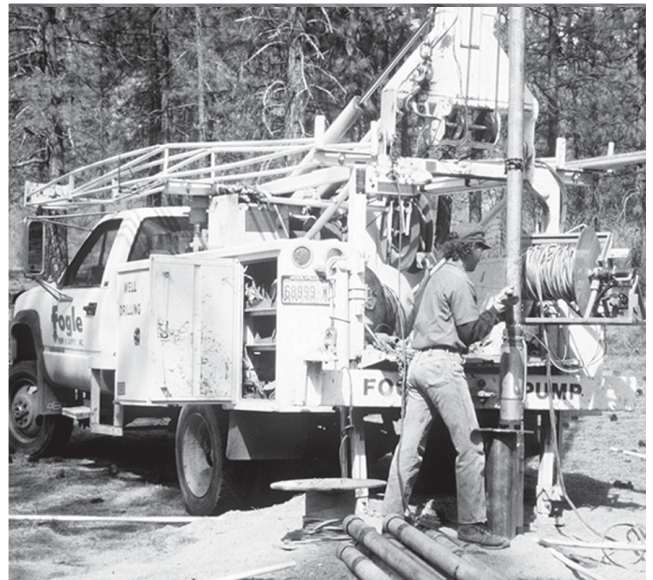




Small Systems Guide to Safe Drinking Water Act Regulations

The First STEP to Providing Safe and Reliable Drinking Water

One of the Simple Tools for Effective Performance [STEP] Guide Series



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Please note that the term “State” is used in this guide to refer to your Primacy Agency. The Primacy Agency for most systems is your State Drinking Water Agency. However, as of September 2003, the Primacy Agency for systems located in the Navajo Nation is your tribal office, and the Primacy Agency for systems located on other Tribal lands, in Wyoming, or in the District of Columbia is your EPA Regional Office.

Introduction

As a small water system owner or operator, you are busy running and managing your system. Complying with current regulations gives you plenty to do, and you may feel overwhelmed by the thought of having to comply with new regulations. You want to do what is best for your customers, but new regulations may mean costly improvements—and higher water rates. If these concerns sound familiar, read on.

This booklet was prepared to help small system owners and operators like you understand existing and upcoming drinking water regulations. It focuses on the why, what, and when of regulations:

- **Why** compliance is important.
- **What** you need to know to comply with existing and new requirements.
- **When** you need to comply with them.

As the owner or operator of a small drinking water system, only you can take the steps necessary to comply with safe drinking water regulations and protect your customer's health. Compliance takes planning and preparation! Reading this booklet is a good first step.

However, please note that this guidance contains only a general introduction to EPA's regulations governing public water systems. The EPA regulations described in this document contain legally binding requirements. The general description provided here does not substitute for those regulations, nor is this document a regulation itself. It does not impose legally-binding requirements on anyone but is intended to provide



only general information. As a result, you will need to be familiar with the details of the rules that are relevant for your system; you cannot rely solely on this guidance for compliance information. Also, many States have different or more stringent requirements than EPA's, so you will need to find out what State laws and regulations apply to your system in addition to the ones described here.

Why Compliance Is Important: Protecting Public Health

Virtually every American consumes water from a regulated “Public Water System,” either at home, work, school, or on the road. A Public Water System (PWS) is any system serving 15 or more connections or an average of 25 or more people per day for at least 60 days per year. Many PWSs are actually owned by private entities!

Public water systems fall into one of three subcategories:

- **Community Water Systems (CWS).** A CWS is a PWS that supplies water to the same residential population year-round. Examples include cities, towns, rural water systems, manufactured home communities, and home owner associations.
- **Non-Transient Non-Community Water Systems (NTNCWS).** A NTNCWS is a PWS that regularly supplies water to at least 25 of the same people at least six months per year, but not to their residences. Examples include schools and factories that have their own water supplies.
- **Transient Non-Community Water Systems (TNCWS).** A TNCWS is a PWS that provides water in a place where people do not remain for long periods of time. Examples include restaurants, rest stops, and campgrounds that have their own water supplies.

A Failure to Protect Public Health: E. Coli Contamination at a New York County Fair

In August 1999, an *E. coli* outbreak at the Washington County Fair in New York led to hundreds of people becoming ill and the deaths of a three-year old girl and an elderly man. According to the New York Department of Health, the likely cause of the outbreak was water contamination caused by either septic system leakage or manure runoff.

Source: State of New York Department of Health, “Health Commissioner Releases E. coli Outbreak Report,” 3/31/00. Available online, <http://www.health.state.ny.us/nysdoh/commish/2000/ecoli.htm>



Public Drinking Water Systems Play an Important Role

Drinking water systems have an enormous impact on public health, and the public health benefits of a well-run system cannot be overstated. Customers rely on their water systems to provide safe water for drinking, bathing, cleaning, and cooking. High-quality drinking water is a major contributor to the high standard of living and health enjoyed by Americans.

Yet since 1971, more than 600 waterborne disease outbreaks have been recorded in the United States. In most cases these outbreaks result in nausea, diarrhea, and cramps. In some cases they result in very serious illness and even death. Experts believe that most waterborne disease outbreaks are not recognized, so in truth, there may have been many

times more than 600 outbreaks since 1971. These outbreaks serve as a constant reminder of the critical importance of ensuring safe drinking water.

The Multiple Barrier Approach

Drinking water professionals have long known that the most effective way to protect consumers from the risk of contamination and waterborne disease is through a multiple barrier approach. This approach sets up a series of technical and managerial barriers that ensure a safe drinking water supply and guard against waterborne disease outbreaks.

For each of these barriers, you can choose from a number of options to improve your system and further protect the health of your customers. Your best option will depend on the unique challenges and opportunities facing your system.

The Multiple Barrier Approach to Protecting Public Health

The multiple barrier approach provides “defense in depth” against waterborne pathogens and chemical contaminants that can cause a variety of illnesses and conditions, some of them potentially fatal. By erecting barriers against these contaminants at each step in the process from raw, untreated source water to the delivery of treated finished water, system owners and operators can protect the health and well being of the people who rely on them for potable water.



Source Water

Barriers: Selecting and protecting the best source of supply.



Treatment

Barriers: Installing treatment methods, implemented by a certified operator, that will improve the quality of the source water.



Storage and Distribution

Barriers: Constructing, operating, and maintaining well-engineered storage facilities and distribution systems.



Monitoring and Public Information

Barriers: Providing consumers with information on water quality and health effects.

Small Systems and the Multiple Barrier Approach

Small systems face many challenges in providing safe, reliable, and affordable drinking water.

Implementation of effective multiple barriers of protection will require technical, financial, and managerial resources which some systems may lack. Such systems will benefit from State “Capacity Development” programs. Through these programs systems will have access to assistance in developing the financial capabilities and the institutional knowledge and structures to reliably and consistently apply multiple barriers of protection.



Source Water Protection: An Ounce of Protection is Worth a Pound of Cure

Drinking water, which may be from ground water, surface water, or both, is vulnerable to being contaminated. If the drinking water source is not protected, contamination can cause a community significant expense as well as put people's health in danger. Cleaning up contamination or finding a new source of drinking water is complicated, costly, and sometimes impossible.

Preventing drinking water contamination at the source makes sense:

- Good public health sense;
- Good economic sense; and,
- Good environmental sense.

Good Public Health Sense

When waterborne diseases occur due to contaminated drinking water, the burden of solving the problem falls on the community and the State. Source water contamination prevention is the first barrier to the outbreak of waterborne illnesses. Keeping contaminants out of the source water helps keep them out of the drinking water supply.

Good Economic Sense

In addition, the community and the State bear the economic burden when drinking water sources are contaminated. Not only can wages be lost and medical costs incurred, but alternative water supplies may be required in the short run. Over the long-term, treatment systems may have to be expanded, or a new water source found, to meet new regulatory requirements or to address new contaminant threats. Source water contamination prevention, however, can keep such costs in check. Preventing contamination is often cheaper than remedying its effects. As the old adage goes, "an ounce of prevention is worth a pound of cure."

Good Environmental Sense

Water is a renewable resource, but there are limits to its quality and quantity. Land development, polluted runoff from agricultural, commercial, and industrial sites, and aging wastewater infrastructure are examples of what can threaten the quality of drinking water sources. In many areas of the country, ground water is being pumped faster than aquifers are being recharged, and depleted aquifers are causing reduced ground water contributions to surface water flow. Surface water withdrawals are diminishing in-stream flows to the point that habitat, as well as water supply uses, are threatened. Planning and taking actions to protect the drinking water sources can also protect the water resource for a multitude of uses.

For more information, visit EPA's Source Water Protection web site:

www.epa.gov/safewater/protect/protect.html



Photo courtesy of Massachusetts Water Resources Authority

What You Need to Know: Complying with Current Requirements

Between 1976 and 2002, EPA promulgated¹ 14 major rules in accordance with the Safe Drinking Water Act (SDWA). These rules have resulted in the regulation of 90 contaminants. Each regulation addresses one of two major categories of risk: microbial contaminants, or chemical/radiological contaminants. Most regulations set a maximum contaminant level (MCL)² or treatment technique (TT)³ for a contaminant or a group of contaminants and establish monitoring and reporting requirements.



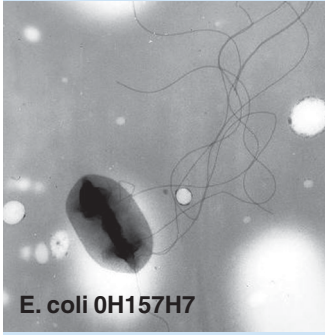
Regularly sampling finished water is an important part of staying in compliance with drinking water regulations.

¹When EPA *promulgates* a rule, it is published in the Federal Register as an official announcement of the requirements of the rule and the dates on which it will go into effect.

²A *Maximum Contaminant Level* is the greatest concentration of a contaminant in drinking water allowed by law. It is set to minimize possible health risks while taking costs into account.

³A *Treatment Technique* is a required process intended to reduce the level of a contaminant in drinking water.

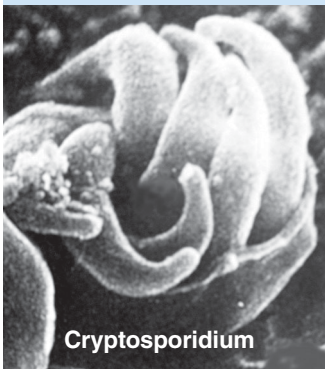
Microbial Contaminants



E. coli 0H157H7



Giardia lamblia



Cryptosporidium

◆ Turbidity

- A measure of the cloudiness of water.
- Used as an indicator for water quality and the effectiveness of treatment processes to remove pathogens from source water.

◆ Total Coliform Bacteria

- The presence of total coliforms is used as an indicator that other, potentially harmful, organisms may be in the water.

◆ Fecal Coliform and *E. coli*

- Bacteria naturally present in the intestines of warm-blooded animals.
- The presence of fecal coliform or *E. coli* is a danger alarm that your system is likely contaminated with fresh human or animal waste.

◆ Viruses

- Enteroviruses (of fecal origin) can cause infections in people.
- Can cause diarrhea, nausea, and/or stomach cramps.

◆ Protozoa

- Disease-causing organisms originating in the intestines of warm-blooded animals that may be present in water containing fecal pollution.
 - + *Giardia lamblia*: A common cause of waterborne disease in the United States. Causes gastrointestinal illness (e.g., diarrhea, nausea, stomach cramps).
 - + *Cryptosporidium parvum*: Has caused several large outbreaks of gastrointestinal illness in the United States. Symptoms are similar to those caused by *Giardia*.

◆ Bacterial Pathogens

- *Legionella*
Can cause Legionnaire's Disease, which is a specific and often fatal type of pneumonia.

Chemical & Radiological Contaminants

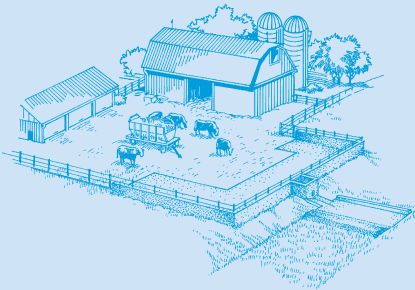


◆ Inorganic Chemicals (IOCs)

- IOCs are mineral-based compounds that can naturally occur in water. They also can enter water through farming, industrial processes, and other human activities.
- Regulated IOCs include (among other compounds) arsenic, asbestos, copper, cyanide, lead, mercury, and certain radionuclides, including radium 226 and 228, uranium, and gross alpha particle radioactivity.

◆ Synthetic Organic Chemicals (SOCs)

- SOCs are carbon-based compounds of man-made origin that can get into water through runoff from croplands or discharge from factories.
- SOCs include (among other compounds) pesticides and herbicides such as atrazine, alachlor, endrin, and lindane.



◆ Disinfectants and Disinfection Byproducts

- Chemicals such as chlorine, chloramine, and chlorine dioxide are disinfectants that are commonly added to a water supply to kill microorganisms such as *Giardia* and *E. coli*, and have a maximum allowable residual level.
- Disinfection byproducts (DBPs) form when the disinfectants added to drinking water react with naturally occurring organic and inorganic matter in water. Regulated disinfection byproducts include total trihalomethanes (TTHM), haloacetic acids (HAA5), bromate, and chlorite.

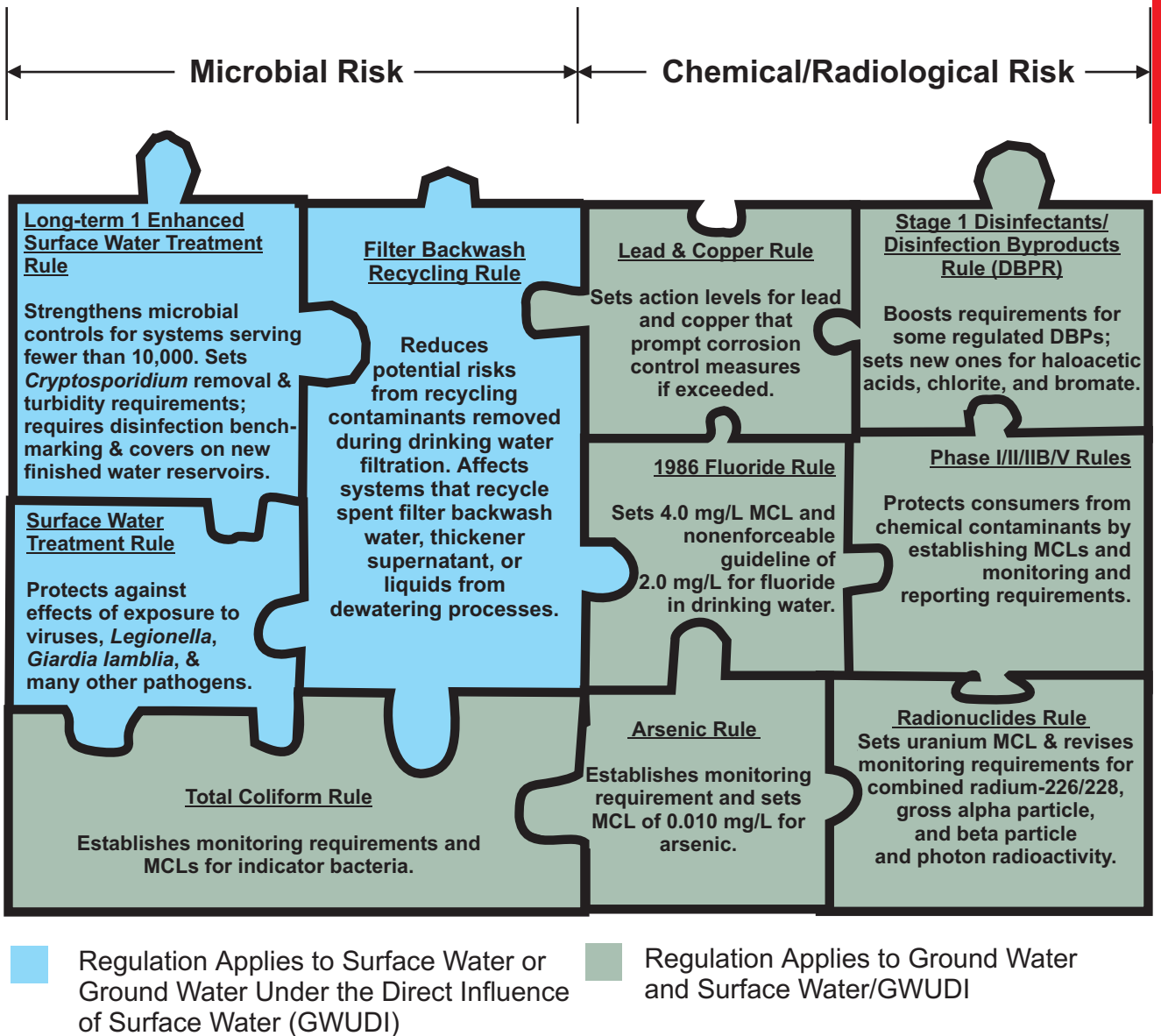
◆ Volatile Organic Chemicals (VOCs)

- Sources of VOCs entering a water supply can include discharge from factories, leakage from gas storage tanks, and leaching from landfills.
- VOCs include industrial and chemical solvents, such as benzene and toluene.



The Multiple Barrier Approach and Current Regulations

The multiple barrier approach recognizes the importance of addressing water quality issues from source to tap. The 1996 Amendments to the SDWA reaffirmed and expanded the role of multiple barrier protection. The drinking water regulations promulgated under the SDWA use the multiple barrier approach: some erect barriers by requiring certain treatment techniques, while others emphasize monitoring source water or the water that comes out of a customer’s tap. Public notification requirements ensure that customers will be warned of health risks. Each individual regulation addresses a piece of the larger drinking water regulatory puzzle.



Note: The above regulations may have different requirements for CWSs, NTNCWSs, and TNCWSs.

What You Need to Know: Complying with Future Regulations

The Multiple Barrier Approach and New Regulations

To continually increase the effectiveness of the multiple barrier approach and protect drinking water consumers, EPA develops regulations as new scientific or health information becomes available.

New regulations help strengthen the barriers you already have in place or require you to establish new barriers. As you will see on the next page, each new regulation strengthens or adds a needed barrier at one or more stages of the water supply process.

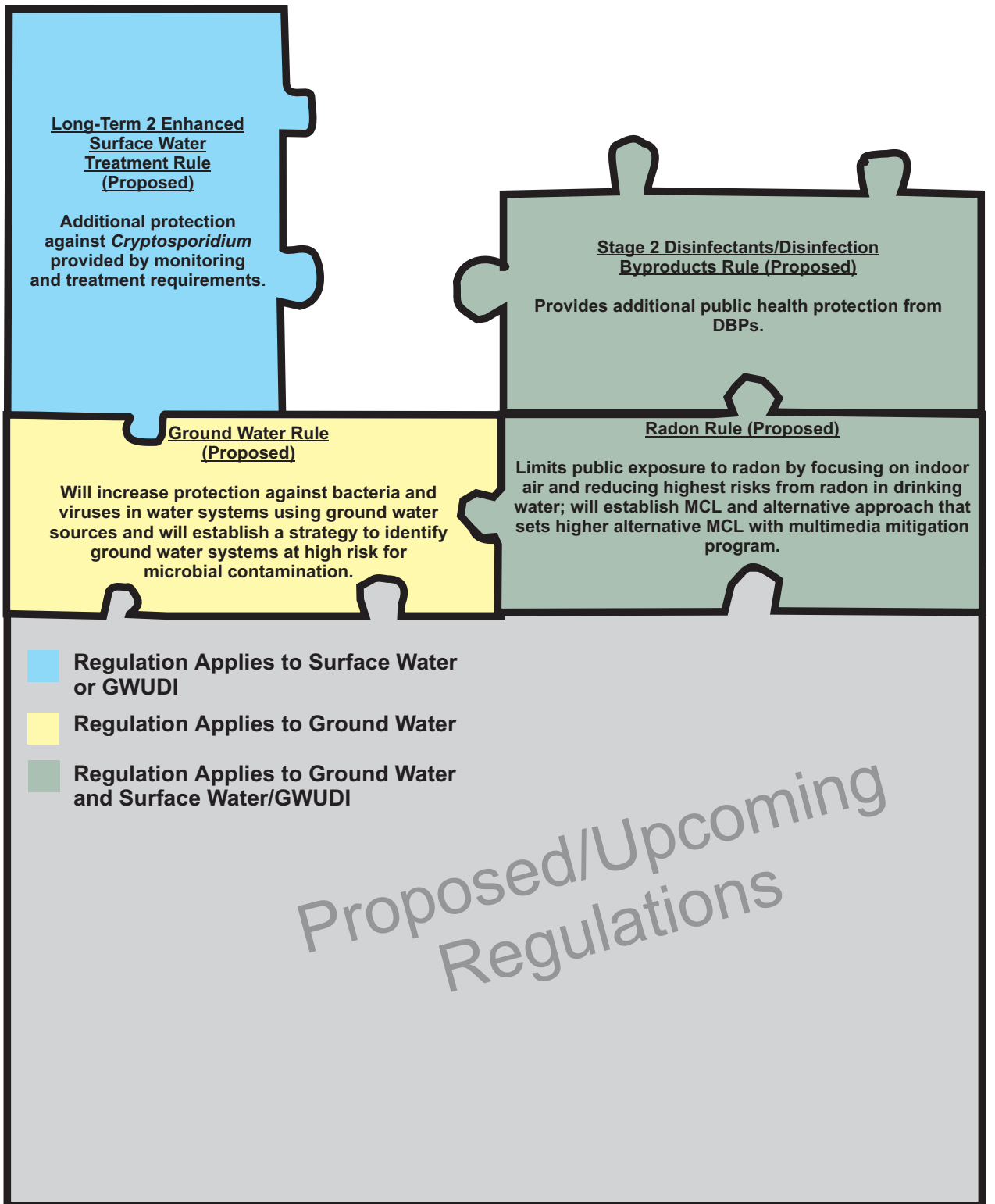
The steps leading up to new regulations are described below.

- After an extensive review of scientific and health information, EPA works with stakeholders and concerned citizens to draft a proposed regulation.
- The proposed regulation is published for public comment.
- EPA considers all comments and revises the regulation, if appropriate.
- A final regulation is published.

- The regulation becomes effective 60 days after it is published.

Note: The final publication date of a regulation is important because it serves as the basis for when you have to comply. For example, if a regulation were published on September 30, 1999, and it called for monitoring within 2 years, your facility would have until September 30, 2001 to comply with this regulatory requirement. It is also important to note that some States may impose more stringent regulations or compliance schedules. Contact your State drinking water agency for more information.

Pieces of the Future Regulatory Puzzle



Note: The above regulations may have different requirements for CWSs, NTNCWSs, and TNCWSs.

Knowing Which Regulations Apply to You

When faced with the full set of SDWA regulations, the responsibility of keeping your system in compliance can seem daunting. However, the task can be made much easier if you understand a few basics about how EPA and the SDWA regulations categorize drinking water systems. Certain rules apply only to certain kinds of systems. This means that *your* system will be regulated according to its size, PWS category, source water, and treatment steps. Once you understand how your system is categorized within a regulation, you will be better

equipped to talk to regulators and get the information you need in order to keep your system in compliance. The short worksheet on the next page will help you understand how your system is categorized by regulations. Just enter the information for your system in the spaces provided, and you will have a quick reference that will be helpful in the future.



SDWA Categorization Worksheet

◆ System Information

Name: _____

Location: _____

◆ Size

The requirements of many rules depend on the population served by a system. The term “small system” is defined differently in different rules, as either fewer than 10,000 people served or fewer than 3,300 people served.

Population Served: _____

◆ Source Water Type

Some rules only apply to systems that use a specific type of source water.

- **Surface Water or GWUDI**, also called Subpart H systems. Surface water means all water open to the atmosphere and subject to surface runoff, such as rivers, lakes, and streams. GWUDI is water beneath the ground with 1) significant occurrence of insects, macroorganisms, algae, or other pathogens such as *Giardia lamblia*, or 2) significant shifts in water characteristics that closely resemble surface water conditions.

- **Ground Water**. Ground water includes water obtained from beneath the surface of the ground.

Check All That Apply

- Surface Water or GWUDI
- Ground Water

◆ PWS Category

A PWS serves an average of at least 25 people or 15 service connections for at least 60 days per year. EPA has defined three types of PWSs, and certain rules only apply to specific types of systems:

- **Community Water System (CWS)**: A PWS that supplies water to the same residential population year-round. Examples include cities, towns, rural water systems, manufactured home communities, and home owners associations.

- **Non-Transient, Non-Community Water System (NTNCWS)**: A PWS that regularly supplies water to at least 25 of the same people at least six months per year, but not to their residences. Examples include schools and factories that have their own water systems.

- **Transient Non-Community Water System (TNCWS)**: A PWS that provides water in a place where people do not remain for long periods of time. Examples include restaurants, rest stops, and campgrounds that have their own water supplies.

Check One

- CWS
- NTNCWS
- TNCWS

◆ Treatment and Disinfection

Some rules apply only to systems that use certain types of treatment. For example, the Filter Backwash Recycling Rule applies to systems that use surface water or GWUDI sources, that use direct or conventional treatment, and that recycle spent filter backwash water, thickener supernatant, or liquids from dewatering processes.

Types of Filtration Include:

- Conventional Filtration (Coagulation - Flocculation - Sedimentation - Filtration)

- Direct Filtration (Coagulation - Flocculation - Filtration)

- Slow Sand Filtration

- Diatomaceous Earth Filtration

- Membrane Filtration

- Bag or Cartridge Filtration

Check All Treatment Processes That Apply

- Chlorine
- Chloramines
- Chlorine Dioxide
- Ozone
- UV Disinfection
- Aeration
- Lime/Soda Ash Softening
- Filtration
Type: _____
- Corrosion Control
Chemical: _____
- Fluoride Addition
- Other: _____

What You Need to Know: Compliance & System Impacts

System Impacts

Although each regulation has its own, sometimes complex, set of requirements, every regulation affects your system in the same basic way. **In general**, you will have to:

- Monitor for a contaminant and report the results to the State.
- Make compliance decisions based on your monitoring results and the outcome of any State review.
- Take action to reduce any health risks that have been identified through monitoring.
- Provide the public information about water quality and public health risks.

System Monitoring

Typically, the first thing you will need to do to comply with a regulation is monitor for the contaminant of concern to determine if it is present in your water and, if so, at what level. Sometimes, you may be able to use previously collected monitoring data to comply with the monitoring requirements of new regulations.

System Decision Making

After your monitoring data has been collected, you will be able to better assess your situation. Your State drinking water program will also review the data to determine where your system stands in regards to compliance. Your State drinking water program also will be able to direct you on what to do if your system appears to have a compliance problem.

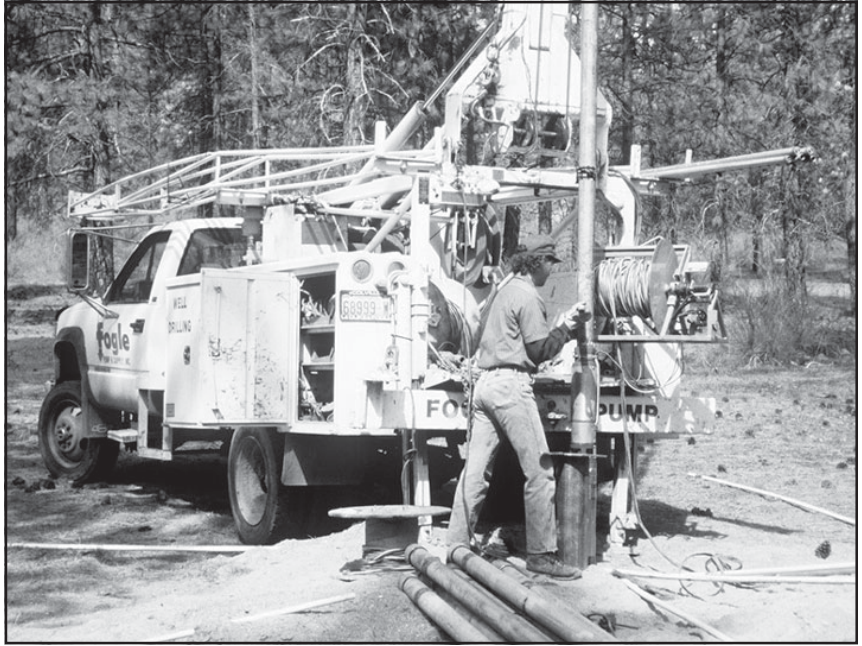


System Actions

Possible system actions may involve installing a new treatment process, modifying an existing process, replacing failing pumps or pipes, or using a new source of water. After exploring a variety of options, you should choose an option that is viable for your system and put that option into action. Extensive technical and financial resources are available to

help you along in these tasks. (See page 28 for a list of sources.)

You may be wondering when some of the rules listed in this booklet will start taking effect and how long you have to prepare before you must comply. Typically, you will need to be in compliance within 3 years after a rule is promulgated. If compliance will involve major capital expenditures, you may have more time to come into compliance. If you feel that you need additional time, check with your State on available options. The “Key Points Chart” on the next few pages provides information on anticipated compliance schedules for existing and new rules. (Please note that the proposed/upcoming rules have not yet been finalized and are subject to change before they are officially published.)



Drilling a new well, or finding a new source of supply, may be necessary for achieving and maintaining compliance with drinking water regulations.

Key Points Chart: Current Rules

| Current Rule | Systems Affected | Overview |
|--|---|--|
| <p>Total Coliform Rule (Published: June 29, 1989)</p> <p>www.epa.gov/safewater/mbdp/mbdp.html</p> <p>www.epa.gov/safewater/source/therule.html#Total</p> | All PWSs. | Sets monitoring requirements for coliforms, which are indicators of the potential for sewage or fecal contamination in the water. |
| <p>Surface Water Treatment Rule (SWTR) (Published: June 29, 1989)</p> <p>www.epa.gov/safewater/mbdp/mbdp.html</p> <p>www.epa.gov/safewater/source/therule.html#Surface</p> | All PWSs that use surface water or GWUDI. These are defined as Subpart H systems. | Establishes criteria under which filtration is required. Systems must either provide filtration and disinfection or comply with the requirements to avoid filtration. |
| <p>Phase I Rule (Published: July 8, 1987)</p> <p>www.epa.gov/safewater/source/therule.html#PhaseI</p> | In general, requirements apply only to CWSs and NTNCWSs. Nitrate and nitrite requirements apply to all PWSs, including transient systems. | Establishes monitoring requirements and MCLs or treatment techniques for 66 chemicals (IOCs, VOCs, and SOCs).* |
| <p>Phase II Rule (Published: January 30, 1991)</p> <p>www.epa.gov/safewater/source/therule.html#PhaseII</p> | | |
| <p>Phase IIB Rule (Published: July 1, 1991)</p> <p>www.epa.gov/safewater/source/therule.html#PhaseII</p> | | |
| <p>Phase V Rule (Published: July 17, 1992)</p> <p>www.epa.gov/safewater/source/therule.html#PhaseV</p> | | <p>*Note: Fluoride is regulated with the other IOCs. However, in addition to a primary MCL of 4 mg/L, it has a secondary MCL of 2 mg/L. If your system has fluoride levels between 2 and 4 mg/L, you are required to provide public education about possible cosmetic dental discoloration.</p> |

Monitoring

For small systems, the number of monthly samples is based on service population. Repeat samples are required within 24 hours if a positive total coliform sample is found. Positive samples must be analyzed for *E. coli* or fecal coliform. At least 5 samples taken from sites in the distribution system must be collected the month after a positive sample.

For systems that *do not* provide filtration, the following samples are required:

Source water: *Fecal or total coliform density* - 1-3 times per week, depending on the number of people served; *Turbidity* - Every 4 hours.

Finished Water: *Total inactivation ratios* - Daily; *Residual disinfectant concentration* - Continuously.

For systems that *do* provide filtration, the following samples are required:

Turbidity - Every 4 hours; *Residual disinfectant concentration* - Continuously.

The **Standardized Monitoring Framework (SMF)**, promulgated under the Phase II Rule, standardizes monitoring requirements and synchronizes monitoring schedules for IOCs, VOCs, and SOCs. Monitoring requirements for asbestos, fluoride, nitrate, and nitrite are different from the monitoring requirements for other IOCs because of these chemicals' unusual characteristics. The SMF established a 9-year "compliance cycle" composed of three 3-year "compliance periods." Newly regulated contaminants will be subject to the SMF. During an initial monitoring period, systems sample for 4 consecutive quarters for each contaminant at each entry point to the distribution system. Depending on the results, systems may be able to reduce their monitoring frequency to annually, or once every 3, 6, or 9 years. The SMF allows States to waive monitoring requirements for all contaminants except nitrate and nitrite.

Treatment

This rule does not directly require treatment. However, if monitoring indicates the presence of coliform bacteria, treatment may have to be added, modified, or adjusted to correct the problem.

Systems may avoid filtration if they have low coliform and turbidity in their source water and meet other site-specific criteria. Systems that do not meet these criteria must install one of the following filtration treatments: conventional filtration treatment or direct filtration; slow sand filtration; diatomaceous earth filtration; or another filtration technology if the State determines that, in combination with disinfection, the proper amount of *Giardia* and virus removal and/or inactivation is achieved.

These rules do not directly affect a system's treatment processes, but, if monitoring indicates chemical contamination, treatment may have to be added, modified, or adjusted to correct the problem.

Management Practices

This rule does not directly affect a system's management practices. However, management practices may need to be adjusted in order to meet the monitoring and reporting requirements and/or to address any problems that are uncovered during monitoring.

Unfiltered systems are required to meet source water quality criteria and maintain a watershed control program. They are also subject to an annual inspection and watershed control program evaluation.

This rule does not directly affect a system's management practices. However, management practices may need to be improved to meet the monitoring and reporting requirements and/or to address any problems that are uncovered during monitoring.

Key Points Chart: Current Rules (cont'd)

| Current Rule | Systems Affected | Overview |
|--|---|---|
| <p>Lead and Copper Rule (Published: June 7, 1991)</p> <p>www.epa.gov/safewater/leadcop.html</p> | <p>All CWSs and NTNCWSs.</p> | <p>Establishes a treatment technique that includes requirements for corrosion control treatment, source water treatment, lead service line replacement, and public education. These requirements may be triggered by lead and copper action levels measured in samples collected at consumers' taps.</p> |
| <p>Stage 1 Disinfectants/Disinfection Byproducts Rule (Stage 1 DBPR) (Published: December 16, 1998)</p> <p>www.epa.gov/safewater/mbdp/mbdp.html</p> <p>www.epa.gov/safewater/mbdp/dbp1.html</p> | <p>CWSs and NTNCWSs that add a chemical disinfectant to the water in any part of the drinking water treatment process. Certain requirements apply to TNCWSs that use chlorine dioxide.</p> | <p>The Stage 1 DBPR will reduce the levels of disinfectants and DBPs in drinking water supplies, including byproducts that were not previously covered by drinking water rules. DBPs result from chemical reactions between chemical disinfectants and organic and inorganic compounds in source waters. The rule sets MCLs for haloacetic acids (HAA5), chlorite (a major chlorine dioxide byproduct), bromate (a major ozone byproduct), and total trihalomethanes (TTHM). It also sets Maximum Residual Disinfectant Levels and Maximum Residual Disinfectant Level Goals for chlorine, chloramines, and chlorine dioxide.</p> |
| <p>Filter Backwash Recycling Rule (FBRR) (Published: June 8, 2001)</p> <p>www.epa.gov/safewater/mbdp/mbdp.html</p> <p>www.epa.gov/safewater/filterbackwash.html</p> | <p>PWSs that use surface water or GWUDI (Subpart H systems), use conventional or direct filtration, and recycle spent filter backwash water, thickener supernatant, or liquids from dewatering processes.</p> | <p>The FBRR requires systems to return regulated streams to a point in the treatment plant where it goes through all of the steps of a conventional or direct filtration system. This is designed to ensure that inadequately treated water is not passed on to the distribution system and then to customers.</p> |

Monitoring

Samples must be taken from consumers' taps. The number of samples required during each 6-month period depends on system size. If monitoring results show that the lead or copper action level is exceeded, the system must implement corrosion control treatment. If the system is below the action level for two consecutive periods, it will be put on a reduced monitoring schedule.

Depending on the type of disinfection used—chlorine, chloramines, chlorine dioxide, or ozone—systems may be required to monitor for different disinfectants and DBPs. Reduced monitoring is possible if a system meets certain requirements. For systems that use surface water or GWUDI (Subpart H systems) and use conventional treatment, monthly samples are required for total organic carbon (TOC) and alkalinity.

This rule has no monitoring requirements, but the FBRR requires that a system meet the following deadlines:

By December 8, 2003: Submit to the State a plant schematic and recycle flow/plant flow information.

By June 8, 2004: Retain additional information on recycle practices on file. By this date systems must also be recycling regulated streams to correct locations or have an approved alternate recycle return location.

By June 8, 2006: Any capital improvements that were needed for the return recycle location must be completed.

Treatment

Corrosion control treatment is required unless a system is below the action level for two consecutive 6-month periods. Source water monitoring and treatment are also required if a system exceeds an action level due to occurrence in the source water. If a system has lead service lines, replacement is required if the system still cannot meet the action level even after installing corrosion control or source water treatment.

Subpart H systems that use conventional filtration must remove specified percentages of TOC using either enhanced coagulation or enhanced softening. The removal requirement depends on the TOC concentration in and alkalinity of the source water.

The FBRR requires a system to return all regulated recycled water (spent filter backwash water, thickener supernatant, and liquids from dewatering processes) to a point in the treatment plant where it will pass through all steps of treatment or treatment processes before entering the distribution system. (Note: Systems can request approval from the State to use alternate locations.)

Management Practices

This rule does not directly affect a system's management practices. However, management practices may be affected by the rule's public education provisions and practices associated with proper monitoring.

This rule does not directly affect a system's management practices. However, management practices may be affected by the need to balance disinfection needs with byproduct formation.

This rule does not directly affect a system's management practices. However, management practices may need to be adjusted along with any change in treatment that is required.

Key Points Chart: Current Rules (cont'd)

| Current Rule | Systems Affected | Overview |
|---|---|--|
| <p>Consumer Confidence Report Rule (CCR) <i>(Published: August 19, 1998)</i> www.epa.gov/safewater/ccr1.html</p> | <p>All CWSs.</p> | <p>The CCR is required to keep customers informed about the quality of their drinking water. A CCR is a report of water quality over the preceding year and includes health effects information. It includes information on source water, contaminants found in the water, and violations.</p> |
| <p>Public Notification (PN) Rule <i>(Published: May 4, 2000)</i> www.epa.gov/safewater/pn.html</p> | <p>All PWSs.</p> | <p>The PN Rule ensures that all people who drink a system's water are informed about any violations that have occurred and their possible health consequences. The rule groups the public notification requirements into 3 tiers, depending on the seriousness of the violation or situation.</p> <p>Tier 1 violations and situations have serious health effects with even a short-term exposure. Systems must issue notice within 24 hours.</p> <p>Tier 2 violations and situations have the potential for serious effects on human health, though not as immediate as Tier 1. Notice is required within 30 days.</p> <p>Tier 3 violations and situations do not present an immediate or serious risk. Notice is required within the year.</p> <p>The PN Rule also specifies how these notices are to be delivered.</p> |
| <p>Arsenic and Clarifications to Compliance and New Source Contaminants Monitoring Rule <i>(Revised Rule Published: January 22, 2001)</i> www.epa.gov/safewater/arsenic.html</p> | <p>CWSs and NTNCWSs (NTNCWSs were not regulated under the previous rule).</p> | <p>The Arsenic Rule sets an MCL as well as monitoring requirements for arsenic, a contaminant shown to cause cancer and other health effects. The revised rule reduces the MCL from the current 0.05 mg/L to 0.010 mg/L.</p> |

Monitoring

Treatment

Management Practices

This rule does not directly involve monitoring. However, the rule requires that certain monitoring results from other rules be reported in the CCR.

This rule does not directly affect treatment. However, treatment problems affect water quality, which must be reported in the CCR.

CWSs are required to make a CCR available annually to all customers.

This rule does not directly involve monitoring. However, the rule requires that certain monitoring results from other rules be reported to the public.

This rule does not directly affect treatment. However, treatment problems affect water quality and may cause violations that must be reported to the public.

PWSs must notify everyone they serve any time they fail to comply with the NPDWRs and in certain other circumstances.

The final Arsenic Rule makes the monitoring requirements for arsenic consistent with those for other IOCs regulated under the SMF (see p. 16, phase rules). Your State will set up a monitoring schedule that will allow you to monitor for all IOCs, including arsenic, at the same time.

This rule lists best available technologies (BATs) and small system compliance technologies (SSCTs) for the removal of arsenic. The BATs and SSCTs that are most likely to be used by small systems include activated alumina, activated alumina and reverse osmosis point-of-use (POU) devices, and modified lime softening.

This rule does not directly address management practices. However, systems that are required to install treatment for the first time will need to focus on developing appropriate technical, managerial, and financial capacity. Systems opting for a point-of-entry (POE) or POU compliance strategy will need to establish and maintain excellent customer relations.

Key Points Chart: Current Rules (cont'd)

| Current Rule | Systems Affected | Overview |
|--|--|---|
| <p>Radionuclides Rule (Revised Rule Published: December 7, 2000)</p> <p>www.epa.gov/safewater/radionuc.html</p> | <p>CWSs.</p> | <p>The Radionuclides Rule sets MCLs as well as monitoring, reporting, and public notification requirements for radionuclides, which are contaminants that emit radiation. The new rule maintains the current MCLs (from the original 1976 Rule) for radium-226, radium-228, and gross alpha. Changes include establishing a new MCL for uranium, requiring systems to monitor separately for radium-228, and requiring systems to monitor for the regulated radionuclides at each entry point to the distribution system.</p> |
| <p>Long-Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR) (Published: January 14, 2002)</p> <p>www.epa.gov/safewater/mdbp/mdbp.html</p> <p>www.epa.gov/safewater/mdbp/lt1eswtr.html</p> | <p>PWSs that use surface water or GWUDI (Subpart H systems) and serve fewer than 10,000 persons.</p> | <p>The LT1ESWTR aims to improve control of microbial contaminants, including <i>Cryptosporidium</i>, for Subpart H systems serving fewer than 10,000 people, in addition to preventing increases in microbial risk while systems control for DBPs.</p> |

Monitoring

Monitoring for gross alpha, radium-226, radium-228, and uranium fit into the Standardized Monitoring Framework (see page 16, chemical phase rules). Monitoring will be required at each entry point to the distribution system. Monitoring for beta particle and photon emitters is not required for most CWSs. If a system is designated by the State as “vulnerable” or “contaminated,” it will have to monitor for beta particle and photon radioactivity.

Continuous **turbidity monitoring** will be required for each individual filter (conventional & direct filtration only), and values will need to be recorded every 15 minutes. This is in addition to monitoring a combined flow from all filters established under the SWTR. This will avoid the situation where a properly working filter masks the poor performance of another filter, thereby allowing contaminants to enter the water.

Treatment

This rule lists BATs for the removal of radionuclides, should a capital investment be required. The BATs are ion exchange, reverse osmosis, lime softening, and enhanced coagulation/filtration. The SSCTs listed in the radionuclides rule are green sand filtration, co-precipitation with barium sulfate, electro dialysis/ electro dialysis reversal, pre-formed hydrous manganese oxide filtration, activated alumina, and POE and POU devices, including POU ion exchange and POU reverse osmosis.

Performance standards of conventional and direct filtration plants also become more strict under this rule. Combined filter effluent must be less than or equal to 0.3 Nephelometric Turbidity Units (NTU) for 95% of the monthly readings and may at no time exceed 1 NTU.

Management Practices

This rule does not directly address management practices. However, the rule involves new monitoring requirements, which may require improved management. In addition, should the installation of a treatment process be required, appropriate management practices may need to be implemented.

Management at those systems required to comply must establish a **Disinfection Profile and Benchmark**. If a system is considering making a significant change in its disinfection practices (for example, in order to comply with new Disinfection Byproducts Rules), it must get approval from the State. The State will use the benchmark as a guideline in deciding the level of disinfection that the system will need to achieve with its new disinfection practices.

Key Points Chart: Proposed/Upcoming Rules

Proposed Rule

Systems Affected

Overview

Ground Water Rule

(Date Proposed: May 10, 2000)

www.epa.gov/safewater/mdbp/mdbp.html

www.epa.gov/safewater/gwr.html

PWSs that use ground water.

The proposed Ground Water Rule aims to protect people served by ground water systems from disease-causing viruses and bacteria. It will also seek to identify defects in water systems that could lead to contamination.

Radon Rule

(Date Proposed: November 2, 1999)

www.epa.gov/safewater/radon.html

CWSs that use ground water, mixed ground and surface water, GWUDI, or that intermittently use ground water as a supplemental source. It will not apply to systems that rely on surface water exclusively.

The proposed Radon Rule aims to reduce people's exposure to radon in drinking water and in indoor air. Under the proposed rule, states would have the option to develop a Multi-Media Mitigation Program to address radon in both indoor air as well as drinking water.

Monitoring

Under the proposed rule, systems that do not achieve a high enough level of virus removal and/or inactivation must, after a positive total coliform result, take a source water sample and conduct further tests (e.g., for *E. coli*, enterococci, or coliphage). Under the proposed rule, states would conduct Hydrogeologic Sensitivity Assessments, and systems identified as being sensitive will have further source water monitoring requirements.

Treatment

This proposed rule does not directly affect treatment. However, systems that detect fecal contamination would be required to take corrective action that may include disinfection.

Management Practices

This proposed rule does not directly address management practices. However, States would evaluate system management as part of sanitary surveys and may require changes.

Under the proposed rule, the results of an initial monitoring period would determine the frequency of further monitoring that will be required. Sampling frequencies may be reduced if a system meets certain requirements, or increased if sampling results exceed radon trigger levels.

Under the proposed rule, treatment technologies that are considered for radon treatment include: high performance aeration (pre-treatment and post-treatment may also be necessary to avoid bacteriological growth and distribution system corrosion); granular activated carbon; and POE granular activated carbon (POU devices are not allowed for radon removal). Special consideration for spent media or cartridge disposal may be required if radon accumulates to high levels in the media.

This proposed rule does not directly address management practices. However, should monitoring be required, some management practices may be affected.

Key Points Chart: Proposed/Upcoming Rules (cont'd)

Proposed Rule

Systems Affected

Overview

Stage 2 Disinfectants/Disinfection Byproducts Rule (Stage 2 DBPR)[†]

www.epa.gov/safewater/mdbp/mdbp.html

www.epa.gov/safewater/mdbp/mdbp.html#lt2

CWSs and NTNCWSs that add a disinfectant other than ultraviolet light or deliver water that has been disinfected.

The proposed Stage 2 DBPR builds on the public health protection provided by the Stage 1 DBPR. Along with the proposed Long-Term 2 Enhanced Surface Water Treatment Rule, it aims to reduce the risks associated with DBPs without increasing the risk of microbial contamination.

[†]**Note:** This rule is to be considered simultaneously with the Long-Term 2 Enhanced Surface Water Treatment Rule in order to protect public health and optimize technology choice decisions.

Long-Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR)^{*}

www.epa.gov/safewater/mdbp/mdbp.html

www.epa.gov/safewater/,dbp/mdbp.html#lt2

All PWSs that use surface water or GWUDI (Subpart H systems).

The proposed LT2ESWTR is being proposed concurrently with the proposed Stage 2 DBPR to ensure that microbial protection is not compromised by efforts to reduce exposure to DBPs. It is also designed to require higher levels of treatment for source waters of lower quality.

^{*}**Note:** This rule is to be considered simultaneously with the Stage 2 DBPR in order to protect public health and optimize technology choice decisions.

Monitoring

Treatment

Management Practices

Under the proposed rule, an **Initial Distribution System Evaluation (IDSE)** will determine where the new monitoring sites will be located. The monitoring schedule would be based on both source water type and system size. Compliance monitoring would come in two phases:
Phase 1: All phase 1 monitoring is conducted at the same monitoring sites used to comply with the Stage 1 DBPR.
Phase 2: Monitoring must be conducted at the new sites determined by the IDSE.

This proposed rule may directly cause changes in treatment. Systems may, in order to reduce DBP concentrations in the distribution system, need to make operational changes or distribution system modifications, use alternative disinfection strategies, enhance DBP precursor removal, and/or remove DBPs.

This proposed rule does not directly address management practices. However, should the installation of a new treatment technology or distribution system modifications be required, some management practices may be affected.

Note: Monitoring takes place at the source prior to treatment.

For SMALL systems (serving fewer than 10,000 persons): Under the proposed rule, *Cryptosporidium* monitoring would be required if *E. coli* annual mean concentrations reach certain levels. (EPA is trying to reduce the burden to small systems by allowing the less expensive *E. coli* monitoring to take place first, and then only requiring the more expensive *Cryptosporidium* monitoring when levels signal there may be a problem.)

Depending on the initial monitoring results, systems that filter would be put into groups or “bins.” Under the proposed rule, each bin (except the bin for the lowest levels) requires a system to install a treatment technology and sets a monitoring schedule, both based on contamination levels in the source water. Under the proposed rule, some new treatment options could possibly involve watershed control, reducing influent *Cryptosporidium* concentrations, improving system performance, and additional treatment barriers such as pretreatment.

This proposed rule does not directly address management practices. However, should the installation of new treatment technology or the adoption of new treatment options be required, some management practices may be affected.

For More Information

Local drinking water suppliers, States, and EPA all work together to provide safe drinking water to the public. With proper planning and preparation, complying with drinking water regulations need not be an overwhelming task. However, EPA recognizes that small systems have special needs and require assistance. The following sources regularly provide information on where to find technical or financial assistance for systems like yours.

- Safe Drinking Water Hotline
(800) 426-4791
hotline-sdwa@epamail.epa.gov
- EPA's Drinking Water Web Site
www.epa.gov/safewater

■ EPA's Small Systems Web Site
www.epa.gov/safewater/smallsys.html

Major Providers of Technical Assistance to Drinking Water Systems

| Name of Program | Contact Information |
|--|--|
| Your State or Tribal Drinking Water Agency or EPA Regional Office | Call the Safe Drinking Water Hotline (see above) for information. |
| National Rural Water Association | www.nrwa.org (800) 332-8715 |
| Rural Community Assistance Program | www.rcap.org (703) 771-8636 |
| Rural Utilities Service | www.rurdev.usda.gov/rus/index.html (202) 720-0962 |

Major Providers of Financial Assistance to Drinking Water Systems

| Name of Program | Description | Contact Information |
|--|---|---|
| Drinking Water State Revolving Fund (DWSRF) | The DWSRF makes low-interest and interest-free loans to water systems to finance infrastructure improvements. States can also “set aside” funds from their annual EPA grant to provide technical assistance to small systems. | www.epa.gov/safewater/dwsrf/contacts.html Call the Safe Drinking Water Hotline (see above). |
| State-specific loan/grant programs | Your State may offer additional funding programs. | Contact your State Drinking Water Agency. |

Financial Assistance (cont'd)

| Name of Program | Description | Contact Information |
|--|---|--|
| Rural Utilities Service (RUS) Water and Waste Disposal Loan and Grant Program | This program offers loans and grants to rural areas to develop water and waste-disposal systems and to reduce the user costs of these systems. | www.usda.gov/rus/water/states/usamap.htm (202) 720-0962 |
| Community Development Block Grants | This program offers grants to disadvantaged cities, urban counties, and States to develop viable urban communities. | www.hud.gov/offices/cpd/communitydevelopment/programs/stateadmin/stateadmincontact.cfm (202) 708-1112 |
| National Bank for Cooperatives Loan Program (CoBank) | CoBank provides loans to larger, creditworthy rural utilities. | www.cobank.com (202) 542-8072 |
| Small Business Administration | The Small Business Administration works with its lending partners to provide financing to small businesses by guaranteeing major portions of their loans. | http://www.sba.gov/ (800) U-ASK-SBA |
| Environmental Finance Centers (EFCs) | The EFC network is a university-based program that provides financial outreach services to regulated communities. The Network consists of nine EFCs across the country. | http://www.epa.gov/efinpage/efcreg.htm (202) 564-4994 |

Other STEP Guides & Rule Reference Guides

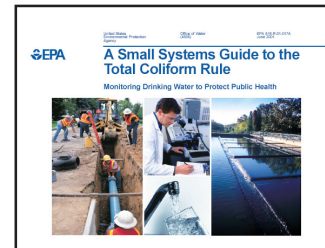
This brochure is one in a series of Simple Tools for Effective Performance (STEP) Guides for small drinking water systems. The currently available STEP Guides can be obtained from EPA by calling the Safe Drinking Water Hotline at 1-800-426-4791 and requesting the document by its publication number. To check on the status and availability of STEP Guides listed below as under development, go to www.epa.gov/safewater/smallsys/ssinfo.htm.

STEP GUIDES AVAILABLE NOW

Small Systems Guide to the Total Coliform Rule (TCR)

This workbook is designed to help small systems understand the TCR and the mandatory monitoring required under the rule. The workbook provides sample worksheets to help systems organize and track TCR monitoring data, and provide appropriate follow-up actions should monitoring show a positive presence of coliform.

EPA publication number: EPA 816-R-01-017A



Arsenic Rule Workbook

This workbook is designed to help systems understand and achieve compliance with the Arsenic Rule. The workbook provides sample worksheets to help systems organize data, and provides guidance for small systems on their selection of appropriate compliance options.

EPA publication number: EPA 816-R-02-008A



STEP GUIDES UNDER DEVELOPMENT

*Disinfectants/Disinfection
Byproducts (D/DBP) Rule Workbook*

Strategic Planning Workbook

Asset Management Workbook

FACT SHEETS FOR EXISTING AND FUTURE RULES

EPA has also developed a series of fact sheets for small systems on the regulatory requirements under the SDWA. These fact sheets can be accessed at the following website:

<http://www.epa.gov/safewater/smallsys/ndwac/finalfac.html>

Surface Water Treatment Rule

*Stage 1 Disinfection Byproducts
Rule*

Total Coliform Rule

*Long Term 1 Enhanced Surface
Water Treatment Rule*

Lead and Copper Rule

Arsenic (Amended)

Chemical Monitoring: Phase II/V

Radon

Radionuclides

Radionuclides (Amended)

Public Notification Rule

Filter Backwash Recycling

Consumer Confidence Reports

Ground Water Rule