To help protect families with their own wells, the states license or registers water-well installers. Most also have construction standards for home wells. In addition, some city and borough health departments have local rules and permitting. All this helps make sure the well is built properly. But what about checking to see that it is working correctly and the water is always healthy to drink? That is the job of the well owner, and it takes some work and some knowledge.

It is recommended that you test your water every year for total coliform bacteria, nitrates, total dissolved solids, and pH levels. If you suspect other contaminants, test for these also. Chemical tests can be expensive. Limit them to possible problems specific to your situation.

To find a certified lab who will test drinking water in your area, visit the ADEC website:
http://www.dec.state.ak.us/eh/lab/labs.htm

Before taking a sample, contact the lab that will perform your tests. Ask for instructions and sampling bottles. Follow the instructions carefully so you will get correct results. The first step is getting a good water sample. It is also important to follow advice about storing the samples. Ask how soon they must be taken to the lab for testing. These instructions can be very different for each contaminant being tested.

Remember to test your water after replacing or repairing any part of the well system (piping, pump, or the well itself.) Also test if you notice a change in your water's look, taste, or smell. For a list of reasons to check your water, visit the Environmental Protection Agencies website at http://epa.gov/safewater/privatewells/booklet/protectinggw.html

For More Information Contact ADEC Fairbanks or the EPA at:

ADEC
Tel: (907) 451-2108
Fax: (907) 451-2188
http://www.dec.state.ak.us/eh/dw

EPA
Safe Drinking Water Hotline (800) 426-4791

Alaska Department of Environmental Conservation
Drinking Water Program
610 University Avenue
Fairbanks, Alaska 99709

What May Be in My Drinking Water That I Can't See or Don't Know About?

Brought to you by:

the Alaska Department of Environmental Conservation Drinking Water Program

Telephone: (907) 451-2108

Why You Should Read This...

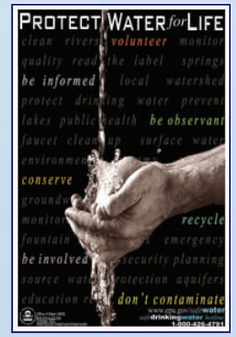
This fact sheet has been prepared to help people understand some of the problems related to drinking water which are caused by potentially disease-causing (pathogenic) agents.

You will find the following questions addressed:

- What might be in the water?
- What problems are caused?
- Don't we have rules to protect our drinking water?
- If the water looks clean, won't treatment do the job?
- Do all surface water supplies have to be filtered?
- Is something wrong with the current situation? Are people getting sick?
- What is the public health significance of coliform bacteria and turbidity in drinking water?
- How can I test my well water to see if it is safe?

Testing Private Water Systems

About 15 percent of Americans have their own sources of drinking water, such as wells, cisterns, and springs. Unlike public drinking water systems serving many people, they do not have experts regularly checking the water's source and its quality before it is sent through pipes to the community.



Background to Waterborne Diseases

What might be in the water? What problems are caused?

The three types of potentially pathogenic micro-organisms commonly found in water are bacteria, viruses, and protozoa. Surface water is especially vulnerable to contamination by these organisms. This is because people, birds, and animals usually have easy access to the water. Some diseases caused by these organisms include Cholera, Typhoid fever, Gastroenteritis, Giardiasis (Beaver Fever), and Cryptosporidiosis. Symptoms can include diarrhea, fever, nausea, vomiting, abdominal cramps, and general discomfort. The severity of illness may range from some combination of upset stomach, fever or diarrhea to death.

What is the public health significance of coliform bacteria in drinking water?

Coliform bacteria have long been used as an indicator of water quality. Finding coliforms in the water may indicate other disease-causing organisms are also present and that contamination from external sources are entering the water system.

What is the public health significance of turbidity in drinking water?

Turbidity is important from at least two perspectives. First, because the turbidity particles, especially if they are from plant or animal sources, can interfere with the disinfection process by 'using up' the disinfectant before it has had a chance to kill pathogens. Second, because the micro-organisms that cause disease are so small, irregularities in the turbidity particles may provide a hiding place for them and "shield" them from the disinfectant. Overall, turbidity gives water an unpleasant appearance, possible offensive taste, and reduces the effectiveness of disinfection.

Don't we have rules to protect our drinking water?

Congress passed the Safe Water Drinking Act (SWDA) in 1974 to ensure that people would have safe drinking water no matter where they lived, worked or traveled in the United States. The Alaska Department of Environmental Conservation has adopted the SDWA. The Drinking Water Program has primary responsibilities for assuring that public water systems in Alaska are able to provide safe and healthy drinking water in a reliable and consistent manner.

The original SDWA set standards and monitoring requirements for about 25 contaminants. Congress added major amendments to the SDWA in 1986 and 1996. The 1996 Amendments focused on Microbial Contaminants (Information Collection Rule), Disinfectants/Disinfection By-Products Rule (D/DBP), Enhanced Surface Water Treatment Rule (ESWTR), the Ground Water Disinfection Rule (GWDR), national primary regulations for arsenic, radon, and sulfate, risk assessment , and monitoring for both regulated and unregulated contaminants.

If the water looks clean, won't treatment do the job?

The presence and numbers of some of the disease-causing organisms listed above cannot be accurately measured, and the tests are very expensive. This makes setting standards impractical. A treatment method which is known to physically remove and disinfect particulates of all types, including micro-organisms, is used instead. This is the thought behind requiring filtration and disinfectant treatment for all surface water sources. Future water treatment technologies will focus on micro, ultra and nanofiltration, as well as reverse osmosis. These technologies will allow effective removal of pathogenic protozoan and D/DBPs.

Do all surface water supplies have to be filtered?

A water system can avoid filtration by meeting eleven criteria in the Surface Water Treatment Rule (SWTR). Meeting these eleven criteria generally provide public health protection equal to that obtained with filtration treatment under current SDWA requirements.

Discussion of Specific Issues

What evidence exists to support the view that unfiltered surface water represents a public health concern?

Surface water is obviously vulnerable to contamination resulting from natural activities (animals and birds) and manmade activities. These activities potentially provide the source of pathogenic (disease-causing) organisms that can cause illness. Disinfection is the only barrier against passage of harmful organisms to the customer's tap in unfiltered water systems. In filtered systems, the filtration process provides one barrier, and disinfection becomes the second barrier.

What types of disinfectants are available? What can we expect the disinfection to do?

The most common disinfectant is chlorine. Chlorine or chlorination can be effective against bacteria, viruses, and the protozoan *Giardia lamblia*. Chlorine has been shown not to be very effective against Cryptosporidium. Ozone, another less commonly used disinfectant, is more effective against Cryptosporidium.

Is something wrong with the current situation? Are people getting sick?

We cannot be certain that anyone has gotten sick. The disease investigation process is very time consuming and complicated, and typically an investigation is not done unless many people are sick. Unfiltered systems have only one barrier keeping disease-causing organisms from reaching its water consuming customers. That barrier is disinfection (chlorination), however, the effectiveness of disinfection is significantly reduced in waters that have elevated turbidity above the designated standard.

"Safe drinking water is extremely important to all of us. Many factors such as the selection of a water source, method of treatment, operation of treatment facility, and monitoring all fit into the process of reducing the risk that drinking water will cause illness."

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