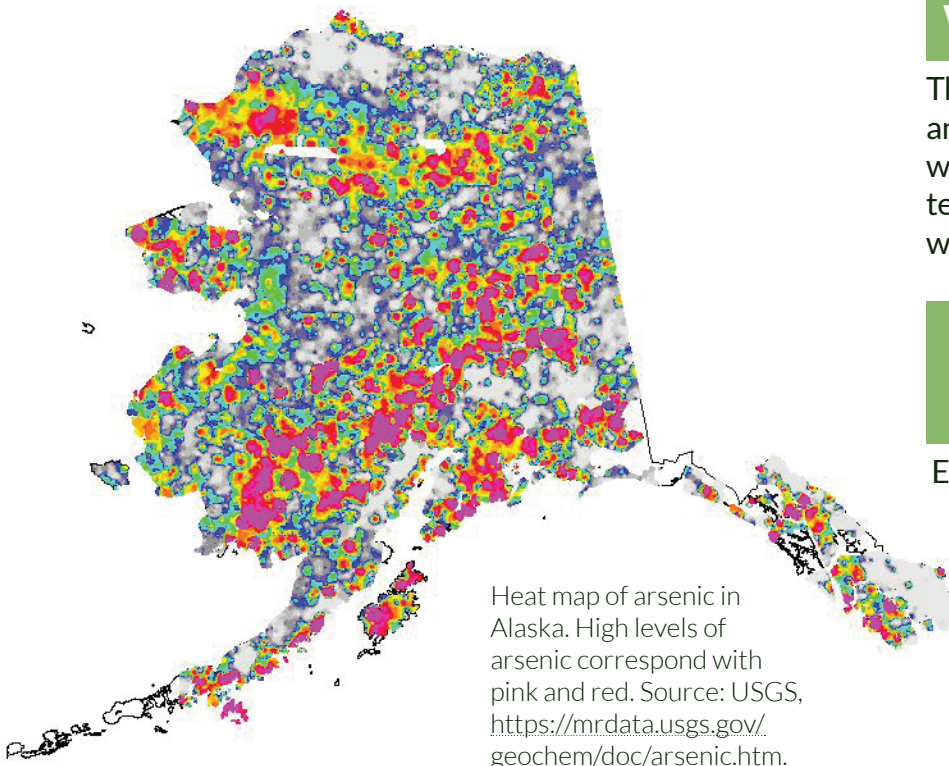
Arsenic
74.922

Arsenic (chemical symbol As) is a toxic metal that occurs naturally in the Earth's crust.

Arsenic that is bound up in minerals may be liberated and make its way into drinking water and soils. Levels of arsenic greater than **10 parts per billion (ppb)**, the current EPA drinking water standard, have been documented in Interior Alaska, Seward and Kenai peninsulas, Mat-Su Valley, and Anchorage.

Where does the arsenic come from?

Natural geologic processes can concentrate arsenic, along with gold and other minerals, in mineral deposits in bedrock. Over time, favorable geologic conditions for the concentration of arsenic have occurred broadly in Alaska, resulting in widespread arsenic-rich rocks. These naturally occurring arsenic-rich rocks are the most likely source of arsenic in groundwater.



Heat map of arsenic in Alaska. High levels of arsenic correspond with pink and red. Source: USGS, <https://mrdata.usgs.gov/geochem/doc/arsenic.htm>.

Why do arsenic levels change?

Several variables can contribute to changing levels of arsenic from year to year, including:

Changes in rainfall
Water use from wells
Thawing permafrost

What should I do if I find arsenic in my well water?

Basic purification methods, such as boiling water, will not remove arsenic from water. To ensure water is safe to drink, an arsenic mitigation system, like a reverse osmosis system, should be installed and maintained, and the water should be routinely tested.

Is there arsenic in the well water of my neighborhood?

There can be extreme variability in the amount of arsenic in adjacent wells, and in wells from year to year, so wells should be tested annually. The only way to know if your well contains arsenic is to test.

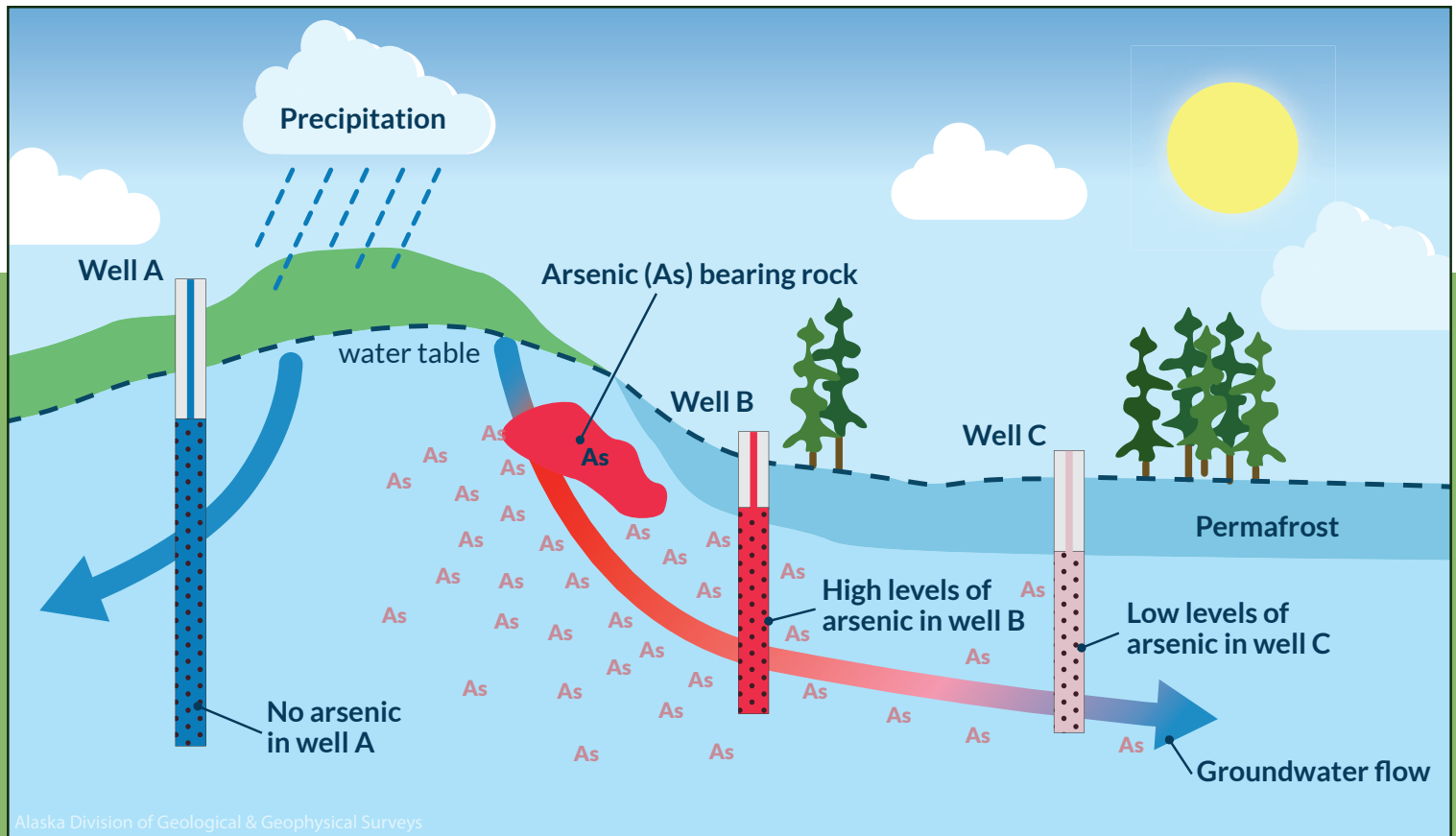
What are the health effects of arsenic?

Exposure to arsenic can cause a variety of health problems, including an increased risk of developing certain cancers. More information can be found here:

<https://www.atsdr.cdc.gov/phs/phs.asp?id=18&tid=3>

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How does arsenic get into well water?

Groundwater in the bedrock breaks down arsenic-bearing minerals, producing a highly mobile form of arsenic. Arsenic in this form can be dissolved and travel in groundwater along fractures (cracks) in bedrock, or through porous aquifers.

Wells may tap into one or more of these arsenic-bearing water sources (like wells B and C), while a neighboring well may miss the contaminated sources (like well A). However, well A may eventually draw on arsenic-contaminated water if conditions change. Water with arsenic may also be able to travel a fair distance before becoming dilute enough to meet drinking water standards, which is why it's important to test well water frequently.

More Resources

UAF Cooperative Extension Service

<https://www.uaf.edu/ces>

DEC Drinking Water Program

<http://dec.alaska.gov/eh/dw.aspx>

Testing your well

In Alaska, **it is the responsibility of the well owner to sample** and have their water tested (preferably annually) by a laboratory that is certified for the chemical analysis of drinking water.

The **Alaska Division of Environmental Health** has a list of laboratories that you can send water samples to test for arsenic (as well as many other contaminants), on their website: <http://dec.alaska.gov/applications/eh/EHLabStatus/Home/Index>

Learn more online: dggg.alaska.gov or contact Jennifer Athey: jennifer.athey@alaska.gov | 907-451-5000

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