

got water?

**The Safe Drinking Water Act (SDWA) of 1974 and
Environmental Protection Agency (EPA) Drinking Water
Standards**

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Introduction

Strategic standards experts assert that whether the average person is aware or not, standards affect every aspect of an individual's daily life. Standards can be roughly categorized as product, process or environmental/health/safety standards. Nowhere is it more apparent that standards are inextricably tied to everyday functioning than in the environmental/health/safety standards that regulate essential life forces including the air we breathe and the water we drink. The Environmental Protection Agency (EPA) is a national organization that works to protect the environment and the health of the humans living in it. One of the ways in which they do so is by establishing regulations for the levels of contaminants in our nation's public drinking water supply.

Need for the standard

Simply stated, water is a basic necessity of life. However, though it may appear to be one of the purest, cleanest naturally occurring substances, the fact is that all water contains varying levels of contaminants. How do these contaminants infiltrate water supplies? Some occur naturally and others are caused by man-made pollution. "As water flows in streams, sits in lakes, and filters through layers of soil and rock into the ground, it dissolves or absorbs the substances it touches. Some of these substances are harmless ... However, at certain levels, minerals ... are considered contaminants that can make water unpalatable or even unsafe." The

other source of contaminants can be “substances discharged from factories, applied to farmlands, or used by consumers in their homes and yards.” (EPA-816-K-99-001, October 1999, p. 2)

Water contaminants can be classified in two groups based upon their effects on human health: acute and chronic. Acute effects are the immediate result of consumption of respectively high levels of contaminants, most commonly microbial bacteria. Those with weakened or underdeveloped immune systems are most susceptible to acute symptoms. Chronic effects result from the consumption of unsafe levels of contaminants over a sustained period of time. Such contaminants include chemicals (i.e. pesticides), radionuclides (i.e. nuclear waste), and minerals (i.e. arsenic). Some chronic effects can include cancer and impaired organ function. (EPA-816-K-99-001, October 1999, p. 5)

Well-known cases, on which books and films have been based, illustrate the the potential chronic effects of contaminants on the public water supply and the communities they serve. Erin Brockovich, on whose life the 2000 film by the same name, became an environmental activist after getting her start assisting with a legal case against California’s Pacific Gas & Electric Company (PG&E) in 1993. The court found that PG&E’s Hinkley Compressor Station had contaminated the town of Hinkley’s drinking water with the poisonous chemical “hexavalent chromium” causing grave health problems, including cancer, for the residents.

Brockovich achieved a settlement of \$333 million in 1996, “the largest settlement ever paid in a direct action lawsuit in U.S. history.” (www.lawbuzz.com). Though some may argue that a price cannot be placed on human health, this settlement illustrates the seriousness with which the government regards protection of public health and safety.

Jonathan Harr’s book, A Civil Action, which also received critical acclaim in its 1998 film format, chronicled a similar suit that took place in Woburn, Massachusetts in the 1980’s, in which several of the town’s children succumbed to leukemia as the result of the drinking water supply being polluted with toxic waste. (www.civil-action.com).

Along with the legal precedents set by the Woburn, MA and the Hinkley, CA cases, the need to consider the effects on children, the elderly, and other members of the population with weakened immune systems when setting contaminant level standards is illustrated. Given the potential risks to public health due to unsafe levels of contaminants in drinking water, the need for monitoring and regulating contaminant levels is apparent.

Another tangential need for drinking water standards worthy of at least brief mention is associated with homeland security. The EPA Water Security division writes, “Improving the security of our nation's drinking water and wastewater infrastructures has become a top priority since the events of 9/11. Significant

actions are underway to assess and reduce vulnerabilities to potential terrorist attacks; to plan for and practice response to emergencies and incidents; and to develop new security technologies to detect and monitor contaminants and prevent security breaches.” (“Water Security”) The EPA standards for monitoring, reporting and regulating levels of contaminants in the public water supply assist with these water infrastructure security efforts.

History

Rather than drinking water standards being adopted by the government, the converse occurred in that a government act mandated the establishment of the standards. Passed by Congress in 1974, the Safe Drinking Water Act (SDWA) was intended to “protect public health by regulating the nation’s public drinking water supply.” The SDWA established a “multiple barrier” approach to ensuring the quality of drinking water that includes: “source water protection, treatment, distribution system integrity, and public information”. (EPA 816-F-04-030, Jun. 2004) Monitoring, testing and public reporting are essential requirements of this system.

EPA standards are another integral component of this multiple barrier approach. “US EPA sets national standards for drinking water based on sound science ... The National Primary Drinking Water Regulations set enforceable maximum contaminant levels for particular contaminants in drinking water.”

(EPA 816-F-04-030, Jun. 2004) “The Safe Drinking Water Act gives the Environmental Protection Agency (EPA) the responsibility for setting national drinking water standards that protect the health of the 250 million people who get their water from public water systems ... Since 1974, EPA has set national standards for over 80 contaminants that may occur in drinking water.” (EPA-816-K-99-001, October 1999, pp. 6-7)

Two amendments to the SDWA have been issued in 1986 and 1996. While the original act emphasized water treatment, the amendments broadened the scope to include other methods of ensuring safe, quality drinking water. Some highlights of the 1996 Amendment include:

- Consumer Confidence Reports
- Cost Benefit Analysis
- Drinking Water State Revolving Fund
- Operator Certification
- Source Water Assessment Programs
- Special Consideration for Small Water Systems

(EPA 816-F-04-030, Jun. 2004)

Who Developed

Though the aforementioned Safe Drinking Water Act (SDWA) gave the EPA the responsibility and the authority for setting drinking water, the process

certainly does not take place in a vacuum or behind closed doors. The EPA solicits and takes into consideration input from a network of interested parties, both organized groups and individual concerned citizens.

Through a formal process the EPA is assisted by one of its primary stakeholders, the National Drinking Water Advisory Council (NDWAC). “This 15-member committee was created by the Safe Drinking Water Act. It is comprised of five members of the general public, five representatives of state and local agencies concerned with water hygiene and public water supply, and five representations of private organizations and groups demonstrating an active interest in water hygiene and public water supply, including two members who are associated with small rural public water systems.” (“Setting Standards”) Though the development of drinking water standards is a government mandated process, the same principles of transparency and fairness that are essential tenets both national and international standardization hold true. All stakeholders are given fair representation and a voice at “the table”.

Other entities are given the opportunity to participate and be heard through less formal forums than that of the NDWAC. These interested parties include water utilities who stand to bear the cost impact of proposed regulations, environmental groups, public interest groups, states and tribes. Public meetings are held and proposed regulations are made available for commentary. Special

meetings are even held to address the concerns of poor, minority communities and small businesses. (“Setting Standards”) This is of key importance, because frequently these smaller communities must evaluate the cost (of implementation) to benefit (to human health) ratio of bringing infrastructure into compliance with new regulations or petitioning the EPA for exemptions.

Development Procedures

In addition to considering public input, when setting a standard for contaminant levels in drinking water, the EPA follows a basic three-step process as well as a cyclical evaluation and revision process, in accordance with the best practices of any standards development organization. First, in short, the EPA identifies drinking water problems, then establishes priorities, and finally sets standards.

During the first step, the EPA generates and publishes a Contaminant Candidate List (CCL) based upon potential effects on human health and probability of their occurrence in public drinking water. The CCL includes contaminants that meet the following criteria: “(1) are not already regulated under the SDWA; (2) may have adverse health effects; (3) are known or anticipated to occur in public water systems; and (4) may require regulations under SDWA.” (“Setting Standards”)

During the second step of the regulatory process, the contaminant candidates are sorted by priority. While the majority are designated for further research in the areas of health risks and likelihood of occurrence, “five or more” are selected for the EPA to decide if “regulating the contaminants would present a meaningful opportunity to reduce health risk.” Also at this stage, the EPA identifies “30 unregulated contaminants from the CCL for monitoring by public water systems serving at least 100,000 people.” (“Setting Standards”)

During the final stage of developing regulations, the EPA determines a Maximum Contaminant Level Goal (MCLG) based upon scientific research on the associated health risks. The key word in this term is “goals”, as the MCLG is “the maximum level of a contaminant in drinking water at which no known or anticipated adverse effect on the health of persons would occur.” (“Setting Standards”) These goals are most often not realistic, nor enforceable due to the fact that they strive for zero impact to human health, and consider only health risks, not feasibility of monitoring, treatment or implementation. There is also a large safety factor and they account for the weaker members of the population who would be more susceptible to the contaminants’ impacts. As such, the EPA then determines an enforceable Maximum Contaminant level (MCL) standard. “The MCL is set as close to the MCLG as feasible, which the Safe Drinking Water Act defines as the level that may be achieved with the use of the best available

technology, treatment techniques, and any other means which EPA finds are available ... taking cost into consideration.” (“Setting Standards”)

The cost consideration plays a critical role at this stage. Enforceable Treatment Techniques (TT) are established in lieu of MCL’s for extremely low levels of contaminants. Determinations of MCL’s or TT’s are “based on affordable technology for large systems.” (“Setting Standards”) Like most organizations, EPA performs cost benefit studies prior to implementing new strategies that are costly to implement. Though it’s difficult to see how the scales balance when weighing health risks reduction versus cost impacts, the EPA can and may adjust MCL’s to achieve a more balanced ratio. As with the stakeholder input, EPA makes efforts to consider small populations (systems serving 3,300 or fewer people) and has the authority to grant variances if compliance is not economically feasible and works to achieve alternate solutions, such as treatment. Exemptions from standards are also possible in order to give less advantaged communities additional time to comply, provided they are not presenting too great of a threat to the health of their residents. (“Setting Standards”)

It should be noted that there are two types of drinking water standards. A National Primary Drinking Water Regulation (NPDWR) is “a legally-enforceable standard that applies to public water systems.” (“Setting Standards”) The previously described MCL’s and TT’s are the basis of these primary regulations

and are intended to protect public health from the effects of known contaminants. National Secondary Drinking Water Regulations (NSDWR) are “non-enforceable guideline(s) regarding contaminants that may cause cosmetic effects ... or aesthetic effects in drinking water.” (“Setting Standards”) Cosmetic effects can include skin and tooth discoloration, while aesthetic effects can include odor, taste and color of the water itself. None of these contaminants are known to present health risks, and public water systems test for them only on a voluntary basis. Through the Secondary Regulations, the EPA, however, does identify and give guidance for removing contaminants that cause those effects to imperceptible levels. (EPA 810/K-92-001, Jul. 1992)

Violations of Standards

It has been established that EPA drinking water standards are legally enforceable. In most cases, EPA designates this responsibility for ensuring compliance of public water systems to the state or tribe in which the systems are located. Water suppliers are required to test and monitor their water prior to distribution. Distributing water that exceeds the EPA levels of regulated contaminants or failure to monitor for a contaminant constitutes a violation and is punishable by fines and penalties. Non-compliant suppliers must notify their consumers of violations in a time-frame appropriate to the severity of the health risk imposed by the violation. In some cases, immediate notification would be

necessary, whereas in others documentation in the supplier's annual report would be sufficient. ("What is a violation ...")

Summary

In 1996, when he reauthorized the Safe Drinking Water Act, President Bill Clinton stated, "A fundamental promise we must make to our people is that the food they eat and the water they drink are safe." ("Setting Standards") While water is an essential lifeblood for all human beings, we must not overlook its ability to adversely impact human health with harmful, levels of contaminants. Through the Safe Drinking Water Act, the EPA has established regulatory infrastructure that, through continual review and revision, will protect the safety and quality of our country's drinking water and allow us to be prepared for new threats, such as bioterrorism, that may loom on the horizon. Though government mandated, the EPA's drinking water standards illustrate the effectiveness of the standardization process.

Works Cited

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