



Rules of
Department of Natural Resources
Division 60—Safe Drinking Water Commission
Chapter 8—Public Notification

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**Title 10—DEPARTMENT OF
NATURAL RESOURCES
Division 60—Safe Drinking Water
Commission
Chapter 8—Public Notification**

**10 CSR 60-8.010 Public Notification of
Conditions Affecting a Public Water
Supply**

PURPOSE: This rule establishes the timing, content, method, and other requirements for notifying the public of violations of the public drinking water rules, situations with potential to have adverse effects on human health, and grants of variances and exemptions. Public notice requirements are divided into three tiers, to take into account the seriousness of the violation or situation and of any potential adverse health effects that may be involved. The public notice requirements for each violation or situation are determined by the tier to which it is assigned.

(1) General Information and Requirements.

(A) Types of Violations and Other Situations Requiring Public Notice.

1. Failure to comply with an applicable maximum contaminant level (MCL) or maximum residual disinfectant levels (MRDL).

2. Failure to comply with a prescribed treatment technique.

3. Failure to perform required water quality monitoring as required by drinking water regulations.

4. Failure to comply with testing procedures as prescribed by a drinking water regulation.

5. Operation under a variance or an exemption.

6. Failure to comply with the requirements of any schedule that has been set under a variance or exemption.

7. Special public notice.

8. Occurrence of a waterborne disease outbreak or other waterborne emergency.

9. Exceedance of the nitrate MCL by noncommunity water systems where granted permission by the department;

10. Exceedance of the secondary maximum contaminant level (SMCL) for fluoride.

11. Availability of unregulated contaminant monitoring data.

12. Other violations and situations determined by the department to require a public notice.

(B) Type of Notice Required for Each Violation or Situation. Public notice requirements are divided into three (3) tiers, to take into account the seriousness of the violation or situation and of any potential adverse health effects that may be involved. The

three (3) tiers are described and specific requirements are set forth in sections (2)–(4) of this rule. The public notice requirements for each violation or situation are determined by the tier to which it is assigned.

(C) Persons Notified and Responsibility for Public Notice.

1. The owner or operator of the public water system shall provide public notice to persons served by the water system in accordance with this rule. Public water systems that sell or otherwise provide drinking water to other public water systems (that is, to consecutive systems) are required to give public notice to the owner or operator of the consecutive system. The consecutive system is responsible for providing public notice to the persons it serves.

2. If the public water system has a violation in a portion of the distribution system that is physically or hydraulically isolated from other parts of the distribution system, the department may allow the system to limit distribution of the public notice to only persons served by that portion of the system which is out of compliance. The department's approval will be in writing.

3. A copy of the public notice shall be sent to the department within ten (10) days of completion of notifying the affected public.

(2) Tier 1 Public Notice.

(A) Violation Categories and Other Situations Requiring a Tier 1 Public Notice.

1. Tier 1 public notice is required for violations or other situations with significant potential to have serious adverse effects on human health as a result of short-term exposure.

2. Specific violations and other situations requiring Tier 1 notice include:

A. Violation of the MCL for total coliforms when fecal coliform or *E. coli* are present in the water distribution system, or when the water system fails to test for fecal coliforms or *E. coli* when any repeat sample tests positive for coliform;

B. Violation of the MCL for nitrate, nitrite, or total nitrate and nitrite, or when the water system fails to take a confirmation sample within twenty-four (24) hours of the system's receipt of the first sample showing an exceedance of the nitrate or nitrite MCL;

C. Exceedance of the nitrate MCL by noncommunity water systems where permitted by the department to exceed the MCL;

D. Violation of the MRDL for chlorine dioxide, when one (1) or more samples taken in the distribution system the day following an exceedance of the MRDL at the entrance of the distribution system, exceed the MRDL, or when the water system does

not take the required samples in the distribution system;

E. Violation of the maximum turbidity level where the sample results exceed five (5) nephelometric turbidity units (NTU);

F. Violation of a treatment technique requirement pursuant to 10 CSR 60-4.050 resulting from a single exceedance of the maximum allowable turbidity limit, where the department determines after consultation that the violation has significant potential to have serious adverse effects on human health or where the system fails to consult with the department within twenty-four (24) hours after the system learns of the violation;

G. Occurrence of a waterborne disease outbreak or other waterborne emergency (such as failure or significant interruption in key water treatment processes, a natural disaster that disrupts the water supply or distribution system, or a chemical spill or unexpected loading of possible pathogens into the source water that significantly increases the potential for drinking water contamination);

H. Other violations or situations with significant potential to have serious adverse effects on human health as a result of short-term exposure, as determined by the department either in regulation or on a case-by-case basis.

(B) Timing of Tier 1 Public Notice. The public water system owner or operator shall:

1. Provide public notice as soon as practical but no later than twenty-four (24) hours after the system learns of the violation or situation;

2. Initiate consultation with the department to determine any additional public notice requirements as soon as practical, but no later than twenty-four (24) hours after the public water system learns of the violation or situation, except that the department may allow additional time in the event of extenuating circumstances beyond the control of the public water system, such as a natural disaster; and

3. Comply with any additional public notification requirements (including any repeat notices or direction on the duration of the posted notices) that are established as a result of the consultation with the department. Such requirements may include the time, form, manner, frequency, and content of repeat notice (if any) and other actions designed to reach all persons served.

(C) Form and Manner of Tier 1 Public Notice.

1. The owner or operator of the public water system shall use the health effects language in section (11) of this rule for MCL violations requiring Tier 1 public notice.



2. Tier 1 public notice shall be provided within twenty-four (24) hours in a form and manner reasonably calculated to reach all persons served. The form and manner used by the public water system are to fit the specific situation, but shall be designed to reach residential, transient, and non-transient users of the water system. In order to reach all persons served, water system shall use, at a minimum, one (1) or more of the following forms of delivery:

A. Appropriate broadcast media, such as radio and television;

B. Posting the notice in conspicuous locations throughout the area served by the water system;

C. Hand delivery of the notice to persons served by the water system; or

D. Another delivery method approved in writing by the department.

(3) Tier 2 Public Notice.

(A) Violation Categories and Other Situations Requiring a Tier 2 Public Notice.

1. Tier 2 public notice is required for violations and other situations with potential to have serious adverse effects on human health.

2. Specific violations and other situations requiring Tier 2 notice.

A. Tier 2 notice is required for violations of MCL, MRDL, or treatment technique requirements, except where a Tier 1 notice is required or where the department determines that a Tier 1 notice is required, for the following: microbiological contaminants; inorganic contaminants (IOCs); synthetic organic contaminants (SOCs); volatile organic contaminants (VOCs); radiological contaminants; disinfection byproducts, byproduct precursors, and disinfectant residuals; treatment techniques for acrylamide, epichlorohydrin, lead, and copper; and other situations determined by the department to require Tier 2 notice. Systems with treatment technique violations involving a single exceedance of a maximum turbidity limit under 10 CSR 60-4.050 must initiate consultation with the department within twenty-four (24) hours of learning of the violation. Based on this consultation the department may subsequently decide to elevate the violation to Tier 1. If a system is unable to make contact with the department in the twenty-four (24)-hour period, the violation is automatically elevated to Tier 1.

B. Failure to comply with the terms and conditions of a variance or exemption; and

C. Violations of the monitoring and testing procedure requirements where the department determines that a Tier 2 rather

than a Tier 3 public notice is required, taking into account potential health impacts and persistence of the violation. This includes but is not limited to collecting no total coliform samples during the applicable monitoring period at the discretion of the department.

(B) Timing of Tier 2 Public Notice.

1. Public water systems must provide the public notice as soon as possible, but not later than thirty (30) days after the system learns of the violation. If the public notice is posted, the notice must remain in place for as long as the violation or situation persists, but in no case for less than seven (7) days, even if the violation or situation is resolved. The department may, in appropriate circumstances, allow additional time for the initial notice of up to three (3) months from the date the system learns of the violation. The department will not grant an extension to the thirty (30)-day deadline for any unresolved violation or provide across-the-board extensions for other violations or situations requiring a Tier 2 public notice. Extensions granted by the department will be in writing.

2. The public water system must repeat the notice every three (3) months as long as the violation or situation persists, unless the department determines that appropriate circumstances warrant a different repeat notice frequency. In no circumstance may the repeat notice be given less frequently than once per year. The department will not allow less frequent repeat notice for an MCL violation pursuant to 10 CSR 60-4.020 or a treatment technique violation pursuant to 10 CSR 60-4.050. The department will not allow across-the-board reductions in the repeat notice frequency for other ongoing violations requiring a Tier 2 repeat notice. The department's determinations allowing repeat notices to be given less frequently than once every three (3) months will be in writing.

3. For violations of the maximum turbidity level and for violations of the treatment technique requirements pursuant to 10 CSR 60-4.050 resulting from a single exceedance of the maximum allowable turbidity limit, public water systems must consult with the department as soon as practical but no later than twenty-four (24) hours after the public water system learns of the violation to determine whether a Tier 1 public notice is required to protect public health. When consultation does not take place within the twenty-four (24)-hour period, the water system must distribute a Tier 1 notice of the violation within the next twenty-four (24) hours (that is, no later than forty-eight (48) hours after the system learns of the violation).

(C) Form and Manner of Tier 2 Public Notice. Public water systems must provide

the initial public notice and any repeat notices in a form and manner reasonably calculated to reach persons served in the required time period. The form and manner of the public notice may vary based on the specific situation and type of water system but must at a minimum meet the following requirements:

1. Unless directed otherwise by the department in writing, community water systems must provide notice by:

A. Mail or other direct delivery to each customer receiving a bill and to other service connections to which water is delivered by the public water system; and

B. Any other method reasonably calculated to reach other persons regularly served by the system, if they would not normally be reached by mail or direct delivery. Such persons may include those who do not pay water bills or do not have service connection addresses (for example, house renters, apartment dwellers, university students, nursing home patients, prison inmates, etc.). These other methods may include: Publication in a local newspaper or newsletter; delivery of multiple copies for distribution by customers that provide their drinking water to others; posting in public places served by the system or on the Internet; or delivery to community organizations.

2. Unless directed otherwise by the department in writing, non-community water systems must provide notice by:

A. Posting the notice in conspicuous locations throughout the distribution system frequented by persons served by the system, or by mail or direct delivery to each customer and service connection (where known); and

B. Any other method reasonably calculated to reach other persons served by the system if they would not normally be reached by posting in a conspicuous location, mail, or direct delivery. Such persons include those served who may not see a posted notice because the posted notice is not in a location they routinely pass by. These other methods may include: Publication in a local newspaper or newsletter distributed to customers; use of e-mail to notify employees or students; or delivery of multiple copies in central locations (for example, community centers).

(4) Tier 3 Public Notice.

(A) Violation Categories and Other Situations Requiring a Tier 3 Public Notice.

1. Tier 3 public notice is required for all other violations and situations not included in Tier 1 and Tier 2.

2. Specific violations and other situations requiring Tier 3 public notice include:

A. Monitoring violations or failure to comply with a testing procedure, except



where a Tier 1 notice is specifically required or where the department determines that a Tier 2 notice is required, for the following: microbiological contaminants; inorganic contaminants (IOCs); synthetic organic contaminants (SOCs); volatile organic contaminants (VOCs); radiological contaminants; disinfection byproducts, byproduct precursors, and disinfectant residuals; treatment techniques for lead, and copper. Specific exceptions are listed under sections (2) and (3) of this rule;

B. Operation under a variance or exemption;

C. Exceedance of the fluoride SMCL; and

D. Other violations or situations determined by the department either in regulation or on a case-by-case basis.

(B) Timing of Tier 3 Public Notice.

1. Public water systems must provide the public notice not later than one (1) year after the public water system learns of the violation or situation or begins operating under a variance or exemption. Following the initial notice, the public water system must repeat the notice annually for as long as the violation, variance, exemption, or other situation persists. If the public notice is posted, the notice must remain in place for as long as the violation, situation, variance, or exemption persists, but in no case less than seven (7) days (even if the violation or situation is resolved).

2. Instead of individual Tier 3 public notices, a public water system may use an annual report detailing all violations and situations that occurred during the previous twelve (12) months as long as the timing requirements of paragraph (4)(B)1. of this rule are met.

(C) Form and Manner of Tier 3 Public Notice. Public water systems must provide the initial notice and any repeat notices in a form and manner that is reasonably calculated to reach persons served in the required time period. The form and manner of the public notice may vary based on the specific situation and type of water system, but it must at a minimum meet the following requirements:

1. Unless directed otherwise by the department in writing, community water systems must provide notice by:

A. Mail or other direct delivery to each customer receiving a bill and to other service connections to which water is delivered by the public water system; and

B. Any other method reasonably calculated to reach other persons regularly served by the system, if they would not normally be reached by mail or other direct delivery. Such persons may include those

who do not pay water bills or do not have service connection addresses (for example, house renters, apartment dwellers, university students, nursing home patients, prison inmates, etc.). Other methods may include: Publication in a local newspaper; delivery of multiple copies for distribution by customers that provide their drinking water to others (for example, apartment building owners or large private employers); posting in public places or on the Internet; or delivery to community organizations.

2. Unless directed otherwise by the department in writing, noncommunity water system must provide notice by:

A. Posting the notice in conspicuous locations throughout the distribution system frequented by persons served by the system, or by mail or direct delivery to each customer and service connection (where known); and

B. Any other method reasonably calculated to reach other persons served by the system, if they would not normally be reached by posting, mail, or direct delivery. Such persons may include those who may not see a posted notice because the notice is not in a location they routinely pass by. Other methods may include: Publication in a local newspaper or newsletter distributed to customer; use of e-mail to notify employees or students; or, delivery of multiple copies in central location (for example, community center).

(D) Use of Consumer Confidence Report to Meet Tier 3 Requirement. The Consumer Confidence Report (CCR) may be used for the Tier 3 public notice as long as:

1. The CCR is provided to persons served no later than twelve (12) months after the system learns of the violation or situation.

2. The Tier 3 notice contained in the CCR follows the content requirements under section (5) of this rule; and

3. The CCR is distributed following the delivery requirements under subsection (4)(C) of this rule.

(5) Content of the Public Notice.

(A) Public Notice for Violations and Other Situations, Including Violation of a Condition of a Variance or Exemption. The public notice must include:

1. A description of the violation or situation, including the contaminant(s) of concern, and (as applicable) the contaminant level(s);

2. When the violation or situation occurred;

3. Any potential adverse health effects from the violation or situation including the standard language under paragraph (5)(D)1.

or (5)(D)2. of this rule, whichever is applicable;

4. The population at risk, including subpopulations particularly vulnerable if exposed to the contaminant in their drinking water;

5. Whether alternative water supplies should be used;

6. What actions consumers should take, including when they should seek medical help, if known;

7. What the system is doing to correct the violation or situation;

8. When the water system expects to return to compliance or resolve the situation;

9. The name, business address, and phone number of the water system owner, operator, or designee of the public water system as a source of additional information concerning the notice; and

10. A statement to encourage the notice recipient to distribute the public notice to other persons served, using the standard language under paragraph (5)(D)3. of this rule, where applicable.

(B) Public Notice for Variances and Exemptions. If a public water system has been granted a variance or an exemption, the public notice must contain:

1. An explanation of the reasons for the variance or exemption;

2. The date on which the variance or exemption was issued.

3. A brief status report on the steps the system is taking to install treatment, find alternative sources of water, or otherwise comply with the terms and schedules of the variance or exemption; and

4. A notice of any opportunity for the public input in the review of the variance or exemption.

(C) Presentation of the Public Notice.

1. Each public notice:

A. Must be displayed in a conspicuous way when printed or posted;

B. Must not contain overly technical language or very small print;

C. Must not be formatted in a way that defeats the purpose of the notice;

D. Must not contain language which nullifies the purpose of the notice.

2. Each public notice must comply with multilingual requirements.

A. Where the department has determined the public water system serves a large proportion of non-English speaking consumers, the public notice must contain information in the appropriate language(s) regarding the importance of the notice or contain a telephone number or address where persons served may contact the water system to obtain



a translated copy of the notice or to request assistance in the appropriate language.

B. Where the department has not made a determination regarding the proportion of non-English speaking consumers, the public notice must contain the same information as in subparagraph (5)(C)2.A. of this rule.

C. Where the department has determined there is not a large proportion of non-English speaking customers, no multilingual requirement applies.

(D) Standard Language Included in the Notice. Public water system owners and operators are required to include the following standard language in their public notice:

1. For MCL, MRDL, and treatment technique violations, and violation of the condition of a variance or exemption, the public notice must include the health effects language specified in section (11) of this rule corresponding to the violation.

2. Public water systems must include the following language in their notice, including the language necessary to fill in the blanks, for all monitoring and testing procedure violations requiring public notice: “We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not your drinking water meets health standards. During {compliance period}, we {“did not monitor or test”} or {“did not complete all monitoring or testing”} for {contaminant(s)} and therefore cannot be sure of the quality of your drinking water during that time.”

3. Public water systems must include the following language in their notice (where applicable) to encourage the distribution of the public notice to all persons served: “Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.”

(6) Notice to New Billing Units or Customers.

(A) Community Water Systems. Community water systems must give a copy of the most recent public notice for any continuing violation, the existence of a variance or exemption, or other ongoing situations requiring a public notice to all new billing units or new customers prior to or at the time service begins.

(B) Non-Community Water Systems. Non-community water systems must continuously

post the public notice in conspicuous locations in order to inform new consumers of any continuing violation, variance, or exemption, or other situation requiring a public notice for as long as the violation, variance, exemption, or other situation persists.

(7) Reserved.

(8) Reserved.

(9) Special Public Notices.

(A) Special Notice for the Availability of Unregulated Contaminant Monitoring Results.

1. Timing of the special notice. The owner or operator of a community water system or nontransient noncommunity water system required to monitor for unregulated contaminants under Environmental Protection Agency’s (EPA’s) Unregulated Contaminant Monitoring Rule must notify persons served by the system of the availability of the results of such sampling no later than twelve (12) months after the monitoring results are known.

2. Form and manner of special notice. The form and manner of the public notice shall follow the requirements for a Tier 3 public notice. The notice shall also identify a person and provide the telephone number to contact for information on the monitoring results.

(B) Special Notice for the Exceedance of the Secondary Maximum Contaminant Level (SMCL) for Fluoride.

1. Timing of the special notice. Community water systems that exceed the fluoride SMCL of 2 mg/L determined by the last single sample taken in accordance with 10 CSR 60-4.030, but do not exceed the MCL of 4 mg/L for fluoride, must provide the public notice in paragraph (9)(B)3. of this rule to persons served. Public notice must be provided as soon as practical, but no later than twelve (12) months from the day the water system learns of the exceedance. A copy of the notice must also be provided to all new billing units and customers at the time service begins and to the state public health officer. The public water system must repeat the notice at least annually for as long as the SMCL is exceeded. If the public notice is posted, the notice must remain in place for as long as the SMCL is exceeded, but in no case less than seven (7) days (even if the exceedance is eliminated). On a case-by-case basis, the department may require an initial notice sooner than twelve (12) months and repeat notices more frequently than annually.

2. Form and manner of the special notice. The form and manner of the public notice (including repeat notices) must follow the requirements for a Tier 3 public notice in subsection (4)(C) and paragraphs (4)(D)1. and (4)(D)3. of this rule.

3. Mandatory language. The notice must contain the following language, including language necessary to fill in the blanks:

“This is an alert about your drinking water and a cosmetic dental problem that might affect children under nine (9) years of age. At low levels, fluoride can help prevent cavities, but children drinking water containing more than two (2) milligrams per liter (mg/L) of fluoride may develop cosmetic discoloration of their permanent teeth (dental fluorosis). The drinking water provided by your community water system {name} has a fluoride concentration of {insert value} mg/L.

“Dental fluorosis, in its moderate or severe forms, may result in a brown staining and/or pitting of the permanent teeth. This problem occurs only in developing teeth, before they erupt from the gums. Children under nine (9) should be provided with alternative sources of drinking water or water that has been treated to remove the fluoride to avoid the possibility of staining and pitting of their permanent teeth. You may also want to contact your dentist about proper use by young children of fluoride-containing products. Older children and adults may safely drink the water.

“Drinking water containing more than four (4) mg/L of fluoride (the maximum contaminant level for fluoride) can increase your risk of developing bone disease. Your drinking water does not contain more than four (4) mg/L of fluoride, but we are required to notify you when we discover that the fluoride levels in your drinking water exceed two (2) mg/L because of this cosmetic dental problem.

“For more information, please call {name of community water system} at {phone number}. Some home water treatment units are also available to remove fluoride from drinking water. To learn more about available home water treatment units, you may call NSF International at 1-877-8-NSF-HELP.”

(C) Special Notice for Nitrate Exceedances Above the MCL by Noncommunity Water Systems.

1. The owner or operator of a noncommunity water system granted permission by the department to exceed the nitrate MCL shall provide notice to persons served according to the requirements for a Tier 1 notice.

2. The owner or operator shall provide continuous posting of the fact that nitrate levels exceed ten (10) mg/L and the potential



health effects of exposure, according to the requirements for Tier 1 notice delivery under section (2) and the content requirements under section (5) of this rule.

(D) Special notice for repeated failure to conduct monitoring of the source water for *Cryptosporidium* and for failure to determine bin classification or mean *Cryptosporidium* level.

1. The owner or operator of a community or noncommunity water system that is required to monitor source water under 10 CSR 60-4.052(2) must notify persons served by the water system that monitoring has not been completed as specified no later than thirty (30) days after the system has failed to collect any three (3) months of monitoring as specified in 10 CSR 60-4.052(2)(C). The notice must be repeated as specified in 10 CSR 60-8.010(3).

2. Special notice for failure to determine bin classification or mean *Cryptosporidium* level. The owner or operator of a community or noncommunity water system that is required to determine a bin classification under 10 CSR 60-4.052(10) must notify persons served by the water system that the determination has not been made as required no later than thirty (30) days after the system has failed to report the determination as specified in 10 CSR 60-4.052(10)(E). The notice must be repeated as specified in 10 CSR 60-8.010(3). The notice is not required if the system is complying with a department-approved schedule to address the violation.

3. Form and manner of the special notice. The form and manner of the public notice must follow the requirements for a Tier 2 public notice prescribed in subsection (3)(C) of this rule. The public notice must be presented as required in section (3) of this rule.

4. Mandatory language that must be contained in the special notice. The notice must contain the following language, including the language necessary to fill in the blanks.

A. The special notice for repeated failure to conduct monitoring must contain the following language:

“We are required to monitor the source of your drinking water for *Cryptosporidium*. Results of the monitoring are to be used to determine whether water treatment at the {treatment plant name} is sufficient to adequately remove *Cryptosporidium* from your drinking water. We are required to complete this monitoring and make this determination by {required bin determination date}. We did not monitor or test or did not complete all monitoring or testing on schedule and, therefore, we may not be able to determine by the

required date what treatment modifications, if any, must be made to ensure adequate *Cryptosporidium* removal. Missing this deadline may, in turn, jeopardize our ability to have the required treatment modifications, if any, completed by the deadline required, {date}. For more information, please call {name of water system contact} of {name of water system} at {phone number}.”

B. The special notice for failure to determine bin classification or mean *Cryptosporidium* level must contain the following language:

“We are required to monitor the source of your drinking water for *Cryptosporidium* in order to determine by {date} whether water treatment at the {treatment plant name} is sufficient to adequately remove *Cryptosporidium* from your drinking water. We have not made this determination by the required date. Our failure to do this may jeopardize our ability to have the required treatment modifications, if any, completed by the required deadline of {date}. For more information, please call {name of water system contact} of {name of water system} at {phone number}.”

C. Each special notice must also include a description of what the system is doing to correct the violation and when the system expects to return to compliance or resolve the situation.

(10) Notice Given by the Department on Behalf of the Public Water System.

(A) The department may give the notice required by this rule on behalf of the owner and operator of the public water system.

(B) The owner or operator of the public water system remains responsible for ensuring that the requirements of this rule are met.

(11) Standard Health Effects Language for Public Notification.

(A) Microbiological Contaminants.

1. Total coliform. “Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems.”

2. Fecal coliform/*E. coli*. “Fecal coliforms and *E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.”

tems.”

3. Turbidity. “Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.”

(B) Surface Water Treatment Rule (SWTR), Interim Enhanced Surface Water Treatment Rule (IESWTR), Long-Term 1 Enhanced Surface Water Treatment Rule, and Filter Backwash Recycling Rule (FBRR) Violations.

1. *Giardia lamblia*. “Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.”

2. Viruses. “Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.”

3. Heterotrophic plate count (HPC) bacteria. “Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.”

4. Legionella. “Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.”

5. *Cryptosporidium*. “Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.”

(C) Inorganic Chemicals (IOCs).

1. Antimony. “Some people who drink water containing antimony well in excess of the MCL over many years could experience increases in blood cholesterol and decreases in blood sugar.”

2. Arsenic. “Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.”

3. Asbestos (> 10 µm). “Some people who drink water containing asbestos in excess of the MCL over many years may have an



increased risk of developing benign intestinal polyps.”

4. Barium. “Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.”

5. Beryllium. “Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions.”

6. Cadmium. “Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage.”

7. Chromium (total). “Some people who use water containing chromium well in excess of the MCL over many years could experience allergic dermatitis.”

8. Cyanide. “Some people who drink water containing cyanide well in excess of the MCL over many years could experience nerve damage or problems with their thyroid.”

9. Fluoride. “Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Fluoride in drinking water at half the MCL or more may cause mottling of children’s teeth, usually in children less than nine years old. Mottling, also known as dental fluorosis, may include brown staining and/or pitting of the teeth, and occurs only in developing teeth, before they erupt from the gums.”

10. Mercury (inorganic). “Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage.”

11. Nitrate. “Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.”

12. Nitrite. “Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.”

13. Total Nitrate and Nitrite. “Infants below the age of six months who drink water containing nitrate and nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.”

14. Selenium. “Selenium is an essential nutrient. However, some people who drink water containing selenium in excess of the MCL over many years could experience hair or fingernail losses, numbness in fingers or

toes, or problems with their circulation.”

15. Thallium. “Some people who drink water containing thallium in excess of the MCL over many years could experience hair loss, changes in their blood, or problems with their kidneys, intestines, or liver.”

(D) Lead and Copper Rule.

1. Lead. “Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.”

2. Copper. “Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson’s Disease should consult their personal doctor.”

(E) Synthetic Organic Chemicals (SOCs).

1. 25. 2,4-D. “Some people who drink water containing the weed killer 2,4-D well in excess of the MCL over many years could experience problems with their kidneys, liver, or adrenal glands.”

2. 26. 2,4,5-TP (Silvex). “Some people who drink water containing silvex in excess of the MCL over many years could experience liver problems.”

3. Alachlor. “Some people who drink water containing alachlor in excess of the MCL over many years could have problems with their eyes, liver, kidneys, or spleen, or experience anemia, and may have an increased risk of getting cancer.”

4. Atrazine. “Some people who drink water containing atrazine well in excess of the MCL over many years could experience problems with their cardiovascular system or reproductive difficulties.”

5. Benzo(a)pyrene (PAHs). “Some people who drink water containing benzo(a)pyrene in excess of the MCL over many years may experience reproductive difficulties and may have an increased risk of getting cancer.”

6. Carbofuran. “Some people who drink water containing carbofuran in excess of the MCL over many years could experience problems with their blood, or nervous or reproductive systems.”

7. Chlordane. “Some people who drink water containing chlordane in excess of the MCL over many years could experience problems with their liver, or nervous system, and may have an increased risk of getting

cancer.”

8. Dalapon. “Some people who drink water containing dalapon well in excess of the MCL over many years could experience minor kidney changes.”

9. Di(2-ethylhexyl)adipate. “Some people who drink water containing di (2-ethylhexyl) adipate well in excess of the MCL over many years could experience general toxic effects or reproductive difficulties.”

10. Di(2-ethylhexyl)phthalate. “Some people who drink water containing di (2-ethylhexyl) phthalate in excess of the MCL over many years may have problems with their liver, or experience reproductive difficulties, and may have an increased risk of getting cancer.”

11. Dibromochloropropane (DBCP). “Some people who drink water containing DBCP in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.”

12. Dinoseb. “Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties.”

13. Dioxin (2,3,7,8-TCDD). “Some people who drink water containing dioxin in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.”

14. Diquat. “Some people who drink water containing diquat in excess of the MCL over many years could get cataracts.”

15. Endothall. “Some people who drink water containing endothall in excess of the MCL over many years could experience problems with their stomach or intestines.”

16. Endrin. “Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems.”

17. Ethylene dibromide. “Some people who drink water containing ethylene dibromide in excess of the MCL over many years could experience problems with their liver, stomach, reproductive system, or kidneys, and may have an increased risk of getting cancer.”

18. Glyphosate. “Some people who drink water containing glyphosate in excess of the MCL over many years could experience problems with their kidneys or reproductive difficulties.”

19. Heptachlor. “Some people who drink water containing heptachlor in excess of the MCL over many years could experience liver damage and may have an increased risk of getting cancer.”

20. Heptachlor epoxide. “Some people who drink water containing heptachlor epoxide in excess of the MCL over many years



could experience liver damage, and may have an increased risk of getting cancer.”

21. Hexachlorobenzene. “Some people who drink water containing hexachlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys, or adverse reproductive effects, and may have an increased risk of getting cancer.”

22. Hexachlorocyclopentadiene. “Some people who drink water containing hexachlorocyclopentadiene well in excess of the MCL over many years could experience problems with their kidneys or stomach.”

23. Lindane. “Some people who drink water containing lindane in excess of the MCL over many years could experience problems with their kidneys or liver.”

24. Methoxychlor. “Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties.”

25. Oxamyl (Vydate). “Some people who drink water containing oxamyl in excess of the MCL over many years could experience slight nervous system effects.”

26. Pentachlorophenol. “Some people who drink water containing pentachlorophenol in excess of the MCL over many years could experience problems with their liver or kidneys, and may have an increased risk of getting cancer.”

27. Picloram. “Some people who drink water containing picloram in excess of the MCL over many years could experience problems with their liver.”

28. Polychlorinated biphenyls (PCBs). “Some people who drink water containing PCBs in excess of the MCL over many years could experience changes in their skin, problems with their thymus gland, immune deficiencies, or reproductive or nervous system difficulties, and may have an increased risk of getting cancer.”

29. Simazine. “Some people who drink water containing simazine in excess of the MCL over many years could experience problems with their blood.”

30. Toxaphene. “Some people who drink water containing toxaphene in excess of the MCL over many years could have problems with their kidneys, liver, or thyroid, and may have an increased risk of getting cancer.”

(F) Volatile Organic Chemicals (VOCs).

1. Benzene. “Some people who drink water containing benzene in excess of the MCL over many years could experience anemia or a decrease in blood platelets, and may have an increased risk of getting cancer.”

2. Carbon tetrachloride. “Some people who drink water containing carbon tetrachloride in excess of the MCL over many years could experience problems with their liver

and may have an increased risk of getting cancer.”

3. Chlorobenzene (monochlorobenzene). “Some people who drink water containing chlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys.”

4. o-Dichlorobenzene. “Some people who drink water containing o-dichlorobenzene well in excess of the MCL over many years could experience problems with their liver, kidneys, or circulatory systems.”

5. p-Dichlorobenzene. “Some people who drink water containing p-dichlorobenzene in excess of the MCL over many years could experience anemia, damage to their liver, kidneys, or spleen, or changes in their blood.”

6. 1,2-Dichloroethane. “Some people who drink water containing 1,2-dichloroethane in excess of the MCL over many years may have an increased risk of getting cancer.”

7. 1,1-Dichloroethylene. “Some people who drink water containing 1,1-dichloroethylene in excess of the MCL over many years could experience problems with their liver.”

8. cis-1,2-Dichloroethylene. “Some people who drink water containing cis-1,2-dichloroethylene in excess of the MCL over many years could experience problems with their liver.”

9. trans-1,2-Dichloroethylene. “Some people who drink water containing trans-1,2-dichloroethylene well in excess of the MCL over many years could experience problems with their liver.”

10. Dichloromethane. “Some people who drink water containing dichloromethane in excess of the MCL over many years could have liver problems and may have an increased risk of getting cancer.”

11. 1,2-Dichloropropane. “Some people who drink water containing 1,2-dichloropropane in excess of the MCL over many years may have an increased risk of getting cancer.”

12. Ethylbenzene. “Some people who drink water containing ethylbenzene well in excess of the MCL over many years could experience problems with their liver or kidneys.”

13. Styrene. “Some people who drink water containing styrene well in excess of the MCL over many years could have problems with their liver, kidneys, or circulatory system.”

14. Tetrachloroethylene. “Some people who drink water containing tetrachloroethylene in excess of the MCL over many years could have problems with their liver, and may have an increased risk of getting cancer.”

15. Toluene. “Some people who drink water containing toluene well in excess of the MCL over many years could have problems with their nervous system, kidneys, or liver.”

16. 1,2,4-Trichlorobenzene. “Some people who drink water containing 1,2,4-trichlorobenzene well in excess of the MCL over many years could experience changes in their adrenal glands.”

17. 1,1,1-Trichloroethane. “Some people who drink water containing 1,1,1-trichloroethane in excess of the MCL over many years could experience problems with their liver, nervous system, or circulatory system.”

18. 1,1,2-Trichloroethane. “Some people who drink water containing 1,1,2-trichloroethane well in excess of the MCL over many years could have problems with their liver, kidneys, or immune systems.”

18. Trichloroethylene. “Some people who drink water containing trichloroethylene in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.”

19. Vinyl chloride. “Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer.”

20. Xylenes (total). “Some people who drink water containing xylenes in excess of the MCL over many years could experience damage to their nervous system.”

(G) Radioactive Contaminants.

1. Beta/photon emitters. “Certain minerals are radioactive and may emit forms of radiation known as photons and beta radiation. Some people who drink water containing beta and photon emitters in excess of the MCL over many years may have an increased risk of getting cancer.”

2. Alpha emitters (Gross alpha). “Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer.”

3. Combined radium (226 & 228). “Some people who drink water containing radium 226 or 228 in excess of the MCL over many years may have an increased risk of getting cancer.”

4. Uranium. “Some people who drink water containing uranium in excess of the MCL over many years may have an increased risk of getting cancer and kidney toxicity.”

(H) Disinfection Byproducts, Byproduct Precursors, and Disinfectant Residuals.

1. Total trihalomethanes (TTHMs). “Some people who drink water containing trihalomethanes in excess of the MCL over



many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer.”

2. Haloacetic Acids (HAA). “Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.”

3. Bromate. “Some people who drink water containing bromate in excess of the MCL over many years may have an increased risk of getting cancer.”

4. Chlorite. “Some infants and young children who drink water containing chlorite in excess of the MCL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorite in excess of the MCL. Some people may experience anemia.”

5. Chlorine. “Some people who use drinking water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach discomfort.”

6. Chloramines. “Some people who use drinking water containing chloramines well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chloramines well in excess of the MRDL could experience stomach discomfort or anemia.”

7. Chlorine dioxide.

A. Where any two (2) consecutive daily samples taken at the entrance to the distribution system are above the MRDL. “Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia. The chlorine dioxide violations reported today are the result of exceedances at the treatment facility only, not within the distribution system which delivers water to consumers. Continued compliance with chlorine dioxide levels within the distribution system minimizes the potential risk of these violations to consumers.”

B. Where one (1) or more distribution system samples are above the MRDL. “Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia. The

chlorine dioxide violations reported today include exceedances of the EPA standard within the distribution system which delivers water to consumers. Violations of the chlorine dioxide standard within the distribution system may harm human health based on short-term exposures. Certain groups, including fetuses, infants, and young children, may be especially susceptible to nervous system effects from excessive chlorine dioxide exposure.”

8. DBP precursors (TOC). “Total organic carbon (TOC) has no health effects. However, total organic carbon provides a medium for the formation of disinfection byproducts. These byproducts include trihalomethanes (THMs) and haloacetic acids (HAAs). Drinking water containing these byproducts in excess of the MCL may lead to adverse health effects, liver or kidney problems, or nervous system effects, and may lead to an increased risk of getting cancer.”

(I) Other Treatment Techniques.

1. Acrylamide. “Some people who drink water containing high levels of acrylamide over a long period of time could have problems with their nervous system or blood, and may have an increased risk of getting cancer.”

2. Epichlorohydrin. “Some people who drink water containing high levels of epichlorohydrin over a long period of time could experience stomach problems, and may have an increased risk of getting cancer.”

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10 CSR 60-8.020 Public Notice Requirements Pertaining to Lead
(Rescinded October 30, 1996)

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10 CSR 60-8.030 Consumer Confidence Reports

PURPOSE: This rule establishes the minimum requirements for the content of annual reports that community water systems must deliver to their customers. These reports must contain information on the quality of the water delivered by the systems and characterize the risks (if any) from exposure to contaminants detected in the drinking water in an accurate and understandable manner.

(1) Applicability, Definitions, and General Requirements.

(A) This rule applies only to community water systems.

(B) The definitions in 10 CSR 60-2.015 apply to this rule with the following exceptions:

1. For the purpose of this rule, customers are defined as billing units or service connections to which water is delivered by a community water system; and

2. For the purpose of this rule, detected means at or above the levels prescribed by 10 CSR 60-5.010(8) for organic, inorganic, and radioactive contaminants and disinfection byproducts.

(C) Each existing community water system must deliver its report to customers by July 1 annually. The report must contain data collected during, or prior to, the previous calendar year as prescribed in paragraph (2)(D)3. of this rule.

(D) A new community water system must deliver its first report to customers by July 1 of the year after its first full calendar year in operation and annually thereafter.

(E) A community water system that sells water to another community water system must deliver to the purchasing water system the information required in subsection (2)(B), and any information required in subsections (2)(D) through (2)(G) of this rule for monitoring conducted at the source or entrypoint to the distribution system. The required information from the seller must be provided no later than April 1 annually or on a date mutually agreed upon by the seller and the purchaser that is documented in writing and signed by both parties.

(2) Content of the Reports.

(A) Each community water system must provide to its customers an annual report that contains the information specified in section (2) and section (3) of this rule.



(B) Information on the source of the water delivered—

1. Each report must identify the source(s) of the water delivered by the community water system by providing information on—

A. The type of the water: e.g., surface water, ground water;

B. The commonly used name (if any) and location of the body (or bodies) of water; and

C. If a source water assessment has been completed, the report must notify consumers of the availability of this information and the means to obtain it, and also include a brief summary of the system's susceptibility to potential sources of contamination, using language provided in the source water assessment or written by the operator. If no source water assessment has been completed, systems are encouraged to highlight in the report significant sources of contamination in the source water area if they have readily available information.

2. *Reserved*

(C) Definitions.

1. Each report must include the following definitions:

A. Maximum contaminant level goal or MCLG—The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety; and

B. Maximum contaminant level or MCL—The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

2. A report for a community water system operating under a variance or an exemption issued under 10 CSR 60-6.010 or 10 CSR 60-6.020 must include the following definition—Variances and exemptions—State permission not to meet an MCL or a treatment technique under certain conditions.

3. A report that contains data on a contaminant that the department regulates using the following terms must use the following definitions as applicable:

A. Treatment technique—A required process intended to reduce the level of a contaminant in drinking water;

B. Action level—The concentration of a contaminant which, if exceeded, triggers treatment or other requirements with which a water system must comply;

C. Maximum residual disinfectant level goal or MRDLG—The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants; and

D. Maximum residual disinfectant

level or MRDL—The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

(D) Information on Detected Contaminants.

1. Subsection (2)(D) specifies the requirements for information to be included in each report for contaminants subject to mandatory monitoring (except *Cryptosporidium*). It applies to—

A. Contaminants subject to an MCL, action level, maximum residual disinfectant level, or treatment technique (regulated contaminants);

B. Contaminants for which monitoring is required by 10 CSR 60-4.110 (unregulated contaminants); and

C. Disinfection by-products or microbial contaminants for which monitoring is required by 40 CFR 141.142 and 141.143, except as provided under paragraph (2)(E)1. of this rule, and which are detected in the finished water.

2. The data relating to these contaminants must be displayed in one (1) table or in several adjacent tables. Any additional monitoring results which a community water system chooses to include in its report must be displayed separately.

3. The data must be derived from data collected to comply with the Environmental Protection Agency and department monitoring and analytical requirements during the previous calendar year except that—

A. Where a system is allowed to monitor for regulated contaminants less often than once a year, the table(s) must include the date and results of the most recent sampling and the report must include a brief statement indicating that the data presented in the report are from the most recent testing done in accordance with the regulations. The system may use the following language or similar language for their statement: "The state has reduced monitoring requirements for certain contaminants to less often than once per year because the concentrations of these contaminants are not expected to vary significantly from year-to-year. Some of our data (e.g., for organic contaminants), though representative, is more than one (1) year old." No data older than five (5) years need be included.

B. Results of monitoring in compliance with 40 CFR 141.142 and 141.143 need only be included for five (5) years from the date of last sample or until any of the detected contaminants becomes regulated and subject to routine monitoring requirements, whichever comes first.

4. For detected regulated contaminants (listed in Appendix A, included herein), the table(s) must contain—

A. The MCL for that contaminant expressed as a number equal to or greater than 1.0 (as provided in Appendix A, included herein);

B. The MCLG for that contaminant expressed in the same units as the MCL;

C. If there is no MCL for a detected contaminant, the table must indicate that there is a treatment technique, or specify the action level applicable to that contaminant, and the report must include the definitions for treatment technique and/or action level, as appropriate, specified in paragraph (2)(C)3. of this rule;

D. For contaminants subject to an MCL, except turbidity and total coliforms, the highest contaminant level used to determine compliance with 10 CSR 60-4.030; 10 CSR 60-4.040; 10 CSR 60-4.060; 10 CSR 60-4.090; 10 CSR 60-4.100 and the range of detected levels, as follows (when rounding of results to determine compliance with the MCL is allowed by the regulations, rounding should be done prior to multiplying the results by the factor listed in Appendix A, included herein):

(I) When compliance with the MCL is determined annually or less frequently—the highest detected level at any sampling point and the range of detected levels expressed in the same units as the MCL;

(II) When compliance with the MCL is determined by calculating a running annual average of all samples taken at a monitoring location—the highest average of any of the monitoring locations and the range of all monitoring locations expressed in the same units as the MCL. For the MCLs for total trihalomethanes (TTHM) and haloacetic acids 5 (HAA5) in 10 CSR 60-4.090(1)(D), systems must include the highest locational running annual average for TTHM and HAA5 and the range of individual sample results for all monitoring locations expressed in the same units as the MCL. If more than one (1) location exceeds the TTHM or HAA5 MCL, the system must include the locational running annual averages for all locations that exceed the MCL; and

(III) When compliance with the MCL is determined on a system-wide basis by calculating a running annual average of all samples at all monitoring locations—the average and range of detection expressed in the same units as the MCL. The system is required to include individual sample results for the Initial Distribution System Evaluation (IDSE) conducted under 10 CSR 60-4.092 when determining the range of TTHM and HAA5 results to be reported in the annual consumer confidence report for the calendar year that the IDSE samples were taken;



E. For turbidity, the highest single measurement and the lowest monthly percentage of samples meeting the turbidity limits specified in 10 CSR 60-4.050.

(I) The report should include an explanation of the reasons for measuring turbidity, such as: "Turbidity is a measure of the cloudiness of water. We monitor turbidity because it is a good indicator of the effectiveness of our filtration system."

(II) If an explanation of the reasons for measuring turbidity is included, it does not have to be included in the table but may be added as a footnote or narrative associated with the table;

F. For lead and copper, the ninetieth percentile value of the most recent round of sampling, the number of sampling sites exceeding the action level in that round, and the most recent source water results;

G. For total coliform.

(I) The highest monthly number of positive compliance samples for systems collecting fewer than forty (40) samples per month; or

(II) The highest monthly percentage of positive compliance samples for systems collecting at least forty (40) samples per month;

H. For fecal coliform or *E. coli*, the total number of positive compliance samples; and

I. The likely source(s) of detected regulated contaminants to the best of the operator's knowledge. Specific information regarding contaminants may be available in sanitary surveys and source water assessments, and should be used when available to the operator. If the operator lacks specific information on the likely source, the report must include one (1) or more of the typical sources for that contaminant which are most applicable to the system. The typical sources for a given contaminant are listed in Appendix B, included herein.

5. If a community water system distributes water to its customers from multiple hydraulically independent distribution systems that are fed by different raw water sources, the table should contain a separate column for each service area and the report should identify each separate distribution system. Alternatively, systems could produce separate reports tailored to include data for each service area.

6. The table(s) must clearly identify any data indicating violations of MCLs or treatment techniques and the report must contain a clear and readily understandable explanation of the violation including: the length of the violation, the potential adverse health effects, and actions taken by the system to address the violation. To describe the potential health effects, the system must use the

relevant language of Appendix C, included herein.

7. For detected unregulated contaminants for which monitoring is required (except *Cryptosporidium*), the table(s) must contain the average and range at which the contaminant was detected. When detects of unregulated contaminants are reported, the report may include a brief explanation of the reasons for monitoring for unregulated contaminants using language such as: "Unregulated contaminants are those for which EPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to assist EPA in determining the occurrence of unregulated contaminants in drinking water and whether future regulation is warranted. Information on all the contaminants that were monitored for, whether regulated or unregulated, can be obtained from this water system or the Department of Natural Resources."

(E) Information on *Cryptosporidium*, Radon, and other Contaminants.

1. If the system has performed any monitoring for *Cryptosporidium*, including monitoring performed to satisfy the requirements of 40 CFR 141.143, which indicates that *Cryptosporidium* may be present in the source water or the finished water, the report must include:

A. A summary of the results of the monitoring; and

B. An explanation of the significance of the results. The system may use the following language or similar language for the explanation: "*Cryptosporidium* is a microbial parasite which is found in surface water throughout the U.S. Although *Cryptosporidium* can be removed by filtration, the most commonly used filtration methods can not guarantee one hundred percent (100%) removal. Monitoring of our source water and/or finished water indicates the presence of these organisms. Current test methods do not enable us to determine if these organisms are dead or if they are capable of causing disease. Symptoms of infection include nausea, diarrhea, and abdominal cramps. Most healthy individuals are able to overcome the disease within a few weeks. However, immuno-compromised people have more difficulty and are at greater risk of developing severe, life threatening illness. Immuno-compromised individuals are encouraged to consult their doctor regarding appropriate precautions to take to prevent infection. *Cryptosporidium* must be ingested for it to cause disease, and may be passed through other means than drinking water."

2. If the system has performed any monitoring for radon which indicates that radon may be present in the finished water, the report must include:

A. The results of the monitoring; and

B. An explanation of the significance of the results. The system may use the following language or similar language for the explanation: "Radon is a naturally occurring gas present in some ground water. It poses a lung cancer risk when the radon gas is released from water into air (as occurs during showering, bathing, or washing dishes or clothes), and a stomach cancer risk when you drink water containing radon. Radon gas released from drinking water is a relatively small part of the total radon in air. Other sources of radon gas are soils which enter homes through foundations, and radon inhaled directly while smoking cigarettes. Experts are not sure exactly what the cancer risk is from a given level of radon in your drinking water. If you are concerned about radon in your home, test kits are available to determine the total exposure level."

3. If the system has performed additional monitoring which indicates the presence of other contaminants in the finished water, systems are encouraged to report any results which may indicate a health concern. To determine if results may indicate a health concern, the department recommends that systems find out if the Environmental Protection Agency has proposed a National Primary Drinking Water Regulation or issued a health advisory for that contaminant by calling the Safe Drinking Water Hotline (800-426-4791). Detects above a proposed MCL or health advisory level may indicate possible health concerns. For such contaminants, the department recommends that the report include:

A. The results of the monitoring; and

B. An explanation of the significance of the results noting the existence of a health advisory or a proposed regulation.

(F) Compliance with Department Regulations. In addition to the requirements of paragraph (2)(D)6., the report must note any violation that occurred during the year covered by the report of a requirement listed below, and include a clear and readily understandable explanation of the violation, any potential adverse health effects, and the steps the system has taken to correct the violation.

1. Monitoring and reporting of compliance data.

2. Filtration and disinfection prescribed by 10 CSR 60-4.055. For systems which have failed to install adequate filtration or disinfection equipment or processes, or have had a failure of such equipment or processes which constitutes a violation, the report must include the following language as part of the explanation of potential adverse health effects: "Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites



which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.”

3. Lead and copper control requirements prescribed by 10 CSR 60-15. For systems which fail to take one (1) or more actions prescribed by 10 CSR 60-15.010(4), 10 CSR 60-15.020, 10 CSR 60-15.030, 10 CSR 60-15.040, or 10 CSR 60-15.050, the report must include the applicable language of Appendix C to this rule for lead, copper, or both.

4. Treatment techniques for Acrylamide and Epichlorohydrin prescribed by 10 CSR 60-4.040(9). For systems which violate the requirements of 10 CSR 60-4.040(9), the report must include the relevant language from Appendix C to this rule.

5. Record keeping of compliance data.

6. Special monitoring requirements prescribed by 10 CSR 60-4.110.

7. Violation of the terms of a variance, an exemption, or an administrative or judicial order.

(G) Variances and Exemptions. If a system is operating under the terms of a variance or an exemption issued under 10 CSR 60-6.010 or 10 CSR 60-6.020, the report must contain—

1. An explanation of the reasons for the variance or exemption;

2. The date on which the variance or exemption was issued;

3. A brief status report on the steps the system is taking to install treatment, find alternative sources of water, or otherwise comply with the terms and schedules of the variance or exemption; and

4. A notice of any opportunity for public input in the review, or renewal, of the variance or exemption.

(H) Additional Information.

1. The report must contain a brief explanation regarding contaminants which may reasonably be expected to be found in drinking water, including bottled water. The report must include the language of subparagraph (2)(H)1.A. of this rule. This explanation must also include the information contained in subparagraphs (2)(H)1.B.–D. of this rule using this language or comparable language.

A. “Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency’s Safe Drinking Water Hotline (800-426-4791).”

B. “The sources of drinking water, (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the

surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.”

C. “Contaminants that may be present in source water include:

(I) Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

(II) Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

(III) Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.

(IV) Organic chemical contaminants, including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.

(V) Radioactive contaminants, which can be naturally-occurring or be the result of oil and gas production and mining activities.”

D. “In order to ensure that tap water is safe to drink, the Department of Natural Resources prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. Department of Health regulations establish limits for contaminants in bottled water which must provide the same protection for public health.”

2. The report must include the telephone number of the owner, operator, or designee of the community water system as a source of additional information concerning the report.

3. In communities with a large proportion of non-English speaking residents, as determined by the department, the report must contain information in the appropriate language(s) regarding the importance of the report. The report may use a notice based on the following wording: “This report contains very important information about your drinking water. Translate it or speak with someone who understands it.” The report may also contain a telephone number or address where such residents may contact the system to obtain a translated copy of the report or assistance in the appropriate language.

4. The report must include information (e.g., time and place of regularly scheduled board meetings) about opportunities for public participation in decisions that may affect the quality of the water.

5. The systems may include such additional information as they deem necessary for public education consistent with, and not detracting from, the purpose of the report.

(3) Required Additional Health Information.

(A) All reports must prominently display the following language: “Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their healthcare providers. Environmental Protection Agency/Centers for Disease Control guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (800-426-4791).”

(B) Arsenic.

1. A system that detects arsenic at levels above 0.005 mg/l and up to and including 0.01 mg/l must include in its report a short informational statement about arsenic, using language such as: “While your drinking water meets EPA’s standard for arsenic, it does contain low levels of arsenic. EPA’s standard balances the current understanding of arsenic’s possible health effects against the costs of removing arsenic from drinking water. EPA continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.” The system may write its own educational statement, but only in consultation with the department.

2. Beginning in the report due by July 1, 2002, and ending January 22, 2006, a community water system that detects arsenic above 0.01 mg/L and up to and including 0.05 mg/L must include the arsenic health effects language prescribed by Appendix C of this rule.

(C) A system which detects nitrate at levels above five milligrams per liter (5 mg/l), but below the MCL:

1. Must include a short informational statement about the impacts of nitrate on children using language such as: “Nitrate in drinking water at levels above 10 ppm is a health risk for infants of less than six months of age. High nitrate levels in drinking water can cause blue-baby syndrome. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. If you are caring for an infant you should ask advice from your health care provider.”



2. May write its own educational statement, but only in consultation with the department.

(D) Systems which detect lead above the action level in more than five percent (5%), and up to and including ten percent (10%), of homes sampled:

1. Must include a short informational statement about the special impact of lead on children using language such as: "Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water, you may wish to have your water tested and flush your tap for 30 seconds to 2 minutes before using tap water. Additional information is available from the Safe Drinking Water Hotline (800-426-4791)."

2. May write its own educational statement, but only in consultation with the department.

(E) Community water systems that detect total trihalomethanes (TTHM) above 0.080 mg/l, but below the MCL in 10 CSR 60-4.090, as an annual average, monitored and calculated under the provisions of 10 CSR 60-4.090, must include health effects language prescribed by paragraph (73) of Appendix C.

(4) Report Delivery and Record Keeping.

(A) Systems serving ten thousand (10,000) or more persons must mail or otherwise directly deliver one (1) copy of the report to each customer annually.

(B) Systems serving greater than five hundred (500) persons but fewer than ten thousand (10,000) persons must use one (1) of the following options:

1. Mail or otherwise directly deliver one (1) copy of the report to each customer annually; or

2. All of the following (Systems choosing this option must notify customers that the report will not be mailed. This notification must be published in the newspaper(s) in which the reports are published and provided with any other notification method that is used)—

A. Publish the report at least once annually in one (1) or more local newspaper(s) of general circulation, as defined in section 493.050, RSMo, serving the area in which the system is located;

B. Provide notice to their customers at least once per year by mail, or door-to-door delivery, or by continuous posting in appropriate locations that the report is available upon request; and

C. Post the report continuously at the

local water system office, the city/county/regional public library, and other public buildings within the water system service area.

(C) Systems serving five hundred (500) or fewer persons must use one (1) of the options:

1. Use the method in paragraph (4)(B)1.;

2. Use the method in paragraph (4)(B)2.; or

3. Provide notice at least once per year to their customers by mail, or door-to-door delivery, or by continuous posting in appropriate locations that the report is available upon request; and post the report continuously at the local water system office and the city/county/regional public library.

(D) Each community water system must make its reports available to the public upon request.

(E) In addition to the delivery requirement in subsection (4)(A) of this rule, each community water system serving one hundred thousand (100,000) or more persons must post its current year's report to a publicly-accessible site on the Internet. Other water systems with access to a publicly-accessible Internet site are encouraged to use the Internet as an additional method of distribution.

(F) The system must make a good faith effort to reach consumers who do not get water bills, using means recommended by the department. The department expects that an adequate good faith effort will be tailored to the consumers who are served by the system but are not bill-paying customers, such as renters or workers. A good faith effort to reach consumers would include a mix of methods appropriate to the particular system such as: Posting the reports on the Internet; mailing to postal patrons in metropolitan areas; advertising the availability of the report in the news media; publication in a local newspaper; posting in libraries or other public places such as cafeterias or lunch rooms of public buildings; delivery of multiple copies for distribution by single-biller customers such as apartment buildings or private employers; delivery to community organizations.

(G) No later than the date the system is required to distribute the report to its customers, each community water system must mail a copy of the report to the department, followed within three (3) months by a certification, on a form provided by the department, that the report has been distributed to customers, and that the information is correct and consistent with the compliance monitoring data previously submitted to the department.

(H) No later than the date the system is required to distribute the report to its cus-

tomers, each community water system must deliver the report to any other agency or clearinghouse identified by the department.

(I) Any system subject to this rule must retain copies of its consumer confidence report for no less than three (3) years.



Appendix A to 10 CSR 60-8.030
Converting MCL Compliance Values for Consumer Confidence Reports

Key

AL = Action Level
MCL = Maximum Contaminant Level
MCLG = Maximum Contaminant Level Goal
MFL = million fibers per liter
mrem/year = millirems per year (a measure of radiation absorbed by the body)

NTU = Nephelometric Turbidity Units
pCi/l = picocuries per liter (a measure of radioactivity)
ppm = parts per million, or milligrams per liter (mg/l)
ppb = parts per billion, or micrograms per liter ($\mu\text{g/l}$)
ppt = parts per trillion, or nanograms per liter
ppq = parts per quadrillion, or picograms per liter
TT = Treatment Technique

Contaminant	MCL in compliance units (mg/l)	multiply by	MCL in CCR units	MCLG in CCR units
Microbiological Contaminants				
1. Total Coliform Bacteria	(Systems that collect 40 or more samples per month) $\geq 5\%$ of monthly samples are positive; (systems that collect fewer than 40 samples per month) 1 positive monthly sample.		(Systems that collect 40 or more samples per month) $\geq 5\%$ of monthly samples are positive; (systems that collect fewer than 40 samples per month) 1 positive monthly sample.	0
2. Fecal coliform and <i>E. coli</i>	0		A routine sample and a repeat sample are total coliform positive, and one is also fecal coliform or <i>E. coli</i> positive.	0
3. Total organic carbon (ppm)	TT		TT	n/a
4. Turbidity	TT		TT (NTU)	n/a
Radioactive Contaminants				
5. Beta/photon emitters	4 mrem/yr		4 mrem/yr	0
6. Alpha emitters	15 pCi/l		15 pCi/l	0
7. Combined radium	5 pCi/l		5 pCi/l	0
8. Uranium (pCi/l)	$30\mu\text{g/l}$		30	0
Inorganic Contaminants				
9. Antimony	.006	1000	6 ppb	6
10. Arsenic	0.05* 0.010**	1000	50 ppb* 10 ppb**	n/a* 0**
*These arsenic values are effective until Jan. 23, 2006. **These arsenic values are effective Jan. 23, 2006.				
11. Asbestos	7 MFL		7 MFL	7
12. Barium	2		2 ppm	2
13. Beryllium	0.004	1000	4 ppb	4
14. Bromate (ppb)	0.010	1000	10	0
15. Cadmium	0.005	1000	5 ppb	5
16. Chloramines (ppm)	MRDL = 4		MRDL = 4	4
17. Chlorine (ppm)	MRDL = 4		MRDL = 4	4
18. Chlorine dioxide (ppb)	MRDL = .8	1000	MRDL = .8	800
19. Chlorite (ppm)	1		1	0.8
20. Chromium	0.1	1000	100 ppb	100
21. Copper	AL = 1.3		AL = 1.3 ppm	1.3
22. Cyanide	0.2	1000	200 ppb	200
23. Fluoride	4		4 ppm	4
24. Lead	AL = .015	1000	AL = 15 ppb	0
25. Mercury (inorganic)	0.002	1000	2 ppb	2
26. Nitrate (as Nitrogen)	10		10 ppm	10
27. Nitrite (as Nitrogen)	1		1 ppm	1
28. Selenium	0.05	1000	50 ppb	50
29. Thallium	0.002	1000	2 ppb	0.5



Synthetic Organic Contaminants Including Pesticides and Herbicides				
30. 2,4-D	0.07	1000	70 ppb	70
31. 2,4,5-TP [Silvex]	0.05	1000	50 ppb	50
32. Acrylamide			TT	0
33. Alachlor	0.002	1000	2 ppb	0
34. Atrazine	0.003	1000	3 ppb	3
35. Benzo(a)pyrene [PAH]	0.0002	1,000,000	200 ppt	0
36. Carbofuran	0.04	1000	40 ppb	40
37. Chlordane	0.002	1000	2 ppb	0
38. Dalapon	0.2	1000	200 ppb	200
39. Di(2-ethylhexyl)adipate	0.4	1000	400 ppb	400
40. Di(2-ethylhexyl)phthalate	0.006	1000	6 ppb	0
41. Dibromochloropropane	0.0002	1,000,000	200 ppt	0
42. Dinoseb	0.007	1000	7 ppb	7
43. Diquat	0.02	1000	20 ppb	20
44. Dioxin [2,3,7,8-TCDD]	0.00000003	1,000,000,000	30 ppq	0
45. Endothall	0.1	1000	100 ppb	100
46. Endrin	0.002	1000	2 ppb	2
47. Epichlorohydrin	TT		TT	0
48. Ethylene dibromide	0.00005	1,000,000	50 ppt	0
49. Glyphosate	0.7	1000	700 ppb	700
50. Heptachlor	0.0004	1,000,000	400 ppt	0
51. Heptachlor epoxide	0.0002	1,000,000	200 ppt	0
52. Hexachlorobenzene	0.001	1000	1 ppb	0
53. Hexachloro-cyclopentadiene	0.05	1000	50 ppb	50
54. Lindane	0.0002	1,000,000	200 ppt	200
55. Methoxychlor	0.04	1000	40 ppb	40
56. Oxamyl [Vydate]	0.2	1000	200 ppb	200
57. PCBs [Polychlorinated biphenyls]	0.0005	1,000,000	500 ppt	0
58. Pentachlorophenol	0.001	1000	1 ppb	0
59. Picloram	0.5	1000	500 ppb	500
60. Simazine	0.004	1000	4 ppb	4
61. Toxaphene	0.003	1000	3 ppb	0
Volatile Organic Contaminants				
62. Benzene	0.005	1000	5 ppb	0
63. Carbon tetrachloride	0.005	1000	5 ppb	0
64. Chlorobenzene	0.1	1000	100 ppb	100
65. o-Dichlorobenzene	0.6	1000	600 ppb	600
66. p-Dichlorobenzene	0.075	1000	75 ppb	75
67. 1,2-Dichloroethane	0.005	1000	5 ppb	0
68. 1,1-Dichloroethylene	0.007	1000	7 ppb	7
69. cis-1,2-Dichloroethylene	0.07	1000	70 ppb	70
70. trans-1,2-Dichloroethylene	0.1	1000	100 ppb	100
71. Dichloromethane	0.005	1000	5 ppb	0
72. 1,2-Dichloropropane	0.005	1000	5 ppb	0
73. Ethylbenzene	0.7	1000	700 ppb	700
74. Haloacetic Acids (HAA) (ppb)	0.060	1000	60	n/a
75. Styrene	0.1	1000	100 ppb	100
76. Tetrachloroethylene	0.005	1000	5 ppb	0
77. 1,2,4-Trichlorobenzene	0.07	1000	70 ppb	70
78. 1,1,1-Trichloroethane	0.2	1000	200 ppb	200
79. 1,1,2-Trichloroethane	0.005	1000	5 ppb	3
80. Trichloroethylene	0.005	1000	5 ppb	0



81. TTHMs [Total trihalomethanes]	0.10/.080	1000	100/80 ppb	n/a
82. Toluene	1		1 ppm	1
83. Vinyl Chloride	0.002	1000	2 ppb	0
84. Xylenes	10		10 ppm	10

**Appendix B to 10 CSR 60-8.030
Regulated Contaminants**

Key

AL=Action Level
MCL=Maximum Contaminant Level
MCLG=Maximum Contaminant Goal
MFL=million fibers per liter
mrem/year=millirems per year (a measure of radiation absorbed by the body)

NTU=Nephelometric Turbidity Units
pCi/l=picocuries per liter (a measure of radioactivity)
ppm=parts per million, or milligrams per liter (mg/l)
ppb=parts per billion, or micrograms per liter ($\mu\text{g/l}$)
ppt=parts per trillion, or nanograms per liter
ppq=parts per quadrillion, or picograms per liter
TT=Treatment Technique

Contaminant (units)	MCLG	MCL	Major sources in drinking water
Microbiological Contaminants			
1. Total Coliform Bacteria	0	(Systems that collect 40 or more samples per month) $\geq 5\%$ of monthly samples are positive; (systems that collect fewer than 40 samples per month) 1 positive monthly sample.	Naturally present in the environment.
2. Fecal coliform and <i>E. coli</i>	0	A routine sample and a repeat sample are total coliform positive, and one is also fecal coliform or <i>E. coli</i> positive.	Human and animal fecal waste.
3. Total organic carbon (ppm)	n/a	TT	Naturally present in the environment.
4. Turbidity	n/a	TT	Soil runoff.
Radioactive Contaminants			
5. Beta/photon emitters (mrem/yr)	0	4	Decay of natural and man-made deposits.
6. Alpha emitters (pCi/l)	0	15	Erosion of natural deposits.
7. Combined radium (pCi/l)	0	5	Erosion of natural deposits.
8. Uranium	0	30	Erosion of natural deposits.
Inorganic Contaminants			
9. Antimony (ppb)	6	6	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder.
10. Arsenic (ppb)	n/a ¹ 0 ²	50 ¹ 10 ²	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes.
¹ These arsenic values are effective until Jan. 23, 2006. ² These arsenic values are effective Jan. 23, 2006.			
11. Asbestos (MFL)	7	7	Decay of asbestos cement water mains; Erosion of natural deposits.



12. Barium (ppm)	2	2	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits.
13. Beryllium (ppb)	4	4	Discharge from metal refineries and coal-burning factories; Discharge from electrical, aerospace, and defense industries.
14. Bromate (ppb)	0	10	By-product of drinking water disinfection.
15. Cadmium (ppb)	5	5	Corrosion of galvanized pipes; Erosion of natural deposits; Discharge from metal refineries; Runoff from waste batteries and paints.
16. Chloramines (ppm)	MRDLG=4	MRDL=4	Water additive used to control microbes.
17. Chlorine (ppm)	MRDL=4	MRDL=4	Water additive used to control microbes
18. Chlorine dioxide (ppb)	MRDLG=800	MRDL=800	Water additive used to control microbes
19. Chlorite (ppm)	0.8	1	By-product of drinking water disinfection.
20. Chromium (ppb)	100	100	Discharge from steel and pulp mills; Erosion of natural deposits.
21. Copper (ppm)	1.3	AL=1.3	Corrosion of household plumbing systems; Erosion of natural deposits.
22. Cyanide (ppb)	200	200	Discharge from steel/metal factories; Discharge from plastic and fertilizer factories.
23. Fluoride (ppm)	4	4	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories.
24. Lead (ppb)	0	AL=15	Corrosion of household plumbing systems; Erosion of natural deposits.
25. Mercury [inorganic] (ppb)	2	2	Erosion of natural deposits; Discharge from refineries and factories; Runoff from landfills; Runoff from cropland.
26. Nitrate [as Nitrogen] (ppm)	10	10	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.
27. Nitrite [as Nitrogen] (ppm)	1	1	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.
28. Selenium (ppb)	50	50	Discharge from petroleum and metal refineries; Erosion of natural deposits; Discharge from mines.
29. Thallium (ppb)	0.5	2	Leaching from ore-processing sites; Discharge from electronics, glass, and drug factories.
Synthetic Organic Contaminants Including Pesticides and Herbicides			
30. 2,4-D (ppb)	70	70	Runoff from herbicide used on row crops.
31. 2,4,5-TP [Silvex] (ppb)	50	50	Residue of banned herbicide.
32. Acrylamide	0	TT	Added to water during sewage/wastewater treatment.
33. Alachlor (ppb)	0	2	Runoff from herbicide used on row crops.
34. Atrazine (ppb)	3	3	Runoff from herbicide used on row crops.
35. Benzo(a)pyrene [PAH] (nanograms/l)	0	200	Leaching from linings of water storage tanks and distribution lines.
36. Carbofuran (ppb)	40	40	Leaching of soil fumigant used on rice and alfalfa.
37. Chlordane (ppb)	0	2	Residue of banned termiticide.
38. Dalapon (ppb)	200	200	Runoff from herbicide used on rights of way.
39. Di(2-ethylhexyl)adipate (ppb)	400	400	Discharge from chemical factories.
40. Di(2-ethylhexyl)phthalate (ppb)	0	6	Discharge from rubber and chemical factories.
41. Dibromochloropropane (ppt)	0	200	Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards.
42. Dinoseb (ppb)	7	7	Runoff from herbicide used on soybeans and vegetables.



43. Diquat (ppb)	20	20	Runoff from herbicide use.
44. Dioxin [2,3,7,8-TCDD] (ppq)	0	30	Emissions from waste incineration and other combustion; Discharge from chemical factories.
45. Endothall (ppb)	100	100	Runoff from herbicide use.
46. Endrin (ppb)	2	2	Residue of banned insecticide.
47. Epichlorohydrin	0	TT	Discharge from industrial chemical factories; An impurity of some water treatment chemicals.
48. Ethylene dibromide (ppt)	0	50	Discharge from petroleum refineries.
49. Glyphosate (ppb)	700	700	Runoff from herbicide use.
50. Heptachlor (ppt)	0	400	Residue of banned termiticide.
51. Heptachlor epoxide (ppt)	0	200	Breakdown of heptachlor.
52. Hexachlorobenzene (ppb)	0	1	Discharge from metal refineries and agricultural chemical factories.
53. Hexachlorocyclopentadiene (ppb)	50	50	Discharge from chemical factories.
54. Lindane (ppt)	200	200	Runoff/leaching from insecticide used on cattle, lumber, gardens.
55. Methoxychlor (ppb)	40	40	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, and livestock.
56. Oxamyl [Vydate](ppb)	200	200	Runoff/leaching from insecticide used on apples, potatoes and tomatoes.
57. PCBs [Polychlorinated biphenyls] (ppt)	0	500	Runoff from landfills; Discharge of waste chemicals.
58. Pentachlorophenol (ppb)	0	1	Discharge from wood preserving factories.
59. Picloram (ppb)	500	500	Herbicide runoff.
60. Simazine (ppb)	4	4	Herbicide runoff.
61. Toxaphene (ppb)	0	3	Runoff/leaching from insecticide used on cotton and cattle.
Volatile Organic Contaminants			
62. Benzene (ppb)	0	5	Discharge from factories; Leaching from gas storage tanks and landfills.
63. Carbon tetrachloride (ppb)	0	5	Discharge from chemical plants and other industrial activities.
64. Chlorobenzene (ppb)	100	100	Discharge from chemical and agricultural chemical factories.
65. o-Dichlorobenzene (ppb)	600	600	Discharge from industrial chemical factories.
66. p-Dichlorobenzene (ppb)	75	75	Discharge from industrial chemical factories.
67. 1,2-Dichloroethane (ppb)	0	5	Discharge from industrial chemical factories.
68. 1,1-Dichloroethylene (ppb)	7	7	Discharge from industrial chemical factories.
69. cis-1,2-Dichloroethylene (ppb)	70	70	Discharge from industrial chemical factories.
70. trans-1,2-Dichloroethylene (ppb)	100	100	Discharge from industrial chemical factories.
71. Dichloromethane (ppb)	0	5	Discharge from pharmaceutical and chemical factories.
72. 1,2-Dichloropropane (ppb)	0	5	Discharge from industrial chemical factories.
73. Ethylbenzene (ppb)	700	700	Discharge from petroleum refineries.
74. Haloacetic Acids (HAA) (ppb)	n/a	60	By-product of drinking water disinfection.
75. Styrene (ppb)	100	100	Discharge from rubber and plastic factories; Leaching from landfills.
76. Tetrachloroethylene (ppb)	0	5	Discharge from factories and dry cleaners.



77. 1,2,4-Trichlorobenzene (ppb)	70	70	Discharge from textile-finishing factories.
78. 1,1,1-Trichloroethane (ppb)	200	200	Discharge from metal degreasing sites and other factories.
79. 1,1,2-Trichloroethane (ppb)	3	5	Discharge from industrial chemical factories.
80. Trichloroethylene (ppb)	0	5	Discharge from metal degreasing sites and other factories.
81. TTHMs [Total trihalomethanes] (ppb)	n/a	100/80	By-product of drinking water disinfection.
82. Toluene (ppm)	1	1	Discharge from petroleum factories.
83. Vinyl Chloride (ppb)	0	2	Leaching from PVC piping; Discharge from plastics factories.
84. Xylenes (ppm)	10	10	Discharge from petroleum factories; Discharge from chemical factories.

**Appendix C to 10 CSR 60-8.030
Health Effects Language**

Microbiological Contaminants

(1) Total Coliform. “Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially-harmful, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems.”

(2) Fecal coliform/*E. coli*. “Fecal coliforms and *E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, and people with severely compromised immune systems.”

(3) Total organic carbon. “Total organic carbon (TOC) has no health effects. However, total organic carbon provides a medium for the formation of disinfection by-products. These by-products include trihalomethanes (THMs) and haloacetic acids (HAAs5). Drinking water containing these byproducts in excess of the MCL may lead to adverse health effects, liver or kidney problems, or nervous system effects, and may lead to an increased risk of getting cancer.”

(4) Turbidity. “Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.”

Radioactive Contaminants

(5) Beta/photon emitters. “Certain minerals are radioactive and may emit forms of radiation known as photons and beta radiation. Some people who drink water containing beta and photon emitters in excess of the MCL over many years may have an increased risk of getting cancer.”

(6) Alpha emitters. “Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer.”

(7) Combined Radium 226/228. “Some people who drink water containing radium 226 or 228 in excess of the MCL over many years may have an increased risk of getting cancer.”

(8) Uranium. “Some people who drink water containing uranium in excess of the MCL over many years may have an increased risk of getting cancer and kidney toxicity.”

Inorganic Contaminants

(9) Antimony. “Some people who drink water containing antimony well in excess of the MCL over many years could experience increases in blood cholesterol and decreases in blood sugar.”

(10) Arsenic. “Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.”

(11) Asbestos. “Some people who drink water containing asbestos in excess of the MCL over many years may have an increased risk of developing benign intestinal polyps.”

(12) Barium. “Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.”

(13) Beryllium. “Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions.”

(14) Bromate. “Some people who drink water containing bromate in excess of the MCL over many years may have an increased risk of getting cancer.”

(15) Cadmium. “Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage.”



(16) Chloramines. “Some people who use water containing chloramines well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chloramines well in excess of the MRDL could experience stomach discomfort or anemia.”

(17) Chlorine. “Some people who use water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach discomfort.”

(18) Chlorine dioxide. “Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia.”

(19) Chlorite. “Some infants and young children who drink water containing chlorite in excess of the MCL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorite in excess of the MCL. Some people may experience anemia.”

(20) Chromium. “Some people who use water containing chromium well in excess of the MCL over many years could experience allergic dermatitis.”

(21) Copper. “Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson’s Disease should consult their personal doctor.”

(22) Cyanide. “Some people who drink water containing cyanide well in excess of the MCL over many years could experience nerve damage or problems with their thyroid.”

(23) Fluoride. “Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Fluoride in drinking water at half the MCL or more may cause mottling of children’s teeth, usually in children less than nine years old. Mottling, also known as dental fluorosis, may include brown staining and/or pitting of the teeth, and occurs only in developing teeth before they erupt from the gums.”

(24) Lead. “Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.”

(25) Mercury (inorganic). “Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage.”

(26) Nitrate. “Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.”

(27) Nitrite. “Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.”

(28) Selenium. “Selenium is an essential nutrient. However, some people who drink water containing selenium in excess of the MCL over many years could experience hair or fingernail losses, numbness in fingers or toes, or problems with their circulation.”

(29) Thallium. “Some people who drink water containing thallium in excess of the MCL over many years could experience hair loss, changes in their blood, or problems with their kidneys, intestines, or liver.”

Synthetic Organic Contaminants Including Pesticides and Herbicides

(30) 2,4-D. “Some people who drink water containing the weed killer 2,4-D well in excess of the MCL over many years could experience problems with their kidneys, liver, or adrenal glands.”

(31) 2,4,5-TP (Silvex). “Some people who drink water containing silvex in excess of the MCL over many years could experience liver problems.”

(32) Acrylamide. “Some people who drink water containing high levels of acrylamide over a long period of time could have problems with their nervous system or blood, and may have an increased risk of getting cancer.”

(33) Alachlor. “Some people who drink water containing alachlor in excess of the MCL over many years could have problems with their eyes, liver, kidneys, or spleen, or experience anemia, and may have an increased risk of getting cancer.”

(34) Atrazine. “Some people who drink water containing atrazine well in excess of the MCL over many years could experience problems with their cardiovascular system or reproductive difficulties.”

(35) Benzo(a)pyrene (PAH). “Some people who drink water containing benzo(a)pyrene in excess of the MCL over many years may experience reproductive difficulties and may have an increased risk of getting cancer.”

(36) Carbofuran. “Some people who drink water containing carbofuran in excess of the MCL over many years could experience problems with their blood, or nervous or reproductive systems.”

(37) Chlordane. “Some people who drink water containing chlordane in excess of the MCL over many years could experience problems with their liver or nervous system, and may have an increased risk of getting cancer.”

(38) Dalapon. “Some people who drink water containing dalapon well in excess of the MCL over many years could experience minor kidney changes.”

(39) Di(2-ethylhexyl)adipate. “Some people who drink water containing di(2-ethylhexyl)adipate well in excess of the MCL over many years could experience toxic effects such as weight loss, liver enlargement, or possible reproductive difficulties.”

(40) Di(2-ethylhexyl)phthalate. “Some people who drink water containing di(2-ethylhexyl)phthalate well in excess of the MCL over many years may have problems with their liver, or experience reproductive difficulties, and may have an increased risk of getting cancer.”

(41) Dibromochloropropane (DBCP). “Some people who drink water containing DBCP in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.”



- (42) Dinoseb. “Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties.”
- (43) Dioxin (2,3,7,8-TCDD). “Some people who drink water containing dioxin in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.”
- (44) Diquat. “Some people who drink water containing diquat in excess of the MCL over many years could get cataracts.”
- (45) Endothall. “Some people who drink water containing endothall in excess of the MCL over many years could experience problems with their stomach or intestines.”
- (46) Endrin. “Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems.”
- (47) Epichlorohydrin. “Some people who drink water containing high levels of epichlorohydrin over a long period of time could experience stomach problems, and may have an increased risk of getting cancer.”
- (48) Ethylene dibromide. “Some people who drink water containing ethylene dibromide in excess of the MCL over many years could experience problems with their liver, stomach, reproductive system, or kidneys, and may have an increased risk of getting cancer.”
- (49) Glyphosate. “Some people who drink water containing glyphosate in excess of the MCL over many years could experience problems with their kidneys or reproductive difficulties.”
- (50) Heptachlor. “Some people who drink water containing heptachlor in excess of the MCL over many years could experience liver damage and may have an increased risk of getting cancer.”
- (51) Heptachlor epoxide. “Some people who drink water containing heptachlor epoxide in excess of the MCL over many years could experience liver damage, and may have an increased risk of getting cancer.”
- (52) Hexachlorobenzene. “Some people who drink water containing hexachlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys, or adverse reproductive effects, and may have an increased risk of getting cancer.”
- (53) Hexachlorocyclopentadiene. “Some people who drink water containing hexachlorocyclopentadiene well in excess of the MCL over many years could experience problems with their kidneys or stomach.”
- (54) Lindane. “Some people who drink water containing lindane in excess of the MCL over many years could experience problems with their kidneys or liver.”
- (55) Methoxychlor. “Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties.”
- (56) Oxamyl (Vydate). “Some people who drink water containing oxamyl in excess of the MCL over many years could experience slight nervous system effects.”
- (57) PCBs (Polychlorinated biphenyls). “Some people who drink water containing PCBs in excess of the MCL over many years could experience changes in their skin, problems with their thymus gland, immune deficiencies, or reproductive or nervous system difficulties, and may have an increased risk of getting cancer.”
- (58) Pentachlorophenol. “Some people who drink water containing pentachlorophenol in excess of the MCL over many years could experience problems with their liver or kidneys, and may have an increased risk of getting cancer.”
- (59) Picloram. “Some people who drink water containing picloram in excess of the MCL over many years could experience problems with their liver.”
- (60) Simazine. “Some people who drink water containing simazine in excess of the MCL over many years could experience problems with their blood.”
- (61) Toxaphene. “Some people who drink water containing toxaphene in excess of the MCL over many years could have problems with their kidneys, liver, or thyroid, and may have an increased risk of getting cancer.”

Volatile Organic Contaminants

- (62) Benzene. “Some people who drink water containing benzene in excess of the MCL over many years could experience anemia or a decrease in blood platelets, and may have an increased risk of getting cancer.”
- (63) Carbon Tetrachloride. “Some people who drink water containing carbon tetrachloride in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.”
- (64) Chlorobenzene. “Some people who drink water containing chlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys.”
- (65) o-Dichlorobenzene. “Some people who drink water containing o-dichlorobenzene well in excess of the MCL over many years could experience problems with their liver, kidneys, or circulatory systems.”
- (66) p-Dichlorobenzene. “Some people who drink water containing p-dichlorobenzene in excess of the MCL over many years could experience anemia, damage to their liver, kidneys, or spleen, or changes in their blood.”
- (67) 1,2-Dichloroethane. “Some people who drink water containing 1,2-dichloroethane in excess of the MCL over many years may have an increased risk of getting cancer.”
- (68) 1,1-Dichloroethylene. “Some people who drink water containing 1,1-dichloroethylene in excess of the MCL over many years could experience problems with their liver.”
- (69) cis-1,2-Dichloroethylene. “Some people who drink water containing cis-1,2-dichloroethylene in excess of the MCL over many years could experience problems with their liver.”
- (70) trans-1,2-Dichloroethylene. “Some people who drink water containing trans-1,2-dichloroethylene well in excess of the MCL over many years could experience problems with their liver.”
- (71) Dichloromethane. “Some people who drink water containing dichloromethane in excess of the MCL over many years could have liver problems and may have an increased risk of getting cancer.”
- (72) 1,2-Dichloropropane. “Some people who drink water containing 1,2-dichloropropane in excess of the MCL over many years may have an increased risk of getting cancer.”



(73) Ethylbenzene. “Some people who drink water containing ethylbenzene well in excess of the MCL over many years could experience problems with their liver or kidneys.”

(74) Haloacetic Acids (HAA). “Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.”

(75) Styrene. “Some people who drink water containing styrene well in excess of the MCL over many years could have problems with their liver, kidneys, or circulatory system.”

(76) Tetrachloroethylene. “Some people who drink water containing tetrachloroethylene in excess of the MCL over many years could have problems with their liver, and may have an increased risk of getting cancer.”

(77) 1,2,4-Trichlorobenzene. “Some people who drink water containing 1,2,4-trichlorobenzene well in excess of the MCL over many years could experience changes in their adrenal glands.”

(78) 1,1,1-Trichloroethane. “Some people who drink water containing 1,1,1-trichloroethane in excess of the MCL over many years could experience problems with their liver, nervous system, or circulatory system.”

(79) 1,1,2-Trichloroethane. “Some people who drink water containing 1,1,2-trichloroethane well in excess of the MCL over many years could have problems with their liver, kidneys, or immune systems.”

(80) Trichloroethylene. “Some people who drink water containing trichloroethylene in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.”

(81) TTHMs (Total Trihalomethanes). “Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer.”

(82) Toluene. “Some people who drink water containing toluene well in excess of the MCL over many years could have problems with their nervous system, kidneys, or liver.”

(83) Vinyl Chloride. “Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer.”

(84) Xylenes. “Some people who drink water containing xylenes in excess of the MCL over many years could experience damage to their nervous system.”

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