

NOTICES OF PROPOSED RULEMAKING

Unless exempted by A.R.S. § 41-1005, each agency shall begin the rulemaking process by first submitting to the Secretary of State's Office a Notice of Rulemaking Docket Opening followed by a Notice of Proposed Rulemaking that contains the preamble and the full text of the rules. The Secretary of State's Office publishes each Notice in the next available issue of the *Register* according to the schedule of deadlines for *Register* publication. Under the Administrative Procedure Act (A.R.S. § 41-1001 et seq.), an agency must allow at least 30 days to elapse after the publication of the Notice of Proposed Rulemaking in the *Register* before beginning any proceedings for making, amending, or repealing any rule. (A.R.S. §§ 41-1013 and 41-1022)

NOTICE OF PROPOSED RULEMAKING

TITLE 4. PROFESSIONS AND OCCUPATIONS

CHAPTER 16. ALLOPATHIC BOARD OF MEDICAL EXAMINERS

PREAMBLE

1. Sections Affected

R4-16-101
R4-16-103
R4-16-109
R4-16-401
R4-16-402
R4-16-403
R4-16-404
R4-16-405
R4-16-406
R4-16-407
R4-16-408
R4-16-409
R4-16-410

Rulemaking Action

Amend
Amend
New Section
New Section
New Section
New Section
New Section
New Section
New Section
New Section
New Section
New Section
New Section

2. The specific authority for the rulemaking, including both the authorizing statute (general) and the statutes the rules are implementing (specific):

Authorizing statutes: A.R.S. §§ 32-1403 (A)(8 and 10) and 32-1404(D)

Implementing statutes: A.R.S. §§ 32-1405(C)(21), (22), (23), (25), (26), and (27), 32-1405(E), 32-1422(E), 32-1451(A), and 32-1426 (C).

3. A list of all previous notices appearing in the Register addressing the proposed rule:

Notice of Rulemaking Docket Opening: 5 A.A.R. 2936, August 27, 1999

Notice of Rulemaking Docket Opening: 5 A.A.R. 4711, December 27, 1999

Notice of Rulemaking Docket Opening: 6 A.A.R. 4043, October 20, 2000

Notice of Rulemaking Docket Opening: 7 A.A.R. 2233, June 1, 2001

Please note that this notice is made up of separate rulemaking docket openings.

4. The name and address of agency personnel with whom persons may communicate regarding the rulemaking:

Name: Dominick Spatafora
Legislative and Regulatory Affairs Director

Address: Board of Medical Examiners
9545 E. Doubletree Ranch Road
Scottsdale, AZ 85258

Telephone: (480) 551-2712

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Fax: (480) 551-2701

5. An explanation of the rule, including the agency's reasons for initiating the rule:

The purpose of R4-16-101 is to designate the number of hours of required annual continuing medical education (CME), those programs which are approved for license holders to attend in order to meet the CME requirement, the process for requesting an extension to complete CME, and the CME reporting requirements. The proposed rule amends the existing rule to be consistent with current rulewriting standards. The need for this amendment was identified during the five-year review process.

Issues were identified regarding the use of the Special Purpose Licensing Examination (SPEX) in both the licensing and disciplinary process. Statutory language required the SPEX to be used as the sole determinant of competence. Chapter 218, Laws 1999, allows the SPEX to be used as part of a comprehensive assessment of competence, not the sole determinant. Now, the failure to pass the SPEX alone does not create a legal presumption of incompetence, however, when used in conjunction with records review, physical and psychological assessments where appropriate and practice history, the SPEX is an appropriate determinant. Therefore, R4-16-103 is amended to interpret statutory changes regarding the SPEX, in addition to, updating outdated rule language to reflect current standards.

The Board is also promulgating rules regarding fees currently in use pursuant to A.R.S. § 32-1436.

The remaining rules in this rulemaking are being promulgated due to Chapter 218, Laws 1999, which allowed the Arizona Board of Medical Examiners to delegate specified functions to the Executive Director. On July 28, 1999 the Board formally voted to delegate the acts promulgated in this rule to the Executive Director. In doing so, specific requirements were also voted on which are contained in this rulemaking. The Board believes this delegation will facilitate the flow of work, improve disciplinary timeliness and allow the Board to focus upon the more important disciplinary matters and critical issues. The delegations include: interim evaluation and investigational interview, direct referral to formal interview, uncontested request for inactive status and cancellation of license, interim consent agreement, mediated case, referral to formal hearing, dismissal of complaint and denial of license. R4-16-410 explains how an aggrieved person may appeal an action taken by the executive director.

6. A reference to any study that the agency proposes to rely on in its evaluation of or jurisdiction for the proposed rule and where the public may obtain or review the study, all data underlying each study, any analysis of the study and other supporting material:

None

7. A showing of good cause why the rule is necessary to promote a statewide interest if the rule will diminish a previous grant of authority of a political subdivision of this state:

Not applicable

8. The preliminary summary of the economic, small business, and consumer impact:

The Board does not anticipate any negative economic, small business, or consumer impacts related to, or created by, the proposed rules. However, on the positive side, a faster disposition of disciplinary matters will save time and resources, thereby saving money. The rules will also allow the Board to more efficiently distribute its resources. Additionally, complainants, who are consumers of medical services, may see faster discipline of doctors.

9. The name and address of agency personnel with whom persons may communicate regarding the accuracy of the economic, small business, and consumer impact statement:

Name: Dominick Spatafora, Legislative and Regulatory Affairs Director
Address: Board of Medical Examiners
9545 E. Doubletree Ranch Road
Scottsdale, AZ 85258
Telephone: (480) 551-2700
Fax: (480) 551-2701

10. The time, place, and nature of the proceedings for the adoption, amendment, or repeal of the rule or, if no proceeding is scheduled, where, when, and how persons may request an oral proceeding on the proposed rule:

The Arizona Board of Medical Examiners will hold an oral proceedings to receive public comments in accordance with A.R.S. § 41-1023. The time, place, and location of the oral proceeding is listed below:

Date: Tuesday, October 16, 2001
Time: 9:00 a.m.

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Location: Board of Medical Examiners
9545 E. Doubletree Ranch Road
Scottsdale, AZ

Nature: Public Hearing

The Board of Medical Examiners will accept written comments which are received by 5:00 p.m. on October 17, 2000, or which are postmarked by that date. The comment period will end and the record will close at 5:00 p.m. on October 17, 2000.

The Board of Medical Examiners is committed to complying with the Americans With Disabilities Act. Persons with a disability may request a reasonable accommodation such as a sign language interpreter, by contacting Board staff at (480) 551-2700, ext. 2751. Requests should be made as early as possible to allow time to arrange the accommodation.

11. Any other matters prescribed by statute that are applicable to the specific agency or to any specific rule or class of rules:

None

12. Incorporations by reference and their location in the rules:

None

13. The full text of the rules follows:

TITLE 4. PROFESSIONS AND OCCUPATIONS

CHAPTER 16. ALLOPATHIC BOARD OF MEDICAL EXAMINERS

ARTICLE 1. GENERAL PROVISIONS

Section

R4-16-101. Continuing Medical Education
R4-16-103. Licensure by Endorsement
R4-16-109. Miscellaneous Fees

ARTICLE 4. EXECUTIVE DIRECTOR DUTIES

Section

R4-16-401. Interim Evaluation and Investigational Interview
R4-16-402. Direct Referral to Formal Interview
R4-16-403. Uncontested Request for Inactive Status and License Cancellation
R4-16-404. Interim Consent Agreement
R4-16-405. Mediated Case
R4-16-406. Referral to Formal Hearing
R4-16-407. Dismissal of Complaint
R4-16-408. Denial of License
R4-16-409. Rehabilitative Consent Agreement
R4-16-410. Appealing Executive Director Actions

ARTICLE 1. GENERAL PROVISIONS

R4-16-101. Continuing Medical Education

- A.** ~~Every calendar year, A physician each person~~ holding an active license to practice medicine in this state ~~State~~ shall complete ~~40 twenty~~ credit hours of the continuing medical education required by A.R.S. § 32-1434 ~~during the two calendar years preceding biennial registration. A physician may not carry excess hours over to another two-year cycle.~~ One hour of credit ~~is will be~~ allowed for each clock hour of participation in ~~Board~~ approved continuing medical education activities, ~~unless otherwise designated in subsection (B) Subsection B below.~~
- B.** ~~A physician may claim continuing medical education for the following: Approved continuing medical education activities include the following:~~
1. Participating in an internship Internship, residency, or fellowship ~~in~~ at a teaching institution approved by the American Medical Association, ~~or~~ the Association of American Medical Colleges, or the American Osteopathic Association. ~~A physician One credit hour may be claimed claim one credit hour of continuing medical education~~ for each full day of training. ~~No other credit may be claimed during~~ The physician may claim credit for the time a physician is in

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full-time training in an approved accredited program. Under this subsection a physician may claim credit for less than full-time study may be claimed training on a pro-rata prorated basis.

2. Participating in an education program Education for an advanced degree in a medical or medically related field in a teaching institution approved by the American Medical Association, ~~or~~ the Association of American Medical Colleges, or the American Osteopathic Association. A physician may claim one credit hour of continuing medical education One credit hour may be claimed for each full day of study. Less than full-time study may be claimed on a pro-rata basis. A physician may claim credit for less than full-time study on a prorated basis.
3. Participating in full-time Full-time research in a teaching institution approved by the American Medical Association or the Association of American Medical Colleges or the American Osteopathic Association. A physician may claim a One credit hour for of continuing medical education may be claimed for each full day of research. A physician may claim credit for less Less than full-time study may be claimed on a pro-rata prorated basis.
4. Participating in an education program Education certified as Category 1 by an organization accredited by the Accreditation Council ~~on~~ for Continuing Medical Education.
5. Participating in a medical education program Medical educational programs designed to provide necessary understanding of current developments, skills, procedures, or treatments treatment related to the practice of medicine, provided by an organization organizations or institution institutions that ~~have not been~~ is accredited by the Accreditation Council ~~on~~ for Continuing Medical Education.
6. Serving as an instructor of medical students, house staff, other physicians, or allied health professionals from a hospital or other health care institution with a formal training program, where the instructional instruction activities ~~are such as will~~ provide the physician participants the licensee with necessary understanding of current developments, skills, procedures, or treatments treatment related to the practice of medicine.
7. Publication Publishing or presentation presenting of medical a paper, report, or book that is authored and published and deals with current developments, skills, procedures, or treatments treatment related to the practice of medicine. The physician may claim Credits credit may be claimed only for materials actually published or presented. Credits may The physician may claim credit only be claimed once after as of the date of publication or presentation. The physician may claim a One credit hour of continuing medical education may be reported per hour of preparation, writing, or and/or presentation presenting.
8. Credit hours may be earned for any of the following activities that which provide necessary an understanding of current developments, skills, procedures, or treatments treatment related to the practice of medicine:
 - a. Completing Completion of a medical education program based on self-instruction that uses which utilized videotapes, audiotapes, films, filmstrips, slides, radio broadcasts, or and computers;
 - b. Reading Independent reading of scientific journals and books;
 - c. Preparing Preparation for specialty board Board certification or recertification examinations;
 - d. Participating Participation on a staff committee or quality of care, or and/or utilization review committee in a hospital, ~~or other health care~~ institution or government agency.
- C. If a person holding an active license to practice medicine in this ~~state~~ State fails to meet the continuing medical education requirements under subsection (A) foregoing requirements because of illness, military service, medical or religious missionary activity, residence in a foreign country, or other extenuating circumstances, the Board, upon appropriate written application, may grant an extension of time to complete the continuing medical education. same on an individual basis.
- D. Each year, with the application for renewal of an active license to practice medicine in this State, the The Board will include a form which requires the person holding the license to certify by signature, under penalty of perjury, that he or she has met the stipulated continuing medical education requirements. In addition, the Board may randomly require physicians submitting such a certification to demonstrate, prior to renewal of license, satisfaction of the continuing medical education requirements stated in his or her certification. The Board shall mail to each physician a license renewal form that includes a section regarding continuing medical education compliance. A physician shall sign and return the form certified under penalty of perjury that the continuing medical education requirements under subsection (A) are satisfied for the two year period preceding biennial renewal. Failure to receive the license renewal form under subsection (A) shall not relieve the physician of the requirements under this Chapter. The Board may randomly audit physicians to demonstrate, prior to the renewal of license, proof of the continuing medical education credits claimed on the renewal form.

R4-16-103. Licensure by Endorsement

- A. An applicant for licensure by endorsement may make a written request ~~from~~ of the Board ~~in writing,~~ for an extension ~~beyond~~ of the seven-year time-period provided by A.R.S. § 32-1426 (B)(4) ~~for passage of one to pass one~~ of the combinations of examinations specified in that subsection. ~~An~~ The applicant shall submit a written ~~the~~ request to the Board ~~together~~ with evidence that:
 1. The applicant meets all requirements for licensure and for taking the United States Medical Licensing Examination,
 2. The combination of examinations cannot be passed in the time required by law, and
 3. The applicant is:
 - a. A full-time student in an approved school of medicine;

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- b. A participant in an approved hospital ~~internship~~ internship, residency, or clinical fellowship program; or
 - c. A full-time student in a recognized degree program concurrently or consecutively with medical school or post-graduate training.
- B.** ~~A requested extension shall be granted by the Board upon~~ If the Board determines determining that an the applicant has submitted evidence which satisfies the requirements of subsection (A), the Board shall grant the extension.
- C.** ~~An applicant may be granted an extension of up to~~ shall not exceed 10 years from the date ~~of the~~ on which the applicant successfully completes completed of the first part of the combination of examinations.
- D.** ~~If the Board denies the request for extension, the~~ An applicant who is denied an extension may request a hearing to contest the denial by filing a written notice with the Board within 16 no later than 30 days of after receipt of notice of the Board's action. A hearing shall be conducted in accordance with A.R.S. Title 41, Chapter 6, Article 6 10.
- E.** ~~For purpose of In~~ In this Section, a "recognized degree program" means an education program ~~that is~~ offered by a college or university approved by the New England Association of Schools and Colleges, Middle States Association of Colleges and Secondary Schools, North Central Association of Colleges and Schools, Northwest Association of Schools and Colleges, Southern Association of Colleges and Schools, or the Western Association of Schools and Colleges; or accredited by the United States Department of Education, the Council on Postsecondary Accreditation, the Association of American Medical Colleges, the Association of Canadian Medical Colleges, or the American Medical Association.
- F.** An applicant for licensure by endorsement under A.R.S. § 32-1426(C) shall:
- 1. Provide proof of passing an examination specified in A.R.S. § 32-1426(A) less than 10 years before the date of filing a license application with the Board; or
 - 2. Hold a current certification in an American Board of Medical Specialty ("ABMS"); or
 - 3. Take and pass the Special Purposes Examination (SPEX).

R4-16-109. Miscellaneous Fees

A. The following fees are established:

- 1. Application to practice allopathic medicine, \$500;
- 2. For issuing a license, \$450, which may be prorated from date of issuance to date of renewal;
- 3. Two-year license renewal, \$450;
- 4. Reactivation of an inactive license, \$450, which may be prorated from date of reactivation to date of renewal;
- 5. Application for a temporary license to practice medicine, \$200;
- 6. Locum tenens registration, \$200;
- 7. Duplicate license, \$50;
- 8. Annual registration of an approved internship, residency, clinical fellowship program, or short-term residency program, \$25;
- 9. Annual teaching license at an approved school of medicine or at an approved hospital internship, residency or clinical fellowship program, \$225;
- 10. Five-day teaching permit at an approved school of medicine or at an approved hospital internship, residency or clinical fellowship program, \$100;
- 11. Copy of the annual allopathic medical directory not distributed free of charge, \$30;
- 12. Initial registration to dispense drugs and devices, \$200;
- 13. Annual renewal to dispense drugs and devices, \$100;
- 14. Penalty fee for late renewal of an active license, \$350;
- 15. Verifying a license, \$5 per request;
- 16. Copies of the minutes of all Board meetings during a fiscal year, \$15 per meeting;
- 17. Copies of records, documents, letters, minutes, applications, and files, \$1 for the first three pages and 25¢ for each additional page; and
- 18. Sale of computerized tapes or diskettes not requiring programming, \$100.

ARTICLE 4. EXECUTIVE DIRECTOR DUTIES

R4-16-401. Interim Evaluation and Investigational Interview

- A.** The executive director may require a licensee, who is under investigation by the Board, to submit to mental, physical, oral or written medical competency examination after considering the following:
- 1. Reviewing the allegations and investigator's summary of findings; and
 - 2. Consulting with and receiving the agreement of the supervising medical consultant or designee that an examination is necessary.
- B.** The executive director shall report to the Board at each regularly scheduled Board meeting, a summary of the numbers and types of evaluations (mental, physical, and oral or written competency) ordered and completed since the preceding Board meeting.
- C.** The executive director may require a licensee to attend an investigational interview to answer questions regarding a complaint against the licensee. Before issuing an order for an investigational interview, the executive director shall review the

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allegations and facts to determine whether an interview is necessary to provide information the Board needs to adjudicate the case. The executive director shall consult with and receive the agreement of either the investigation supervisor or supervising medical consultant that an investigational interview is necessary before ordering one.

R4-16-402. Direct Referral to Formal Interview

The executive director may refer a case to a formal interview on a future Board meeting agenda if:

1. The case involves quality of care, and the investigative staff, including the medical consultant, concur after review of the case that a formal interview is appropriate; and
2. The lead Board member concurs with the investigative staff.

R4-16-403. Uncontested Request for Inactive Status and License Cancellation

A. If a licensee requests inactive status or license cancellation and meets the requirements of A.R.S. §§ 32-1431 and 32-1433, and if the request is not contested, the executive director shall grant the request.

B. he executive director shall provide to the Board at each regularly scheduled Board meeting a list of the individuals granted inactive or cancelled license status since the preceding Board meeting.

R4-16-404. Interim Consent Agreement

The executive director may enter into an interim consent agreement with a licensee if there is evidence that a restriction is needed to mitigate imminent danger to the public health and safety and:

1. The investigative staff, including the medical consultant, concur after review of the case that a consent agreement is appropriate; and
2. The lead Board member concurs with the investigative staff.

R4-16-405. Mediated Case

A. The executive director shall close a case resolved through mediation.

B. The executive director shall provide to the Board at each regularly scheduled Board meeting a list of the individuals whose cases are resolved through mediation since the preceding Board meeting.

R4-16-406. Referral to Formal Hearing

A. The executive director may directly refer a case to a formal hearing if:

1. The investigative staff, including the medical consultant, concur after review of the licensee's case that a formal hearing is appropriate; and
2. The lead Board member concurs with the investigative staff.

B. The executive director shall provide to the Board at each regularly scheduled Board meeting a list of the licensees whose cases were referred to formal hearing since the preceding Board meeting and whether the referral is for revocation, suspension, the result of an out of state discipline, or due to being a complex case.

R4-16-407. Dismissal of Complaint

The executive director, with the concurrence of the investigative staff, may dismiss a complaint if a review shows the complaint is without merit and dismissal is appropriate.

The executive director shall provide to the Board at each regularly scheduled Board meeting a list of the individuals whose cases were dismissed since the preceding Board meeting.

R4-16-408. Denial of License

A. The executive director shall deny a license to an applicant who does not meet statutory requirements for licensure if the executive director, in consultation with the investigative staff, including the medical consultant, if necessary, concur after reviewing the application, that the applicant does not meet the statutory requirements for licensure.

B. The executive director shall provide to the Board at each regularly scheduled Board meeting a list of the individuals whose applications were denied since the preceding Board meeting.

R4-16-409. Rehabilitative Consent Agreement

A. The executive director may enter into a consent agreement pursuant to A.R.S. § 32-1451(F) with a licensee to limit the licensee's practice if there is evidence that a licensee is mentally or physically unable safely to engage in the practice of medicine and:

1. The investigative staff, including the medical consultant, concur after review of the case that a consent agreement is appropriate; and
2. The lead Board member concurs with the investigative staff.

R4-16-410. Appealing Executive Director Actions

A. Any person aggrieved by an action taken by the executive director may appeal that action to the Board. The aggrieved person shall file a written request to the Board within 30 days after notification of the action in person or within 35 days after the Board mails notification to the person.

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- B.** The aggrieved person shall provide, in the written request, evidence showing:
1. There was an irregularity in the investigative process or the executive director's review that deprived the party of a fair decision; or
 2. There was misconduct by Board staff, Board consultants, or the executive director that deprived the party of a fair decision; or
 3. There is material evidence newly discovered that could have a bearing on the decision and that, with reasonable diligence, could not have been discovered and produced earlier.
- C.** The fact that the aggrieved party does not agree with the final decision is not grounds for a review by the Board.
- D.** If an aggrieved person fails to submit a written request within the time specifications in subsection (A), the Board is relieved of the requirement to review actions taken by the Executive Director. The Executive Director may, however, evaluate newly provided information that is material and substantial in content to determine whether the Board should review the case.
- E.** If a written request is submitted that meets the requirements of subsection (B):
1. The Board shall schedule the case for review at its next regularly scheduled meeting.
 2. If the written request provides new material or substantial content that requires additional investigation, the investigation shall be conducted as expeditiously as possible and the case shall be forwarded to the Board at the first possible regularly scheduled meeting.

NOTICE OF PROPOSED RULEMAKING

TITLE 18. ENVIRONMENTAL QUALITY

CHAPTER 4. DEPARTMENT OF ENVIRONMENTAL QUALITY - SAFE DRINKING WATER

PREAMBLE

<u>1. Sections Affected</u>	<u>Rulemaking Action</u>
R18-4-101	Amend
R18-4-103	Amend
R18-4-104	Amend
Appendix A	New Appendix
R18-4-205	Amend
R18-4-210	Amend
R18-4-214	Amend
R18-4-214.01	New Section
R18-4-214.02	New Section
R18-4-220	Amend
R18-4-301	Amend
R18-4-301.02	New Section
R18-4-302	Amend
R18-4-303	Amend
R18-4-401	Repeal
R18-4-401	New Section
R18-4-401	Amend
R18-4-402	Renumber
R18-4-402	New Section
R18-4-402	Amend
R18-4-403	Renumber
R18-4-403	New Section
R18-4-404	Repeal
R18-4-405	Repeal
Appendix A	Repeal
R18-4-703	Amend
R18-4-704	Amend
R18-4-706	Amend
R18-4-709	Amend
Appendix A	Repeal
Appendix B	Repeal

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2. The specific authority for the rulemaking, including both the authorizing statute (general) and the statutes the rules are implementing (specific):

Authorizing statutes: A.R.S. §§ 49-104, 49-202, 49-203, 49-351, 49-352, 49-353, 49-353.01

Implementing statutes: A.R.S. §§ 49-203, 49-351, 49-352, 49-353, 49-353.01

3. A list of all previous notices appearing in the Register addressing the proposed rule:

Notice of Rulemaking Docket Opening: 7 A.A.R. 32, August 10, 2001

4. The name and address of agency personnel with whom persons may communicate regarding the rulemaking:

Name: Jeffrey W. Stuck, Manager, Drinking Water Section, or
Nina Miller, Primacy Coordinator, Drinking Water Section

Address: Department of Environmental Quality
3033 N. Central Avenue (M0248A)
Phoenix, AZ 85012-2809

Telephone: Jeff Stuck, (602) 207-4617, jws@ev.state.az.us

& E-mail: Nina Miller, (602) 207-4641, nem@ev.state.az.us
(In Arizona: (800) 234-5677 and ask for the four-digit extension.)

Fax: (602) 207-4634

5. An explanation of the rule, including the agency's reasons for initiating the rule:

A. Background for These Proposed Rules:

The Arizona Department of Environmental Quality (ADEQ) has been granted primacy by the U.S. Environmental Protection Agency (EPA) for purposes of enforcement of the federal Safe Drinking Water Act and related regulations in Arizona. To maintain primacy, ADEQ must adopt rules that are no less stringent than the National Primary Drinking Water Regulations (NPDWRs). ADEQ has reviewed the Arizona drinking water rules at 18 A.A.C. 4, and determined that revisions need to be made to the rules in order for ADEQ to maintain primacy. The proposed revisions are for the purpose of adopting three final regulations promulgated by the EPA: 1) Public Notification Rule, 2) Interim Enhanced Surface Water Treatment Rule, and 3) Stage 1 Disinfectants and Disinfection Byproducts Rule. Summaries of the changes to the rules follow.

On May 4, 2000, the EPA published final regulations to revise the general public notification requirements for public water systems in the NPDWRs. On May 4, 2000, EPA also published revisions to the Consumer Confidence Report rule to be consistent with the final public notification rule. Public notification of violations is an integral part of the public health protection and consumer right-to-know provisions of the 1996 amendments and set the requirements that a community water system and noncommunity water system must follow regarding the form, manner, frequency, and content of a public notice.

ADEQ is making revisions to the Arizona Safe Drinking Water rules public notice section to be as stringent as the Federal rule. The Public Notice rule requires a public water system to notify persons served when the system fails to comply with a maximum contaminant level (MCL), maximum residual disinfectant level (MRDL) or treatment technique requirement; has a variance or exemption from the drinking water rules; or has a violation of any provision of the Safe Drinking Water rules.

The following is a summary of the Public Notice rule proposed revisions:

1. Public notice requirements are divided into Acute (24 hour), Nonacute Level 1 (30 day), and Nonacute Level 2 (12 month) categories. An Acute (24 hour) public notice is for a violation or situation that poses a serious health threat as a result of short-term exposure. A Nonacute Level 1 (30 day) public notice is for a violation or situation not urgent enough to require an emergency notice, and a Nonacute Level 2 (12 month) public notice is for a violation or situation that poses even less of a health risk.
2. The proposed revisions allow ADEQ flexibility in determining whether a specific monitoring or treatment technique violation should be elevated to a more stringent public notice category.
3. The turbidity consultation subsection requires a public water system to consult with ADEQ within 24 hours after learning of a treatment technique violation resulting from a single exceedance of the maximum allowable turbidity limit, or MCL violation resulting from an exceedance of the two-day turbidity limit. This requirement allows ADEQ to determine if a specific turbidity exceedance violation needs to be elevated from a Nonacute Level 2 (30 day) public notice to an Acute (24 hour) public notice due to public health risk.

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4. Appendices A and B of Article 7, and Appendix A of Article 5 are consolidated and moved to Article 1 Appendix A. This Appendix lists regulated contaminants, corresponding MCLs/MRDLs, health effects language, major sources in drinking water, and public notice requirements.
5. The multilingual subsection requires a public water system to determine (after consultation with ADEQ) if the system serves a large proportion of non-English speaking consumers. The public water system is required to provide information in the appropriate alternate language regarding the importance of the public notice.

EPA published the "Interim Enhanced Surface Water Treatment; Final Rule" on December 16, 1998. The EPA also published a complimentary rule on December 16, 1998, the "Disinfectants and Disinfection Byproducts; Final Rule", with the intent of simultaneous compliance by applicable water systems to reduce the health risks associated with disinfection byproducts and to increase the control of microbial pathogens.

The EPA published "Revisions to the Interim Enhanced Surface Water Treatment Rule (IESWTR), the Stage 1 Disinfectants and Disinfection Byproducts Rule (Stage 1 DBPR), and Revisions to State Primacy Requirements to Implement the Safe Drinking Water Act Amendments" on January 16, 2001. Under this action, EPA made minor revisions to the IESWTR and Stage 1 DBPR and revised the compliance dates in both rules to coincide with calendar quarters.

The IESWTR builds upon the treatment technique requirements of the Surface Water Treatment Rule, promulgated by EPA and adopted by ADEQ. The purposes of the IESWTR are to: improve control of microbiological pathogens, including the protozoan *Cryptosporidium*, and address risk trade-offs with disinfection byproducts. The IESWTR applies to surface water systems that serve 10,000 or more people.

The key provisions in the IESWTR include: a 99% (2 log) *Cryptosporidium* removal requirement for systems that filter; strengthened combined filter effluent turbidity performance standards and individual filter turbidity provisions; and inclusion of *Cryptosporidium* in the definition of groundwater under the direct influence of surface water. EPA believes that implementation of the IESWTR will significantly increase the protection from exposure to *Cryptosporidium*, *Giardia lamblia*, and other waterborne bacterial and viral pathogens.

The Stage 1 DBPR sets requirements for three disinfectants (chlorine, chloramines, and chlorine dioxide), two groups of organic disinfection byproducts (total trihalomethanes (TTHM)--a sum of chloroform, bromodichloromethane, dibromochloromethane, and bromoform); and haloacetic acids (HAA5)--a sum of dichloroacetic acid, trichloroacetic acid, monochloroacetic acid and mono- and dibromoacetic acids), and two inorganic disinfection byproducts (chlorite and bromate).

The regulations consist of MCLs, MRDLs or treatment techniques for disinfectants and their byproducts. The regulations also include monitoring, reporting, and public notification requirements for the compounds. The regulations include the best available technologies upon which the MCLs, and MRDLs are based.

EPA believes the implementation of the Stage 1 DBPR will reduce the levels of disinfectants and disinfection byproducts in drinking water supplies and will provide public health protection for households that were not previously covered by drinking water rules for disinfection byproducts. In addition, the rule will for the first time provide public health protection from exposure to haloacetic acids, chlorite (a major byproduct of chlorine dioxide) and bromate (a major byproduct of ozone). According to the EPA, certain disinfection byproducts, including some trihalomethanes and some haloacetic acids, have been shown to cause cancer in laboratory animals. Other disinfection byproducts have been shown to affect the liver and the nervous system, and cause reproductive or developmental effects in laboratory animals. Exposure to disinfection byproducts may produce similar effects in people.

The Stage 1 DBPR applies to community water systems and nontransient noncommunity water systems that treat their water with a chemical disinfectant for either primary or residual treatment. In addition, requirements for chlorine dioxide apply to transient noncommunity water systems.

ADEQ has conducted workshops around the state to educate water systems on the federal requirements and the upcoming ADEQ rulemaking. Workshops were held in Flagstaff, Payson, Safford, Prescott, Apache Junction, Goodyear, Yuma, Sierra Vista, Tucson, Springerville, and Lake Havasu City. Stakeholder meetings were held in Phoenix on June 6, 2000, March 22, 2001, and June 25, 2001 to receive input from stakeholders regarding this rulemaking.

B. Section-by-section Explanation of the Rules

R18-4-101 sets forth definitions. ADEQ proposes to add terms used in the new requirements.

R18-4-103 sets forth recordkeeping requirements. ADEQ proposes to revise R18-4-103 to include recordkeeping requirements for continuous individual filter monitoring.

R18-4-104 sets forth reporting requirements. ADEQ proposes to revise R18-4-104 by adding reporting requirements for disinfection byproduct MCLs, disinfectant MRDLs, enhanced coagulation, individual filter monitoring, and turbidity.

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R18-4-105 sets forth general public notification requirements. ADEQ proposes to repeal and replace the existing requirements on May 6, 2002. The replacement requirements revise the time-frames and delivery methods of public notice.

ADEQ proposes to add Article 1 Appendix A. This appendix lists regulated contaminants, corresponding MCLs/MRDLs, health effects language, major sources in drinking water, and public notice requirements.

ADEQ proposes to repeal R18-4-210 on May 6, 2002, and to incorporate the special public notice requirements for fluoride in R18-4-105.

R18-4-214 sets forth a MCL and monitoring requirements for total trihalomethanes. ADEQ proposes to repeal R18-4-214 on January 1, 2004

ADEQ proposes to add R18-4-214.01 which establishes MCLs, MRDLs, and monitoring requirements for disinfection byproducts and disinfectant residuals for surface water systems serving 10,000 or more people. ADEQ proposes an effective date of January 1, 2002 for this Section.

ADEQ proposes to add R18-4-214.02 which establishes MCLs, MRDLs, and monitoring requirements for disinfection byproducts and disinfectant residuals for surface water systems and groundwater systems serving any number of people. ADEQ proposes an effective date of January 1, 2004 for this Section

R18-4-220 sets forth Best Available Technologies for applicable MCLs. ADEQ proposes to revise R18-4-220 to include the Best Available Technologies for compliance with disinfection byproduct MCLs and disinfectant MRDLs.

R18-4-301 sets forth treatment requirements for surface water systems. ADEQ proposes to revise R18-4-301 to include a two log removal requirement for *Cryptosporidium*.

ADEQ proposes to add R18-4-301.02 which establishes methods for control of disinfection byproduct precursors (total organic carbon) by enhanced coagulation and enhanced softening.

R18-4-302 sets forth filtration requirements. ADEQ proposes to revise R18-4-302 to include a more stringent turbidity requirement and two log removal requirement of *Cryptosporidium* for surface water systems that serve over 10,000 people.

R18-4-303 sets forth disinfection requirements. ADEQ proposes to revise R18-4-303 to include a two log removal requirement for *Cryptosporidium* for surface water systems that serve over 10,000 people.

R18-4-401 sets forth special monitoring requirements for sulfate. ADEQ proposes to repeal R18-4-401, because as of December 31, 2000, the NPDWRs no longer require systems to monitor for sulfate.

R18-4-402 sets forth special monitoring requirements for sodium. ADEQ proposes to renumber these requirements under R18-4-401.

R18-4-403 sets forth special monitoring requirements for nickel. ADEQ proposes to renumber these requirements under R18-4-402.

R18-4-403 sets forth special monitoring requirements for turbidity. ADEQ proposes to add R18-4-403 to require continuous monitoring for individual filters for surface water and groundwater under the direct influence of surface water systems that serve over 10,000 people.

R18-4-404 sets forth special monitoring requirements for unregulated volatile organic chemicals. ADEQ proposes to repeal R18-4-404, because as of December 31, 2000, the NPDWRs no longer require systems to monitor for these unregulated volatile organic chemicals.

R18-4-405 sets forth special monitoring requirements for unregulated synthetic organic chemicals. ADEQ proposes to repeal R18-4-405, because as of December 31, 2000, the NPDWRs no longer require systems to monitor for these unregulated synthetic organic chemicals.

Article 5 Appendix A contains the mandatory health effects language for MCL violations. ADEQ proposes to incorporate Article 5 Appendix A. in Article 1 Appendix A.

Article 7 sets forth the requirements for Consumer Confidence Reports (CCRs). ADEQ proposes to amend the title of this Article and the title of R18-4-703 to "Reports" to comply with existing federal regulations.

R18-4-703 sets forth the requirements for the content of the CCRs. ADEQ proposes to amend R18-4-703(D) to add definitions that must be included in a CCR, and to delete the reference to R18-4-110 and R18-4-111, because this subsection applies to any variance or exemption issued by ADEQ.

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R18-4-704 sets forth the information on detected contaminants that must be included in a CCR. ADEQ proposes to amend R18-4-704(A)(1) to add a reference to Article 1 Appendix A. ADEQ proposes to amend R18-4-704(A)(2) to delete the references to R18-4-404 and R18-4-405, and replace them with a reference to Table 1. ADEQ proposes this change to address the changes to the federal unregulated contaminant monitoring regulations. ADEQ proposes to amend R18-4-704(B)(4) to clarify that the detected contaminant, MCL, and Maximum Contaminant Level Goal (MCLG) must all be expressed in the same unit. ADEQ proposes to amend R18-4-704(B)(9) to reference Article 1 Appendix A. ADEQ proposes to repeal R18-4-704(F), because a system is only required to report unregulated contaminant results for the previous year, which is indicated in Table 1.

R18-4-706 sets forth requirements for information on violations. ADEQ proposes to amend this Section to add the reference to Article 1 Appendix A, and to add MRDL to the list of violations that must be reported.

R18-4-709 sets forth requirements for additional health information that must be included in a CCR. ADEQ proposes to amend this Section to reflect the changes that EPA requires regarding arsenic levels.

Article 7 Appendix A lists regulated contaminants, MCLs, and possible sources of contamination. ADEQ proposes to incorporate in Article 7 Appendix A in Article 1 Appendix A.

Article 7 Appendix B contains health effects language that must be contained in the CCR for MCL violations. ADEQ proposes to incorporate Article 7 Appendix B in Article 1 Appendix A.

6. A reference to any study that the agency proposes to rely on in its evaluation of or justification for the proposed rule and where the public may obtain or review the study, all data underlying each study, any analysis of the study and other supporting material:

Not applicable

7. A showing of good cause why the rule is necessary to promote a statewide interest if the rule will diminish a previous grant of authority of a political subdivision of this state:

Not applicable

8. The preliminary summary of the economic, small business and consumer impact:

EXECUTIVE SUMMARY

This rulemaking will update the state rules to include changes in the National Primary Drinking Water Regulations. ADEQ expects that the rule will have a minimal economic, small business and consumer impact over the long term, but first year monitoring requirements may have a moderate financial impact on small public water systems and some large water systems required to comply with this rule. The rule allows reduced monitoring for systems which have low levels of the targeted contaminants during the first year of monitoring results. After the first year of monitoring has been accomplished, the economic impact on these systems will be minimal.

Entities who will be affected by the rule include community water systems, non-transient non-community water systems, transient non-community water systems, the general public, laboratories that perform drinking water analyses, and ADEQ. Laboratories in Arizona that perform the analyses required under this rule may see an economic impact because of expanded monitoring requirements and new monitoring for contaminants. Consumers may have a small increase in their water bill as public water systems pass on the costs associated with implementing the requirements of this rule. ADEQ expects this rule to cause no additional administrative burden or other costs to the Department beyond those associated with the current rules.

9. The name and address of agency personnel with whom persons may communicate regarding the accuracy of the economic, small business, and consumer impact statement:

Name: Nina Miller, Primacy Coordinator
Address: Department of Environmental Quality
3033 N. Central Avenue (M0248A)
Phoenix, AZ 85012-2809
Telephone: (602) 207-4641
(In Arizona: (800) 234-5677 and ask for the four-digit extension.)
Fax: (602) 207-4634
E-mail: nem@ev.state.az.us

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10. The time, place, and nature of the proceedings for the making, amendment, or repeal of the rule or, if no proceeding is scheduled, where, when, and how persons may request an oral proceeding on the proposed rule:

ADEQ will hold oral proceedings to receive public comments in accordance with A.R.S. § 41-1023. The time, place, and location of the hearings are listed below:

Date: October 9, 2001

Time: 1:30 p.m. to 3:30 p.m.

Location: Game and Fish Department
3500 S. Lake Mary Road
Flagstaff, AZ 86001

Phone: (520) 774-5045

Date: October 10, 2001

Time: 9:00 a.m. to 11:00 a.m.

Location: Lake Havasu City Public Works Department
900 London Bridge Road
Lake Havasu, AZ 86404

Phone: (928) 855-2618

Date: October 11, 2001

Time: 10:00 a.m. to 12:00 a.m.

Location: Department of Environmental Quality - Southern Regional Office, State Office Complex
400 W. Congress, Room 444
Tucson, AZ 85701

Phone: (520) 628-6733

Date: October 12, 2001

Time: 1:30 a.m. to 3:30 p.m.

Location: Department of Environmental Quality
3033 N. Central Ave, Room 1709/1710
Phoenix, AZ 85012

Phone: (602) 207-4644

The record will close on October 12, 2001. ADEQ will accept written comments that are received at ADEQ by 5:00 p.m. October 12, 2001.

ADEQ is committed to complying with the Americans With Disabilities Act. If any individual with a disability needs any type of accommodation, please contact ADEQ at least 72 hours before the hearing.

11. Any other matters prescribed by statute that are applicable to the specific agency or to any specific rule or class of rules:

Not applicable

12. Incorporations by reference and their location in the rules:

Not applicable

13. The full text of the rules follows:

TITLE 18. ENVIRONMENTAL QUALITY

CHAPTER 4. DEPARTMENT OF ENVIRONMENTAL QUALITY - SAFE DRINKING WATER

ARTICLE 1. GENERAL REQUIREMENTS

Section	
R18-4-101.	Definitions
R18-4-103.	Recordkeeping Requirements
R18-4-104.	Reporting Requirements
R18-4-105.	Public Notification Requirements (<u>Repeal May 6, 2002</u>)
<u>R18-4-105.01</u>	<u>Public Notification Requirements (Effective May 6, 2002)</u>
<u>Appendix A.</u>	<u>Regulated Contaminants</u>

ARTICLE 2. MAXIMUM CONTAMINANT LEVELS AND MONITORING REQUIREMENTS; MONITORING ASSISTANCE PROGRAM

Section	
R18-4-210.	Fluoride; Special Public Notice (<u>Repeal May 6, 2002</u>)
R18-4-214.	Total Trihalomethanes; MCL and Monitoring Requirements (<u>Repeal January 1, 2004</u>)
<u>R18-4-214.01.</u>	<u>Disinfectant Residuals and Disinfection Byproducts (Effective January 1, 2002)</u>
<u>R18-4-214.02.</u>	<u>Disinfectant Residuals and Disinfection Byproducts (Effective January 1, 2004)</u>
R18-4-220.	Best Available Technology

ARTICLE 3. TREATMENT TECHNIQUES

Section	
R18-4-301.	Surface Water Treatment
<u>R18-4-301.02.</u>	<u>Control of Disinfection Byproduct Precursors by Enhanced Coagulation and Enhanced Softening</u>
R18-4-302.	Filtration
R18-4-303.	Disinfection

ARTICLE 4. SPECIAL MONITORING REQUIREMENTS

Section	
R18-4-401.	Special Monitoring for Sulfate
R18-4-402.	R18-4-401. Special Monitoring for Sodium
R18-4-403.	R18-4-402. Special Monitoring for Nickel
<u>R18-4-403.</u>	<u>Special Monitoring for Turbidity</u>
R18-4-404.	Special Monitoring for Unregulated Volatile Organic Chemicals <u>Repealed</u>
R18-4-405.	Special Monitoring for Unregulated Synthetic Organic Chemicals <u>Repealed</u>

ARTICLE 5. MINIMUM DESIGN CRITERIA

Section	
Appendix A.	Mandatory Health Effects Language <u>Repealed</u>

ARTICLE 7. CONSUMER CONFIDENCE ~~REPORT~~ REPORTS

Section	
R18-4-703.	Content of the Consumer Confidence Report <u>Reports</u>
R18-4-704.	Information on Detected Contaminants
R18-4-706.	Information on Violations
R18-4-709.	Additional Health Information
Appendix A.	Regulated Contaminants <u>Repealed</u>
Appendix B.	Health Effects Language <u>Repealed</u>

ARTICLE 1. GENERAL REQUIREMENTS

R18-4-101. Definitions

The terms in this Chapter have the following meanings:

1. "Action level" means a concentration of 0.015 mg/L for lead or 1.3 mg/L for copper.
"ADHS" means the Arizona Department of Health Services.
2. "Air-gap separation" means a physical separation between the discharge end of a supply pipe and the top rim of its receiving vessel, which has a separation distance equal to at least one inch or twice the diameter of the supply pipe, whichever is greater.
"ANSI/NSF Standard 60" means American National Standards Institute/NSF International Standard 60 - 2000a, Drinking Water Treatment Chemicals - Health Effects, incorporated by reference and on file with the Department and the Office of

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the Secretary of State. Available from NSF International, 789 North Dixboro Road, P.O. Box 130140, Ann Arbor, MI 48113-0140, USA; 734-769-8010; <http://www.nsf.org>. This incorporation by reference includes no future editions or amendments.

“ANSI/NSF Standard 61” means American National Standards Institute/NSF International Standard 61 - 2000a, Drinking Water System Components - Health Effects, incorporated by reference and on file with the Department and the Office of the Secretary of State. Available from NSF International, 789 North Dixboro Road, P.O. Box 130140, Ann Arbor, MI 48113-0140, USA; 734-769-8010; <http://www.nsf.org>. This incorporation by reference includes no future editions or amendments.

- 3- ~~“A.R.S.” means Arizona Revised Statutes.~~
- 4- “Backflow” means a reverse flow condition, that causes water or mixtures of water and other liquids, gases, or substances to flow back into the distribution system. Backflow can be created by a difference in water pressure (backpressure), a vacuum or partial vacuum (backsiphonage), or a combination of both.
- 5- “Backflow-prevention assembly” means a mechanical device used to prevent backflow.
- 6- “Baseline sampling” means the routine monitoring of contaminants covered under the monitoring assistance program for the purpose of determining compliance with the MCLs listed in Article 2, and the monitoring requirements listed in Article 4, not including repeat monitoring necessary for compliance after detection of a contaminant or ~~an~~ a MCL violation.
- 7- “BAT” means best available technology.
- 8- “Best available technology” means a technology, treatment technique, or other means which has been identified by ~~the~~ U.S. Environmental Protection Agency EPA as being the best available for removing or reducing the concentration of a contaminant in water, taking costs into consideration, after examination for efficacy under field conditions and not solely under laboratory conditions.
“CCR” means Consumer Confidence Report.
- 9- “Certified operator” ~~has the meaning prescribed at R18-5-101, means a person who holds an operator certificate issued by the Department to operate a water treatment plant or a distribution system.~~
- 10- “Coagulation” means a treatment process that uses coagulant chemicals and mixing by which colloidal and suspended materials are destabilized and agglomerated into flocs.
- 11- “Community water system” means a public water system that serves 15 or more service connections used by year-round residents or that serves 25 or more year-round residents.
- 12- “Compliance cycle” means a 9-calendar-year time-frame during which a public water system is required to monitor. Each compliance cycle consists of ~~three~~ three-year compliance periods. The first compliance cycle began January 1, 1993, and ends December 31, 2001. The second compliance cycle begins January 1, 2002, and ends December 31, 2010. The ~~3rd~~ third compliance cycle begins January 1, 2011, and ends December 31, 2019.
- 13- “Compliance period” means a three-calendar-year time-frame within a compliance cycle. Within the ~~1st~~ first compliance cycle, the ~~1st~~ first compliance period began January 1, 1993, and ended December 31, 1995. The ~~2nd~~ second compliance period began January 1, 1996, and ~~ends~~ ended December 31, 1998. The ~~3rd~~ third compliance period ~~begins~~ began January 1, 1999, and ends December 31, 2001.
“Comprehensive performance evaluation” means a thorough review and analysis of a treatment plant’s performance-based capabilities and associated administrative, operation and maintenance practices. A comprehensive performance evaluation consists of at least the following components: assessment of plant performance, evaluation of major unit processes, identification and prioritization of performance limiting factors, assessment of the applicability of comprehensive technical assistance, and preparation of a CPE report.
- 14- “Consecutive public water system” means a public water system that obtains all of its water from another public water system that is regulated by the Department.
- 15- “Contaminant” means any physical, chemical, biological, or radiological substance in water.
- 16- “Contractor” means a private party, or statewide nonprofit organization representing a water system, that the Department contracts with to implement the monitoring assistance program under A.R.S. § 49-360(B).
- 17- “Conventional filtration” means a series of treatment processes, including coagulation, flocculation, sedimentation, and filtration that result in substantial particulate removal.
- 18- “Corrosion inhibitor” means a substance that reduces corrosion of metal plumbing materials, especially lead and copper, by forming a protective film on the interior surface of those materials.
“CPE” means comprehensive performance evaluation.
- 19- “Cross connection” means a physical connection between a public water system and any source of water or other substance that may lead to contamination of the water provided by the public water system through backflow.
- 20- “CWS” means community water system.
- 21- “Detected” means measured in a laboratory at a concentration that is at or above the method detection limit.
- 22- “Diatomaceous earth filtration” means a treatment process that results in substantial particulate removal in which a pre-coat cake of diatomaceous earth filter media is deposited on a support membrane (septum) and, while the water is filtered through the cake on the septum, additional filter media (body feed) is continuously added to the feed water to maintain the permeability of the filter cake.

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23. “Direct filtration” means a series of treatment processes, including coagulation and filtration but excluding sedimentation, that result in substantial particulate removal.
24. “Disinfectant” means an oxidant, including chlorine, chlorine dioxide, chloramines, ozone, or an equivalent agent or process such as ultraviolet light, that kills or inactivates pathogenic organisms.
25. “Disinfection” means a treatment process that kills or inactivates pathogenic organisms in water by oxidants, ultraviolet light, or equivalent agents.
26. “Distribution system” means ~~the pipelines, appurtenances, devices, and facilities~~ a pipeline, appurtenance, device, and facility of a public water system ~~which conduct~~ that conducts water from a source or water treatment plant to persons served by the system.
27. “Domestic or other non-distribution system plumbing problem” means a total coliform contamination problem in a public water system with more than one service connection that is limited to a specific service connection from which a total coliform-positive sample is taken.
28. “Dose equivalent” means the product of the absorbed dose from ionizing radiation and such factors as account for differences in biological effectiveness due to the type of radiation and its distribution in the body as specified by the International Commission on Radiological Units and Measurements.
29. “Double check valve assembly” means a backflow-prevention assembly composed of two independently acting check valves with tightly closing, resilient-seated shut-off valves on each end of the assembly and properly located, resilient-seated test cocks.
30. ~~“Effective corrosion inhibitor residual” means a concentration of a corrosion inhibitor that is sufficient to form a protective film on the interior walls of a pipe.~~
31. “Elementary business plan” means a document containing all items required to be submitted for evaluation necessary for a complete review for technical, managerial, and financial capacity of a new public water system under Article 6.
“Engineer” means an engineer who is registered to practice the applicable branch of engineering by the Arizona Board of Technical Registration.
“Enhanced coagulation” means the addition of sufficient coagulant for improved removal of disinfection byproduct precursors by conventional filtration treatment.
“Enhanced softening” means the improved removal of disinfection byproduct precursors by precipitative softening.
“EPA” means the United States Environmental Protection Agency.
32. “Exclusion” means a waiver granted by the Department under R18-4-112 from a requirement of this Chapter that is not a requirement contained in the National Primary Drinking Water Regulations.
33. “Exemption” means a temporary deviation from a ~~maximum contaminant level~~ MCL or treatment technique required by ~~in~~ this Chapter that is granted by the Department under R18-4-111.
34. “Existing public water system” means a public water system, as defined in A.R.S. § 49-352(B)(1), that has been issued a public water system identification number before October 1, 1999.
“Filter profile” means a graphical representation of individual filter performance, based on continuous turbidity measurements or total particle counts versus time for an entire filter run, from startup to backwash inclusively, that includes an assessment of filter performance while another filter is being backwashed.
35. “Filtration” means a treatment process for removing particulate matter from water by passage through porous media.
36. “Financial capacity” means the ability of a public water system to acquire and manage sufficient financial resources for the system to achieve and maintain compliance with the federal ~~safe drinking water act~~ Safe Drinking Water Act, ~~as amended in 1996~~.
37. “First-draw sample” means a 1-liter sample of tap water, collected in accordance with R18-4-310(D).
38. “Flocculation” means a treatment process to enhance agglomeration or collection of smaller floc particles into larger and more easily settleable particles through gentle stirring by hydraulic or mechanical means.
39. “GAC” means granular activated carbon.
“GAC10” means granular activated carbon filter beds with an empty-bed contact time of 10 minutes based on average daily flow and a carbon reactivation frequency of every 180 days.
40. “GC” means gas chromatography.
41. “GC/MS” means gas chromatography/mass spectrometry.
42. “Gross alpha particle activity” means the total radioactivity due to alpha particle emission as inferred from measurements on a dry sample.
43. “Gross beta particle activity” means the total radioactivity due to beta particle emission as inferred from measurements on a dry sample.
44. “Groundwater system” means a public water system that is supplied solely by groundwater that is not under the direct influence of surface water.
45. “Groundwater under the direct influence of surface water” means any water beneath the surface of the ground with:
a. A significant occurrence of insects or other macroorganisms, algae, large diameter pathogens such as *Giardia lamblia*, or total coliform; or

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- b. Significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH that closely correlate to climatological or surface water conditions.
“HAA5” means haloacetic acids (five). “Haloacetic acids (five)” means the sum of the concentrations in milligrams per liter of the haloacetic acid compounds (monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid), rounded to two significant figures after addition.
46. “Halogenated” means treated or mixed with chlorine, bromine, or iodine.
47. “HPC” means heterotrophic plate count.
48. “Initial compliance period” means the ~~last~~ first, full three-year compliance period in a compliance cycle that a public water system conducts initial monitoring.
49. “Initial monitoring year” means the calendar year designated by the Department within a compliance period in which a public water system conducts initial monitoring at a point of entry.
50. “Large water system”, for R18-4-306 through R18-4-316 only, means a public water system that serves more than 50,000 persons.
51. “Lead-free” means that the pipe, solder, or flux used in the installation or repair of ~~any~~ a public water system or in a user facility that provides water for human consumption and which is connected to such public water system meets the following criteria:
- a. All solders and flux contain not more than 0.2% lead;
- b. All pipes and pipe fittings contain not more than 8.0% lead.
When used with respect to plumbing fittings and fixtures intended by the manufacturer to dispense water for human ingestion, “lead-free” refers to fittings and fixtures that are in compliance with ANSI/NSF Standard 61, Section 9.
52. “Lead service line” means a service line made of lead—that connects a water main to a building inlet and any lead pigtail, gooseneck, or fitting that is connected to the service line.
53. “Log” means; the percentage removal or inactivation of *Cryptosporidium* oocysts, *Giardia lamblia* cysts, or viruses as follows:
- a. “One-log” is 90%.
- b. “Two-log” is 99%.
- c. “Three-log” is 99.9%.
- d. “Four-log” is 99.99%.
54. “Major stockholder” means a person who has 20% or more ownership interest in a public water system.
55. “Man-made beta particle and photon emitters” means all radionuclides emitting beta particles or photons, except the daughter products of Thorium-232, Uranium-235, and Uranium-238, listed in “Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure,” Handbook 69, U.S. Department of Commerce, National Bureau of Standards, amended as of August 1963 (and no future editions), which is incorporated by reference and on file with the Office of the Secretary of State and the Department. Copies of Handbook 69 are also available from the Library of Congress by telephoning (202) 707-5640.
56. “Managerial capacity” means the ability of a public water system to conduct its affairs in a manner that will meet and maintain compliance with the requirements of the federal ~~safe drinking water act~~ Safe Drinking Water Act, as amended in 1996.
57. “Maximum contaminant level” means the maximum permissible level for a contaminant in drinking water that is delivered to any person who is served by a public water system.
“Maximum residual disinfectant level” means a level of a disinfectant added for water treatment that may not be exceeded at the consumer’s tap without an unacceptable possibility of adverse health effects.
58. “Maximum total trihalomethane potential” means the maximum concentration of total trihalomethanes produced in water containing a disinfectant residual after 7 seven days at a temperature of 25° C or above.
59. “MCL” means maximum contaminant level.
60. “MFL” means million fibers per liter greater than 10 microns in length.
61. “Medium water system”, for R18-4-306 through R18-4-316 only, means a public water system that serves more than 3,300 persons and 50,000 or fewer persons.
62. “Meter” means a device that measures the volume of water that passes through it.
63. “Meter weight” means the number of gallons per minute (gpm) that flows through a meter divided by 30.
64. “Millirem” means 1/1000 of a rem.
“MRDL” means maximum residual disinfectant level.
65. “MTP” means maximum total trihalomethane potential.
66. “Monitoring assistance program” means the program established by ~~to~~ A.R.S. § 49-360, under which a contractor provides for collection, transportation, and analysis of samples from a public water system under the provisions of R18-4-224 through R18-4-226.
67. “Nephelometric turbidity unit” means the unit of measure for turbidity. Turbidity is a measure of light scatter or absorption caused by suspended or colloidal matter in water. Turbidity is measured as an indicator of the effectiveness of filtration treatment.

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68. “New public water system” means a public water system, as defined in A.R.S. § 49-352(B)(1), to which the Department issues its ~~1st~~ first unique public water system identification number on or after October 1, 1999.
69. “Noncommunity water system” means a public water system that is either a nontransient, noncommunity water system or a transient, noncommunity water system.
70. “Nontransient, noncommunity water system” means a public water system that:
- a. Serves 15 or more service connections that are used by the same persons for at least six months per year; or
 - b. Serves the same 25 or more persons for at least six months per year.
71. “NTNCWS” means nontransient, noncommunity water system.
72. “NTU” means nephelometric turbidity unit.
73. “Optimal corrosion control treatment” means the corrosion control treatment that minimizes lead and copper concentrations at the tap without violating any rule prescribed in this Chapter.
74. “OX” means chlorine or ozone oxidation.
“PCBs” means polychlorinated biphenyls.
75. “pCi” means picocurie.
76. “Picocurie” means the quantity of radioactive material producing 2.22 nuclear transformations per minute.
77. “Point-of-entry into the distribution system” means the point at which water is discharged into the distribution system from a well, storage tank, pressure tank, or water treatment plant.
78. “Point-of-entry treatment device” means a device that applies treatment to drinking water entering a house or building for the purpose of reducing contaminants in the drinking water that is distributed throughout the house or building.
79. “Point-of-use treatment device” means a device that applies treatment to the drinking water flowing to a single tap to reduce contaminants in drinking water at that single tap.
80. “Pressure vacuum breaker assembly” means a backsiphonage prevention assembly that contains an independently operated, internally loaded check valve; an internally operated air-inlet valve located on the discharge side of the check valve; tightly closing resilient seated shut-off valves on each end of the check valve assembly; and properly located resilient seated test cocks.
81. ~~“Private agricultural water system” has the same meaning as prescribed in A.R.S. § 49-352(I)(1).~~
82. “PTA” means packed tower aeration.
83. ~~“Public water system” means a system for the distribution of water to the public for human consumption that serves 15 or more service connections or an average of at least 25 persons per day for at least 60 days a year.~~
- a. ~~A public water system includes:~~
 - i. ~~Any collection, treatment, storage, and distribution facility under the control of the water supplier and used in connection with the system; and~~
 - ii. ~~Any collection or pretreatment storage facility not under the control of the water supplier that is used with the system.~~
 - b. ~~A public water system is either a community water system; a nontransient, noncommunity water system; or a transient, noncommunity water system.~~
- “Public water system” has the same meaning prescribed in A.R.S. § 49-352. A public water system is either a community water system; a nontransient, noncommunity water system; or a transient, noncommunity water system.
84. “Reduced pressure principle backflow-prevention assembly” means a backflow-prevention assembly that contains two independently acting check valves; a hydraulically operating, mechanically independent pressure differential relief valve located between the two check valves; tightly closing, resilient seated shut-off valves on each end of the check valve assembly; and properly located resilient seated test cocks.
85. “Rem” means the unit of dose equivalent from ionizing radiation to the total body or any internal organ or organ system.
86. “Repeat compliance period” means any subsequent compliance period after the initial compliance period.
87. “Residual disinfectant concentration” means the concentration of disinfectant measured in mg/L in a representative sample of water.
“Safe Drinking Water Act” means the federal Safe Drinking Water Act as amended (42 U.S.C. §§ 300f et seq., Title XIV of the Public Health Service Act).
88. “Sanitary survey” means an onsite review of the water source, facilities, equipment, operation, and maintenance of a public water system to evaluate their adequacy to produce and distribute safe drinking water.
89. “Sedimentation” means a treatment process that holds water in a low-flow condition before filtration to remove solids by gravity or separation.
90. ~~“Semipublic water system” means a system for the distribution of water to the public for human consumption with at least four service connections but less than 15 service connections that:~~
- a. ~~Serves an average of less than 25 persons per day; or~~
 - b. ~~Serves an average of 25 or more persons a day but for less than 60 days a year.~~
91. “Service connection” means a location at the meter, or in the absence of a meter, at the curbstop or at the building inlet.
92. “Service line” means the water line that runs from the corporation stop at a water main to the building inlet, including any pigtail, gooseneck, or fitting.

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93. “Service line sample” means a ~~first draw sample collected in accordance with R18-4-310(D)~~ one liter sample of water collected in accordance with R18-4-315(D).
94. “Single-family structure” means a building constructed as a single-family residence that is used as a residence or as a place of business.
95. “Slow sand filtration” means a treatment process which involves the passage of raw water through a bed of sand at low velocity, generally less than 0.4 m/h, that results in substantial particulate removal by physical and biological mechanisms.
96. “Small water system” for R18-4-306 through R18-4-316 only, means a public water system that serves 3,300 or fewer persons.
97. “SOC” means synthetic organic chemical.
98. “Source” means a body of water above or below the ground that supplies water to a public water system, including a well, spring, or surface water.
“Specific ultraviolet absorption” means an indicator of the humic content of a water at 254 nanometers (nm). It is a calculated parameter obtained by dividing a sample’s ultraviolet absorption at a wavelength of 254 nm (UV_{254}) (in m^{-1}) by its concentration of dissolved organic carbon (DOC) (in mg/L).
99. “Standard sample” means the aliquot of finished drinking water that is examined for the presence of coliform bacteria. The standard sample volume is 100 milliliters.
100. “Surface water” means a source that is exposed to the unenclosed atmosphere and subject to surface runoff.
101. “Surface water system” means a public water system that uses surface water or groundwater under the direct influence of surface water, in whole or in part, as a source.
“SUVA” means specific ultraviolet absorption.
102. “TNCWS” means a transient, noncommunity water system.
103. “Technical capacity” means the ability of a public water system to meet the requirements of R18-4-604 and the federal ~~safe drinking water act~~ Safe Drinking Water Act as amended in 1996 at all times, and includes the ability to correct problems with its distribution, water quality, or source availability and to sustain compliance with its operations and maintenance plan.
“TOC” means total organic carbon.
“Total organic carbon” means total organic carbon in mg/L measured using heat, oxygen, ultraviolet irradiation, chemical oxidants, or combinations of these oxidants that convert organic carbon to carbon dioxide, rounded to two significant figures.
104. “Total trihalomethanes” means the sum of the concentrations of the following trihalomethane compounds: trichloromethane (chloroform), dibromochloromethane, bromo-dichloromethane and tribromomethane (bromoform).
105. “Transient, noncommunity water system” means a public water system that:
- a. Serves 15 or more service connections but does not serve 15 service connections used by the same persons for more than ~~6~~ six months per year; or
 - b. Serves an average of at least 25 persons per day for at least 60 days per year but does not serve the same 25 persons for more than ~~6~~ six months per year.
106. “Treatment” means a process that changes the quality of water by physical, chemical, or biological means.
107. “Treatment technique” means a treatment procedure that has been promulgated by EPA in lieu of a ~~maximum contaminant level~~ MCL. Treatment techniques include the requirements for filtration, disinfection, lead, copper, acrylamide, and epichlorohydrin that are prescribed in Article 3 of this Chapter.
108. “Trihalomethane” means one of the family of organic compounds, named as derivatives of methane, wherein three of four hydrogen atoms in methane are substituted by a halogen atom in the molecular structure.
109. “TTHM” means total trihalomethanes.
110. “Unit fee” means the amount charged to a public water system under the monitoring assistance program for a meter weight of one in accordance with R18-4-225.
111. “User ~~facilities~~ facility” means ~~all facilities~~ a facility on the customer’s side of the service connection.
112. “Virus” means an enteric virus which is infectious to humans by waterborne transmission.
113. “VOC” means volatile organic chemical.
114. “Water main” means a pipe that is used to distribute drinking water that serves more than one property and is exterior to buildings.
115. “Water supplier” means a person who owns or who supervises or directs the operation of a public water system.
116. “Waterborne disease outbreak” means the occurrence of illness that is epidemiologically associated with the ingestion of drinking water from a public water system.
117. “Water treatment plant” means a facility in which the quality of the water is intentionally changed by a physical, chemical, or biological process. A booster chlorination facility which is designed to maintain an effective disinfectant residual in water in the distribution system is not a water treatment plant.

R18-4-103. Recordkeeping Requirements

- A. A ~~water supplier~~ public water system shall retain on ~~the its premises of a public water system~~ or at a convenient location near its premises, the following records for the following minimum periods of time:
1. Records of bacteriological analyses, including records of analyses for total coliform, fecal coliform, *Escherichia coli* (*E. coli*), and heterotrophic bacteria for five years.
 2. Records of chemical analyses, for 10 years.
 3. Records of actions taken by the water supplier to correct violations of this Chapter for three years after the last action taken to correct the violation.
 4. Records concerning a variance or exemption granted to the public water system for five years after the expiration of the variance or exemption.
 5. Copies of written reports, summaries, or communications relating to a sanitary survey of the public water system for 10 years after completion of the sanitary survey.
 6. Records of all sampling data and analyses, reports, surveys, letters, evaluations, schedules, Department determinations, and any other information required by R18-4-305 through R18-4-316 for 12 years.
 7. A ~~water supplier of a surface water system~~ shall retain the following records for 10 years:
 - a. Records of turbidity measurements, including the number and percentage of filtered water turbidity measurements taken during the month that are less than or equal to the turbidity limits specified in R18-4-302 for the filtration technology used.
 - b. The date and value of any turbidity measurement taken during a month that exceeds five NTUs.
 - c. Records of the lowest residual disinfectant concentration (in mg/L) in water entering the distribution system for each day that each water treatment plant operates;
 - d. Records of the residual disinfectant concentration (in mg/L) in water for each sampling site in the distribution system;
 - e. Records of analyses for heterotrophic bacteria if HPC is measured instead of residual disinfectant concentration in the distribution system.
 8. A surface water system shall retain records of individual filter monitoring specified in R18-4-403 for three years.
 9. A public water system shall retain copies of a public notice and a certification for three years after issuance.
- B. A water supplier shall keep the original laboratory reports of drinking water analyses or copies of Department-approved reporting forms.

R18-4-104. Reporting Requirements

- A. Routine monitoring: Except as specified in this subsection, a ~~water supplier~~ public water system, or a contractor shall report the result of any test measurement or analysis required by Article 2 to the Department within the ~~1st first~~ 10 days following the month that the ~~water supplier~~ public water system receives the analytical result or the ~~1st first~~ 10 days following the end of an applicable monitoring period prescribed by Article 2, whichever occurs ~~1st first~~.
1. No change.
 2. No change.
 3. Total trihalomethanes: A ~~water supplier~~ public water system monitoring under R18-4-214 shall report the arithmetic average of analytical results for total trihalomethanes within 30 days of receipt of the last analytical results of the previous quarter.
 4. Disinfection byproducts, disinfectant residuals, disinfection byproduct precursors and enhanced coagulation or enhanced softening: The following results shall be reported as specified by the time-frame under subsection (A).
 - a. Disinfection byproducts. A system shall report the information specified in the following table:

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IF YOU ARE A...	YOU MUST REPORT...
<u>System monitoring for TTHMs and HAA5 under the requirements of R18-4-214.01 or R18-4-214.02 on a quarterly or more frequent basis</u>	<ol style="list-style-type: none"> 1. <u>The number of samples taken during the last quarter.</u> 2. <u>The location, date, and result of each sample taken during the last quarter.</u> 3. <u>The arithmetic average of all samples taken in the last quarter.</u> 4. <u>The annual arithmetic average of the quarterly arithmetic averages of this section for the last four quarters.</u> 5. <u>Whether, based on R18-4-214.01(I)(3) or R18-4-214.02(H)(3), the MCL was violated.</u>
<u>System monitoring for TTHMs and HAA5 under the requirements of R18-4-214.01 or R18-4-214.02 less frequently than quarterly (but at least annually)</u>	<ol style="list-style-type: none"> 1. <u>The number of samples taken during the last year.</u> 2. <u>The location, date, and result of each sample taken during the last monitoring period.</u> 3. <u>The arithmetic average of all samples taken over the last year.</u> 4. <u>Whether, based on R18-4-214.01(I)(3) or R18-4-214.02(H)(3), the MCL was violated.</u>
<u>System monitoring for TTHMs and HAA5 under the requirements of R18-4-214.01 or R18-4-214.02 less frequently than annually</u>	<ol style="list-style-type: none"> 1. <u>The location, date, and result of the last sample taken.</u> 2. <u>Whether, based on, R18-4-214.01(I)(3) or R18-4-214.02(H)(3), the MCL was violated.</u>
<u>System monitoring for chlorite under the requirements of R18-4-214.01 or R18-4-214.02</u>	<ol style="list-style-type: none"> 1. <u>The number of entry point samples taken each month for the last three months.</u> 2. <u>The location, date, and result of each sample (both entry point and distribution system) taken during the last quarter.</u> 3. <u>For each month in the reporting period, the arithmetic average of all samples taken in each three sample set taken in the distribution system.</u> 4. <u>Whether, based on R18-4-214.01(I)(5) or R18-4-214.02(H)(5), the MCL was violated, in which month, and how many times it was violated each month.</u>
<u>System monitoring for bromate under the requirements of R18-4-214.01 or R18-4-214.02</u>	<ol style="list-style-type: none"> 1. <u>The number of samples taken during the last quarter.</u> 2. <u>The location, date, and result of each sample taken during the last quarter.</u> 3. <u>The arithmetic average of the monthly arithmetic averages of all samples taken in the last year.</u> 4. <u>Whether, based on R18-4-214.01(I)(4) or R18-4-214.02(H)(4), the MCL was violated.</u>

b. Disinfectant Residuals. A system shall report the information specified in the following table:

IF YOU ARE A...	YOU MUST REPORT...
<u>System monitoring for chlorine or chloramines under the requirements of R18-4-214.01 or R18-4-214.02</u>	<ol style="list-style-type: none"> 1. <u>The number of samples taken during each month of the last quarter.</u> 2. <u>The monthly arithmetic average of all samples taken in each month for the last 12 months.</u> 3. <u>The arithmetic average of all monthly averages for the last 12 months.</u> 4. <u>Whether, based on R18-4-214.01(K)(2) or R18-4-214.02(J)(2), the MRDL was violated.</u>
<u>System monitoring for chlorine dioxide under the requirements of R18-4-214.01 or R18-4-214.02</u>	<ol style="list-style-type: none"> 1. <u>The dates, results, and locations of samples taken during the last quarter.</u> 2. <u>Whether, based on R18-4-214.01(K)(3) or R18-4-214.02(J)(3), the MRDL was violated.</u> 3. <u>Whether the MRDL was exceeded in any two consecutive daily samples and whether the resulting violation required an Acute or Nonacute Level 1 public notice.</u>

c. Disinfection byproduct precursors and enhanced coagulation or enhanced softening. A system shall report the information specified in the following table:

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<u>IF YOU ARE A...</u>	<u>YOU MUST REPORT...</u>
<p><u>System monitoring monthly or quarterly for TOC and alkalinity under the requirements of R18-4-214.01 or R18-4-214.02 and required to meet the enhanced coagulation or enhanced softening requirements in R18-4-301.02</u></p>	<ol style="list-style-type: none"> <u>1. The number of sample sets (source water TOC and alkalinity and treated water TOC) taken during the last quarter.</u> <u>2. The location, date, and results of each sample set taken during the last quarter.</u> <u>3. For each month in the reporting period that sample sets were taken, the monthly arithmetic average of the percent removal of TOC and the required TOC percent removal.</u> <u>4. Calculations for determining compliance with the TOC percent removal requirements, as provided in R18-4-301.02(D).</u> <u>5. Whether the system is in compliance with the enhanced coagulation or enhanced softening percent removal requirements in R18-4-301.02(C) for the last four quarters.</u>
<p><u>System monitoring monthly or quarterly for TOC under the requirements of R18-4-214.01 or R18-4-214.02 and meeting one or more of the alternative compliance criteria in R18-4-301.02(A)(1)-(8)</u></p>	<ol style="list-style-type: none"> <u>1. The alternative compliance criterion that the system is using.</u> <u>2. The number of sample sets (source water TOC and alkalinity and treated water TOC) taken during the last quarter.</u> <u>3. The location, date, and result of each sample set taken during the last quarter.</u> <u>4. The running annual arithmetic average based on monthly averages (or quarterly samples) of source water TOC for systems meeting a criterion in R18-4-301.02(A)(1) or (8) or of treated water TOC for systems meeting the criterion in R18-4-301.02(A)(2).</u> <u>5. The running annual arithmetic average based on monthly averages (or quarterly samples) of source water SUVA for systems meeting the criterion in R18-4-301.02(A)(4) or of treated water SUVA for systems meeting the criterion in R18-4-301.02(A)(5).</u> <u>6. The running annual average of source water alkalinity for systems meeting the criterion in R18-4-301.02(A)(8) and of treated water alkalinity for systems meeting the criterion in R18-4-301.02(A)(6).</u> <u>7. The running annual average for both TTHM and HAA5 for systems meeting the criterion in R18-4-301.02(A)(3) or (8).</u> <u>8. The running annual average of the amount of magnesium hardness removal (as CaCO₃, in mg/L) for systems meeting the criterion in R18-4-301.02(A)(7).</u> <u>9. Whether the system is in compliance with the particular alternative compliance criterion in R18-4-301.02(A)(1) - (8).</u>

- B. MCL and MRDL violations:** Except as specified in this subsection, a ~~water supplier~~ public water system shall report a violation of a MCL or MRDL to the Department within 48 hours of receipt of analytical results that indicate a violation.
1. No change.
 2. No change.
 3. A ~~water supplier~~ public water system shall report a violation of an interim-MCL for turbidity to the Department, by telephone or facsimile:
 - a. Within the ~~1st~~ first 10 days following the end of the month if the arithmetic average of the analytical results of daily samples taken during the month exceeds one NTU.
 - b. Within ~~48~~ 24 hours of receipt of analytical results for the ~~2nd~~ second daily sample if the arithmetic average of the results of daily samples taken on two consecutive days exceeds five NTUs.
 4. A water supplier shall report an acute violation of the chlorine dioxide MRDL to the Department, by phone or facsimile as soon as possible but no later than 24 hours after receipt of analytical results that indicate an acute violation.
- C. Filtration:** Except as provided in subsection (C)(4), a ~~water supplier~~ of a surface water system that provides filtration shall report the following turbidity measurements to the Department within 10 days after the end of each month for each water treatment plant that operates during the month:
1. The total number of filtered water turbidity measurements taken during the month;
 2. The number and percentage of filtered water turbidity measurements taken during the month that are less than or equal to the turbidity limits prescribed in R18-4-302 for the filtration technology used;
 3. The date and value of any filtered water turbidity measurement taken during the month that exceeds ~~five NTUs~~ the maximum turbidity limits specified in R18-4-302 for the filtration technology used.

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4. If the turbidity of the filtered water exceeds ~~five NTUs~~, the maximum turbidity limits specified in R18-4-302 for the filtration technology used, then the ~~water supplier~~ surface water system shall report the exceedance to the Department, by telephone or facsimile, as soon as possible but no later than 24 hours after the exceedance.
- D. Disinfection: Except as provided in subsection (D)(4), ~~a water supplier~~ of a surface water system that provides disinfection shall report the following information to the Department within 10 days after the end of each month for each water treatment plant that operates during the month:
 1. For each day, the lowest measurement of residual disinfectant concentration in mg/L in water entering the distribution system;
 2. The date and duration of each time period the residual disinfectant concentration in water entering the distribution system fell below 0.2 mg/L; and
 3. The value of "V" calculated by the formula prescribed in R18-4-303(C)(2) for the current and previous month.
 4. If the residual disinfectant concentration falls below 0.2 mg/L in water entering the distribution system, the ~~water supplier~~ system shall report the occurrence to the Department as soon as possible, but no later than 24 hours after the occurrence. The ~~water supplier~~ system shall report whether the residual disinfectant concentration was restored to at least 0.2 mg/L within four hours.
- E. No change.
- F. No change.
- G. No change.
- H. No change.
- I. No change.
- J. No change.
- K. Special monitoring: A ~~water supplier~~ public water system, or a contractor that conducts special monitoring ~~prescribed required~~ in Article 4, shall report the following information to the Department:
 1. ~~For sulfate under R18-4-401, the sulfate monitoring results within 30 days of receipt of the analytical results;~~
 2. ~~For sodium under required in R18-4-402 R18-4-401, the sodium monitoring results in the 1st first 10 days of the month after the month that the analytical results were received. A water supplier shall notify the Arizona Department of Health Services (ADHS) and the local county health department of the sodium monitoring results by direct mail within three months of receipt of the analytical results. The water supplier shall send a copy of each notice provided to ADHS and the local county health department to the Department within 10 days of issuance;~~
 2. For nickel required in R18-4-402, the nickel monitoring results within the first 10 days following the month that the public water system receives the analytical result or the first 10 days following the end of an applicable monitoring period prescribed by R18-4-402, whichever occurs first.
 3. ~~For unregulated VOCs under R18-4-404, the analytical results to the Department within 30 days of receipt of the analytical results; and~~
 3. For turbidity monitoring under R18-4-403:
 - a. A system shall report that the continuous turbidity monitoring was conducted within 10 days after the end of each month the system served water to the public.
 - b. A system shall report the continuous turbidity measurements within 10 days after the end of each month the system served water to the public only if measurements demonstrate one or more conditions in R18-4-403(A)(3) through (6). Information that shall be reported:
 - i. The filter number, the turbidity measurement, the date(s) on which the turbidity limit was exceeded.
 - ii. If the system is required to produce a filter profile, the system shall report that the filter profile has been produced, or report the obvious reason for the abnormal filter performance.
 - iii. If the system is required to conduct a filter self-assessment, the system shall report that the filter self-assessment has been conducted.
 - iv. If the system is required to arrange for a comprehensive performance evaluation, the evaluation shall be completed and submitted to the Department no later than 90 days following the exceedance.
 4. ~~For unregulated SOCs under R18-4-405 shall report the analytical results to the Department within 30 days of receipt of the analytical results.~~
- L. No change.
- M. No change.
- N. No change.
- O. No change.
- P. No change.
- Q. No change.
- R. No change.
- S. No change.
- T. No change.
- U. No change.

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R18-4-105. Public Notification Requirements (Repeal May 6, 2002)

- A. MCL, MRDL, or treatment technique violations: A ~~water supplier of a~~ public water system that fails to comply with an applicable MCL, MRDL, or a treatment technique requirement shall provide public notice to persons served by the system as follows:
1. Publish public notice in a daily newspaper of general circulation in the area served by the system as soon as possible but not later than 14 days after the violation. If the area served by a public water system is not served by a daily newspaper of general circulation, the public water system shall provide public notice by publication in a weekly newspaper of general circulation serving the area; and
 2. Mail delivery of a public notice of the violation by direct mail or with the water bill not later than 45 days after the violation. The Department may waive mail delivery of the public notice if the public water system corrects the violation within the 45-day period.
- B. Acute violations: In addition to the public notice requirements prescribed in subsection (A), a ~~water supplier~~ public water system shall provide public notice by television or radio broadcast for an acute violation defined in this subsection. A ~~water supplier~~ public water system shall provide a copy of the public notice to radio and television stations that broadcast to the area served by the system as soon as possible but not later than 72 hours after an acute violation occurs. An acute violation is:
1. A violation of a MCL for total coliform when fecal coliforms or *E. coli* are present as specified in R18-4-202(A)(3) or R18-4-202(A)(4).
 2. A violation of the MCL for nitrate or nitrite as specified in R18-4-205.
 3. An occurrence of a waterborne disease outbreak that is attributable to water distributed by ~~the a~~ a public water system.
 4. A violation of the MRDL for chlorine dioxide as specified in R18-4-214.01(C) and determined in R18-4-214.01(K)(3)(a).
- C. Monitoring violations, exemptions, and variances: A ~~water supplier of a~~ public water system that fails to conduct required monitoring, fails to use approved analytical methods, or that obtains an exemption or variance from the Department shall give public notice as follows:
1. Publish public notice in a daily newspaper of general circulation within three months of the monitoring violation or the grant of an exemption or variance, or
 2. If the area served by ~~the a~~ a public water system is not served by a daily newspaper of general circulation, a ~~water supplier~~ public water system shall publish the public notice in a weekly newspaper of general circulation serving the area within three months of the monitoring violation or the grant of an exemption or variance.
- D. Alternative public notification procedures:
1. Community water systems: A ~~water supplier of a community water system~~ CWS that is located in an area that is not served by radio, television, or a daily or weekly newspaper of general circulation shall provide public notice by hand delivery or continuous posting in conspicuous places within the area served by the system. Posting shall continue for a minimum of 10 days and as long as a violation exists or for as long as an exemption or variance remains in effect.
 - a. Acute violations: A ~~water supplier~~ public water system shall provide public notice of an acute violation by hand delivery or posting as soon as possible but not later than 72 hours after an acute violation occurs.
 - b. MCL, MRDL, or treatment technique violations: A ~~water supplier~~ public water system shall provide public notice of a MCL, MRDL, or treatment technique violation by hand delivery or posting within 14 days after a violation occurs.
 - c. Monitoring violations, exemptions, and variances: A ~~water supplier~~ public water system shall provide public notice by hand delivery or by posting within three months of a monitoring violation or the grant of an exemption or variance by the Department.
 2. Noncommunity water systems: Instead of providing public notice as prescribed in subsection (A), (B), or (C), a ~~water supplier of a noncommunity water system~~ may provide public notice by hand delivery or by continuous posting in conspicuous places within the area served by the noncommunity system. Posting shall continue for a minimum of 10 days and for as long as a violation exists or an exemption or variance remains in effect.
 - a. Acute violations: A ~~water supplier of a noncommunity water system~~ shall provide public notice by hand delivery or posting as soon as possible but not later than 72 hours after an acute violation occurs;
 - b. MCL, MRDL, or treatment technique violations: A ~~water supplier of a noncommunity water system~~ shall provide public notice by hand delivery or posting within 14 days after a MCL, MRDL, or treatment technique violation occurs.
 - c. Monitoring violations, exemptions, and variances: A ~~water supplier of a noncommunity water system~~ shall provide public notice by hand delivery or posting within three months of a monitoring violation or the grant of an exemption or variance by the Department.
- E. Repeat public notice: ~~The water supplier~~ A public water system shall give repeat public notice at least once every three months by mail delivery (by direct mail or with the water bill) for as long as any violation exists. ~~The water supplier~~ A public water system shall give repeat public notice of the existence of a variance or exemption every three months for as

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long as the variance or exemption remains in effect. For a ~~community water system CWS~~ or a noncommunity water system that provides public notice by posting, repeat public notice requirements are satisfied by continuous posting.

- F. Limited public notice: ~~The water supplier~~ A public water system may give public notice to only a portion of the population served by a public water system if the public water system demonstrates that only a segment of the population served by the public water system is affected by the problem which results in the need for public notice.
- G. Notice to new customers: A ~~water supplier~~ public water system shall give a copy of the most recent public notice for any outstanding violation of a MCL, MRDL, treatment technique requirement, or a violation of a schedule of compliance prescribed pursuant to a variance or exemption to all new billing units or hookups prior to or at the time service begins.
- H. General content of a public notice: ~~Each~~ A public notice shall provide a clear and readily understandable explanation of the violation, any potential adverse health effects, the population at risk, the steps that the public water system is taking to correct the violation, the necessity for using alternative water supplies; and any measures the consumer should take to minimize exposure until the violation is corrected. ~~Each~~ A public notice shall be conspicuous and free of unduly technical language, small print, editorial comments, or similar problems that frustrate the purposes of the public notice. ~~Each~~ A public notice shall include the name and telephone number of a person at the public water system who can be contacted for additional information about the public notice. Where appropriate, the public notice shall be multi-lingual.
- I. Mandatory health effects language: A ~~water supplier~~ public water system shall include the mandatory health effects language prescribed in Appendix A in a public notice for the violation of a maximum contaminant level, maximum residual disinfectant level, or treatment technique and in a public notice regarding the granting or continued existence of a variance or exemption.
- J. The Department shall not provide public notice on behalf of the ~~water supplier~~ public water system. If a ~~water supplier~~ public water system fails to notify the public in accordance with the requirements, the Department may provide public notice to persons served by the public water system by any of the methods listed in this Section or by issuance of a press release. ~~The water supplier~~ A public water system remains legally responsible for ensuring that the requirements of this Section are met.
- K. This Section is repealed May 6, 2002.

R18-4-105.01 Public Notification Requirements (Effective May 6, 2002)

A. A public water system shall give public notice for all violations of this Chapter and for the following situations:

- 1. Operation under a variance or an exemption.
- 2. Failure to comply with the requirements of any schedule that has been set under a variance or exemption.
- 3. Occurrence of a waterborne disease outbreak or other waterborne emergency.
- 4. Distributing water with a concentration of fluoride greater than 2.0 mg/L but less than 4.0 mg/L
- 5. Availability of unregulated contaminant monitoring data.

B. Public notice requirements are divided into three categories, to take into account the seriousness of the violation or situation and of any potential adverse health effects that may be involved.

Table 1 provides the public notice categories. Appendix A identifies the public notice requirement for a specific violation or situation:.

<u>1. Acute (24 hour) public notice - required for violations and situations with significant potential to have serious adverse effects on human health as a result of short-term exposure.</u>
<u>2. Nonacute Level 1 (30 day) public notice - required for violations and situations with potential to have serious adverse effects on human health, but not as a result of short-term exposure.</u>
<u>3. Nonacute Level 2 (12 month) public notice - required for all other violations and situations not included in Acute (24 hour) and Nonacute Level 1 (30 day) public notice.</u>

C. A public water system shall provide public notice to persons served by the system, in accordance with this Section.

- 1. A public water system that sells or otherwise provides drinking water to a consecutive system is required to give public notice to the consecutive system. The consecutive system is responsible for providing public notice to the persons it serves.
- 2. A public water system that has a violation in a portion of the distribution system that is physically or hydraulically isolated from other parts of the distribution system may be allowed by the Department to limit distribution of the public notice to persons served by that portion of the system which is out of compliance. The Department's decision to allow limited distribution of the notice shall in writing.
- 3. The Department may provide public notice on behalf of the public water system. If a public water system fails to notify the public in accordance with the public notice requirements, the Department may provide public notice to persons served by the public water system by any of the methods listed in this Section or by issuance of a press release. A public water system remains legally responsible for ensuring that the requirements are met.

D. Acute (24 hour) public notice

- 1. Table 2 lists the violations and other situations requiring an Acute (24 hour) public notice:

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Table 2. Violations and Other Situations Requiring an Acute (24 hour) Public Notice

<p>1. Violation of the MCL for total coliforms when fecal coliform or <i>E. coli</i> are present in the water distribution system, as specified in R18-4-202(A)(3) or (4);</p> <p>2. Failure to test for fecal coliforms or <i>E. coli</i> when any repeat sample tests positive for total coliform;</p> <p>3. Violation of the MCL for nitrate, nitrite, or total nitrate and nitrite, as defined in R18-4-205;</p> <p>4. Failure to take a confirmation sample within 24 hours of the system's receipt of the initial sample showing a violation of the nitrate or nitrite MCL, as specified in R18-4-208(I) and R18-4-209(J);</p> <p>5. Violation of the nitrate MCL by a noncommunity water system, where permitted to exceed the MCL by the Department in R18-4-205;</p> <p>6. Violation of the MRDL for chlorine dioxide when one or more samples taken in the distribution system the day following a violation of the MRDL at the entrance of the distribution system exceed the MRDL;</p> <p>7. Failure to take the required chlorine dioxide samples in the distribution system.</p> <p>8. Violation of the interim turbidity MCL, as specified in R18-4-204(A)(2), where the Department determines after consultation that an Acute (24 hour) public notice is required or where consultation does not take place within 24 hours after the system learns of the violation;</p> <p>9. Violation of the maximum allowable turbidity limit, as specified in R18-4-302, where the Department determines after consultation that an Acute (24 hour) public notice is required or where consultation does not take place within 24 hours after the system learns of the violation; and</p> <p>10. Occurrence of a waterborne disease outbreak or other waterborne emergency with significant potential to have serious adverse effects on human health as a result of short-term exposure (such as a 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).</p>
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2. A public water system shall provide an Acute (24 hour) public notice according to the following procedures:
 - a. Provide a public notice as soon as possible, but no later than 24 hours after the system learns of the violation; and
 - b. Initiate consultation with the Department as soon as possible, but no later than 24 hours after the public water system learns of the violation or situation, to determine additional public notice requirements.
3. A public water system shall provide an Acute (24 hour) public notice in a form and manner reasonably expected to reach all persons served by one or more of the following delivery methods:
 - a. Appropriate broadcast media (such as radio and television);
 - b. Posting of the public notice in conspicuous locations throughout the area served by the water system;
 - c. Hand delivery of the public notice to persons served by the water system; or
 - d. Another delivery method approved in writing by the Department.

E. Nonacute Level 1 (30 day) public notice

1. Table 3 lists the violations and other situations requiring a Nonacute Level 1 (30 day) public notice.

Table 3. Violations and Other Situations Requiring a Nonacute Level 1 (30 day) Public Notice

<p>1. Violation of a MCL, MRDL, or treatment technique requirement where an Acute (24 hour) public notice is not required;</p> <p>2. Violation of a monitoring requirement, where the Department determines that a Nonacute Level 1 (30 day) public notice rather than a Nonacute Level 2 (12 month) public notice is required, taking into account potential health impacts and persistence of the violation; and</p> <p>3. Failure to comply with the terms and conditions of a variance or exemption granted to a public water system by the Department.</p>

2. A public water system shall provide a Nonacute Level 1 (30 day) public notice according to the following procedures:
 - a. Provide the public notice as soon as possible, but no later than 30 days after the system learns of the violation. If a public water system posts the public notice, the notice shall remain in place for at least seven days, or for as long as the violation or situation exists, whichever is longer. The Department may, in appropriate circumstances, allow additional time for the initial public notice of up to three months from the date the system learns of the violation. The Department shall not grant an extension for an unresolved violation. The Department's decision to grant an extension shall be in writing.
 - b. A public water system shall provide a repeat public notice every three months for as long as the violation or situation exists. The Department may determine that appropriate circumstances warrant a different repeat public notice frequency. A public water system shall provide reduced repeat public notice at least once a year. The Department's determination to allow a public water system to provide repeat public notices less frequently shall be in writing.

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- c. A public water system that is unable to consult with the Department within 24 hours due to weekends or holidays, may distribute a Nonacute Level 1 (30 day) public notice if one or more of the following is met:
 - i. The water system is able to document that water has been fed to waste and not served to customers;
 - ii. The water system is able to document that water has been recycled and not served to customers; or
 - iii. The water system is able to document that the testing equipment malfunctioned and high turbidity readings were erroneously obtained.
 - d. A public water system shall give a copy of the most recent public notice for a continuing violation, the existence of a variance or exemption, or other ongoing situation requiring a public notice to all new billing units or new customers prior to or at the time service begins.
3. A public water system shall provide a Nonacute Level 1 (30 day) public notice in a form and manner reasonably expected to reach all persons served by one or more of the following delivery methods:
- a. A CWS shall provide public notice by:
 - i. 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; or
 - ii. Any other public notice delivery method reasonably expected to reach other persons regularly served by the system, if they would not normally be reached by the public notice required in subsection (E)(3)(a)(1). 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 the public notice in public places served by the system or on the Internet, or delivery to community organizations.
 - b. A noncommunity water system shall provide public notice by:
 - i. Posting the public 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); or
 - ii. Any other public notice delivery method reasonably expected to reach other persons served by the system if they would not normally be reached by the public notice required in subsection (E)(3)(b)(1). 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 such as community centers.
 - iii. A noncommunity water system shall 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 exists.

E. Nonacute Level 2 (12 month) public notice

1. Table 4 lists the violations and other situations requiring a Nonacute Level 2 (12 month) public notice.

Table 4. Violations and Other Situations Requiring a Nonacute Level 2 (12 month) Public Notice

<p>1. <u>Monitoring violations where an Acute (24 hour) public notice or a Nonacute Level 1 (30 day) public notice is not required;</u></p> <p>2. <u>Operation under a variance or an exemption granted by the Department;</u></p> <p>3. <u>Availability of unregulated contaminant monitoring results required by 40 CFR § 141.40; and</u></p> <p>4. <u>Distributing water with a concentration of fluoride greater than 2.0 mg/L but less than 4.0 mg/L 4.</u></p>
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2. A public water system shall provide a Nonacute Level 2 (12 month) public notice according to the following procedures:
- a. Provide the public notice no later than one year (12 months) after the public water system learns of the violation or situation or begins operating under a variance or exemption. A public water system shall repeat the public notice annually for as long as the violation, variance, exemption, or other situation exists. If a public water system posts the public notice, the notice shall remain in place for at least seven days, or for as long as the violation, variance, exemption, or other situation exists, whichever is longer.
 - b. A public water system may use one annual public notice detailing all violations and situations that occurred during the previous twelve months, rather than individual public notices as long as the timing requirements of subsection (F)(2)(a) are met.
 - c. A CWS may use the Consumer Confidence Report (CCR) as a vehicle for the initial Nonacute Level 2 (12 month) public notice and all required repeat public notices, as long as the timing, content, and distribution requirements of this Section are met.
3. A public water system shall provide a Nonacute Level 2 (12 month) public notice in a form and manner reasonably expected to reach all persons served by one or more of the following delivery methods:
- a. A CWS shall provide public notice by:

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- i. 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; or
- ii. Any other public notice delivery method reasonably expected to reach other persons regularly served by the system, if they would not normally be reached by the public notice required in subsection (F)(3)(a)(i). 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 the public notice in public places or on the Internet, or delivery to community organizations.
- b. A noncommunity water system shall provide public notice by:
 - i. Posting the public 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); or
 - ii. Any other public notice delivery method reasonably expected to reach other persons served by the system, if they would not normally be reached by the public notice required in subsection (F)(3)(b)(i). 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).
 - iii. A noncommunity water system shall 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 exists.

G. Content of the public notice.

- 1. A public notice shall contain the following elements:
 - a. A description of the violation or situation, including the contaminant(s) of concern, and (as applicable) the contaminant level(s);
 - b. When the violation or situation occurred;
 - c. Any potential adverse health effects from the violation or situation, including the applicable health effects language in Appendix A;
 - d. The population at risk, if known, including subpopulations particularly vulnerable if exposed to the contaminant in their drinking water;
 - e. Whether alternative water supplies should be used;
 - f. What actions consumers should take, including when they should seek medical help, if known;
 - g. What the system is doing to correct the violation or situation;
 - h. When the water system expects to return to compliance or resolve the situation;
 - i. 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 public notice; and
 - j. A statement to encourage the public notice recipient to distribute the public notice to other persons served using the standard language as specified in subsection (G)(6), where applicable.
- 2. For a public water system that has been granted a variance or an exemption, the public notice shall contain the following:
 - a. An explanation of the reasons for the variance or exemption;
 - b. The date on which the variance or exemption was issued;
 - c. 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
 - d. A notice of opportunity for public input in the review of the variance or exemption.
- 3. A public notice required by this Section:
 - a. Shall be displayed in a conspicuous way when printed or posted;
 - b. Shall not contain overly technical language or very small print;
 - c. Shall not be formatted in a way that defeats the purpose of the public notice; and
 - d. Shall not contain language which nullifies the purpose of the public notice.
- 4. A public water system that serves a large proportion of non-English speaking consumers, as determined by the public water system after consultation with the Department, shall include information in the appropriate language regarding the importance of the public notice or include a telephone number or address where persons served may contact the water system to obtain a translated copy of the public notice or to request assistance in the appropriate language.
- 5. A public water system shall include the following language in their public notice, including the language necessary to fill in the blanks, for all monitoring violations:

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.

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6. A public water system shall include in a public notice the following language (where applicable): 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.

H. This Section is effective May 6, 2002.

Appendix A. Regulated Contaminants

<u>Microbiological Contaminants</u>	<u>MCL</u>	<u>MCLG¹</u>	<u>Major Sources in Drinking Water</u>	<u>Mandatory Health Language</u>	<u>Type of PN* required</u>	
					<u>MCL</u>	<u>Monit.</u>
<u>Total Coliform Bacteria</u>	<u>Presence of coliform bacteria in 5% or more of monthly samples (CWSs that collect 40 or more samples per month); one positive monthly sample (CWSs that collect fewer than 40 samples per month).</u>	<u>0</u>	<u>Naturally present in the environment.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Fecal coliform and E. coli</u>	<u>A routine sample and a repeat sample are total coliform positive, and one one is also fecal coliform or E. coli positive</u>	<u>0</u>	<u>Human and animal fecal waste.</u>	<u>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.</u>	<u>AC</u>	<u>AC, NAL2</u>
<u>Turbidity</u>	<u>Treatment Technique</u>	<u>N/A</u>	<u>Soil Run-off</u>	<u>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.</u>	<u>NAL1, AC</u>	<u>NAL2</u>
<u>Radiochemicals</u>	<u>MCL</u>	<u>MCLG</u>	<u>Major Sources in Drinking Water</u>	<u>Mandatory Health Language</u>	<u>Type of PN* required</u>	
					<u>MCL</u>	<u>Monit.</u>
<u>Beta/photon emitters</u>	<u>4 millirems/ Year</u>	<u>0</u>	<u>Decay of natural and man-made deposits.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>

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<u>Alpha emitters</u>	<u>15 picocuries/Liter</u>	<u>0</u>	<u>Erosion of natural deposits.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Combined radium 226/228</u>	<u>5 Picocuries/ Liter</u>	<u>0</u>	<u>Erosion of natural deposits.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Disinfectants and Disinfection Byproducts</u>	<u>MCL in mg/L</u>	<u>MCLG in mg/L</u>	<u>Major Sources in Drinking Water</u>	<u>Mandatory Health Language</u>	<u>Type of PN* required</u>	
					<u>MRDL</u>	<u>Monit.</u>
<u>Bromate</u>	<u>.010</u>	<u>0</u>	<u>By-product of drinking water chlorination</u>	<u>Some people who drink water containing bromate in excess of the MCL over many years may have an increased risk of getting cancer.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Chloramines</u>	<u>MRDL = 4</u>	<u>MRDLG ² = 4</u>	<u>Water additive used to control microbes</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Chlorine</u>	<u>MRDL = 4</u>	<u>MRDLG ² = 4</u>	<u>Water additive used to control microbes</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Chlorine dioxide</u>	<u>MRDL = .8</u>	<u>MRDLG ² = .8</u>	<u>Water additive used to control microbes</u>	<u>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.^a</u>	<u>AC, NAL1</u>	<u>AC, NAL1, NAL2</u>
<u>Chlorite</u>	<u>1</u>	<u>.8</u>	<u>By-product of drinking water chlorination</u>	<u>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.</u>	<u>NAL1NA L2</u>	

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<u>Haloacetic Acids (HAA5)</u>	<u>.060b</u>	<u>N/A</u>	<u>By-product of drinking water disinfection</u>	<u>Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>TTHMs (Total trihalomethanes)</u>	<u>.10/.080^c</u>	<u>N/A</u>	<u>Byproduct of drinking water chlorination.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Inorganic Contaminants</u>	<u>MCL in mg/L</u>	<u>MCLG in mg/L</u>	<u>Major Sources in Drinking Water</u>	<u>Mandatory Health Language</u>	<u>Type of PN* required</u>	
					<u>MCL</u>	<u>Monit.</u>
<u>Antimony</u>	<u>.006</u>	<u>.006</u>	<u>Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Arsenic</u>	<u>.05</u>	<u>N/A</u>	<u>Erosion of natural deposits; Run-off from orchards; Run-off from glass and electronics production wastes.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Asbestos</u>	<u>7 million fibers/Liter (MFL)</u>	<u>7 MFL</u>	<u>Decay of asbestos cement water mains; Erosion of natural deposits.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Barium</u>	<u>2</u>	<u>2</u>	<u>Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits.</u>	<u>Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Beryllium</u>	<u>.004</u>	<u>.004</u>	<u>Discharge from metal refineries and coal-burning factories; Discharge from electrical, aerospace, and defense industries.</u>	<u>Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Cadmium</u>	<u>.005</u>	<u>.005</u>	<u>Corrosion of galvanized pipes; Erosion of natural deposits; Discharge from metal refineries; run-off from waste batteries and paints.</u>	<u>Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Chromium</u>	<u>.1</u>	<u>.1</u>	<u>Discharge from steel and pulp mills; Erosion of natural deposits.</u>	<u>Some people who use water containing chromium well in excess of the MCL over many years could experience allergic dermatitis.</u>	<u>NAL1</u>	<u>NAL2</u>

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<u>Copper</u>	<u>Action Level =1.3</u>	<u>1.3</u>	<u>Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservatives.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Cyanide</u>	<u>.2</u>	<u>.2</u>	<u>Discharge from steel/metal factories; Discharge from plastic and fertilizer factories.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Fluoride</u>	<u>4.0</u>	<u>4.0</u>	<u>Erosion of natural deposits; Water additive that promotes strong teeth; Discharge from fertilizer and aluminum factories.</u>	<u>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. Children may get mottled teeth.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Fluoride Levels greater than 2.0 mg/L, but less than 4.0 mg/L.</u>	<u>N/A</u>	<u>N/A</u>		<u>See endnote ^d</u>		
<u>Lead</u>	<u>Action Level =.015</u>	<u>0</u>	<u>Corrosion of household plumbing systems; Erosion of natural deposits.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Mercury</u>	<u>.002</u>	<u>.002</u>	<u>Erosion of natural deposits; Discharge from refineries and factories; Runoff from landfills; Runoff from cropland.</u>	<u>Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Nitrate</u>	<u>10</u>	<u>10</u>	<u>Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.</u>	<u>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.</u>	<u>AC</u>	<u>AC, NAL2</u>
<u>Nitrite</u>	<u>1</u>	<u>1</u>	<u>Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.</u>	<u>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.</u>	<u>AC</u>	<u>AC, NAL2</u>

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<u>Selenium</u>	<u>.05</u>	<u>.05</u>	<u>Discharge from petroleum and metal refineries; Erosion of natural deposits; Discharge from mines.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Thallium</u>	<u>.002</u>	<u>.0005</u>	<u>Leaching from ore-processing sites; Discharge from electronics, glass, and drug factories.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Synthetic Organic Contaminants including Pesticides and Herbicides</u>	<u>MCL in mg/L</u>	<u>MCLG in mg/L</u>	<u>Major Sources in Drinking Water</u>	<u>Mandatory Health Language</u>	<u>Type of PN* required</u>	
					<u>MCL</u>	<u>Monit.</u>
<u>2,4-D</u>	<u>.07</u>	<u>.07</u>	<u>Runoff from herbicide used on row crops.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>2,4,5-TP [Silvex]</u>	<u>.05</u>	<u>.05</u>	<u>Residue of banned herbicide.</u>	<u>Some people who drink water containing silvex in excess of the MCL over many years could experience liver problems.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Acrylamide</u>	<u>Treatment Technique</u>	<u>0</u>	<u>Added to water during sewage/wastewater treatment.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Alachlor</u>	<u>.002</u>	<u>0</u>	<u>Runoff from herbicide used on row crops.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Atrazine</u>	<u>.003</u>	<u>.003</u>	<u>Runoff from herbicide used on row crops.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Benzo(a)pyrene [PAH]</u>	<u>.0002</u>	<u>0</u>	<u>Leaching from linings of water storage tanks and distribution lines.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>

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<u>Carbofuran</u>	<u>.04</u>	<u>.04</u>	<u>Leaching of soil fumigant used on rice and alfalfa.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Chlordane</u>	<u>.002</u>	<u>0</u>	<u>Residue of banned termiticide.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Dalapon</u>	<u>.2</u>	<u>.2</u>	<u>Runoff from herbicide used on rights of way.</u>	<u>Some people who drink water containing dalapon well in excess of the MCL over many years could experience minor kidney changes.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Di(2-ethylhexyl) adipate</u>	<u>.4</u>	<u>.4</u>	<u>Discharge from chemical factories.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Di(2-ethylhexyl) phthalate</u>	<u>.006</u>	<u>0</u>	<u>Discharge from rubber and chemical factories.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Dibromochloropropane (DBCP)</u>	<u>.0002</u>	<u>0</u>	<u>Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Dinoseb</u>	<u>.007</u>	<u>.007</u>	<u>Runoff from herbicide used on soybeans and vegetables.</u>	<u>Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Dioxin [2,3,7,8-TCDD]</u>	<u>.00000003</u>	<u>0</u>	<u>Emissions from waste incineration and other combustion; Discharge from chemical factories.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Diquat</u>	<u>.02</u>	<u>.02</u>	<u>Runoff from herbicide use.</u>	<u>Some people who drink water containing diquat in excess of the MCL over many years could get cataracts.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Endothall</u>	<u>.1</u>	<u>.1</u>	<u>Runoff from herbicide use.</u>	<u>Some people who drink water containing endothall in excess of the MCL over many years could experience problems with their stomach or intestines.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Endrin</u>	<u>.002</u>	<u>.002</u>	<u>Residue of banned insecticide.</u>	<u>Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems.</u>	<u>NAL1</u>	<u>NAL2</u>

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<u>Epichlorohydrin</u>	<u>Treatment Technique</u>	<u>0</u>	<u>Discharge from industrial chemical factories; An impurity of some water treatment chemicals.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Ethylene dibromide</u>	<u>.00005</u>	<u>0</u>	<u>Discharge from petroleum refineries.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Glyphosate</u>	<u>.7</u>	<u>.7</u>	<u>Runoff from herbicide use.</u>	<u>Some people who drink water containing glyphosate in excess of the MCL over many years could experience problems with their kidneys or reproductive difficulties.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Heptachlor</u>	<u>.0004</u>	<u>0</u>	<u>Residue of banned pesticide.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Heptachlor epoxide</u>	<u>.0002</u>	<u>0</u>	<u>Breakdown of heptachlor.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Hexachlorobenzene</u>	<u>.001</u>	<u>0</u>	<u>Discharge from metal refineries and agricultural chemical factories.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Hexachlorocyclopentadiene</u>	<u>.05</u>	<u>.05</u>	<u>Discharge from chemical factories.</u>	<u>Some people who drink water containing hexachlorocyclopentadiene well in excess of the MCL over many years could experience problems with their kidneys or stomach.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Lindane</u>	<u>.0002</u>	<u>.0002</u>	<u>Runoff/leaching from insecticide used on cattle, lumber, gardens.</u>	<u>Some people who drink water containing lindane in excess of the MCL over many years could experience problems with their kidneys or liver.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Methoxychlor</u>	<u>.04</u>	<u>.04</u>	<u>Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock.</u>	<u>Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Oxamyl [Vydate]</u>	<u>.2</u>	<u>.2</u>	<u>Runoff/leaching from insecticide used on apples, potatoes and tomatoes.</u>	<u>Some people who drink water containing oxamyl in excess of the MCL over many years could experience slight nervous system effects.</u>	<u>NAL1</u>	<u>NAL2</u>

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<u>PCBs [Polychlorinated biphenyls]</u>	<u>.0005</u>	<u>0</u>	<u>Runoff from landfills; discharge of waste chemicals.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Pentachlorophenol</u>	<u>.001</u>	<u>0</u>	<u>Discharge from wood preserving factories.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Picloram</u>	<u>.5</u>	<u>.5</u>	<u>Herbicide runoff.</u>	<u>Some people who drink water containing picloram in excess of the MCL over many years could experience problems with their liver.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Simazine</u>	<u>.004</u>	<u>.004</u>	<u>Herbicide runoff.</u>	<u>Some people who drink water containing simazine in excess of the MCL over many years could experience problems with their blood.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Toxaphene</u>	<u>.003</u>	<u>0</u>	<u>Runoff/leaching from insecticide used on cotton and cattle.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Volatile Organic Contaminants</u>	<u>MCL in mg/L</u>	<u>MCLG in mg/L</u>	<u>Major Sources in Drinking Water</u>	<u>Mandatory Health Language</u>	<u>Type of PN* required</u>	
					<u>MCL</u>	<u>Monit.</u>
<u>Benzene</u>	<u>.005</u>	<u>0</u>	<u>Discharge from factories; Leaching from gas storage tanks and landfills.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Carbon tetrachloride</u>	<u>.005</u>	<u>0</u>	<u>Discharge from chemical plants and other industrial activities.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Chlorobenzene</u>	<u>.1</u>	<u>.1</u>	<u>Discharge from chemical and agricultural chemical factories.</u>	<u>Some people who drink water containing chlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>o-Dichlorobenzene</u>	<u>.6</u>	<u>.6</u>	<u>Discharge from industrial chemical factories.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>

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<u>p-Dichlorobenzene</u>	<u>.075</u>	<u>.075</u>	<u>Discharge from industrial chemical factories.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>1,2-Dichloroethane</u>	<u>.005</u>	<u>0</u>	<u>Discharge from industrial chemical factories.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>1,1-Dichloroethylene</u>	<u>.007</u>	<u>.007</u>	<u>Discharge from industrial chemical factories.</u>	<u>Some people who drink water containing 1,1-dichloroethylene in excess of the MCL over many years could experience problems with their liver.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>cis-1,2-Dichloroethylene</u>	<u>.07</u>	<u>.07</u>	<u>Discharge from industrial chemical factories.</u>	<u>Some people who drink water containing cis-1,2-dichloroethylene in excess of the MCL over many years could experience problems with their liver.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>trans-1,2-Dichloroethylene</u>	<u>.1</u>	<u>.1</u>	<u>Discharge from industrial chemical factories.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Dichloromethane</u>	<u>.005</u>	<u>0</u>	<u>Discharge from pharmaceutical and chemical factories.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>1,2-Dichloropropane</u>	<u>.005</u>	<u>0</u>	<u>Discharge from industrial chemical factories.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Ethylbenzene</u>	<u>.7</u>	<u>.7</u>	<u>Discharge from petroleum refineries.</u>	<u>Some people who drink water containing ethylbenzene well in excess of the MCL over many years could experience problems with their liver or kidneys.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Styrene</u>	<u>.1</u>	<u>.1</u>	<u>Discharge from rubber and plastic factories; Leaching from landfills.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Tetrachloroethylene</u>	<u>.005</u>	<u>0</u>	<u>Discharge from factories and dry cleaners.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>1,2,4-Trichlorobenzene</u>	<u>.07</u>	<u>.07</u>	<u>Discharge from textile-finishing factories.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>

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<u>1,1,1- Trichloroethane</u>	<u>.2</u>	<u>.2</u>	<u>Discharge from metal degreasing sites and other factories.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>1,1,2- Trichloroethane</u>	<u>.005</u>	<u>.003</u>	<u>Discharge from industrial chemical factories.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Trichloroethylene</u>	<u>.005</u>	<u>0</u>	<u>Discharge from metal degreasing sites and other factories.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Toluene</u>	<u>1</u>	<u>1</u>	<u>Discharge from petroleum factories.</u>	<u>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.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Vinyl Chloride</u>	<u>.002</u>	<u>0</u>	<u>Leaching from PVC piping; Discharge from plastics factories.</u>	<u>Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer.</u>	<u>NAL1</u>	<u>NAL2</u>
<u>Xylenes</u>	<u>10</u>	<u>10</u>	<u>Discharge from petroleum factories; Discharge from chemical factories.</u>	<u>Some people who drink water containing xylenes in excess of the MCL over many years could experience damage to their nervous system.</u>	<u>NAL1</u>	<u>NAL2</u>

*Type of PN required

AC = Acute (24 hour) public notice

NAL1 = Nonacute Level 1 (30 day) public notice

NAL2 = Nonacute Level 2 (12 month) public notice

¹ MCLG = Maximum Contaminant Level Goal

²MRDLG = Maximum Residual Disinfectant Level Goal

Endnotes to Appendix A

- a. In addition to the mandatory health language, systems must include either the language in Endnote (a)(1) or (a)(2). Systems with a violation at the treatment plant, but not in the distribution system, are required to use the language in Endnote (a)(1) and provide a Nonacute public notice. Systems with a violation in the distribution system are required to use the language in Endnote (a)(2) and provide an Acute public notice.
 - i. The chlorine dioxide violations reported today are the result of violations at the treatment facility only, and do not include violations within the distribution system serving users of this water supply. Continued compliance with chlorine dioxide levels within the distribution system minimizes the potential risk of these violations to present consumers.
 - ii. The chlorine dioxide violations reported today include violations of the EPA standard within the distribution system serving water users. Violations of the chlorine dioxide standard within the distribution system may harm human health based on short-term exposures. Certain groups, including pregnant women, infants, and young children, may be especially susceptible to adverse effects of excessive exposure to chlorine dioxide-treated water. The purpose of this notice is to advise that such persons should consider reducing their risk of adverse

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effects from these chlorine dioxide violations by seeking alternate sources of water for human consumption until such violations are rectified. Local and state health authorities are the best sources for information concerning alternate drinking water.

- b. Haloacetic Acids (HAA5): The MCL of .060mg/L is effective 1/1/02. The CCR for calendar year 2002 shall reflect the MCL of .060mg/L.
- c. Total trihalomethanes (TTHM): The MCL of .080mg/L is effective 1/1/02. The CCR for calendar year 2001 shall reflect the MCL of .10mg/L, and the CCR for calendar year 2002 shall reflect the MCL of .080mg/L.
- d. Mandatory Health Effects Language for Fluoride levels greater than 2 b:

This is an alert about your drinking water and a cosmetic dental problem that might affect children under nine years of age. At low levels, fluoride can help prevent cavities, but children drinking water containing more than two 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 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 mg/L of fluoride (the U.S. Environmental Protection Agency's drinking water standard) can increase your risk of developing bone disease. Your drinking water does not contain more than four mg/L of fluoride, but we're required to notify you when we discover that the fluoride levels in your drinking water exceed 2 mg/L because of this cosmetic dental problem.

For more information, please call [name of water system contact] of [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.

ARTICLE 2. MAXIMUM CONTAMINANT LEVELS AND MONITORING REQUIREMENTS; MONITORING ASSISTANCE PROGRAM; MONITORING ASSISTANCE PROGRAM

R18-4-210. Fluoride; Special Public Notice (Repeal May 6, 2002)

- A. A CWS that distributes water with a concentration of fluoride that exceeds 2.0 mg/L but does not exceed 4.0 mg/L shall give public notice to the following:
 - 1. All billing units annually, and
 - 2. All new billing units at the time service begins.
- B. The special public notice shall contain the mandatory health effects language for fluoride prescribed in Appendix A.
- C. This Section repealed May 6, 2002.

R18-4-214. Total Trihalomethanes: MCL And Monitoring Requirements (Repeal January 1, 2004)

- A. This Section does not apply to surface water systems serving 10,000 or more persons after January 1, 2002. The maximum contaminant level for total trihalomethanes applies only to water that is distributed by a community water system CWS which serves a population of 10,000 or more persons and which adds a halogenated disinfectant to the water at any point in the treatment process [hereafter referred to as a CWS in this Section].
- B. The maximum contaminant level for total trihalomethanes is 0.10 mg/L.
- C. A CWS shall take four samples per quarter for each water treatment plant operated by the CWS. For purposes of this Section, the minimum number of samples required to be taken shall be based upon the number of water treatment plants used by the CWS, except that multiple wells drawing water from a single aquifer may, with Department approval, be considered one water treatment plant for determining the minimum number of samples required. All samples taken within a quarter shall be collected within a 24-hour period.
- D. At least 25% of the total trihalomethane samples shall be taken at locations within the distribution system which reflect the maximum residence time of water in the system. The remaining 75% of the samples shall be taken at representative locations in the distribution system.
- E. Upon the written request of a CWS, the Department may reduce the number of samples taken per quarter to a minimum of one sample for each water treatment plant. The Department's decision to reduce the number of samples shall be in writing. The Department may reduce the number of quarterly samples, provided that:
 - 1. The sample is taken at a point in the distribution system which reflects the maximum residence time of the water in the system; and
 - 2. There is at least one year of monitoring data which demonstrates that total trihalomethane concentrations are below 0.10 mg/L.
 - 3. If the concentration of total trihalomethanes in any sample exceeds 0.10 mg/L and the analytical results are confirmed by at least one confirmation sample taken within 24 hours after such analytical results are received or, if the CWS

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changes its source or treatment process, the CWS shall immediately resume monitoring in accordance with the monitoring frequency prescribed in subsection (C) and continue such monitoring for at least one year.

- F. A CWS that is a groundwater system may make a written request that the Department reduce monitoring frequency to a minimum of one sample for maximum total trihalomethane potential [MTP] per year for each water treatment plant used by the system. The Department may reduce monitoring frequency by a groundwater system provided the groundwater system submits data which demonstrates that the MTP is less than 0.10 mg/L and the groundwater system is not likely to exceed the maximum contaminant level for total trihalomethanes. The Department's decision to reduce monitoring frequency to one sample for MTP per water treatment plant shall be in writing. The required MTP sample shall be taken at a point which reflects the maximum residence time of the water in the distribution system. If the analytical results of a sample taken by a groundwater system for MTP are equal to or greater than 0.10 mg/L and such results are confirmed by at least one sample taken within 24 hours after analytical results are received, then the groundwater system shall immediately resume monitoring at the frequency prescribed in subsection (C) and continue such monitoring for at least one year. If the groundwater system changes its source of water or treatment process, the groundwater system shall immediately analyze an additional sample for MTP. The additional sample shall be taken at a point which reflects the maximum residence time of the water in the distribution system.
- G. The Department may increase monitoring frequency where necessary to detect variations of levels of total trihalomethanes within a distribution system.
- H. The results of all analyses taken each quarter shall be arithmetically averaged and reported to the Department within 30 days of a water system's receipt of the last results of the previous quarter. Unless the analytical results are invalidated by the Department because the samples were not collected and analyzed in conformance with this Section, all samples collected shall be used in the computation of the average.
- I. Compliance with the maximum contaminant level for total trihalomethanes shall be determined based on a running annual average of quarterly samples collected by a CWS.
- J. This Section repealed January 1, 2004.

R18-4-214.01. Disinfectant Residuals and Disinfection Byproducts (Repeal January 1, 2004)

- A. This Section applies to surface water systems serving 10,000 or more persons, after January 1, 2002. A CWS or NTNCWS shall comply with the following MCLs for disinfection byproducts:
 - Disinfection byproduct: MCL (mg/L)
 - Total trihalomethanes (TTHM): 0.080
 - Haloacetic acids (five) (HAA5):- 0.060
 - Bromate: 0.010
 - Chlorite: 1.0
- B. A CWS or NTNCWS that is installing GAC or membrane technology to comply with the MCLs listed in subsection (A), may make a written request to the Department for an extension of up to 24 months past the compliance date, but not beyond December 31, 2003. The Department shall develop, and a system shall comply with, an extension agreement. An extension agreement shall provide the following:
 - 1. A schedule for compliance with specific project milestones.
 - 2. A schedule for submission of progress reports.
 - 3. A requirement for notice of monitoring results and extension in the system's Consumer Confidence Report.
 - 4. A Public Notification requirement if a MCL in subsection (A) is exceeded, and
 - 5. Interim treatment requirements.
 - a. In order to determine the appropriate interim treatment requirements for an extension agreement, the Department may consider, but is not limited to, the following information: monitoring data for disinfection byproducts, current treatment practices, current plant infrastructure, construction plans, and pilot studies.
 - b. Interim treatment requirements may include: moving the point of disinfection, treatment changes to improve TOC removal, changing primary or secondary disinfectants, adjusting pH to reduce disinfection byproduct formation, and implementing a main flushing program in areas with high detention times or biofilm problems.
- C. A CWS or NTNCWS shall comply with the following MRDLs for disinfectant residuals:
 - Disinfectant residual: MRDL (mg/L)
 - Chlorine: 4.0 (as Cl₂)
 - Chloramines: 4.0 (as Cl₂)
 - Chlorine dioxide: 0.8 (as ClO₂)
- D. A TNCWS that uses chlorine dioxide as a disinfectant or oxidant shall comply with the chlorine dioxide MRDL in subsection (C).
- E. In order to protect public health, a system may increase residual disinfectant levels in the distribution system of chlorine or chloramines (but not chlorine dioxide) to a level and for a time necessary to address specific microbiological contamination problems caused by circumstances such as, but not limited to, distribution line breaks, storm run-off events, source water contamination events, or cross-connection events.

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- E.** A system shall collect disinfection byproduct and residual disinfection level samples at sites which are representative of water throughout the distribution system according to a written monitoring plan. The system shall submit the monitoring plan to the Department for review. After review, the Department may require changes to the monitoring plan. The system shall maintain the plan and make it available for inspection by the Department and the general public no later than January 31, 2002. The system shall submit a copy of the monitoring plan to the Department no later than the date of the first report required in R18-4-104(A). The plan shall include at least the following elements:
1. Specific locations and schedules for collecting samples for any parameters included in this Section;
 2. Compliance calculation methods for applicable MCLs, MRDLs, and treatment techniques; and
 3. If approved for monitoring as a consecutive system or if providing water to a consecutive system as prescribed under R18-4-113, the sampling plan shall reflect the entire distribution system.
- G.** General Monitoring requirements for disinfectant residuals and disinfection byproducts.
1. A system shall collect all samples during normal operating conditions.
 2. A system shall monitor in accordance with the monitoring plan required in subsection (F).
 3. A system may use only data collected under the provisions of this Section to qualify for reduced monitoring.
- H.** Monitoring requirements for disinfection byproducts.
1. TTHM and HAA5. A CWS or NTNCWS, shall monitor for TTHM and HAA5 at the following frequencies:
 - a. Routine monitoring: A system shall collect at least four samples per quarter per treatment plant in the distribution system. A system shall collect at least 25 percent of the samples collected in a quarter at locations representing maximum residence time. A system shall collect the remaining samples at locations representative of at least average residence time in the distribution system and representing the entire distribution system, taking into account number of persons served, different sources of water, and different treatment methods. If a system elects to collect more than the minimum samples required, the system shall collect at least 25 percent of all samples taken each quarter at locations that represent the maximum residence time of the water in the distribution system. A system shall collect the remaining samples at locations representative of at least average residence time in the distribution system.
 - b. Reduced monitoring: A system may submit a written request, to the Department for a reduction in TTHM and HAA5 monitoring. The Department's decision to reduce monitoring for TTHM and HAA5 shall be in writing.
 - i. The Department may reduce TTHM and HAA5 monitoring to one sample per treatment plant per quarter if a system's source water annual average TOC level, before any treatment, is less than or equal to 4.0 mg/L and TTHM annual average is less than or equal to 0.040 mg/L and HAA5 annual average is less than or equal to 0.030mg/L. A system on a reduced monitoring schedule shall collect samples at a distribution system location reflecting maximum residence time.
 - ii. If the average of all samples collected in a year for a system on a reduced monitoring schedule is greater than 0.060 mg/L or 0.045 mg/L for TTHM or HAA5, respectively, the system shall resume monitoring at the frequency identified in subsection (H)(1)(a) in the quarter immediately following the monitoring period in which the average exceeds 0.060 mg/L or 0.045 mg/L for TTHM or HAA5, respectively.
 2. Chlorite: A CWS or NTNCWS using chlorine dioxide for disinfection or oxidation shall monitor for chlorite at the following frequencies:
 - a. Routine monitoring: A system shall collect a daily sample at the entrance to the distribution system. If a daily sample exceeds the chlorite MCL, the system shall collect additional samples in the distribution system the following day at the locations required in subsection (H)(2)(c), in addition to the sample required at the entrance to the distribution system.
 - b. Monthly monitoring: A system shall collect a three-sample set each month in the distribution system. The system shall collect one sample at each of the following locations: near the first customer, at a location representative of average residence time, and at a location reflecting maximum residence time in the distribution system. A system may collect additional routine samples and shall collect them in the same manner as previously specified (as three-sample sets, at the specified locations). The system may use the results of additional monitoring conducted under subsection (H)(2)(c) to meet the requirement for monitoring in this subsection.
 - c. Additional monitoring: On each day following a routine sample monitoring result that exceeds the chlorite MCL at the entrance to the distribution system, the system shall collect three chlorite samples in the distribution system at the following locations: as close to the first customer as possible, in a location representative of average residence time, and as close to the end of the distribution system as possible (reflecting maximum residence time in the distribution system).
 - d. Reduced monitoring:
 - i. The Department shall not reduce chlorite monitoring at the entrance to the distribution system.
 - ii. A system may submit a written request to the Department for a reduction in chlorite monitoring in the distribution system required in subsection (H)(2)(b). The Department may reduce chlorite monitoring in the distribution system to one three-sample set per quarter after the system has monitored for one year and no individual chlorite sample collected in the distribution system under subsection (H)(2)(b) has exceeded the

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chlorite MCL and the system has not been required to conduct monitoring under subsection (H)(2)(c). The Department's decision to reduce monitoring for chlorite in the distribution system shall be in writing.

iii. A system may remain on the reduced monitoring schedule until either any of the three individual chlorite samples collected monthly in the distribution system under subsection (H)(2)(b) exceeds the chlorite MCL or the system is required to conduct monitoring under subsection (H)(2)(c) of this Section, at which time the system shall revert to routine monitoring.

3. Bromate. A CWS or NTNCWS using ozone for disinfection or oxidation shall monitor for bromate at the following frequencies:

a. Routine monitoring: A system shall collect one sample per month for each treatment plant in the system using ozone. A system shall collect a sample each month at the entrance to the distribution system while the ozonation system is operating under normal conditions.

b. Reduced monitoring: A system may submit a written request to the Department for a reduction in bromate monitoring. The Department may reduce bromate monitoring in the distribution system to once per quarter, if the system demonstrates that the annual average for source water bromide concentration is less than 0.05 mg/L based upon representative monthly bromide measurements. A system must continue bromide monitoring to remain on reduced bromate monitoring. The Department's decision to reduce monitoring for bromate shall be in writing.

c. The system may remain on reduced bromate monitoring until the running annual average source water bromide concentration, computed quarterly, is equal to or greater than 0.05 mg/L based upon representative monthly measurements. If the running annual average source water bromide concentration is greater than or equal to 0.05 mg/L, the system shall resume routine monitoring required in subsection (H)(3)(a).

I. Compliance for disinfection byproducts. The Department shall determine compliance with a disinfection byproduct as follows:

1. All samples collected and analyzed under the provisions of this Section shall be included in determining compliance, even if that number is greater than the minimum required.

2. During the first year of monitoring under this Section, if the average for an individual quarter will cause the running annual average of a system to exceed a MCL, the system is out of compliance at the end of that quarter.

3. TTHM and HAA5: For a system that monitors quarterly, the Department shall determine compliance with a MCL for TTHM and HAA5 based on the running annual average of all samples collected by the system as required in of subsection (H)(1). For a system that fails to collect four consecutive quarters of monitoring, the Department shall determine compliance with the MCL for TTHM and HAA5 based on an average of the available data.

4. Bromate: For a system required to monitor for bromate, the Department shall determine compliance with the MCL for bromate based on the running annual arithmetic average, computed quarterly, of monthly samples (or, for months in which the system collects more than one sample, the average of all samples collected during the month) collected by the system as required in subsection (H)(3). For a system that fails to collect 12 consecutive months of monitoring for bromate, the Department shall determine compliance with the MCL for bromate based on an average of the available data.

5. Chlorite: For a system required to monitor for chlorite, the Department shall determine compliance with the MCL for chlorite based on a monthly arithmetic average of samples collected by the system as required in subsection (H)(2).

J. Monitoring requirements for disinfectant residuals.

1. Chlorine and chloramines. A CWS or NTNCWS that uses chlorine or chloramines shall measure the residual disinfectant level in the distribution system when total coliforms are sampled. A system may use the results of residual disinfectant concentration sampling conducted under R18-4-303(C)(3) in lieu of taking separate samples. The Department shall not reduce monitoring for chlorine or chloramines.

2. Chlorine dioxide. A CWS, NTNCWS, or TNCWS that uses chlorine dioxide for disinfection or oxidation shall monitor for chlorine dioxide at the following frequencies:

a. Routine monitoring: A system shall collect a daily sample at the entrance to the distribution system. For a daily sample that exceeds the MRDL, the system shall collect samples in the distribution system the following day at the locations required by subsection (J)(2)(b), in addition to the sample required at the entrance to the distribution system.

b. Additional monitoring: On each day following a routine sample monitoring result that exceeds the MRDL, the system shall collect three chlorine dioxide distribution system samples.

i. If chlorine dioxide or chloramines are used to maintain a disinfectant residual in the distribution system, or if chlorine is used to maintain a disinfectant residual in the distribution system and there are no disinfection addition points after the entrance to the distribution system (i.e., no booster chlorination), the system shall collect three chlorine dioxide samples as close to the first customer as possible, at intervals of at least six hours.

ii. If chlorine or chloramines are used to maintain a disinfectant residual in the distribution system and there are one or more disinfection addition points after the entrance to the distribution system (i.e., booster chlorination), the system shall collect one chlorine dioxide sample at each of the following locations: as close to the

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first customer as possible, in a location representative of average residence time, and as close to the end of the distribution system as possible (reflecting maximum residence time in the distribution system).

iii. The Department shall not reduce monitoring for chlorine dioxide.

K. Compliance for disinfectant residuals. The Department shall determine compliance with a residual disinfectant in subsection (C) as follows:

1. All samples collected and analyzed under the provisions of this Section shall be included in determining compliance, even if that number is greater than the minimum required.
2. Chlorine and chloramines.
 - a. For a system that fails to monitor for a residual level where compliance is based on a running annual average of monthly or quarterly samples or averages and the system's failure to monitor makes it impossible to determine compliance with MRDLs for chlorine and chloramines, the system will be out of compliance for the entire period covered by the annual average.
 - b. The Department shall determine compliance with a MRDL for chlorine and chloramines based on a running annual arithmetic average, computed quarterly, of monthly averages of all samples collected by the system under subsection (J)(1).
 - c. For a system that switches between the use of chlorine and chloramines for residual disinfection during the year, the Department shall determine compliance by including all monitoring results of both chlorine and chloramines in calculating compliance.
3. Chlorine dioxide. The Department shall determine compliance with the MRDL for chlorine dioxide based on consecutive daily samples collected by the system under subsection (J)(2).
 - a. Any sample collected in the distribution system which exceeds the MRDL the day after a sample collected at the entrance to the distribution system exceeds the MRDL is an acute violation. The system shall immediately take corrective action to lower the level of chlorine dioxide below the MRDL. Failure to collect samples in the distribution system on the day following a sample taken at the entrance to the distribution system exceeding the chlorine dioxide MRDL, is an acute violation.
 - b. Any two consecutive daily samples collected at the entrance to the distribution system that exceed the MRDL and all the samples the system collected in the distribution are below the MRDL is a non-acute violation. The system shall take corrective action to lower the level of chlorine dioxide below the MRDL at the point of sampling. Failure to collect a sample at the entrance to the distribution system the day after a sample at the entrance to the distribution system exceeds the chlorine dioxide MRDL is a non-acute violation.

L. Monitoring requirements for disinfection byproduct precursors (TOC).

1. Routine monitoring: A CWS or NTNCWS that uses conventional filtration treatment shall monitor each treatment plant for TOC no later than the point of combined filter effluent turbidity monitoring that is representative of the treated water. A system that is required to monitor under this subsection shall also monitor for TOC and alkalinity in the source water prior to any treatment at the same time as monitoring for TOC in the treated water. These samples (TOC and alkalinity) are referred to as a sample set. A system shall collect one sample set per month per plant at a time representative of normal operating conditions and source water quality.
2. Reduced monitoring: Upon the written request from a system, the Department may approve a reduction in monitoring to one sample set per plant per quarter for a system with an average treated water TOC of less than 2.0 mg/L for two consecutive years, or less than 1.0 mg/L for one year. The system shall revert to routine monitoring in the month following the quarter when the annual average treated water TOC is greater than or equal to 2.0 mg/L. The Department's decision to reduce monitoring for TOC shall be in writing.

M. This Section repealed January 1, 2004.

R18-4-214.02. Disinfectant Residuals and Disinfection Byproducts (Effective January 1, 2004)

A. This Section applies to surface water systems and ground water systems of any size that use a chemical disinfectant, after January 1, 2004. A CWS or NTNCWS shall comply with the following MCLs for disinfection byproducts:

Disinfection byproduct: MCL (mg/L)
Total trihalomethanes (TTHM): 0.080
Haloacetic acids (five) (HAA5): 0.060
Bromate: 0.010
Chlorite: 1.0

B. A CWS or NTNCWS shall comply with the following MRDLs for disinfectant residuals:

Disinfectant Residual: MRDL (mg/L)
Chlorine: 4.0 (as Cl₂)
Chloramines: 4.0 (as Cl₂)
Chlorine dioxide: 0.8 (as ClO₂)

C. A TNCWS that uses chlorine dioxide as a disinfectant or oxidant shall comply with the MRDL for chlorine dioxide in subsection (B).

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- D.** In order to protect public health, a system may increase residual disinfectant levels in the distribution system of chlorine or chloramines (but not chlorine dioxide) to a level and for a time necessary to address specific microbiological contamination problems caused by circumstances such as, but not limited to, distribution line breaks, storm run-off events, source water contamination events, or cross-connection events.
- E.** A system shall collect disinfection byproduct and residual disinfection level samples at sites which are representative of water throughout the distribution system according to a written monitoring plan. A surface water system that serves more than 3,300 people shall submit a copy of the monitoring plan to the Department for review no later than the date of the first report required under R18-4-104(A). After review, the Department may require changes to the monitoring plan. The system shall maintain the plan and make it available for inspection by the Department and the general public no later than January 31, 2004. The Department may require any other PWS to submit a copy of the monitoring plan. A monitoring plan is subject to review and approval by the Department. A monitoring plan shall include at least the following elements:
1. Specific locations and schedules for collecting samples for any parameters included in this Section;
 2. Compliance calculation methods for applicable MCLs, MRDLs, and treatment techniques;
 3. If approved for monitoring as a consecutive system or if providing water to a consecutive system as prescribed under R18-4-113, the sampling plan shall reflect the entire distribution system.
- F.** General Monitoring requirements for disinfectant residuals and disinfection byproducts:
1. A system shall take a sample during normal operating conditions.
 2. Upon the written request from a system, the Department may consider multiple wells drawing water from a single aquifer as one treatment plant for determining the minimum number of TTHM and HAA5 samples required. In order to determine the appropriate reduction in monitoring for TTHM and HAA5, the Department may consider, but is not limited to, the following information:
 - a. Well construction and geology,
 - b. Water characteristics and chemistry,
 - c. Number of water treatment plants,
 - d. Hydrologic reports which delineate the source aquifer or aquifers,
 - e. Previous TTHM analytical results,
 - f. Number of persons served, and
 - g. Land area encompassed by the water system.
 3. A system shall monitor in accordance with the monitoring plan required under subsection (E).
 4. A system may use only data collected under the provisions of this Section to qualify for reduced monitoring.
- G.** Monitoring requirements for disinfection byproducts.
1. Routine monitoring for TTHM and HAA5: A CWS or NTNCWS shall monitor at the frequency indicated in the following table:

<u>Type of system</u>	<u>Minimum Monitoring Frequency</u>	<u>Sample Location in the distribution system</u>
<u>CWS or NTNCWS using surface water and serving at least 10,000 persons</u>	<u>four water samples per quarter per treatment plant</u>	<u>At least 25 percent of all samples collected each quarter at locations representing maximum residence time. Remaining samples taken at locations representative of at least average residence time in the distribution system and representing the entire distribution system, taking into account number of persons served, different sources of water, and different treatment methods.</u>
<u>CWS or NTNCWS using surface water and serving from 500 to 9,999 persons</u>	<u>one water sample per quarter per treatment plant</u>	<u>Locations representing maximum residence time.</u>
<u>CWS or NTNCWS surface water and serving fewer than 500 persons</u>	<u>one water sample per year per treatment plant during month of warm-est water temperature</u>	<u>Locations representing maximum residence time. If the sample (or average of annual samples, if more than one sample is taken) exceeds the MCL, the system shall increase monitoring to one sample per treatment plant per quarter, taken at a point reflecting the maximum residence time in the distribution system, until the system meets criteria in subsection (G)(2)(c).</u>
<u>CWS or NTNCWS using solely groundwater and using chemical disinfectant and serving at least 10,000 persons</u>	<u>one water sample per quarter per treatment plant</u>	<u>Locations representing maximum residence time.</u>

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<u>CWS or NTNCWS using solely groundwater and using chemical disinfectant and serving fewer than 10,000 persons</u>	<u>one water sample per year per treatment plant during month of warmest water temperature</u>	<u>Locations representing maximum residence time. If the sample (or average of annual samples, if more than one sample is taken) exceeds the MCL, the system shall increase monitoring to one sample per treatment plant per quarter, taken at a point reflecting the maximum residence time in the distribution system, until the system meets criteria in subsection (G)(2)(c).</u>
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- a. A system that elects to sample more frequently than the minimum required, shall collect at least 25 percent of all samples collected each quarter at locations that represent the maximum residence time of the water in the distribution system. The system shall collect the remaining samples at locations representative of at least average residence time in the distribution system.
 - b. Multiple wells drawing water from a single aquifer may be considered one treatment plant for determining the minimum number of samples required, with Department approval in accordance with criteria listed under subsections (F)(2)(a) through (g).
2. Reduced monitoring for TTHM and HAA5: Upon the written request from a system, the Department may approve a reduction in TTHM and HAA5 monitoring, except as otherwise provided, in accordance with the following table:

<u>Type of System</u>	<u>Routine Monitoring Results for at Least One Year</u>	<u>Reduced Monitoring and Sample Location</u>
<u>CWS or NTNCWS using surface water and serving 10,000 persons or more with a source water annual average TOC level, before any treatment of 4.0 mg/L or less.</u>	<u>TTHM annual average is less than or equal to 0.040 mg/L and HAA5 annual average is less than or equal to 0.030mg/L</u>	<u>one sample per treatment plant per quarter at distribution system location reflecting maximum residence time</u>
<u>CWS or NTNCWS using surface water and serving 500 to 9,999 persons with a source water annual average TOC level, before any treatment of 4.0 mg/L or less.</u>	<u>TTHM annual average is less than or equal to 0.040 mg/L and HAA5 annual average is less than or equal to 0.030mg/L</u>	<u>one sample per treatment plant per year at distribution system location reflecting maximum residence time during month of warmest water temperature. NOTE: Any system serving surface water and serving fewer than 500 persons may not reduce its monitoring to less than one sample per treatment plant per year.</u>
<u>CWS NTNCWS using solely groundwater and using a chemical disinfectant and serving 10,000 persons or more.</u>	<u>TTHM annual average is less than or equal to 0.040 mg/L and HAA5 annual average is less than or equal to 0.030mg/L</u>	<u>one sample per treatment plant per year at distribution system location reflecting maximum residence time during month of warmest water temperature</u>
<u>CWS or NTNCWS using only groundwater and using chemical a disinfectant and serving fewer than 10,000 persons</u>	<u>TTHM annual average is less than or equal to 0.040 mg/L and HAA5 annual average is less than or equal to 0.030mg/L for two consecutive years OR TTHM annual average is less than or equal to 0.020 mg/L and HAA5 annual average is less than or equal to 0.015mg/L for one year</u>	<u>one sample per treatment plant per three year monitoring cycle at distribution system location reflecting maximum residence time during month of warmest water temperature, with the three-year cycle beginning on January one following quarter in which system qualifies for reduced monitoring.</u>

- a. A system on a reduced monitoring schedule may remain on that reduced schedule as long as the average of all samples taken in the year (for a system that monitors quarterly) or the result of the sample (for a system that monitors no more frequently than annually) is no more than 0.060 mg/L and 0.045 mg/L for TTHM and HAA5, respectively. A system that does not meet these levels shall resume monitoring at the frequency identified in subsection (G)(1) (minimum monitoring frequency column) in the quarter immediately following the monitoring period in which the system exceeds 0.060 mg/L or 0.045 mg/L for TTHM or HAA5, respectively.
- b. For a system serving solely groundwater and serving fewer than 10,000 persons, if either the TTHM annual average is greater than 0.080 mg/L or the HAA5 annual average is greater than 0.060 mg/L, the system shall increase monitoring as specified in subsection (G)(1) (sample location column) in the quarter immediately following the monitoring period in which the system exceeds 0.080 mg/L or 0.060 mg/L for TTHM or HAA5, respectively.

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- c. A system on increased monitoring may return to routine monitoring if, after at least one year of monitoring the TTHM annual average is less than or equal to 0.060 mg/L and their HAA5 annual average is less than or equal to 0.045 mg/L.
3. Chlorite: A CWS or NTNCWS using chlorine dioxide for disinfection or oxidation shall monitor for chlorite at the following frequencies:
- a. Routine monitoring: A system shall collect a daily sample at the entrance to the distribution system. If a daily sample exceeds the chlorite MCL, the system shall collect additional samples in the distribution system the following day at the locations required in subsection (G)(3)(c), in addition to the sample required at the entrance to the distribution system.
- b. Monthly monitoring: A system shall collect a three-sample set each month in the distribution system. The system shall collect one sample at each of the following locations: near the first customer, at a location representative of average residence time, and at a location reflecting maximum residence time in the distribution system. A system may collect additional routine samples and shall collect them in the same manner as previously specified (as three-sample sets, at the specified locations). The system may use the results of additional monitoring conducted under subsection (G)(3)(c) to meet the requirement for monitoring in this subsection.
- c. Additional monitoring: On each day following a routine sample monitoring result that exceeds the chlorite MCL at the entrance to the distribution system, the system shall collect three chlorite samples in the distribution system at the following locations: as close to the first customer as possible, in a location representative of average residence time, and as close to the end of the distribution system as possible (reflecting maximum residence time in the distribution system).
- d. Reduced monitoring:
- i. The Department shall not reduce chlorite monitoring at the entrance to the distribution system.
- ii. A system may submit a written request to the Department for a reduction in chlorite monitoring in the distribution system required in subsection (G)(3)(b). The Department may reduce chlorite monitoring in the distribution system to one three-sample set per quarter after the system has monitored for one year and no individual chlorite sample collected in the distribution system under subsection (G)(3)(b) has exceeded the chlorite MCL and the system has not been required to conduct monitoring under subsection (G)(3)(c). The Department's decision to reduce monitoring for chlorite in the distribution system shall be in writing.
- iii. A system may remain on the reduced monitoring schedule until either any of the three individual chlorite samples collected monthly in the distribution system under subsection (G)(3)(b) exceeds the chlorite MCL or the system is required to conduct monitoring under subsection (G)(3)(c) of this Section, at which time the system shall revert to routine monitoring.
4. Bromate. A CWS or NTNCWS using ozone for disinfection or oxidation shall monitor for bromate at the following frequencies:
- a. Routine monitoring: A system shall collect one sample per month for each treatment plant in the system using ozone. A system shall collect a sample each month at the entrance to the distribution system while the ozonation system is operating under normal conditions.
- b. Reduced monitoring: A system may submit a written request to the Department for a reduction in bromate monitoring. The Department may reduce bromate monitoring in the distribution system to once per quarter, if the system demonstrates that the annual average for source water bromide concentration is less than 0.05 mg/L based upon representative monthly bromide measurements. A system must continue bromide monitoring to remain on reduced bromate monitoring. The Department's decision to reduce monitoring for bromate shall be in writing.
- c. The system may remain on reduced bromate monitoring until the running annual average source water bromide concentration, computed quarterly, is equal to or greater than 0.05 mg/L based upon representative monthly measurements. If the running annual average source water bromide concentration is greater than or equal to 0.05 mg/L, the system shall resume routine monitoring required in subsection (G)(4)(a).
- H.** Compliance for disinfection byproducts. The Department shall determine compliance with a disinfection byproduct as follows:
1. All samples collected and analyzed under the provisions of this Section shall be included in determining compliance, even if that number is greater than the minimum required.
2. During the first year of monitoring under this Section, if the average for an individual quarter will cause the running annual average of a system to exceed a MCL, the system is out of compliance at the end of that quarter.
3. TTHM and HAA5:
- a. For a system that monitors quarterly, the Department shall determine compliance with a MCL for TTHM and HAA5 based on a running annual average of all samples collected by the system as required in of subsections (G)(1) and (2). For a system that fails to collect four consecutive quarters of monitoring, the Department shall determine compliance with the MCL for TTHM and HAA5 based on an average of the available data.
- b. For a system that monitors less frequently than quarterly, the Department shall determine compliance with a MCL for TTHM and HAA5 based on the average of samples collected that year by the system as required in sub-

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sections (G)(1) and (2). If the average of these samples exceeds the MCL, the system shall increase monitoring to once per quarter per treatment plant and the system is not in violation of the MCL until it has completed one year of quarterly monitoring, unless the result of fewer than four quarters of monitoring will cause the running annual average to exceed the MCL, in which case the system is in violation at the end of that quarter. A system required to increase monitoring frequency to quarterly monitoring shall calculate compliance by including the sample which triggered the increased monitoring plus the following three quarters of monitoring.

4. Bromate: For a system required to monitor for bromate, the Department shall determine compliance with the MCL for bromate based on the running annual arithmetic average, computed quarterly, of monthly samples (or, for months in which the system collects more than one sample, the average of all samples collected during the month) collected by the system as required in subsection(G)(4). For a system that fails to collect 12 consecutive months of monitoring for bromate, the Department shall determine compliance with the MCL for bromate based on an average of the available data.
5. Chlorite: For a system required to monitor for chlorite, the Department shall determine compliance with the MCL for chlorite based on a monthly arithmetic average of samples collected by the system as required in subsection (G)(3).

I. Monitoring requirements for disinfectant residuals.

1. Chlorine and chloramines. A CWS or NTNCWS that uses chlorine or chloramines shall measure the residual disinfectant level in the distribution system when total coliforms are sampled. A system may use the results of residual disinfectant concentration sampling conducted under R18-4-303(C)(3) in lieu of taking separate samples. The Department shall not reduce monitoring for chlorine or chloramines.
2. Chlorine dioxide. A CWS, NTNCWS, or TNCWS that uses chlorine dioxide for disinfection or oxidation shall monitor for chlorine dioxide at the following frequencies:
 - a. Routine monitoring: A system shall collect a daily samples at the entrance to the distribution system. For a daily sample that exceed the MRDL, the system shall collect samples in the distribution system the following day at the locations required by subsection (I)(2)(b), in addition to the sample required at the entrance to the distribution system.
 - b. Additional monitoring: On each day following a routine sample monitoring result that exceeds the MRDL, the system shall collect three chlorine dioxide distribution system samples.
 - i. If chlorine dioxide or chloramines are used to maintain a disinfectant residual in the distribution system, or if chlorine is used to maintain a disinfectant residual in the distribution system and there are no disinfection addition points after the entrance to the distribution system (i.e., no booster chlorination), the system shall collect three chlorine dioxide samples as close to the first customer as possible, at intervals of at least six hours.
 - ii. If chlorine or chloramines are used to maintain a disinfectant residual in the distribution system and there are one or more disinfection addition points after the entrance to the distribution system (i.e., booster chlorination), the system shall collect one chlorine dioxide sample at each of the following locations: as close to the first customer as possible, in a location representative of average residence time, and as close to the end of the distribution system as possible (reflecting maximum residence time in the distribution system).
 - iii. The Department shall not reduce monitoring for chlorine dioxide.

I. Compliance for disinfectant residuals. The Department shall determine compliance with a residual disinfectant in subsection (C) as follows:

1. All samples collected and analyzed under the provisions of this Section shall be included in determining compliance, even if that number is greater than the minimum required.
2. Chlorine and chloramines.
 - a. For a system that fails to monitor for a residual level where compliance is based on a running annual average of monthly or quarterly samples or averages and the system's failure to monitor makes it impossible to determine compliance with MRDLs for chlorine and chloramines, the system will be out of compliance for the entire period covered by the annual average.
 - b. The Department shall determine compliance with a MRDL for chlorine and chloramines based on a running annual arithmetic average, computed quarterly, of monthly averages of all samples collected by the system under subsection (I)(1).
 - c. For a system that switches between the use of chlorine and chloramines for residual disinfection during the year, the Department shall determine compliance by including all monitoring results of both chlorine and chloramines in calculating compliance.
3. Chlorine dioxide. The Department shall determine compliance with the MRDL for chlorine dioxide based on consecutive daily samples collected by the system under subsection (I)(2).
 - a. Any sample collected in the distribution system which exceeds the MRDL the day after a sample collected at the entrance to the distribution system exceeds the MRDL is an acute violation. The system shall immediately take corrective action to lower the level of chlorine dioxide below the MRDL. Failure to collect samples in the distri-

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bution system on the day following a sample taken at the entrance to the distribution system exceeding the chlorine dioxide MRDL, is an acute violation.

- b. Any two consecutive daily samples collected at the entrance to the distribution system that exceed the MRDL and all the samples the system collected in the distribution are below the MRDL is a non-acute violation. The system shall take corrective action to lower the level of chlorine dioxide below the MRDL at the point of sampling. Failure to collect a sample at the entrance to the distribution system the day after a sample at the entrance to the distribution system exceeds the chlorine dioxide MRDL is a non-acute violation.

K. Monitoring requirements for disinfection byproduct precursors (TOC).

1. Routine monitoring: A CWS or NTNCWS that uses conventional filtration treatment shall monitor each treatment plant for TOC no later than the point of combined filter effluent turbidity monitoring that is representative of the treated water. A system that is required to monitor under this subsection shall also monitor for TOC and alkalinity in the source water prior to any treatment at the same time as monitoring for TOC in the treated water. These samples (TOC and alkalinity) are referred to as a sample set. A system shall collect one sample set per month per plant at a time representative of normal operating conditions and source water quality.
2. Reduced monitoring: Upon the written request from a system, the Department may approve a reduction in monitoring to one sample set per plant per quarter for a system with an average treated water TOC of less than 2.0 mg/L for two consecutive years, or less than 1.0 mg/L for one year. The system shall revert to routine monitoring in the month following the quarter when the annual average treated water TOC is greater than or equal to 2.0 mg/L. The Department's decision to reduce monitoring for TOC shall be in writing.

L. This Section effective January 1, 2004.

R18-4-220. Best Available Technology

- A. A public water system that is not in compliance with an applicable maximum contaminant level shall install and use best available technology to achieve compliance with that maximum contaminant level. The best available technologies for achieving compliance with maximum contaminant levels are as follows:
1. Inorganic chemicals

Chemical	BATs
Antimony	2, 9
Asbestos	2, 3, 4, 5
Barium	7, 8, 9, 10
Beryllium	1, 2, 7, 8, 9
Cadmium	2, 7, 8, 9
Chromium III	2, 7, 8, 9
Chromium VI	2, 7, 9
Cyanide	7, 9, 11
Fluoride	1, 9
Mercury	2 ^a , 6, 8 ^a , 9 ^a
Nickel	7, 8, 9
Nitrate	7, 9, 10
Nitrite	7, 9
Selenium IV	1, 2, 8, 9, 10
Selenium VI	1, 7, 8, 9
Thallium	1, 7

Key to BATs:

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- | | |
|--|---------------------------------|
| 1 = Activated alumina | 7 = Ion exchange |
| 2 = Conventional filtration ^b | 8 = Lime softening ^b |
| 3 = Corrosion control | 9 = Reverse osmosis |
| 4 = Direct filtration | 10 = Electrodialysis |
| 5 = Diatomaceous earth filtration | 11 = Chlorine oxidation |
| 6 = Granular activated carbon | |

^aBAT only if influent Hg concentration < 10 ~~mG/L~~ mg/L.

^bNot BAT for public water systems with < 500 service connections

2. Synthetic and volatile organic chemicals:

<u>Chemical</u>	<u>GAC</u>	<u>PTA</u>	<u>OX</u>
Alachlor	X		
Atrazine	X		
Benzene	X	X	
Benzo(a)pyrene	X		
Carbofuran	X		
Carbon tetrachloride	X	X	
Chlordane	X		
2,4-D	X		
Dalapon	X		
Dibromochloropropane (DBCP)	X	X	
o-Dichlorobenzene	X	X	
p-Dichlorobenzene	X	X	
1,2-Dichloroethane	X	X	
1,1-Dichloroethylene	X	X	
cis-1,2-Dichloroethylene	X	X	
trans-1,2-Dichloroethylene	X	X	
Dichloromethane	X		
1,2-Dichloropropane	X	X	
Di(2-ethylhexyl)adipate	X	X	
Di(2-ethylhexyl)phthalate	X		
Dinoseb	X		
Diquat	X		
Endothall	X		
Endrin	X		
Ethylbenzene	X	X	
Ethylene dibromide (EDB)	X	X	
Glyphosate			X
Heptachlor	X		

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Heptachlor epoxide	X		
Hexachlorobenzene	X		
Hexachlorocyclopentadiene	X	X	
Lindane	X		
Methoxychlor	X		
Monochlorobenzene	X	X	
Oxamyl (Vydate)	X		
Pentachlorophenol	X		
Picloram	X		
Polychlorinatedbiphenyls (PCBs)	X		
Simazine	X		
Styrene	X	X	
2,3,7,8-TCDD (Dioxin)	X		
Tetrachloroethylene	X	X	
Toluene	X	X	
Toxaphene	X		
2,4,5-TP (Silvex)	X		
1,2,4-Trichlorobenzene	X	X	
1,1,1-Trichloroethane	X	X	
1,1,2-Trichloroethane	X	X	
Trichloroethylene	X	X	
Vinyl chloride	X		
Xylenes	X	X	

Key to BATs:

GAC = Granulated activated carbon

PTA = Packed tower aeration

OX = Chlorine or ozone oxidation

- B.** The best available technologies, treatment techniques, or other means for achieving compliance with the maximum contaminant levels for total coliform are as follows:
1. Protection of wells from contamination by coliforms by appropriate placement and construction;
 2. Maintenance of a disinfectant residual throughout the distribution system;
 3. Maintenance of the distribution system, which includes appropriate pipe replacement and repair procedures, ongoing main flushing programs, proper operation and maintenance of storage tanks and reservoirs, and continual maintenance of positive water pressure in all parts of the distribution system; and
 4. Filtration and disinfection of surface water and groundwater under the direct influence of surface water or disinfection of groundwater.
- C.** The best available technology for achieving compliance with the maximum contaminant level for turbidity is filtration.
- D.** The best available technologies, treatment techniques or other means for achieving compliance with the maximum contaminant levels for total trihalomethanes are as follows: for disinfection byproducts are as follows:
1. ~~Use of chloramines as an alternate or supplemental disinfectant or oxidant;~~
 2. ~~Use of chlorine dioxide as an alternate or supplemental disinfectant or oxidant;~~
 3. ~~Improved existing clarification for trihalomethane precursor reduction;~~
 4. ~~Moving the point of chlorination to reduce total trihalomethane formation and, where necessary, substituting chloramines, chlorine dioxide, or potassium permanganate for the use of chlorine as a pre-oxidant.~~
 5. ~~Use of powdered activated carbon for trihalomethane precursor or total trihalomethane reduction seasonally or intermittently at dosages not to exceed 10 mg/L on an annual average basis.~~

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1. Total trihalomethanes under the requirements of R18-4-214.
 - a. Use of chloramines as an alternate or supplemental disinfectant or oxidant;
 - b. Use of chlorine dioxide as an alternate or supplemental disinfectant or oxidant;
 - c. Improved existing clarification for trihalomethane precursor reduction;
 - d. Moving the point of chlorination to reduce total trihalomethane formation and, where necessary, substituting chloramines, chlorine dioxide, or potassium permanganate for the use of chlorine as a pre-oxidant.
 - e. Use of powdered activated carbon for trihalomethane precursor or total trihalomethane reduction seasonally or intermittently at dosages not to exceed 10 mg/L on an annual average basis.
2. Disinfection byproducts under the requirements of R18-4-214.01 and R18-4-214.02.

<u>DISINFECTION BYPRODUCT</u>	<u>BEST AVAILABLE TECHNOLOGY</u>
<u>TTHM</u>	<u>Enhanced coagulation or enhanced softening or GAC10, with chlorine as the primary and residual disinfectant</u>
<u>HAA5</u>	<u>Enhanced coagulation or enhanced softening or GAC10, with chlorine as the primary and residual disinfectant</u>
<u>Bromate</u>	<u>Control of ozone treatment process to reduce production of bromate</u>
<u>Chlorite</u>	<u>Control of treatment processes to reduce disinfectant demand and control of disinfection treatment processes to reduce disinfectant levels</u>

E. The best available technologies for achieving compliance with the maximum residual disinfectant levels for disinfectants are the control of treatment processes to reduce disinfectant demand and the control of disinfection treatment processes to reduce disinfectant levels.

~~E.F.~~ A public water system may defer installation and use of best available technology by obtaining an exemption pursuant to R18-4-111. The Department may require a public water system to use bottled water, point-of-use treatment devices, point-of-entry treatment devices, or other means as a condition of granting an exemption to avoid an unreasonable risk to public health.

~~F.G.~~ A public water system shall install and use best available technology as a condition for granting a variance under R18-4-110. The Department may require a public water system to use bottled water, point-of-use treatment devices, point-of-entry treatment devices, or other means as a condition of granting a variance to avoid an unreasonable risk to public health. If a water supplier can demonstrate through a comprehensive engineering assessment of a public water system that installation of best available technology will achieve only a de minimis reduction in contaminant levels, the Department may issue a schedule of compliance that requires the public water system to examine other treatment methods as a condition of obtaining a variance. If the Department determines that another treatment method is technically feasible, the Department may require the public water system to install and use that treatment method under a compliance schedule.

~~G.H.~~ An alternative technology, the removal of a source from service, or blending may be used to achieve compliance with a maximum contaminant level provided that the alternative technology, source removal, or blending is approved, in writing, by the Department and is at least as effective as the best available technology identified in this Section.

ARTICLE 3. TREATMENT TECHNIQUES

R18-4-301. Surface Water Treatment

- A.** A surface water system shall provide filtration and disinfection which reliably achieves:
 1. At least a 99.9% (3-log) removal and inactivation of *Giardia lamblia* cysts between a point where the raw water is not subject to recontamination by surface water runoff and a point downstream before or at the first customer; ~~and~~
 2. At least a 99.99% (4-log) removal and inactivation of viruses between a point where the raw water is not subject to recontamination by surface water runoff and a point downstream before or at the first customer; and
 3. Effective January 1, 2002, a surface water system serving at least 10,000 persons shall provide, in addition to the removal requirements for *Giardia lamblia* and viruses, at least a 99% (2-log) removal and inactivation of *Cryptosporidium* oocysts between a point where the raw water is not subject to recontamination by surface water runoff and a point downstream before or at the first customer.
- B.** A surface water system shall be considered to be in compliance with the *Giardia lamblia*, ~~and virus~~, and *Cryptosporidium* removal and inactivation requirements prescribed in subsection (A) if the system provides filtration as prescribed by R18-4-302 and disinfection as prescribed in R18-4-303.
- C.** A surface water system shall provide filtration and disinfection ~~by June 29, 1993~~. A public water system with a source that is determined to be groundwater under the direct influence of surface water shall provide filtration and disinfection ~~by~~

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~~June 29, 1993,~~ or within 18 months of the date that the Department determines that the groundwater is under the direct influence of surface water, whichever is later. Failure to provide filtration and disinfection ~~by the date specified in this subsection~~ is a treatment technique violation.

- D. A surface water system which has not installed filtration shall comply, before filtration is installed, with the interim maximum contaminant level and monitoring requirements for turbidity prescribed at R18-4-204 and any interim disinfection requirements prescribed by the Department that the Department considers necessary to protect public health.
- E. ~~Variance or exemptions-~~The Department shall not grant a variance or exemption from a treatment technique requirements requirement related to filtration and disinfection are not allowed.

R18-4-301.02. Control of Disinfection Byproduct Precursors by Enhanced Coagulation and Enhanced Softening

A. Effective January 1, 2002, a CWS or NTNCWS that serves 10,000 or more persons and is a surface water system that uses conventional filtration shall operate with enhanced coagulation or enhanced softening requirements unless the system meets at least one of the following alternate compliance criteria:

1. Source water TOC level is less than 2.0 mg/L, calculated quarterly as a running annual average;
2. Treated water TOC level is less than 2.0 mg/L, calculated quarterly as a running annual average;
3. Running annual average for TTHM is less than or equal to 0.040m g/L and HAA5 is less than or equal to 0.030mg/L and chlorine is the only disinfectant used by the system;
4. Source water SUVA is less than or equal to 2.0 L/mg-m, measured monthly and calculated quarterly as a running annual average;
5. Treated water SUVA is less than or equal to 2.0 L/mg-m, measured monthly and calculated quarterly as a running annual average;
6. Softening that results in lowering treated water alkalinity to less than 60 mg/L (as CaCO₃), measured monthly and calculated quarterly as a running annual average;
7. Softening that results in removing at least 10 mg/L of magnesium hardness (as CaCO₃), measured monthly and calculated quarterly as a running annual average; or
8. Source water TOC is less than 4.0 mg/L, calculated quarterly as a running annual average, and source water alkalinity is greater than 60 mg/L (as CaCO₃), calculated quarterly as a running annual average, and either TTHM and HAA5 running annual averages are less than or equal to 0.040 mg/L and 0.030 mg/L, respectively; or if the system can submit evidence to the Department by the enhanced coagulation compliance date that control technology will be installed and operating by June 30, 2005 with a schedule for the reduction of TTHM and HAA5 to 0.040 mg/L and 0.030 mg/L.

B. Effective January 1, 2004 for CWS or NTNCWS that serves fewer than 10,000 persons and is a surface water system that uses conventional filtration shall operate with enhanced coagulation or enhanced softening requirements unless the system meets at least one of the alternate compliance criteria in R18-4-301.02(A)(1) -(8).

C. A CWS or NTNCWS that is a surface water system that uses conventional filtration and that does not meet at least one of the alternate compliance criteria shall determine the enhanced coagulation and enhanced softening requirement with the following steps:

1. Step 1: The Step 1 TOC percent reduction requirement is based on source water alkalinity and source water TOC. A system shall use the following table to determine TOC percent reduction requirement. A system that practices water softening shall meet TOC percent reduction in the far right column of the table.

<u>Source Water TOC, mg/L</u>	<u>Source Water Alkalinity, mg/L as CaCO₃</u>		
	<u>0-60</u>	<u>>60-120</u>	<u>>120</u>
<u>>2.0-4.0</u>	<u>35.0%</u>	<u>25.0%</u>	<u>15.0%</u>
<u>>4.0-8.0</u>	<u>45.0%</u>	<u>35.0%</u>	<u>25.0%</u>
<u>>8.0</u>	<u>50.0%</u>	<u>40.0%</u>	<u>30.0%</u>

2. Step 2: A system that cannot meet the TOC reduction requirements in Step 1 due to water quality parameters and or operational constraints shall notify the Department within three months of the effective date in subsection (A) if the system serves at least 10,000 persons or subsection (B) if the system serves less than 10,000, to request Department approval of a Step 2 TOC removal requirement. The Step 2 TOC removal requirement shall be based on the results from bench- or pilot- scale testing performed by the system. A system shall included the results from bench- or pilot-scale testing in the request to the Department for an approval of a Step 2 TOC removal requirement. Once approved by the Department, the Step 2 TOC removal requirement supercedes the Step 1 TOC removal requirement. A system

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shall meet the Department approved Step 2 removal requirement until the system requests, and the Department approves, a new TOC removal requirement.

- a. The Step 2 TOC removal requirement is the percent removal of TOC at the point of diminishing return on the “TOC removal versus coagulant dose” curve under subsection (C)(2)(d) which results from bench- or pilot- scale testing.
- b. Bench- or pilot-scale testing must be conducted by using representative water samples.
- c. Before the “TOC removal versus coagulant dose” test is performed, 10 mg/L incremental doses of alum (or an equivalent amount of ferric salt) are added until the target pH on the following table is reached. The target pH is based on the alkalinity of the water. The total amount of coagulant dose needed to reach the target pH is noted.

<u>Alkalinity (mg/L as CaCO₃)</u>	<u>Target pH</u>
<u>0-60</u>	<u>5.5</u>
<u>>60-120</u>	<u>6.3</u>
<u>>120-240</u>	<u>7.0</u>
<u>>240</u>	<u>7.5</u>

- d. The “TOC removal versus coagulant dose” is found by adding incremental 10 mg/L doses of alum (or an equivalent amount of ferric salt) to the point where TOC removal is less than or equal to 0.3 mg/L and is within the target pH. Systems are not required to add additional coagulant past the dose needed to reach the target pH unless the water has low alkalinity.
- e. For water with alkalinity less than 60 mg/L for which the addition of small amounts of alum or equivalent amounts of iron coagulant drives the pH below 5.5 before significant TOC removal occurs, the system must add necessary chemicals to maintain the pH between 5.3 and 5.7 in the samples until the TOC removal of 0.3 mg/L per 10 mg/L alum or equivalent amount of iron coagulant is reached.

D. Compliance: After a system collects 12 months of data, the system shall determine the annual average of TOC percent removal using the following method:

1. Monthly TOC percent removal:

$$1 - \left(\frac{\text{Treated water TOC}}{\text{Source water TOC}} \right) \times 100$$

2. Monthly TOC percent removal ratio:

$$\frac{\text{Monthly TOC percent removal value from (D)(1)}}{\text{Step 1 or Step 2 percent reduction requirement}}$$

3. Annual average of TOC percent removal:

Sum of previous 12 months TOC percent removal ratio value from (D)(2)

12

4. If the annual average of TOC percent removal calculated in subsection (D)(3) is less than 1, then the system is in violation of the TOC removal requirement. A system may assign a value of one for a month, in lieu of calculating the monthly TOC percent removal ratio in subsection (D)(2), if any of the following occur:
 - a. Any month the system’s treated or source water TOC level is less than 2.0 mg/L;
 - b. Any month the system practices softening that removes at least 10 mg/L of magnesium hardness (as CaCO₃);
 - c. Any month that the system’s source water SUVA, prior to any treatment, is less than or equal to 2.0 L/mg-m;
 - d. Any month that the system’s finished water SUVA is less than or equal to 2.0 L/mg-m; or
 - e. Any month that a system practicing enhanced softening which lowers alkalinity below 60 mg/L (as CaCO₃).
5. All samples collected and analyzed under the provisions of this Section shall be included in determining compliance, even if that number is greater than the minimum required.
6. A system may use monitoring data from 12 months prior to the applicable compliance date to determine whether Step 1 TOC removals can be met. Any system that does not use previous monitoring data and then determines in the first

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12 months after the applicable compliance date that it is not able to meet the Step 1 requirements in subsection (C)(1) and must therefore apply for alternate minimum TOC removal (Step 2) requirements, is not eligible for retroactive approval of alternate minimum TOC removal (Step 2) requirements as allowed in subsection (C)(2) and is in violation. A system may apply for alternate minimum TOC removal (Step 2) requirements any time after the compliance date.

E. Waiver

1. A system may submit a written request to the Department for a waiver of enhanced coagulation requirements. The system shall submit documentation demonstrating that the TOC removal during the bench- or pilot-scale tests is consistently less than 0.3 mg/L of TOC per 10 mg/L of incremental alum dose at all doses of alum (or equivalent addition of iron coagulant) for four quarters of bench- or pilot-scale tests. The Department's decision to approve or deny a waiver shall be in writing.
2. A waiver shall remain in effect until four quarters after such time as the running annual averages for TTHM and HAA5 are equal to or greater than 0.064 mg/L and 0.048 mg/L, respectively. In the four quarters subsequent to the running annual averages for TTHM and HAA5 equaling or exceeding 0.064 mg/L and 0.048 mg/L, respectively, a system may perform four quarters of bench- or pilot- scale testing and submit the results to the Department to demonstrate that the TOC remains non-amenable to enhanced coagulation with a request to renew the waiver.
 - a. A system that conducts bench- or pilot- scale testing within four quarters after such time as the running annual averages for TTHM and HAA5 are equal to or greater than 0.064 mg/L and 0.048 mg/L, respectively, may request Department approval of a Step 2 TOC removal requirement under subsection (C)(2) instead of a waiver renewal.
 - b. A system that does not request a waiver renewal or approval of a Step 2 TOC removal requirement from the Department shall revert back to the Step 1 TOC removal requirement in subsection (C)(1) four quarters after such time as the running annual averages for TTHM and HAA5 are equal to or greater than 0.064 mg/L and 0.048 mg/L, respectively.

R18-4-302. Filtration

- A. A surface water system shall treat water by filtration.
- B. Conventional or direct filtration: ~~The turbidity of filtered water shall be # 0.5 NTU in at least 95% of the measurements taken each month. The turbidity of filtered water shall not exceed five NTUs.~~
 1. For a system serving under 10,000 people, the turbidity of filtered water shall be less than or equal to 0.5 NTU in at least 95% of the measurements taken each month. The turbidity of filtered water shall not exceed five NTUs.
 2. Effective January 1, 2002, for a system serving at least 10,000 people, the turbidity of filtered water shall be less than or equal to 0.3 NTU in at least 95% of the measurements taken each month. The turbidity of filtered water shall not exceed one NTU.
- C. Slow sand filtration: The turbidity of filtered water shall be #1 NTU in at least 95% of the measurements taken each month. The turbidity of filtered water shall not exceed five NTUs.
- D. Diatomaceous earth filtration: The turbidity of filtered water shall be #1 NTU in at least 95% of the measurements taken each month. The turbidity of filtered water shall not exceed five NTUs.
- E. Other filtration technologies: A surface water system may use a filtration technology other than conventional filtration, direct filtration, slow sand filtration, or diatomaceous earth filtration if the water supplier demonstrates to the Department, through pilot plant studies or other means, that the filtration technology, in combination with disinfection, consistently achieves a 99.9% (3-log) removal and inactivation of *Giardia lamblia* cysts and a 99.99% (4-log) removal and inactivation of viruses. The turbidity of filtered water shall be #1 NTU in at least 95% of the measurements taken each month. The turbidity of filtered water shall not exceed five NTUs. Effective January 1, 2002, a surface water system that serves over 10,000 people shall, in addition, demonstrate to the Department, through pilot studies or other means, that the filtration technology, in combination with disinfection, consistently achieves a 99% (2-log) removal and inactivation of *Cryptosporidium*.
- F. Frequency of turbidity monitoring: A surface water system shall take a grab sample and measure the turbidity of filtered water at least once every four hours that a water treatment plant is operating or monitor turbidity continuously. If a surface water system continuously monitors the turbidity of filtered water, the water supplier shall calibrate its turbidity monitoring equipment regularly in accordance with the manufacturer's specifications.
- G. Location of turbidity monitoring: A surface water system shall monitor the turbidity of filtered water at one of the following locations:
 1. Combined filter effluent prior to entry into a clearwell,
 2. Clearwell effluent,
 3. Water treatment plant effluent, or
 4. Another location that is approved by the Department.
- H. Reduced turbidity monitoring: Upon the written request of a water supplier, the Department may reduce the frequency of grab sampling for turbidity if the Department determines that less frequent turbidity monitoring is sufficient to indicate

effective filtration performance. A Department decision to reduce turbidity monitoring shall be in writing. The Department may reduce turbidity monitoring as follows:

1. The Department may reduce the frequency of grab sampling by a surface water system using slow sand filtration or a filtration technology other than conventional filtration, direct filtration, or diatomaceous earth filtration to once per day;
2. The Department may reduce the frequency of grab sampling by a surface water system that serves 500 or fewer persons to once per day, regardless of the type of filtration used.

R18-4-303. Disinfection

- A.** A surface water system shall provide disinfection sufficient to ensure that the total treatment processes of the system achieve at least a 99.9% (3-log) inactivation and removal of *Giardia lamblia* cysts and at least a 99.99% (4-log) inactivation and removal of viruses. Effective January 1, 2002, a surface water system that serves over 10,000 people shall ensure that total treatment processes achieves a 99% (2-log) removal and inactivation of *Cryptosporidium*.
- B.** The residual disinfectant concentration in water entering the distribution system (measured as free chlorine, combined chlorine, or chlorine dioxide) shall be not less than 0.2 mg/L for more than four consecutive hours.
1. A surface water system that serves more than 3,300 persons per day shall continuously monitor the residual disinfectant concentration in water entering the distribution system. If there is a failure of the continuous monitoring equipment, a surface water system shall take grab samples every four hours to monitor residual disinfectant concentration. A surface water system shall repair or replace the continuous monitoring equipment within five days of initial failure.
 2. A surface water system that serves 3,300 or fewer persons per day may take grab samples to monitor the residual disinfectant concentration in water entering the distribution system instead of continuous monitoring.
 - a. The surface water system shall sample each day at the following frequency:

<i>System size by population</i>	<i>Number of grab samples / day¹</i>
500 or less	1
501 to 1,000	2
1,001 to 2,500	3
2,501 to 3,300	4

¹ Grab samples shall not be taken at the same time. Sampling intervals are subject to Department review and approval.
 - b. If the residual disinfectant concentration in a grab sample is less than 0.2 mg/l, a surface water system shall increase the frequency of grab sampling to once every four hours. The surface water system shall continue to take a grab sample every four hours until the residual disinfectant concentration in water entering the distribution system is greater than or equal to 0.2 mg/L.
- C.** The residual disinfectant concentration of water in the distribution system (measured as total chlorine, free chlorine, combined chlorine, or chlorine dioxide) shall be detectable in 95% or more of the samples each month for any two consecutive months that a surface water system serves water to the public.
1. A surface water system may measure the concentration of heterotrophic bacteria in water in the distribution system as heterotrophic plate count (HPC) instead of measuring the residual disinfectant concentration in water in the distribution system. Water in the distribution system with a heterotrophic bacteria concentration that is less than 500/ml (measured as HPC) is deemed to have a detectable residual disinfectant concentration.
 2. The water supplier shall calculate the value “V” in the following formula to determine whether there is a detectable residual concentration in water in the distribution system in 95% of the samples taken each month. The value “V” shall not exceed five in each month for any two consecutive months:

$$V = \frac{c + d + e}{a + b} \times 100$$

Where:

a = Number of instances the residual disinfectant concentration is measured;

b = Number of instances the residual disinfectant concentration is not measured but HPC is measured;

c = Number of instances the residual disinfectant concentration is measured but not detected and no HPC is measured;

d = Number of instances no residual disinfectant concentration is detected and the HPC is greater than 500/ml; and

e = Number of instances the residual disinfectant concentration is not measured and HPC is greater than 500/ml.

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3. The residual disinfectant concentration in water in the distribution system shall be measured at the same sampling sites and at the same time as total coliform sampling.
- D. A water supplier shall submit a treatment technique compliance study to the Department that demonstrates the total treatment processes of the surface water system achieve the *Giardia lamblia* and virus removal and inactivation rates prescribed in subsection (A). The water supplier shall submit an additional treatment technique compliance study if there is a change in the treatment process that may affect the percent removal or inactivation of *Giardia lamblia* cysts or viruses or an additional or different source is developed. Effective January 1, 2002, a surface water system serving at least 10,000 persons shall, in addition, demonstrate that total treatment technique processes achieve a 99% (2-log) removal and inactivation of *Cryptosporidium* in the treatment technique compliance study.

ARTICLE 4. SPECIAL MONITORING REQUIREMENTS

~~R18-4-401.~~ Special Monitoring Requirements for Sulfate

- ~~A. Each CWS, NTNCWS, or a contractor on behalf of a CWS or NTNCWS, shall monitor for sulfate.~~
- ~~B. Each CWS, NTNCWS, or a contractor on behalf of a CWS or NTNCWS, shall take one sample for sulfate at each sampling point as prescribed in R18-4-218.~~
- ~~C. Each CWS, NTNCWS, or a contractor on behalf of a CWS or NTNCWS, shall monitor for sulfate once every five years.~~
- ~~D. A CWS or NTNCWS may apply for a waiver from sulfate monitoring requirements. The Department may initiate a waiver for a CWS or NTNCWS. The Department may waive sulfate monitoring requirements at a sampling point if previous analytical results are available that indicate that the concentration of sulfate does not exceed 250 mg/L, provided the monitoring data was collected after January 1, 1990. The Department's decision to waive sulfate monitoring requirements shall be in writing.~~
- ~~E. The Department may require a confirmation sample.~~
- ~~F. A CWS, NTNCWS, or a contractor on behalf of a CWS or NTNCWS, may composite sulfate samples as prescribed in R18-4-219.~~

~~R18-4-402.~~ R18-4-401. Special Monitoring for Sodium

- A. A CWS, or a contractor on behalf of a CWS, shall conduct monitoring for sodium.
- B. Each CWS, or a contractor on behalf of a CWS, shall collect one sample per water treatment plant. Multiple wells drawing raw water from a single aquifer may, with Department approval, be considered one treatment plant for purposes of determining the minimum number of sodium samples required.
- C. Each CWS, or a contractor on behalf of the CWS, shall collect and analyze one sample annually for each water treatment plant utilizing a surface water source, in whole or in part. A CWS shall collect and analyze one sample every three years for each water treatment plant utilizing only groundwater sources. The Department may require a water supplier public water system to collect and analyze water samples more frequently in locations where the sodium content is variable.

~~R18-4-403.~~ R18-4-402. Special Monitoring for Nickel

- A. Each CWS and NTNCWS shall monitor for nickel.
- B. Each CWS and NTNCWS shall monitor for nickel at each sampling point as prescribed in R18-4-218.
- C. A CWS or NTNCWS may composite samples for nickel as prescribed in R18-4-219.
- D. Each CWS and NTNCWS shall monitor for nickel at the following frequencies:
 1. Each CWS and NTNCWS shall take one sample at each groundwater sampling point once every three years.
 2. Each CWS and NTNCWS shall take one sample at each surface water sampling point annually.
- E. A water supplier public water system may request a reduction in the monitoring frequency for nickel as follows:
 1. Groundwater sampling points: The Department may reduce monitoring frequency from once every three years to a less frequent basis if the CWS or NTNCWS has monitored for nickel at least once every three years for nine years at the groundwater sampling point and all analytical results were below 0.1 mg/L.
 2. Surface water sampling points: The Department may reduce monitoring frequency from annually to a less frequent basis if a CWS or NTNCWS has monitored annually at the surface water sampling point for at least three consecutive years and all analytical results for nickel were below 0.1 mg/L.
 3. The Department may reduce monitoring frequency for nickel for a term not to exceed nine years.
 4. A CWS or NTNCWS shall take at least one sample for nickel during the reduced monitoring term.
 5. In determining the appropriate reduced monitoring frequency at a sampling point, the Department shall consider the following factors:
 - a. Reported concentrations of nickel from all previous monitoring;
 - b. The degree of variation in the reported concentrations of nickel; and
 - c. Other factors that may affect the concentration of nickel such as changes in groundwater pumping rates, changes in the configuration of the CWS or NTNCWS, or changes in operating procedures, stream flows, or source water characteristics.

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6. A decision by the Department to reduce monitoring frequency for nickel at a sampling point shall be in writing and shall set forth the grounds for the decision. A ~~water supplier~~ public water system may make a written request for reduced monitoring or the Department may reduce monitoring on its own. A ~~water supplier~~ public water system shall provide documentation of analytical results that supports a request for reduced monitoring. If a CWS or NTNCWS submits new data or other data relevant to the public water system's appropriate monitoring frequency become available, the Department shall review the data and, if appropriate, revise its determination of monitoring frequency.
7. A ~~CWS or NTNCWS that uses a new source~~ A new sampling point is not eligible for reduced monitoring until three consecutive rounds of monitoring from the new ~~source~~ sampling point have been completed.

R18-4-403. Special Monitoring for Turbidity

Effective January 1, 2002, a surface water system serving at least 10,000 people and that uses conventional filtration or direct filtration, shall conduct continuous turbidity monitoring on each individual filter.

1. The system shall record the results of individual filter monitoring every 15 minutes.
2. In the event of a failure in the continuous turbidity monitoring equipment, the system shall conduct grab sampling every four hours in lieu of continuous monitoring. The system shall conduct grab sampling for no more than five working days.
3. For an individual filter that has a measured turbidity level of greater than 1.0 NTU in two consecutive measurements taken 15 minutes apart, the system shall produce a filter profile within seven days of such event if the system is not able to identify an obvious reason for the abnormal filter performance.
4. For an individual filter that has a measured turbidity level of greater than 0.5 NTU in two consecutive measurements taken 15 minutes apart at the end of the first four hours of continuous filter operation after the filter has been back-washed or otherwise taken offline, the system shall produce a filter profile within seven days of such event if the system is not able to identify an obvious reason for the abnormal filter performance.
5. For an individual filter that has a measured turbidity level of greater than 1.0 NTU in two consecutive measurements taken 15 minutes apart at anytime in each of three consecutive months, the system shall conduct a self-assessment of the filter within 14 days of such event. A self-assessment of a filter shall contain an assessment of filter performance, development of filter profile, identification and prioritization of factors limiting filter performance, assessment of the applicability of corrections, and preparation of a filter self-assessment report.
6. For an individual filter that has a measured turbidity level of greater than 2.0 NTU in two consecutive measurements taken 15 minutes apart at anytime in each of two consecutive months, the system shall arrange for a comprehensive performance evaluation to be conducted by the state or a third party approved by the state no later than 30 days after such event.

R18-4-404. Special Monitoring for Unregulated Volatile Organic Chemicals Repealed

~~**A.** Each CWS, NTNCWS, or a contractor on behalf of the CWS or NTNCWS, shall monitor for the unregulated VOCs listed in this subsection.~~

1. ~~Bromobenzene~~
2. ~~Bromodichloromethane~~
3. ~~Bromoform~~
4. ~~Bromomethane~~
5. ~~Chlorodibromomethane~~
6. ~~Chloroethane~~
7. ~~Chloroform~~
8. ~~Chloromethane~~
9. ~~o-Chlorotoluene~~
10. ~~p-Chlorotoluene~~
11. ~~Dibromomethane~~
12. ~~m-Dichlorobenzene~~
13. ~~1,1-Dichloroethane~~
14. ~~1,3-Dichloropropane~~
15. ~~2,2-Dichloropropane~~
16. ~~1,1-Dichloropropene~~
17. ~~1,3-Dichloropropene~~
18. ~~1,1,1,2-Tetrachloroethane~~
19. ~~1,1,2,2-Tetrachloroethane~~
20. ~~1,2,3-Trichloropropane~~

~~**B.** A CWS, NTNCWS, or a contractor on behalf of a CWS, shall monitor for unregulated VOCs at sampling points prescribed in R18-4-218.~~

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- C.** A CWS, NTNCWS, or a contractor on behalf of a CWS, shall take four consecutive quarterly samples at each surface water sampling point for each unregulated VOC listed in this Section. A CWS, NTNCWS, or a contractor on behalf of a CWS, shall take one sample at each groundwater sampling point for each unregulated VOC listed in this Section. A CWS, NTNCWS, or a contractor on behalf of a CWS, shall monitor for unregulated VOCs at least once every five years.
- D.** A CWS or NTNCWS may use monitoring data collected prior to the initial monitoring year to meet the initial monitoring requirements for unregulated VOCs listed in this Section provided the monitoring data was collected after January 1, 1983.
- E.** A CWS, NTNCWS, or a contractor on behalf of a CWS, may composite samples for the unregulated VOCs listed in this Section as prescribed in R18-4-219.
- F.** A CWS or NTNCWS may apply for a waiver from the monitoring requirements for the unregulated VOCs listed in this Section. The Department may grant a waiver based upon the criteria specified in R18-4-212(L). The Department may initiate a waiver for a CWS or NTNCWS.
- G.** A water supplier shall notify a person served by the public water system of the availability of the monitoring results for unregulated VOCs listed in this Section by including a notice in the 1st set of water bills issued by a public water system after receipt of the monitoring results or by direct mail within three months of receipt of the monitoring results. The notice shall identify a contact person and supply a telephone number that a person may be called for more information on the monitoring results. For surface water systems, public notification is required only after the 1st quarter's monitoring results. The notice shall include a statement that the public water system shall monitor for unregulated VOCs for three more quarters and the monitoring results are available upon request.

R18-4-405. Special Monitoring for Unregulated Synthetic Organic Chemicals Repealed

- A.** Each CWS, NTNCWS, or a contractor on behalf of a CWS, shall monitor for the unregulated SOC's listed in this Section.
 - 1. Aldicarb
 - 2. Aldicarb-sulfone
 - 3. Aldicarb-sulfoxide
 - 4. Aldrin
 - 5. Butachlor
 - 6. Carbaryl
 - 7. Dicamba
 - 8. Dieldrin
 - 9. 3-Hydroxycarbofuran
 - 10. Methomyl
 - 11. Metolachlor
 - 12. Metribuzin
 - 13. Propachlor
- B.** A CWS, NTNCWS, or a contractor on behalf of a CWS or NTNCWS, shall monitor for the unregulated SOC's listed in this Section at sampling points as prescribed in R18-4-218.
- C.** A CWS, NTNCWS, or a contractor on behalf of a CWS or NTNCWS, shall take four consecutive quarterly samples at each sampling point for each unregulated SOC listed in this Section. Each CWS and NTNCWS shall complete initial monitoring for the unregulated SOC's listed in this Section and report the analytical results to the Department by December 31, 1995. A CWS, NTNCWS, or a contractor on behalf of a CWS or NTNCWS, shall monitor for unregulated SOC's at least once every five years.
- D.** A CWS, NTNCWS, or a contractor on behalf of a CWS, may composite samples for the unregulated SOC's listed in this Section as prescribed in R18-4-219.
- E.** A CWS and NTNCWS may submit a written request to the Department for a waiver from the monitoring requirements for unregulated SOC's listed in this Section. The Department under the monitoring assistance program, may initiate a waiver to a CWS or NTNCWS. The Department may grant a use waiver or a susceptibility waiver for an unregulated SOC based upon the waiver criteria specified in R18-4-216(M).

ARTICLE 5. MINIMUM DESIGN CRITERIA

Appendix A. Mandatory Health Effects Language

- (1) **Acrylamide.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that acrylamide is a health concern at certain levels of exposure. Polymers made from acrylamide are sometimes used to treat water supplies to remove particulate contaminants. Acrylamide has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. Sufficiently large doses of acrylamide are known to cause neurological injury. EPA has set the drinking water standard for acrylamide using a treatment technique to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. This treatment technique limits the amount of acrylamide in

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the polymer and the amount of the polymer which may be added to drinking water to remove particulates. Drinking water systems which comply with this treatment technique have little to no risk and are considered safe with respect to acrylamide.

- (2) **Alachlor.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that alachlor is a health concern at certain levels of exposure. This organic chemical is a widely used pesticide. When soil and climatic conditions are favorable, alachlor may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for alachlor at 0.002 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets this standard is associated with little to none of this risk and is considered safe with respect to alachlor.
- (3) **Antimony.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that antimony is a health concern at certain levels of exposure. This inorganic chemical occurs naturally in soils, groundwater and surface waters and is often used in the flame retardant industry. It is also used in ceramics, glass, batteries, fireworks, and explosives. It may get into drinking water through natural weathering of rock, industrial production, municipal waste disposal, or manufacturing processes. This chemical has been shown to decrease longevity, and alter blood levels of cholesterol and glucose in laboratory animals such as rats exposed to high levels during their lifetimes. EPA has set the drinking water standard for antimony at 0.006 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to antimony.
- (4) **Asbestos.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that asbestos fibers greater than 10 micrometers in length are a health concern at certain levels of exposure. Asbestos is a naturally occurring mineral. Most asbestos fibers in drinking water are less than 10 micrometers in length and occur in drinking water from natural sources and from corroded asbestos-cement pipes in the distribution system. The major uses of asbestos were in the production of cements, floor tiles, paper products, paint, and caulking; in transportation-related applications; and in the production of textiles and plastics. Asbestos was once a popular insulating and fire-retardant material. Inhalation studies have shown that various forms of asbestos have produced lung tumors in laboratory animals. The available information on the risk of developing gastrointestinal tract cancer associated with the ingestion of asbestos from drinking water is limited. Ingestion of intermediate range chrysotile asbestos fibers greater than 10 micrometers in length is associated with causing benign tumors in male rats. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for asbestos at 7 million long fibers per liter to reduce the potential risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to asbestos.
- (5) **Atrazine.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that atrazine is a health concern at certain levels of exposure. This organic chemical is a herbicide. When soil and climatic conditions are favorable, atrazine may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to affect offspring of rats and the heart of dogs. EPA has set the drinking water standard for atrazine at 0.003 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to atrazine.
- (6) **Barium.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that barium is a health concern at certain levels of exposure. This inorganic chemical occurs naturally in some aquifers that serve as sources of groundwater. It is also used in oil and gas drilling muds, automotive paints, bricks, tiles, and jet fuels. It generally gets into drinking water after dissolving from naturally occurring minerals in the ground. This chemical may damage the heart and cardiovascular system and is associated with high blood pressure in laboratory animals such as rats exposed to high levels during their lifetimes. In humans, EPA believes that effects from barium on blood pressure should not occur below two parts per million (ppm) in drinking water. EPA has set the drinking water standard for barium at two parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to barium.
- (7) **Benzene.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that the benzene is a health concern at certain levels of exposure. This chemical is used as a solvent and degreaser of metals. It is also a major component of gasoline. Drinking water contamination generally results from leaking underground gasoline and petroleum tanks or improper waste disposal. This chemical has been associated with significantly increased risks of leukemia among certain industrial workers who were exposed to relatively large amounts of this chemical during their working careers. This chemical has also been shown to cause cancer in labora-

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tory animals when the animals are exposed at high levels over their lifetimes. Chemicals that cause increased risk of cancer among exposed industrial workers and in laboratory animals also may increase the risk of cancer in humans who are exposed at lower levels over long periods of time. EPA has set the enforceable drinking water standard for benzene at 0.005 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in humans and laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.

- (8) **Benzo[a]pyrene.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that benzo[a]pyrene is a health concern at certain levels of exposure. Cigarette smoke and charbroiled meats are common sources of general exposure. The major source of benzo[a]pyrene in drinking water is the leaching from coal tar lining and sealants in water storage tanks. This chemical has been shown to cause cancer in animals such as rats and mice when the animals are exposed at high levels. EPA has set the drinking water standard for benzo[a]pyrene at 0.0002 parts per million (ppm) to protect against the risk of cancer. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to benzo[a]pyrene.
- (9) **Beryllium.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that beryllium is a health concern at certain levels of exposure. This inorganic metal occurs naturally in soils, groundwater, and surface waters and is often used in electrical equipment and electrical components. It generally gets into water from runoff from mining operations, discharge from processing plants, and improper waste disposal. Beryllium compounds have been associated with damage to the bones and lungs and induction of cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. There is limited evidence to suggest that beryllium may pose a cancer risk via drinking water exposure. Therefore, EPA based the health assessment on noncancer effects with an extra uncertainty factor to account for possible carcinogenicity. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for beryllium at 0.004 part per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to beryllium.
- (10) **Cadmium.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that cadmium is a health concern at certain levels of exposure. Food and the smoking of tobacco are common sources of general exposure. This inorganic metal is a contaminant in the metals used to galvanize pipe. It generally gets into water for corrosion of galvanized pipes or by improper waste disposal. This chemical has been shown to damage the kidney in animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Some industrial workers who were exposed to relatively large amounts of this chemical during working careers also suffered damage to the kidney. EPA has set the drinking water standard for cadmium at 0.005 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to cadmium.
- (11) **Carbofuran.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that carbofuran is a health concern at certain levels of exposure. This organic chemical is a pesticide. When soil and climatic conditions are favorable, carbofuran may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to damage the nervous and reproductive systems of laboratory animals such as rats and mice exposed at high levels over their lifetimes. Some humans who were exposed to relatively large amounts of this chemical during their working careers also suffered damage to the nervous system. Effects on the nervous system are generally rapidly reversible. EPA has set the drinking water standard for carbofuran at 0.04 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to carbofuran.
- (12) **Carbon tetrachloride.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that carbon tetrachloride is a health concern at certain levels of exposure. This chemical was once a popular household cleaning fluid. It generally gets into drinking water by improper waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed at lower levels over long periods of time. EPA has set the enforceable drinking water standard for carbon tetrachloride at 0.005 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.
- (13) **Chlordane.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that chlordane is a health concern at certain levels of exposure. This organic chemical is a pesticide used to control termites. Chlordane is not very mobile in soils. It usually gets into drinking water after application near water supply intakes or wells. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking

water standard for chlordane at 0.002 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to chlordane.

- (14) **Chromium.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that chromium is a health concern at certain levels of exposure. The inorganic metal occurs naturally in the ground and is often used in the electroplating of metals. It generally gets into water from runoff from old mining operations and improper waste disposal from plating operations. This chemical has been shown to damage the kidney, nervous system, and the circulatory system of laboratory animals such as rats and mice when the animals are exposed at high levels. Some humans who were exposed to high levels of this chemical suffered liver and kidney damage, dermatitis, and respiratory problems. EPA has set the drinking water standard for chromium at 0.1 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to chromium.
- (15) **Copper.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that copper is a health concern at certain exposure levels. Copper, a reddish-brown metal, is often used to plumb residential and commercial structures that are connected to water distribution systems. Copper contaminating drinking water as a corrosion by-product occurs as the result of the corrosion of copper pipes that remain in contact with water for a prolonged period of time. Copper is an essential nutrient, but at high doses it has been shown to cause stomach and intestinal distress, liver and kidney damage, and anemia. Persons with Wilson's disease may be at a higher risk of health effects due to copper than the general public. EPA's national primary drinking water regulation requires all public water systems to install optimal corrosion control to minimize copper contamination resulting from the corrosion of plumbing materials. Public water systems serving 50,000 people or fewer that have copper concentrations below 1.3 parts per million (ppm) in more than 90% of tap water samples (the EPA "action level") are not required to install or improve their treatment. Any water system that exceeds the action level must also monitor their source water to determine whether treatment to remove copper in source water is needed.
- (16) **Cyanide.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that cyanide is a health concern at certain levels of exposure. This inorganic chemical is used in electroplating, steel processing, plastics, synthetic fabrics, and fertilizer products. It usually gets into water as a result of improper waste disposal. This chemical has been shown to damage the spleen, brain, and liver of humans fatally poisoned with cyanide. EPA has set the drinking water standard for cyanide at 0.2 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to cyanide.
- (17) **2,4-D.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that 2,4-D is a health concern at certain levels of exposure. This organic chemical is used as a herbicide and to control algae in reservoirs. When soil and climatic conditions are favorable, 2,4-D may get into drinking water by runoff into surface water or by leaching into groundwater. The chemical has been shown to damage the liver and kidney of laboratory animals such as rats exposed at high levels during their lifetimes. Some humans who were exposed to relatively large amounts of this chemical also suffered damage to the nervous system. EPA has set the drinking water standard for 2,4-D at 0.07 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to 2,4-D.
- (18) **Dalapon.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that dalapon is a health concern at certain levels of exposure. This organic chemical is a widely used herbicide. It may get into drinking water after application to control grasses in crops, drainage ditches, and along railroads. This chemical has been shown to cause damage to the kidney and liver in laboratory animals when the animals are exposed to high levels over their lifetimes. EPA has set the drinking water standard for dalapon at 0.2 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to dalapon.
- (19) **Dibromochloropropane (DBCP).** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that DBCP is a health concern at certain levels of exposure. This organic chemical was once a popular pesticide. When soil and climatic conditions are favorable, dibromochloropropane may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for DBCP at 0.0002 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to DBCP.
- (20) **o-Dichlorobenzene.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that o-dichlorobenzene is a health concern at certain levels of exposure. This organic chemical is used as a solvent in the production of pesticides and dyes. It generally gets into water by improper waste disposal. This

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chemical has been shown to damage the liver, kidney, and the blood cells of laboratory animals such as rats and mice exposed to high levels during their lifetimes. Some industrial workers who were exposed to relatively large amounts of this chemical during working careers also suffered damage to the liver, nervous system, and circulatory system. EPA has set the drinking water standard for o-dichlorobenzene at 0.6 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to o-dichlorobenzene.

- (21) **Para-dichlorobenzene.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that para-dichlorobenzene is a health concern at certain levels of exposure. This chemical is a component of deodorizers, moth balls, and pesticides. It generally gets into drinking water by improper waste disposal. This chemical has been shown to cause liver and kidney damage in laboratory animals such as rats and mice when the animals are exposed to high levels over their lifetimes. Chemicals which cause adverse effects in laboratory animals also may cause adverse health effects in humans who are exposed at lower levels over long periods of time. EPA has set the enforceable drinking water standard for para-dichlorobenzene at 0.075 parts per million (ppm) to reduce the risk of these adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.
- (22) **1,2-Dichloroethane.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that 1,2-dichloroethane is a health concern at certain levels of exposure. This chemical is used as a cleaning fluid for fats, oils, waxes, and resins. It generally gets into drinking water from improper waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed at lower levels over long periods of time. EPA has set the enforceable drinking water standard for 1,2-dichloroethane at 0.005 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.
- (23) **1,1-Dichloroethylene.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that 1,1-dichloroethylene is a health concern at certain levels of exposure. This chemical is used in industry and is found in drinking water as a result of the breakdown of related solvents. The solvents are used as cleaners and degreasers of metals and generally get into drinking water by improper waste disposal. This chemical has been shown to cause liver and kidney damage in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals which cause adverse effects in laboratory animals also may cause adverse health effects in humans who are exposed at lower levels over long periods of time. EPA has set the enforceable drinking water standard for 1,1-dichloroethylene at 0.007 parts per million (ppm) to reduce the risk of these adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.
- (24) **cis-1,2-Dichloroethylene.** The United States Environmental Protection Agency (EPA) establishes drinking water standards and has determined that cis-1,2-Dichloroethylene is a health concern at certain levels of exposure. This organic chemical is used as a solvent and intermediate in chemical production. It generally gets into water by improper waste disposal. This chemical has been shown to damage the liver, nervous system, and circulatory system of laboratory animals such as rats and mice when exposed at high levels over their lifetimes. Some humans who were exposed to relatively large amounts of this chemical also suffered damage to the nervous system. EPA has set the drinking water standard for cis-1,2-dichloroethylene at 0.07 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to cis-1,2-dichloroethylene.
- (25) **trans-1,2-Dichloroethylene.** The United States Environmental Protection Agency (EPA) establishes drinking water standards and has determined that trans-1,2-dichloroethylene is a health concern at certain levels of exposure. This organic chemical is used as a solvent and intermediate in chemical production. It generally gets into water by improper waste disposal. This chemical has been shown to damage the liver, nervous system, and the circulatory system of laboratory animals such as rats and mice when exposed at high levels over their lifetimes. Some humans who were exposed to relatively large amounts of this chemical also suffered damage to the nervous system. EPA has set drinking water standard for trans-1,2-dichloroethylene at 0.1 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to trans-1,2-dichloroethylene.
- (26) **Dichloromethane.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that dichloromethane (methylene chloride) is a health concern at certain levels of exposure. This organic chemical is a widely used solvent. It is used in the manufacture of paint remover, as a metal degreaser, and as an aerosol propellant. It generally gets into drinking water after improper discharge of waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for dichloromethane at 0.005

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parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe with respect to dichloromethane.

- (27) **1,2-Dichloropropane.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that 1,2-dichloropropane is a health concern at certain levels of exposure. This organic chemical is used as a solvent and pesticide. When soil and climate conditions are favorable, 1,2-dichloropropane may get into drinking water by runoff into surface water or by leaching into groundwater. It may also get into drinking water through improper waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for 1,2-dichloropropane at 0.005 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to 1,2-dichloropropane.
- (28) **Di(2-ethylhexyl)adipate.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that di(2-ethylhexyl)adipate is a health concern at certain levels of exposure. Di(2-ethylhexyl)adipate is a widely used plasticizer in a variety of products, including synthetic rubber, food packaging materials, and cosmetics. It may get into drinking water after improper waste disposal. This chemical has been shown to damage liver and testes in laboratory animals such as rats and mice exposed to high levels. EPA has set the drinking water standard for di(2-ethylhexyl)adipate at 0.4 parts per million (ppm) to protect against the risk of adverse health effects. Drinking water which meets the EPA standards is associated with little to none of this risk and should be considered safe with respect to di(2-ethylhexyl)adipate.
- (29) **Di(2-ethylhexyl)phthalate.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that di(2-ethylhexyl)phthalate is a health concern at certain levels of exposure. Di(2-ethylhexyl)phthalate is a widely used plasticizer, which is primarily used in the production of polyvinyl chloride (PVC) resins. It may get into drinking water after improper waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice exposed to high levels over their lifetimes. EPA has set the drinking water standard for di(2-ethylhexyl)phthalate at 0.006 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to di(2-ethylhexyl)phthalate.
- (30) **Dinoseb.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that dinoseb is a health concern at certain levels of exposure. Dinoseb is a widely used pesticide and generally gets into drinking water after application on orchards, vineyards, and other crops. This chemical has been shown to damage the thyroid and reproductive organs in laboratory animals such as rats exposed to high levels. EPA has set the drinking water standard for dinoseb at 0.007 parts per million (ppm) to protect against the risk of adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to dinoseb.
- (31) **Diquat.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that diquat is a health concern at certain levels of exposure. This organic chemical is a herbicide used to control terrestrial and aquatic weeds. It may get into drinking water by runoff into surface water. This chemical has been shown to damage the liver, kidney, and gastrointestinal tract and causes cataract formation in laboratory animals such as dogs and rats exposed at high levels over their lifetimes. EPA has set the drinking water standard for diquat at 0.02 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to diquat.
- (32) **Endothall.** The United States Environmental Protection Agency (EPA) has determined that endothall is a health concern at certain levels of exposure. This organic chemical is a herbicide used to control terrestrial and aquatic weeds. It may get into water by runoff into surface water. This chemical has been shown to damage the liver, kidney, gastrointestinal tract, and reproductive system of laboratory animals such as rats and mice exposed at high levels over their lifetimes. EPA has set the drinking water standard for endothall at 0.1 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to endothall.
- (33) **Endrin.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that endrin is a health concern at certain levels of exposure. This organic chemical is a pesticide no longer registered for use in the United States. However, this chemical is persistent in treated soils and accumulates in sediments and aquatic and terrestrial biota. This chemical has been shown to cause damage to the liver, kidney, and heart in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. EPA has set the drinking water standard for endrin at 0.002 parts per million (ppm) to protect against the risk of these adverse health effects which have been observed in laboratory animals. Drinking water that meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to endrin.

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- (34) **Epichlorohydrin.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that epichlorohydrin is a health concern at certain levels of exposure. Polymers made from epichlorohydrin are sometimes used in the treatment of water supplies as a flocculent to remove particulates. Epichlorohydrin generally gets into drinking water by improper use of these polymers. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are expected over long periods of time. EPA has set the drinking water standard for epichlorohydrin using a treatment technique to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. This treatment technique limits the amount of epichlorohydrin in the polymer and the amount of the polymer which may be added to drinking water as a flocculent to remove particulates. Drinking water systems which comply with this treatment technique have little to no risk and are considered safe with respect to epichlorohydrin.
- (35) **Ethylbenzene.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined ethylbenzene is a health concern at certain levels of exposure. This organic chemical is a major component of gasoline. It generally gets into water by improper waste disposal or leaking gasoline tanks. This chemical has been shown to damage the kidney, liver, and nervous system of laboratory animals such as rats exposed to high levels during their lifetimes. EPA has set the drinking water standard for ethylbenzene at 0.7 part per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to ethylbenzene.
- (36) **Ethylene dibromide (EDB).** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that EDB is a health concern at certain levels of exposure. This organic chemical was once a popular pesticide. When soil and climatic conditions are favorable, EDB may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for EDB at 0.00005 part per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets this standard is associated with little to none of this risk and is considered safe with respect to EDB.
- (37) **Fecal Coliforms/E. coli.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that the presence of fecal coliforms or *E. coli* is a serious health concern. Fecal coliforms and *E. coli* are generally not harmful themselves, but their presence in drinking water is serious because they usually are associated with sewage or animal wastes. The presence of these bacteria in drinking water is generally a result of a problem with water treatment or the pipes which distribute the water and indicates that the water may be contaminated with organisms that can cause disease. Disease symptoms may include diarrhea, cramps, nausea, and possibly jaundice, and associated headaches and fatigue. These symptoms, however, are not just associated with disease-causing organisms in drinking water but also may be caused by a number of factors other than your drinking water. EPA has set an enforceable drinking water standard for fecal coliforms and *E. coli* to reduce the risk of these adverse health effects. Under this standard all drinking water samples must be free of these bacteria. Drinking water which meets this standard is associated with little or none of this risk and should be considered safe. State and local health authorities recommend that consumers take the following precautions: [To be inserted by the public water system, according to instructions from state or local authorities].
- (38) **Fluoride.** The notice shall contain the following language including the language necessary to replace footnotes 1, 2 (if applicable), and 3:

Dear User,

The U.S. Environmental Protection Agency requires that we send you this notice on the level of fluoride in your drinking water. The drinking water in your community has a fluoride concentration of one milligram per liter (mg/l). Federal regulations require that fluoride, which occurs naturally in your water supply, not exceed a concentration of 4.0 mg/l in drinking water. This is an enforceable standard called a Maximum Contaminant Level (MCL), and it has been established to protect the public health. Exposure to drinking water levels above 4.0 mg/l for many years may result in some cases of crippling skeletal fluorosis, which is a serious bone disorder.

Federal law also requires that we notify you when monitoring indicates that the fluoride in your drinking water exceeds 2.0 mg/l. This is intended to alert families about dental problems that might affect children under 9 years of age. The fluoride concentration of your water exceeds this federal guideline.

Fluoride in children's drinking water at levels of approximately 1.0 mg/l reduces the number of dental cavities. However, children exposed to levels of fluoride greater than about 2.0 mg/l may develop dental fluorosis. Dental fluorosis, in its moderate to severe forms, is a brown staining and pitting of the permanent teeth.

Because dental fluorosis occurs only when developing teeth (before they erupt from the gums) are exposed to elevated fluoride levels, households without children are not expected to be affected by this level of fluoride. Families with children under the age of 9 are encouraged to seek other sources of drinking water for their children to avoid the possibility of staining and pitting.

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Your water supplier can lower the concentration of fluoride in your water so that you will still receive the benefits of cavity prevention while the possibility of stained and pitted teeth is minimized. Removal of fluoride may increase your water costs. Treatment systems are also commercially available for home use. Information on such systems is available at the address given below. Low-fluoride bottled drinking water that would meet all standards is also commercially available.

(If a violation of the MCL (4.0 mg/l) has occurred, the following sentence must also be included: The following steps are being taken to come into compliance with the MCL for fluoride: 2)

For further information, contact 3 at your public water system.

1PWS shall insert the compliance result which triggered notification under this part.

2If an MCL violation occurred, PWS shall insert steps which are being taken to come into compliance with the fluoride MCL.

3PWS shall insert the name, address, and telephone number of a contact person at the PWS.

- (39) **Glyphosate.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that glyphosate is a health concern at certain levels of exposure. This organic chemical is a herbicide used to control grasses and weeds. It may get into drinking water by runoff into surface water. This chemical has been shown to cause damage to the liver and kidneys in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. EPA has set the drinking water standard for glyphosate at 0.7 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to glyphosate.
- (40) **Heptachlor.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that heptachlor is a health concern at certain levels of exposure. This organic chemical was once a popular pesticide. When soil and climatic conditions are favorable, heptachlor may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standards for heptachlor at 0.0004 part per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets this standard is associated with little to none of this risk and is considered safe with respect to heptachlor.
- (41) **Heptachlor epoxide.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that heptachlor epoxide is a health concern at certain levels of exposure. This organic chemical was once a popular pesticide. When soil and climatic conditions are favorable, heptachlor epoxide may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standards for heptachlor epoxide at 0.0002 part per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets this standard is associated with little to none of this risk and is considered safe with respect to heptachlor epoxide.
- (42) **Hexachlorobenzene.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that hexachlorobenzene is a health concern at certain levels of exposure. This organic chemical is produced as an impurity in the manufacture of certain solvents and pesticides. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed to high levels during their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for hexachlorobenzene at 0.001 parts per million (ppm) to protect against the risk of cancer and other adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to hexachlorobenzene.
- (43) **Hexachlorocyclopentadiene.** The United States Environmental Protection Agency (EPA) establishes drinking water standards and has determined that hexachlorocyclopentadiene is a health concern at certain levels of exposure. This organic chemical is used as an intermediate in the manufacture of pesticides and flame retardants. It may get into water by discharge from production facilities. This chemical has been shown to damage the kidney and the stomach of laboratory animals when exposed at high levels over their lifetimes. EPA has set the drinking water standard for hexachlorocyclopentadiene at 0.05 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to hexachlorocyclopentadiene.
- (44) **Lead.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that lead is a health concern at certain exposure levels. Materials that contain lead have frequently been used in the construction of water supply distribution systems, and plumbing systems in private homes and other buildings. The most commonly found materials include service lines, pipes, brass and bronze fixtures, and solders and fluxes. Lead in these materials can contaminate drinking water as a result of the corrosion that takes place when water comes into

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contact with those materials. Lead can cause a variety of adverse health effects in humans. At relatively low levels of exposure, these effects may include interference with red blood cell chemistry, delays in normal physical and mental development in babies and young children, slight deficits in the attention span, hearing, and learning abilities of children, and slight increases in the blood pressure of some adults. EPA's national primary drinking water regulation requires all public water systems to optimize corrosion control to minimize lead contamination resulting from the corrosion of plumbing materials. Public water systems serving 50,000 people or fewer that have lead concentrations below 15 parts per billion (ppb) in more than 90% of tap water samples (the EPA "action level") have optimized their corrosion control treatment. Any water system that exceeds the action level must also monitor their source water to determine whether treatment to remove lead in source water is needed. Any water system that continues to exceed the action level after installation of corrosion control and/or source water treatment must eventually replace all lead service lines contributing in excess of 15 (ppb) of lead to drinking water. Any water system that exceeds the action level must also undertake a public education program to inform consumers of ways they can reduce their exposure to potentially high levels of lead in drinking water.

- (45) **Lindane.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that lindane is a health concern at certain levels of exposure. This organic chemical is used as a pesticide. When soil and climatic conditions are favorable, lindane may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to damage the liver, kidney, nervous system, and immune system of laboratory animals such as rats, mice, and dogs exposed at high levels during their lifetimes. Some humans who were exposed to relatively large amounts of this chemical also suffered damage to the nervous system and circulatory system. EPA has established the drinking water standard for lindane at 0.0002 part per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to lindane.
- (46) **Mercury.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that mercury is a health concern at certain levels of exposure. This inorganic metal is used in electrical equipment and some water pumps. It usually gets into water as a result of improper waste disposal. This chemical has been shown to damage the kidney of laboratory animals such as rats when the animals are exposed at high levels over their lifetimes. EPA has set the drinking water standard for mercury at 0.002 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to mercury.
- (47) **Methoxychlor.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that methoxychlor is a health concern at certain levels of exposure. This organic chemical is used as a pesticide. When soil and climatic conditions are favorable, methoxychlor may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to damage the liver, kidney, nervous system, and reproductive system of laboratory animals such as rats exposed at high levels during their lifetimes. It has also been shown to produce growth retardation in rats. EPA has set the drinking water standard for methoxychlor at 0.04 part per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to methoxychlor.
- (48) **Microbiological contaminants** [for use when there is a violation of the treatment technique requirements for filtration and disinfection, R18-4-302 or R18-4-303]. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that the presence of microbiological contaminants are a health concern at certain levels of exposure. If water is inadequately treated, microbiological contaminants in that water may cause disease. Disease symptoms may include diarrhea, cramps, nausea, and possibly jaundice, and any associated headaches and fatigue. These symptoms, however, are not just associated with disease-causing organisms in drinking water but also may be caused by a number of factors other than your drinking water. EPA has set enforceable requirements for treating drinking water to reduce the risk of these adverse health effects. Treatment such as filtering and disinfecting the water removes or destroys microbiological contaminants. Drinking water which is treated to meet EPA requirements is associated with little to none of this risk and should be considered safe.
- (49) **Monochlorobenzene.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that monochlorobenzene is a health concern at certain levels of exposure. This organic chemical is used as a solvent. It generally gets into water by improper waste disposal. This chemical has been shown to damage the liver, kidney, and nervous system of laboratory animals such as rats and mice exposed to high levels during their lifetimes. EPA has set the drinking water standard for monochlorobenzene at 0.1 part per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to monochlorobenzene.
- (50) **Nitrate.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that nitrate poses an acute health concern at certain levels of exposure. Nitrate is used in fertilizer and is found in sewage and wastes from human and/or farm animals and generally gets into drinking water from those activities. Excessive levels of nitrate in drinking water have caused serious illness and sometimes death in infants under six months of age. The serious illness in infants is caused because nitrate is converted to nitrite in the body. Nitrite inter-

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feres with the oxygen-carrying capacity of the child's blood. This is an acute disease in that symptoms can develop rapidly in infants. In most cases, health deteriorates over a period of days. Symptoms include shortness of breath and blueness of the skin. Clearly, expert medical advice should be sought immediately if these symptoms occur. The purpose of this notice is to encourage parents and other responsible parties to provide infants with an alternate source of drinking water. Local and state health authorities are the best source for information concerning alternate sources of drinking water for infants. EPA has set the drinking water standard at 10 parts per million (ppm) for nitrate to protect against the risk of these adverse effects. EPA has also set a drinking water standard for nitrite at one ppm. To allow for the fact that the toxicity of nitrate and nitrite are additive, EPA has also established a standard for the sum of nitrate and nitrite at 10 ppm. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to nitrate.

- (51) **Nitrite.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that nitrite poses an acute health concern at certain levels of exposure. This inorganic chemical is used in fertilizers and is found in sewage and wastes from humans and/or farm animals and generally gets into drinking water as a result of those activities. While excessive levels of nitrite in drinking water have not been observed, other sources of nitrite have caused serious illness and sometimes death in infants under 6 months of age. The serious illness in infants is caused because nitrite interferes with the oxygen-carrying capacity of the child's blood. This is an acute disease in that symptoms can develop rapidly. However, in most cases, health deteriorates over a period of days. Symptoms include shortness of breath and blueness of the skin. Clearly, expert medical advice should be sought immediately if these symptoms occur. The purpose of this notice is to encourage parents and other responsible parties to provide infants with an alternate source of drinking water. EPA has set the drinking water standard at one part per million (ppm) for nitrite to protect against the risk of these adverse effects. EPA has also set a drinking water standard for nitrate (converted to nitrite in humans) at 10 ppm and for the sum of nitrate and nitrite at 10 ppm. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to nitrite.
- (52) **Oxamyl.** The United States Environmental Protection Agency (EPA) establishes drinking water standards and has determined that oxamyl is a health concern at certain levels of exposure. This organic chemical is used as a pesticide for the control of insects and other pests. It may get into drinking water by runoff into surface water or leaching into groundwater. This chemical has been shown to damage the kidneys of laboratory animals such as rats when exposed at high levels over their lifetimes. EPA has set the drinking water standard for oxamyl at 0.2 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to oxamyl.
- (53) **Pentachlorophenol.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that pentachlorophenol is a health concern at certain levels of exposure. This organic chemical is used as a wood preservative, herbicide, disinfectant, and defoliant. It generally gets into drinking water by runoff into surface water or leaching into groundwater. This chemical has been shown to produce adverse reproductive effects and to damage the liver and kidneys of laboratory animals such as rats exposed to high levels during their lifetimes. Some humans who were exposed to relatively large amounts of this chemical also suffered damage to the liver and kidneys. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed to high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for pentachlorophenol at 0.001 parts per million (ppm) to protect against the risk of cancer or other adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to pentachlorophenol.
- (54) **Picloram.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that picloram is a health concern at certain levels of exposure. This organic chemical is used as a pesticide for broadleaf weed control. It may get into drinking water by runoff into surface water or leaching into groundwater as a result of pesticide application and improper waste disposal. This chemical has been shown to cause damage to the kidneys and liver in laboratory animals such as rats when the animals are exposed at high levels over their lifetimes. EPA has set the drinking water standard for picloram at 0.5 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to picloram.
- (55) **Polychlorinated biphenyls (PCBs).** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that polychlorinated biphenyls (PCBs) are a health concern at certain levels of exposure. These organic chemicals were once widely used in electrical transformers and other industrial equipment. They generally get into drinking water by improper waste disposal or leaking electrical industrial equipment. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for PCBs at 0.0005 part per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory

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animals. Drinking water that meets this standard is associated with little to none of this risk and is considered safe with respect to PCBs.

- (56) **Selenium.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that selenium is a health concern at certain high levels of exposure. Selenium is also an essential nutrient at low levels of exposure. This inorganic chemical is found naturally in food and soils and is used in electronics, photocopy operations, the manufacture of glass, chemicals, drugs, and as a fungicide and a feed additive. In humans, exposure to high levels of selenium over a long period of time has resulted in a number of adverse health effects, including a loss of feeling and control in the arms and legs. EPA has set the drinking water standard for selenium at 0.05 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to selenium.
- (57) **Simazine.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that simazine is a health concern at certain levels of exposure. This organic chemical is a herbicide used to control annual grasses and broadleaf weeds. It may leach into groundwater or runs off into surface water after application. This chemical may cause cancer in laboratory animals such as rats and mice exposed at high levels during their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for simazine at 0.004 parts per million (ppm) to reduce the risk of cancer or other adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to simazine.
- (58) **Styrene.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that styrene is a health concern at certain levels of exposure. This organic chemical is commonly used to make plastics and is sometimes a component of resins used for drinking water treatment. Styrene may get into drinking water from improper waste disposal. This chemical has been shown to damage the liver and nervous system in laboratory animals when exposed at high levels during their lifetimes. EPA has set the drinking water standard for styrene at 0.1 part per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to styrene.
- (59) **2,3,7,8 TCDD (Dioxin).** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that dioxin is a health concern at certain levels of exposure. This organic chemical is an impurity in the production of some pesticides. It may get into drinking water by industrial discharge of wastes. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for dioxin at 0.0000003 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe with respect to dioxin.
- (60) **Tetrachloroethylene.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that tetrachloroethylene is a health concern at certain levels of exposure. This organic chemical has been a popular solvent, particularly for dry cleaning. It generally gets into drinking water by improper waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for tetrachloroethylene at 0.005 part per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets this standard is associated with little to none of this risk and is considered safe with respect to tetrachloroethylene.
- (61) **Thallium.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that thallium is a health concern at certain high levels of exposure. This inorganic metal is found naturally in soils and is used in electronics, pharmaceuticals, and the manufacture of glass and alloys. This chemical has been shown to damage the kidney, liver, brain, and intestines of laboratory animals when the animals are exposed at high levels over their lifetimes. EPA has set the drinking water standard for thallium at 0.002 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to thallium.
- (62) **Toluene.** The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that toluene is a health concern at certain levels of exposure. This organic chemical is used as a solvent and in the manufacture of gasoline for airplanes. It generally gets into water by improper waste disposal or leaking underground storage tanks. This chemical has been shown to damage the kidney, nervous system, and circulatory system of laboratory animals such as rats and mice exposed to high levels during their lifetimes. Some industrial workers who were exposed to relative large amounts of this chemical during working careers also suffered damage to the liver, kidney, and nervous system. EPA has set the drinking water standard for toluene at one part per million (ppm) to protect against the risk of adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to toluene.

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- (63) **Total coliforms** [To be used when there is a violation of R18-4-202(A)(1) or R18-4-202(A)(2)] The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that the presence of total coliforms is a possible health concern. Total coliforms are common in the environment and are generally not harmful themselves. The presence of these bacteria in drinking water, however, generally is a result of a problem with water treatment or the pipes which distribute the water and indicates that the water may be contaminated with organisms that can cause disease. Disease symptoms may include diarrhea, cramps, nausea, and possibly jaundice, and any associated headaches and fatigue. The symptoms, however, are not just associated with disease-causing organisms in drinking water but also may be caused by a number of factors other than your drinking water. EPA has set an enforceable drinking water standard for total coliforms to reduce the risk of these adverse health effects. Under this standard, no more than 5.0% of the samples collected during a month can contain these bacteria, except that systems collecting fewer than 40 samples/month that have one total coliform-positive sample per month are not violating the standard. Drinking water which meets this standard is usually not associated with a health risk from disease-causing bacteria and should be considered safe.
- (64) **Toxaphene**. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that toxaphene is a health concern at certain levels of exposure. This organic chemical was once a pesticide widely used on cotton, corn, soybeans, pineapples, and other crops. When soil and climatic conditions are favorable, toxaphene may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for toxaphene at 0.003 part per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets this standard is associated with little to none of this risk and is considered safe with respect to toxaphene.
- (65) **2,4,5-TP**. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that 2,4,5-TP is a health concern at certain levels of exposure. This organic chemical is used as a herbicide. When soil and climatic conditions are favorable, 2,4,5-TP may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to damage the liver and kidney of laboratory animals such as rats and dogs exposed to high levels during their lifetimes. Some industrial workers who were exposed to relatively large amounts of this chemical during working careers also suffered damage to the nervous system. EPA has set the drinking water standard for 2,4,5-TP at 0.05 part per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to 2,4,5-TP.
- (66) **1,2,4-Trichlorobenzene**. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that 1,2,4-trichlorobenzene is a health concern at certain levels of exposure. This organic chemical is used as a dye carrier and as a precursor in herbicide manufacture. It generally gets into drinking water by discharges from industrial activities. This chemical has been shown to cause damage to several organs, including the adrenal glands. EPA has set the drinking water standard for 1,2,4-trichlorobenzene at 0.07 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to 1,2,4-trichlorobenzene.
- (67) **1,1,1-Trichloroethane**. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that the 1,1,1-trichloroethane is a health concern at certain levels of exposure. This chemical is used as a cleaner and degreaser of metals. It generally gets into drinking water by improper waste disposal. This chemical has been shown to damage the liver, nervous system, and circulatory system of laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Some industrial workers who were exposed to relatively large amounts of this chemical during their working careers also suffered damage to the liver, nervous system, and circulatory system. Chemicals which cause adverse effects among exposed industrial workers and in laboratory animals also may cause adverse health effects in humans who are exposed at lower levels over long periods of time. EPA has set the enforceable drinking water standard for 1,1,1-trichloroethane at 0.2 parts per million (ppm) to protect against the risk of these adverse health effects which have been observed in humans and laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.
- (68) **1,1,2-Trichloroethane**. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined 1,1,2-trichloroethane is a health concern at certain levels of exposure. This organic chemical is an intermediate in the production of 1,1-dichloroethylene. It generally gets into water by industrial discharge of wastes. This chemical has been shown to damage the kidney and liver of laboratory animals such as rats exposed to high levels during their lifetimes. EPA has set the drinking water standard for 1,1,2-trichloroethane at 0.005 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to 1,1,2-trichloroethane.
- (69) **Trichloroethylene**. The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that trichloroethylene is a health concern at certain levels of exposure. This chemical is a common metal

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cleaning and dry cleaning fluid. It generally gets into drinking water by improper waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed at lower levels over long periods of time. EPA has set forth the enforceable drinking water standard for trichloroethylene at 0.005 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little or none of this risk and should be considered safe.

(70) ~~Vinyl chloride.~~ The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that vinyl chloride is a health concern at certain levels of exposure. This chemical is used in industry and is found in drinking water as a result of the breakdown of related solvents. The solvents are used as cleaners and degreasers of metals and generally get into drinking water by improper waste disposal. This chemical has been associated with significantly increased risks of cancer among certain industrial workers who were exposed to relatively large amounts of this chemical during their working careers. This chemical has also been shown to cause cancer in laboratory animals when the animals are exposed at high levels over their lifetimes. Chemicals that cause increased risk of cancer among exposed industrial workers and in laboratory animals also may increase the risk of cancer in humans who are exposed at lower levels over long periods of time. EPA has set the enforceable drinking water standard for vinyl chloride at 0.002 part per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in humans and laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.

(71) ~~Xylenes.~~ The United States Environmental Protection Agency (EPA) sets drinking water standards and has determined that xylene is a health concern at certain levels of exposure. This organic chemical is used in the manufacture of gasoline for airplanes and as a solvent for pesticides, and as a cleaner and degreaser of metals. It usually gets into water by improper waste disposal. This chemical has been shown to damage the liver, kidney, and nervous system of laboratory animals such as rats and dogs exposed to high levels during their lifetimes. Some humans who were exposed to relatively large amounts of this chemical also suffered damage to the nervous system. EPA has set the drinking water standard for xylene at 10 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to xylene.

ARTICLE 7. CONSUMER CONFIDENCE ~~REPORT~~ REPORTS

R18-4-703. Content of the Consumer Confidence ~~Report~~ Reports

- A. A CWS shall provide to its customers an annual CCR that contains the following information on the source of the water delivered:
1. The type of the water (e.g., for example, surface water, ground water); and
 2. The name, if any, and location of the body of water.
- B. If a source water assessment has been completed, the CCR shall notify consumers of the availability of this information and how to obtain it. If a CWS has received a source water assessment from the Department, the CCR shall contain a brief summary of the assessment findings and the CWS's susceptibility to potential origins of contamination, using language provided by the Department or written by the CWS in consultation with the Department.
- C. Each CCR shall contain the following definitions:
1. "Maximum Contaminant Level" or "MCL" means 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; and
 2. "Maximum Contaminant Level Goal" or "MCLG" means 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.
 3. "Maximum residual disinfectant level" or "MRDL" means 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.
 4. "Maximum residual disinfectant level goal" or "MRDLG" means 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.
- D. A CCR for a CWS operating under a variance or an exemption ~~under R18-4-110 or R18-4-111~~ issued by the Department shall contain the following definition:
"Variance" or "exemption" means permission from the Department or the EPA not to meet ~~an~~ a MCL or a treatment technique under certain conditions.
- E. A CCR that contains data on a contaminant for which the Department has set a treatment technique or an action level shall contain one or both of the following definitions, as applicable:
1. "Treatment technique" means a required process to reduce the level of a contaminant in drinking water.
 2. "Action level" means the concentration of a contaminant that, if exceeded, triggers treatment or other requirements that a CWS shall follow.

R18-4-704. Information on Detected Contaminants

- A.** A CCR shall contain information on the following detected contaminants ~~that are subject to mandatory monitoring:~~
1. Contaminants subject to ~~an~~ a MCL, MRDL, action level, or treatment technique (regulated contaminants), listed in Appendix A of Article 1; and
 2. Contaminants listed in Table 1 for which monitoring is required by R18-4-404 or R18-4-405 (unregulated contaminants).
- B.** The CWS shall display in ~~+~~ one table, or several adjacent tables, data relating to the detected contaminants in subsection (A). If the CWS includes voluntary monitoring data, those data shall be listed in a table separate from the table of detected contaminants. For detected regulated contaminants, the table shall contain:
1. The MCL for that contaminant;
 2. The MCLG for that contaminant expressed in the same units as the MCL;
 3. If there is no MCL for a detected contaminant, the table shall indicate that there is a treatment technique, or specify the action level applicable to that contaminant, and the CCR shall include the definitions for “treatment technique” or “action level”, as appropriate, specified in R18-4-703(E)(1) and (2);
 4. For contaminants subject to ~~an~~ a MCL, except turbidity and total coliforms, the highest monitoring result used to determine compliance and the range of monitoring results expressed in the same units as the MCL, as follows:
 - a. When compliance with the MCL is determined annually or less frequently, the highest monitoring result at any sampling point and the range of detected monitoring results ~~expressed in the same units as the MCL.~~
 - b. When compliance with the MCL is determined by calculating a running annual average of all monitoring results taken at a sampling point, the highest average of the monitoring results and the range of all detected monitoring results ~~expressed in the same units as the MCL.~~
 - c. When compliance with the MCL is determined on a system-wide basis by calculating a running annual average of all monitoring results at all sampling points, the average and range of detected monitoring results. ~~expressed in the same units as the MCL.~~
 5. For turbidity, the highest single measurement and lowest monthly percentage of samples meeting turbidity limits specified in R18-4-302 for the filtration technology being used. The CCR shall include an explanation of the reasons for measuring turbidity;
 6. For lead and copper, the 90th percentile value of the most recent round of sampling and the number of sampling sites that exceed the action level;
 7. For total coliform:
 - a. The highest number of positive samples collected each month for a CWS that collects fewer than 40 samples per month; or
 - b. The highest percentage of positive samples collected each month for a CWS that collects at least 40 samples per month.
 8. For fecal coliform, the total number of positive samples; and
 9. The likely source of detected contaminants. Specific information regarding contaminants may be available in sanitary surveys and source water assessments, and shall be used when available to the CWS. If the CWS lacks specific information on the likely source of contamination, the CCR shall include one or more of the typical origins for that contaminant listed in Appendix A of Article 1 ~~Appendix B~~ that are most applicable to the CWS.
- C.** The table shall clearly identify any data indicating a violation of a MCLs, MRDL, or treatment techniques.
- D.** The CWS shall derive information in the CCR on detected contaminants from data collected to comply with monitoring and analytical requirements of this Chapter for the previous year. The table for a CWS that monitors less often than once a year for regulated contaminants under this Chapter shall contain the date and results of the most recent sampling. The CCR shall contain a brief statement indicating that the data presented in the CCR are from the most recent testing done within the last five years in accordance with this Chapter.
- E.** For a detected ~~unregulated contaminant for which monitoring is required~~ contaminant listed in Table 1, the table shall contain the average and range at which the contaminant was detected. The CCR may include a brief explanation of the reasons for monitoring for ~~unregulated~~ these contaminants.
- F.** The CWS shall include in the CCR results of monitoring in compliance with R18-4-404 and R18-4-405 for five years from the date of last sample or until the detected contaminant becomes regulated and subject to routine monitoring requirements, whichever comes first.
- G.** If the CWS distributes water to its customers from multiple hydraulically independent distribution systems that are fed by different raw water sources, the table shall contain a separate column for each service area and the CCR shall identify each separate distribution system. Alternatively, a CWS may produce separate CCRs tailored to include data for each service area. Multiple points of entry to a distribution system are not necessarily considered hydraulically independent.

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Table 1. Required Monitoring for Unregulated Contaminants

A CWS serving 100,000 or more persons required to monitor for the following disinfection by-products and microbial contaminants per 40 CFR § 141.142 and 141.143, shall include the results of the most recent sampling, and shall report the average and range of results for the contaminant that was detected. Results need only be included for five years from the date of the last sample or until any of the detected contaminants becomes regulated and subject to routine monitoring requirements, whichever comes first.

<u>Haloacetic Acids*</u>	<u>Haloacetilenitrile</u>	<u>Haloketones</u>
<u>Chlorite*</u>	<u>Chloral Hydrate</u>	<u>Total Organic Halides</u>
<u>Bromate*</u>	<u>Chloropicrin</u>	<u>Aldehydes</u>
<u>Cyanogen Chloride</u>	<u>Chlorate</u>	<u>Total Culturable Viruses</u>

*MCLs and monitoring requirements will become effective January 1, 2002 for a CWS that use surface water and serves more than 10,000 people.

A CWS required to monitor for the following contaminants per 40 CFR § 141.40, shall include the results of the most recent sampling and shall report the average and range of results for the contaminant that was detected. Results from the previous year need only be included.

<u>Assessment Monitoring</u>		
<u>2,4-dinitrotoluene</u>	<u>2,6-dinitrotoluene</u>	<u>Acetochlor</u>
<u>DCPA Mono- Acid Degradate</u>	<u>DCPA Di-acid Degradate</u>	<u>4,4'-DDE</u>
<u>EPTC</u>	<u>Molinate</u>	<u>MTBE</u>
<u>Nitrobenzene</u>	<u>Perchlorate</u>	<u>Terbacil</u>
<u>Screening Survey</u>		
<u>1,2-diphenylhydrazine</u>	<u>2-methyl-phenol</u>	<u>2,4-dichlorophenol</u>
<u>2,4-dinitrophenol</u>	<u>2,4,6-trichlorophenol</u>	<u>Diazinon</u>
<u>Disulfoton</u>	<u>Diuron</u>	<u>Fonofos</u>
<u>Linuron</u>	<u>Low-level Nitrobenzene</u>	<u>Prometon</u>
<u>Terbufos</u>	<u>Alachlor Esa</u>	<u>Polonium-210</u>

R18-4-706. Information on Violations

A CCR shall contain a clear, understandable explanation of any violation that occurred during the year covered by the CCR, the length of the violation, an explanation of any potential adverse health effects, the health effects language from Article 1 Appendix A Appendix B of this Article, and the steps the CWS has taken to correct a violation of any of the following:

1. ~~An~~ A MCL, MRDL, treatment technique, or action level;
2. Monitoring and reporting of regulated and unregulated compliance data;
3. Filtration and disinfection for a CWS that has had a failure of filtration equipment or processes, that constitutes a violation. The CCR shall contain 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 that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches."
4. Lead and copper. For a CWS that failed to take one or more actions prescribed by ~~R18-4-306~~ R18-4-307 through R18-4-308, and R18-4-311 through R18-4-315;
5. Treatment techniques for Acrylamide and Epichlorohydrin. For a CWS that violated the requirements of R18-4-317;
6. Recordkeeping of compliance data; or
7. Violation of the terms of a variance, an exemption, or an administrative or judicial order.

R18-4-709. Additional Health Information.

A. A CCR shall 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, persons 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 health care providers. United States Environmental Protection Agency and Centers for Disease Control guidelines on appropriate means to lessen the risk of infection

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by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (800-426-4791).”

- B.** A CWS that detects arsenic ~~at levels more than 0.25 milligrams per liter~~ above 0.005 mg/L, but less than the MCL and up to and including 0.01 mg/L, shall include in its CCR a short informational statement about arsenic. The CWS may create its own informational statement, in consultation with the Department, or the CWS may use the following language:

~~“The EPA is reviewing the drinking water standard for arsenic because of special concerns that it may not be stringent enough. Arsenic is a naturally occurring mineral known to cause cancer in humans at high concentrations.”~~

“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.”

- C.** A CWS that detects arsenic above 0.01 mg/L and up to and including 0.05 mg/L shall include in its CCR the arsenic health effects language in Appendix A of Article 1.

- ~~**D.**~~**D.**A CWS that detects nitrate at levels more than five mg/l, but less than the MCL shall include in its CCR a short informational statement about the impacts of nitrate on children. The CWS may create its own informational statement, in consultation with the Department, or the CWS may use the following language:

~~“Nitrate in drinking water at levels above 10 ppm is a health risk for infants of less than 6 ~~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.”~~

- ~~**E.**~~**E.**A CWS that detects lead above the action level in more than 5%, but ~~fewer than 10%~~, less than or equal to 10%, of homes sampled shall include in its CCR a short informational statement about the special impact of lead on children. The CWS may create its own informational statement, in consultation with the Department, or the CWS may use the following language:

~~“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 two minutes before using tap water. Additional information is available from the Safe Drinking Water Hotline (800-426-4791).”~~

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Appendix A. Regulated Contaminants Repealed

Microbiological Contaminants	MCL	Major Sources in Drinking Water
1. Total Coliform Bacteria	Presence of coliform bacteria in 5% or more of monthly samples.	Naturally present in the environment.
2. Fecal coliform and <i>E. coli</i>	A routine sample and a repeat sample are total coliform positive, and 1 is also fecal coliform or <i>E. coli</i> positive	Human and animal fecal waste.
3. Turbidity	Treatment Technique	Soil Run-off
Radioactive Contaminants	MCL	Major Sources in Drinking Water
4. Beta/photon emitters	4 Millirems/ Year	Decay of natural and man made deposits.
5. Alpha emitters	15 Picocuries/Liter	Erosion of natural deposits.
6. Combined radium	5 Picocuries/ Liter	Erosion of natural deposits.
Inorganic Contaminants	MCL in mg/l	Major Sources in Drinking Water
7. Antimony	.006	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder.
8. Arsenic	.05	Erosion of natural deposits; Run-off from orchards; Run-off from glass and electronics production wastes.
9. Asbestos	7 Million Fibers/Liter	Decay of asbestos-cement water mains; Erosion of natural deposits.
10. Barium	2	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits.
11. Beryllium	.004	Discharge from metal refineries and coal-burning factories; Discharge from electrical, aerospace, and defense industries.
12. Cadmium	.005	Corrosion of galvanized pipes; Erosion of natural deposits; Discharge from metal refineries; run-off from waste batteries and paints.
13. Chromium	1	Discharge from steel and pulp mills; Erosion of natural deposits.
14. Copper	Action Level =1.3	Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservatives.
15. Cyanide	.2	Discharge from steel/metal factories; Discharge from plastic and fertilizer factories.
16. Fluoride	4	Erosion of natural deposits; Water additive that promotes strong teeth; Discharge from fertilizer and aluminum factories.
17. Lead	Action Level =.015	Corrosion of household plumbing systems; Erosion of natural deposits.
18. Mercury	.002	Erosion of natural deposits; Discharge from refineries and factories; Runoff from landfills; Runoff from cropland.
19. Nitrate	10	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.
20. Nitrite	1	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.
21. Selenium	.05	Discharge from petroleum and metal refineries; Erosion of natural deposits; Discharge from mines.

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22. Thallium	.002	Leaching from ore processing sites; Discharge from electronics, glass, and drug factories.
Synthetic Organic Contaminants including Pesticides and Herbicides	MCL in mg/l	Major Sources in Drinking Water
23. 2,4-D	.07	Runoff from herbicide used on row crops.
24. 2,4,5-TP [Silvex]	.05	Residue of banned herbicide.
25. Acrylamide	Treatment Technique	Added to water during sewage/wastewater treatment.
26. Alachlor	.002	Runoff from herbicide used on row crops.
27. Atrazine	.003	Runoff from herbicide used on row crops.
28. Benzo(a)pyrene [PAH]	.0002	Leaching from linings of water storage tanks and distribution lines.
29. Carbofuran	.04	Leaching of soil fumigant used on rice and alfalfa.
30. Chlordane	.002	Residue of banned termiticide.
31. Dalapon	.2	Runoff from herbicide used on rights of way.
32. Di(2-ethylhexyl) adipate	.4	Discharge from chemical factories.
33. Di(2-ethylhexyl) phthalate	.006	Discharge from rubber and chemical factories.
34. Dibromochloropropane (DBCP)	.0002	Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards.
35. Dinoseb	.007	Runoff from herbicide used on soybeans and vegetables.
36. Diquat	.02	Runoff from herbicide use.
37. Dioxin [2,3,7,8-TCDD]	.00000003	Emissions from waste incineration and other combustion; Discharge from chemical factories.
38. Endothal	.1	Runoff from herbicide use.
39. Endrin	.002	Residue of banned insecticide.
40. Epichlorohydrin	Treatment Technique	Discharge from industrial chemical factories; An impurity of some water treatment chemicals.
41. Ethylene dibromide	.00005	Discharge from petroleum refineries.
42. Glyphosate	.7	Runoff from herbicide use.
43. Heptachlor	.0004	Residue of banned pesticide.
44. Heptachlor epoxide	.0002	Breakdown of heptachlor.
45. Hexachlorobenzene	.001	Discharge from metal refineries and agricultural chemical factories.
46. Hexachloro-cyclopentadiene	.05	Discharge from chemical factories.
47. Lindane	.0002	Runoff/leaching from insecticide used on cattle, lumber, gardens.
48. Methoxychlor	.04	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock.
49. Oxamyl [Vydate]	.2	Runoff/leaching from insecticide used on apples, potatoes and tomatoes.
50. PCBs [Polychlorinated biphenyls]	.0005	Runoff from landfills; discharge of waste chemicals.
51. Pentachlorophenol	.001	Discharge from wood preserving factories.
52. Picloram	.5	Herbicide runoff.
53. Simazine	.004	Herbicide runoff.
54. Toxaphene	.003	Runoff/leaching from insecticide used on cotton and cattle.
Volatile Organic Contaminants	MCL in mg/l	Major Sources in Drinking Water

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55. Benzene	.005	Discharge from factories; Leaching from gas storage tanks and landfills.
56. Carbon tetrachloride	.005	Discharge from chemical plants and other industrial activities.
57. Chlorobenzene	±	Discharge from chemical and agricultural chemical factories.
58. o-Dichlorobenzene	.6	Discharge from industrial chemical factories.
59. p-Dichlorobenzene	.075	Discharge from industrial chemical factories.
60. 1,2-Dichloroethane	.005	Discharge from industrial chemical factories.
61. 1,1-Dichloroethylene	.007	Discharge from industrial chemical factories.
62. cis 1,2-Dichloroethylene	.07	Discharge from industrial chemical factories.
63. trans 1,2-Dichloroethylene	±	Discharge from industrial chemical factories.
64. Dichloromethane	.005	Discharge from pharmaceutical and chemical factories.
65. 1,2-Dichloropropane	.005	Discharge from industrial chemical factories.
66. Ethylbenzene	.7	Discharge from petroleum refineries.
67. Styrene	±	Discharge from rubber and plastic factories; Leaching from landfills.
68. Tetrachloroethylene	.005	Leaching from PVC pipes; Discharge from factories and dry cleaners.
69. 1,2,4-Trichlorobenzene	.07	Discharge from textile-finishing factories.
70. 1,1,1-Trichloroethane	.2	Discharge from metal degreasing sites and other factories.
71. 1,1,2-Trichloroethane	.005	Discharge from industrial chemical factories.
72. Trichloroethylene	.005	Discharge from metal degreasing sites and other factories.
73. THMs {Total trihalomethanes}	±	Byproduct of drinking water chlorination.
74. Toluene	±	Discharge from petroleum factories.
75. Vinyl Chloride	.002	Leaching from PVC piping; Discharge from plastics factories.
76. Xylenes	±0	Discharge from petroleum factories; Discharge from chemical factories.

Appendix B. ~~Health Effects Language Repealed~~

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. 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

4. 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.

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5. 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.
6. 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.

Inorganic Contaminants

7. 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.
8. 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.
9. 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.
10. Barium. Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.
11. Beryllium. Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions.
12. Cadmium. Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage.
13. Chromium. Some people who use water containing chromium well in excess of the MCL over many years could experience allergic dermatitis.
14. 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.
15. 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.
16. 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. Children may get mottled teeth.
17. 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.
18. Mercury (inorganic). Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage.
19. Nitrate. Infants below the age of 6 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.
20. Nitrite. Infants below the age of 6 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.
21. 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.
22. 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

23. 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.
24. 2,4,5-TP (Silvex). Some people who drink water containing silvex in excess of the MCL over many years could experience liver problems.
25. 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.
26. 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.
27. 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.
28. 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.
29. 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.

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30. 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.
31. Dalapon. Some people who drink water containing dalapon well in excess of the MCL over many years could experience minor kidney changes.
32. 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.
33. 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.
34. 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.
35. Dinoseb. Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties.
36. 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.
37. Diquat. Some people who drink water containing diquat in excess of the MCL over many years could get cataracts.
38. Endothall. Some people who drink water containing endothall in excess of the MCL over many years could experience problems with their stomach or intestines.
39. Endrin. Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems.
40. 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.
41. 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.
42. 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.
43. 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.
44. 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.
45. 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.
46. 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.
47. Lindane. Some people who drink water containing lindane in excess of the MCL over many years could experience problems with their kidneys or liver.
48. Methoxychlor. Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties.
49. Oxamyl [Vydate]. Some people who drink water containing oxamyl in excess of the MCL over many years could experience slight nervous system effects.
50. 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.
51. 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.
52. Picloram. Some people who drink water containing picloram in excess of the MCL over many years could experience problems with their liver.
53. Simazine. Some people who drink water containing simazine in excess of the MCL over many years could experience problems with their blood.
54. 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

55. 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.
56. 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.

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57. Chlorobenzene. Some people who drink water containing chlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys.
58. 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.
59. 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.
60. 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.
61. 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.
62. 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.
63. 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.
64. 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.
65. 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.
66. 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.
67. 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.
68. 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.
69. 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.
70. 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.
71. 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.
72. 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.
73. 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.
74. 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.
75. 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.
76. Xylenes. Some people who drink water containing xylenes in excess of the MCL over many years could experience damage to their nervous system.