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Office of Water
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EPA FACT SHEET

CITIZEN MONITORING: RECOMMENDATIONS TO PUBLIC WATER SYSTEM USERS

How can you as a user of a public water supply be assured of the safety of the water you drink? In what activities do water officials engage to provide an adequate water supply? What substances or human actions represent potential threats to your water? Are there activities that can be pursued in the home to further the public health quality of water you drink? This fact sheet is intended to help answer these questions as well as provide additional information on drinking water quality.

Approximately 85 percent of the Nation's citizens (230 million people) consume water from public supplies or systems. These systems are regulated by the U.S. Environmental Protection Agency (EPA) and most State health or environmental departments under a body of law known as the Safe Drinking Water Act. By virtue of being regulated, public systems must ensure that their water meets health standards as defined by the government. That is, the water must be "safe" for people to consume. In general, most water from public systems meets Federal standards and is safe to drink.

Potential Drinking Water Contaminants and Their Related Health Threats

Probably one of the most important and basic concepts to understand about the Earth's water is that it is not pure. The composition of water is such that materials - both natural and man-made - are easily dissolved upon direct contact. The level of quantity of a substance in water is the central issue with respect to determining whether the water is adequate for human consumption.

Potential drinking water contaminants include both microbiological and chemical substances. These agents can be found in nature or be the result of some past or present human activity. Microbiological substances of concern include **bacteria, viruses and protozoa.** Chemical contaminants primarily include **metals, minerals,** and both **organic** and **inorganic substances.** The health effects related to drinking contaminated water can either occur over the short or the long term, depending upon the nature of the pollutant. Short term or acute effects are those that occur with hours or days following consumption of contaminated water. Long-term or chronic effects are those that occur after water with low doses of a contaminant has been consumed over several years or a lifetime.

Microbiological organisms in drinking water are generally associated with human and animal wastes. These organisms are naturally occurring. They can enter a system with the source water or contaminate treated water during distribution. Microbiological organisms can cause acute health effects. Although the potential for serious disease remains a concern, the most common illnesses due to the microbiological contamination of drinking water are short-term gastrointestinal disorders. Typical symptoms include cramps and diarrhea that may be mild to very severe.

Naturally occurring chemical contaminants found in some drinking water are primarily metals (e.g. chromium, mercury, and zinc) and minerals (e.g. asbestos). Some naturally occurring chemical contaminants, such as radium and radon, are radioactive. Man-made chemicals found in drinking water are primarily organics and inorganics. These substances have numerous industrial, agricultural, municipal and residential applications. The improper discharge or use of man-made chemicals in the environment can result in their presence in drinking water. The health effects related to the consumption of chemicals in drinking water are highly chemical-specific. (See Chemical specific fact sheets under "Drinking Water and Health") With a few exceptions (e.g. nitrates), these effect are chronic (long-term) in nature. Some of the important health risks resulting from high exposure to chemical contaminants include liver, kidney, and nervous system disorders, cardiovascular and hypertensive effects, anemia, and carcinogenicity.

How Public Water Supplies Are Regulated

The Safe Drinking Water Act requires that public systems test their water on a routine basis for the presence of contaminants. In addition, the law requires that when necessary, public systems treat their water continuously to remove or reduce specific contaminants to levels that will not adversely affect human health. **Public water systems are defined by the SDWA as systems connecting 15 or more households/businesses, or systems serving 25 or more persons daily at least 60 days out of a year.** Some States, however, define public water supplies more broadly. The State of Washington, for example, considers any system connecting to more than one household/business as a public supply.

In instances where a contaminant is found at an unacceptable level in a public supply, the system in question is required to notify consumers of such contamination as well as take remedial action through treatment or other means. If the contamination problem cannot be resolved in a short time frame, the public system is to provide consumers with an alternative source of drinking water.

ACTION STEPS FOR THE CONSUMER

1. CONTACT YOUR STATE DRINKING WATER OFFICE for the information identified below. The drinking water office is usually located in the State's health or environment department; consult the blue government pages of the phone book.

   A. Federal and State laws governing public water systems; listing of drinking water contaminants for which testing and treatment is required by such systems; listing of contaminants for which household testing would be useful (i.e. lead and bacteria).

   B. The name and address of the public system from which you receive water. In addition, obtain the system's compliance record (i.e., has the system had frequent, infrequent or no violations of safe drinking water laws) and a listing of recent monitoring results.

   C. A listing of laboratories certified by the State to conduct drinking water analyses. This information will be especially useful if testing is conducted on water from household taps. (Refer to Action Steps in the Home for further discussion.)

2. Contact EPA's Safe Drinking Water Hotline (800-426-4791) to obtain explanations of drinking water standards and to obtain copies of health information relative to specific drinking water contaminants.

3. Engage in a tour of your public water facility to learn more about the source and treatment of your drinking water. Ask to review the public water system's compliance records; compare this information with that obtained from the State.

ACTION STEPS IN THE HOME

1. If you are concerned that your water may not meet Federal or State health standards, you may wish to have your own individual tap or faucet tested. This step would be especially worthwhile for such contaminants as lead, nitrates, and bacteria since these substances can enter drinking water after it has left the treatment plant.

   Lead can get into drinking water following treatment since it is present in many of the plumbing materials that carry water to and within homes. Until a ban was introduced on lead plumbing materials in 1986, pipes and solder containing lead were often used in water systems and homes. Lead is a poison that can accumulate in the body and cause brain, kidney, or nerve damage in addition to anemia and even death. Lead is especially dangerous to children and pregnant women. While lead exposure through various media can happen, it has been found to occur in drinking war at sufficient levels to warrant concern.

   In addition to lead, nitrates can also enter water following treatment. The presence of nitrates in water suggests the possibility that human and/or animal wastes or fertilizers used in agricultural or gardening activities are entering the system. Faulty cross-connections with wastewater piping are often the source of nitrate contamination when it occurs in treated water. Nitrates are of special concern to young children and women of child-bearing age. Excessive levels of nitrates have been linked to the occurrence of "blue baby" syndrome.

   Bacteria can enter water following treatment in both the distribution system and household plumbing networks. Coliform bacteria are used as an indicator of the presence of these organisms in water.

2. Contact your public water system and describe any problems or suspicions you may have about your water. The system may, in turn, send an official to your home to investigate and/or collect water samples for analysis.

3. Contact State and local drinking water officials for information on water testing services. Some government agencies provide such services to consumers free of charge.

4. Consult State-certified drinking water laboratories for information on testing procedures and their costs. Lab tests are generally substance specific or specific to a given class of contaminants. It is not likely that one test will cover all contaminants of concern to a consumer at any one time. Depending upon the sophistication of a given sampling and testing procedure, the lab will either collect the appropriate sample(s) or will provide sampling collection bottles and instructions to the concerned consumer. Be certain to shop

around among labs before embarking upon testing; prices can be expensive and are likely to vary from lab to lab.

5. Regardless of how or by whom testing is conducted, have test results explained by lab personnel or ask State or local drinking water officials for assistance. Concentrations of contaminants, if detected, for which testing has been conducted will be listed on the test result form. Results will be expressed in milligrams or micrograms per liter (parts per million and parts per billion, respectively). Test results should be compared to relevant Federal and State standards for the particular contaminant(s) in question. Remember, a contaminant may exist below some level in water at which it does not pose a threat to human health. Just because a substance is detected through testing does not mean that the water from which the sample was taken is harmful to health.

6. If testing reveals concentrations of contaminants above levels acceptable to human health, you may wish to conduct additional tests. If repeat tests also show unacceptable levels of a given contaminant, consult your State drinking water office and your public water system. An investigation may need to be initiated to find the source of the contamination. If the problem is caused by household plumbing, remediation could be the responsibility of the homeowner. Public systems are generally responsible for problems at the treatment plant and in the distribution system.

7. Installation of new plumbing materials or making plumbing repairs represent two possible remedies if contamination problems are occurring in the home. Home treatment units also represent a means for remediating some contamination problems. It is important to keep in mind that no single household treatment unit will remove all potential drinking water contaminants. Treatment is very specific to the substance(s) of concern.

Selected Sources of Information

- Public Water System
- State Drinking Water Office
- U.S. Environmental Protection Agency (EPA) Safe Drinking Water Hotline 1-800-426-4791

Information on Home Treatment Units, Contact:

- NSF, International
  P.O. Box 1468
  Ann Arbor, MI 48106
  http://www.nsf.org

- Water Quality Association
  P.O. Box 606
  Lisle, IL 60532
  http://www.wqa.org