Healthy Drinking Waters

for

MASSACHUSETTS

Safe and healthy lives in safe and healthy communities

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Drinking Water Standards

The U.S. Environmental Protection Agency (EPA) was authorized by the 1974 Safe Drinking Water Act and its amendments to establish limits on the concentrations of certain contaminants that are allowed in public drinking water supplies. These limits, or standards, are set to protect public health by ensuring good water quality. EPA standards for drinking water fall into two categories: Primary Standards and Secondary Standards.

Drinking Water Standards Are Not Absolute

Setting drinking water standards is an imperfect process influenced by economic, political, and social considerations, in addition to scientific data. In fact, data relating human health effects to chemicals in drinking water are limited, and scientists have difficulty predicting the effects of drinking small amounts of chemicals for many years. Furthermore, standards do not take into account the presence of multiple chemicals, which may increase or decrease the toxicity of a particular contaminant.

For these reasons, it is important to understand that primary drinking water standards do not guarantee that water with a contaminant level below the standard is risk-free, nor do they indicate that water with a higher level is unsafe. Drinking water standards represent conservative judgments of scientists and regulatory officials, which are based on all available information on the health effects of drinking water contaminants.

National Primary Drinking Water Standards

Primary standards protect consumers from microbial contaminants, radioactive elements, and toxic chemicals. The EPA sets a non-enforceable goal and an enforceable goal for each drinking water contaminant that is a concern for health. The non-enforceable, maximum contaminant level goal (MCLG) is based entirely on health considerations; as a health goal, it is set at a level at which no adverse health effects should occur. The maximum contaminant level (MCL) represents an enforceable limit. The MCL is the highest concentration of a contaminant allowed in public drinking water supplies. The MCL is

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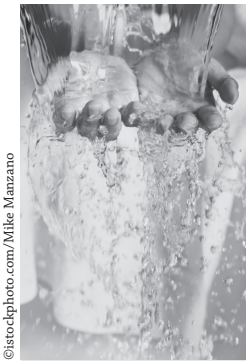
set as close as possible to the MCLG for any particular contaminant. However, the MCL also takes into consideration the ability of laboratories to detect the contaminant at low levels; the feasibility of treatment; and the cost of maintaining the levels of the contaminant below the MCL.

National Secondary Drinking Water Standards

Secondary standards relate to aesthetic contaminants that cause offensive taste, odor, color, corrosivity, foaming, or staining. The concentration limit is called the secondary maximum contaminant level (SMCL). Secondary standards are not enforced; they are guidelines for water treatment plant operators and state governments attempting to provide communities with the best quality water possible.



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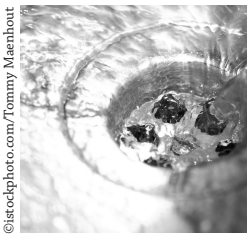

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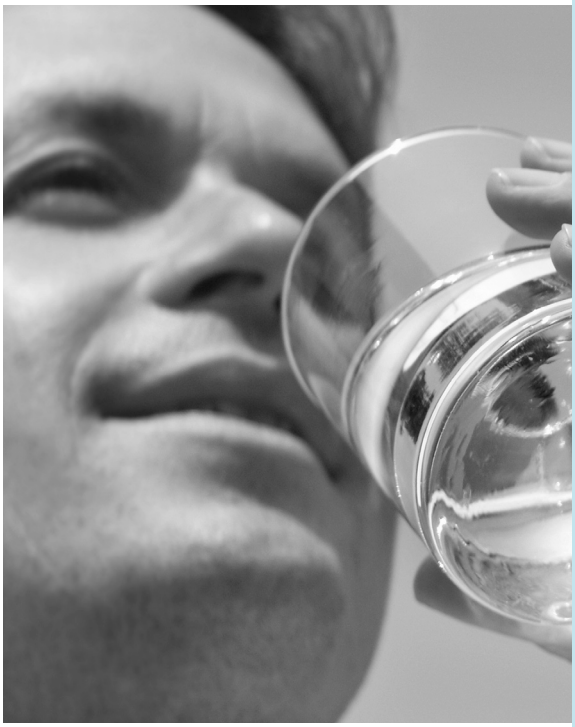
Health Advisories

EPA also issues Health Advisories (HA) which provide information on contaminants that can cause human health effects and are known or anticipated to occur in drinking water. Health Advisories are guidance values based on non-cancer health effects for different durations of exposure (e.g., one-day, ten-day, and lifetime). They provide technical guidance to EPA Regional Offices, State governments, and other public health officials on health effects, analytical methodologies, and treatment technologies associated with drinking water contamination.

How EPA Sets Primary Drinking Water Standards

Primary standards for drinking water contaminants are based on three criteria:

- The contaminant causes adverse health effects.
- The contaminant is detectable in drinking water.



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- The contaminant is known to occur in drinking water.

In setting Primary Standards for a drinking water contaminant, the EPA first looks at the toxicological data on that contaminant, usually obtained from acute and chronic animal studies. Human clinical or epidemiological data are used when available, but scientific data linking human health to drinking water contaminants are limited. Experts use this information to estimate the concentration of the contaminant that may be toxic and the concentration level, if any, at which the contaminant causes no adverse health effects.

Acute and Chronic Health Effects

Toxic doses of chemicals cause either acute or chronic health effects. An acute effect usually follows exposure to a large dose of a chemical and occurs almost immediately. Examples of

acute health effects are nausea, vomiting, lung irritation, skin rash, dizziness, and even death.

The levels of contaminants found in drinking water are seldom high enough to cause acute health effects. Levels of some contaminants may cause chronic health effects, which occur long after exposure to small amounts of a contaminant. Examples of chronic health effects include cancer, birth defects, organ damage, disorders of the nervous system, and damage to the immune system.

Acceptable Daily Intake

The acceptable daily intake (ADI) is the daily dose of a substance (including a safety margin) that a person can ingest over a lifetime without suffering adverse health effects. The ADI is used to establish the MCLG for a contaminant, which in turn is used to set the enforceable MCL.

Risk Estimate

If a contaminant causes cancer, it is assumed that no concentration is safe. Consequently, the MCLG is set at zero, a level that is not always possible to achieve. However, at very low levels the risk of cancer becomes so small that it is considered negligible. Therefore, regulatory officials must decide what level of risk is acceptable. The risk estimate is the level of exposure to a chemical estimated to cause this "acceptable level" of risk.

Current Drinking Water Standards

The EPA is required to update the list of regulated contaminants every 5 years. Currently, EPA regulates over 80 contaminants found in drinking water.

Although the EPA oversees community drinking water quality, regulatory officials in each state ultimately set and enforce drinking water standards for EPA-regulated and other contaminants. States are permitted to set standards that are stricter, but not less stringent, than those set by EPA. When a standard is exceeded, the EPA, through the designated state agency, requires that the contaminant level be reduced to the MCL. The corrective treatment is left to the individual water supply system. The Massachusetts Department of Environmental Protection (DEP) has that jurisdiction over drinking water quality.

Massachusetts Department of Environmental Protection's Role

The MassDEP's Office of Research and Standards (ORS) has adopted the EPA's National Primary Drinking Water Standards for contaminants known to impact health as enforceable standards for public water supplies. Additionally, ORS takes into consideration EPA's Secondary Drinking Water Standards, Action Levels, and Health Advisories in setting standards for drinking water in Massachusetts.

ORS may establish Drinking Water Guidelines for chemicals other than those with MCLs. Standards promulgated by the EPA but not yet effective may be included on the Guidelines list. These values are derived based on a review and evaluation of all available data for the chemical of interest. ORS uses methodology similar to that used by the EPA's Office of Groundwater and Drinking Water (OGWDW) when setting guidelines for chemicals in drinking water.

For private wells in Massachusetts, the local Boards of Health have the authority to determine water quality testing requirements, and the applicable standards. You should check with your local Board of Health to see what testing they require, and what standards apply in your town.

Private Well Owner Responsibility

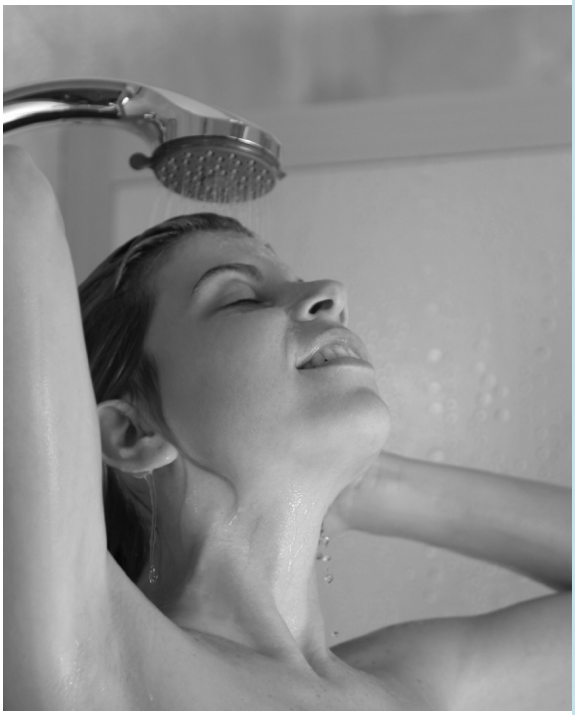
As a private well owner, you are responsible for the quality of your own drinking water. Hom-

eowners with private wells are generally not required to test their drinking water to meet standards. However, you can use the public drinking water standards as guidelines when evaluating the quality of your drinking water.

Public water systems provide treated, potable water to their customers for a fee. The cost of public water includes the costs of protecting the water source, managing and training personnel to use the water supply equipment, monitoring the water for contaminants, obtaining professional engineers' opinions and advice, making improvements to the water treatment and distribution system, planning for expansion, reporting to State and Federal agencies, and managing the financial aspects of the business.

Private well owners should consider the cost of well water maintenance and protection as a budget item, just as if they were paying a water bill. Improvements to water wells, treatment systems and plumbing are a necessary expense that directly benefits the homeowner. Although some treatment systems are more expensive, the costs are often less than the price paid by the owner in health effects or nuisance problems.

The seller must disclose the condition of a private well water system at the time of sale of their home. The buyer will likely investigate the water quality and quantity and it will be considered in the final sale price. It is advisable for both parties to work with qualified professionals to inspect the condition of homes and to seek legal advice from attorneys during their transactions.



Testing your drinking water will tell you what is in your water at the time the sample is collected. Test results from six months ago represent the water quality at that well six months ago. The levels of most naturally occurring contaminants stay fairly consistent, or slowly increase or decrease over time, or have a seasonal fluctuation, depending on water levels.

Resources

UMass Extension

This fact sheet is one in a series on drinking water wells, testing, protection, common contaminants, and home water treatment methods available on-line at the University of Massachusetts website: http://www.umass.edu/nrec/watershed_water_quality/watershed_online_docs.html and Cape Cod Cooperative Extension: 508-375-6699 http://www.capecodextension.org

MA Department of Environmental Protection, Division of Environmental Analysis

Offers assistance, information on testing and state certified laboratories: 617-292-5770 For a listing of MassDEP certified private laboratories in Massachusetts: http://www.mass.gov/dep/service/compliance/wespub02.htm

U.S. Environmental Protection Agency, New England Office

Information and education on where drinking water comes from; drinking water testing and national laws; and how to prevent contamination: http://www.epa.gov/ne/eco/drinkwater

US Environmental Protection Agency

For a complete list of primary and secondary drinking water standards: http://www.epa.gov/safewater

MA Department of Conservation and Recreation, Division of Water Supply Protection

Maintains listing of registered well drillers, information on well location and construction: 617-626-1409 http://www.mass.gov/dcr/waterSupply/welldril/index.htm

NSF International

The NSF International has tested and certified treatment systems since 1965. For information on water treatment systems: 800-NSF-MARK (800-673-6275) http://www.nsf.org/consumer/

Water Quality Association

The Water Quality Association is a not-for-profit international trade association representing the household, commercial, industrial, and small community water treatment industry. For information on water quality contaminants and treatment systems: http://www.wqa.org

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