
Rules of
Department of Natural Resources
Division 60—Public Drinking Water Program
Chapter 4—Contaminant Levels and Monitoring

Title	Page
10 CSR 60-4.010 Maximum Contaminant Levels and Monitoring Requirements	3
10 CSR 60-4.020 Maximum Microbiological Contaminant Levels and Monitoring Requirements	3
10 CSR 60-4.030 Maximum Inorganic Chemical Contaminant Levels, Action Levels and Monitoring Requirements	6
10 CSR 60-4.040 Maximum Synthetic Organic Chemical Contaminant Levels and Monitoring Requirements	9
10 CSR 60-4.050 Maximum Turbidity Contaminant Levels and Monitoring Requirements	10
10 CSR 60-4.055 Disinfection Requirements	10
10 CSR 60-4.060 Maximum Radionuclide Contaminant Levels and Monitoring Requirements	12
10 CSR 60-4.070 Secondary Contaminant Levels and Monitoring Requirements	13
10 CSR 60-4.080 Operational Monitoring	13
10 CSR 60-4.090 Maximum Trihalomethane Contaminant Level and Monitoring Requirements	16
10 CSR 60-4.100 Maximum Volatile Organic Chemical Contaminant Levels and Monitoring Requirements	17
10 CSR 60-4.110 Special Monitoring for Unregulated Chemicals	18



**Title 10—DEPARTMENT OF
NATURAL RESOURCES**
**Division 60—Public Drinking Water
Program**
**Chapter 4—Contaminant Levels and
Monitoring**

**10 CSR 60-4.010 Maximum Contaminant
Levels and Monitoring Requirements**

PURPOSE: This rule establishes sampling requirements and monitoring requirements for public water systems.

(1) The accompanying provisions contain maximum contaminant levels (MCLs) permissible in public water systems and describe associated monitoring requirements. A supplier of water must collect or have collected samples of the water and shall provide for analysis of these samples for designated contaminants. Nothing in this rule shall preclude a duly designated representative of the department from taking samples or from using the results from the samples to determine compliance by a supplier of water with applicable provisions of these rules.

(2) Laboratory services required by this chapter to determine contaminant levels are available from the Department of Natural Resources (DNR) or the Department of Health according to the fee schedule set out in 10 CSR 60-16.030.

(A) Samples must be collected at no less than the required frequency and in accordance with schedules established by the department when samples are submitted to the DNR or the Department of Health laboratory for analysis.

(B) A supplier of water which submits samples to the DNR or the Department of Health laboratory must collect and submit samples using containers provided by the department in accordance with the instructions enclosed.

(C) A supplier of water not using the DNR or the Department of Health laboratory must have the analysis done by a laboratory certified by the department.

(3) Samples taken to determine compliance with the requirements of this chapter shall be taken at representative points of the public water system, as approved by the department. The supplier of water shall provide satisfactory sampling taps. Samples for microbiological analysis must be received in the laboratory for analysis within forty-eight (48) hours of collection.

(4) All analytical results must be accurate to at least the same number of significant figures as the applicable MCL.

(5) All analyses must be consistent with the methods and procedures described in 10 CSR 60-5.010 and 10 CSR 60-5.020. The results of all analyses must be used to determine compliance with the MCLs unless the analytical results are invalidated for technical reasons, such as obvious sampling errors.

(6) When a public water supply system supplies water to one (1) or more other public water supply systems, the department may modify the monitoring requirements imposed by these rules to the extent that the interconnection of the systems justifies treating them as a single system for monitoring purposes. Any modified monitoring must be conducted pursuant to a schedule specified by the department.

(7) The provisions of this rule are declared severable. If any fee fixed by this rule is held invalid by a court of competent jurisdiction or by the Administrative Hearing Commission, the remaining provisions of this rule shall remain in full force and effect, unless otherwise determined by a court of competent jurisdiction or by the Administrative Hearing Commission.

AUTHORITY: section 640.100, RSMo (Cum. Supp. 1993). Original rule filed May 4, 1979, effective Sept. 14, 1979. Amended: Filed April 14, 1981, effective Oct. 11, 1981. Amended: Filed Aug. 13, 1982, effective Jan. 13, 1983. Amended: Filed June 2, 1988, effective Aug. 31, 1988. Amended: Filed Dec. 4, 1990, effective July 8, 1991. Amended: Filed April 14, 1994, effective Nov. 30, 1994.*

**Original authority 1939, amended 1978, 1981, 1982, 1988, 1989, 1992, 1993.*

**10 CSR 60-4.020 Maximum Microbiological
Contaminant Levels and Monitoring
Requirements**

PURPOSE: This rule establishes maximum contaminant levels and monitoring requirements for microbiological contaminants.

(1) Routine Monitoring.

(A) Public water systems must collect total coliform samples according to a written sample siting plan at sites which are representative of water throughout the distribution sys-

tem. This plan shall be made available to the inspector conducting a sanitary survey or on-site inspection, or to the department upon request and the department will either approve or recommend improvements.

1. All routine samples should be taken from the distribution system.

2. Distribution sampling points should be chosen where both upstream and downstream repeat samples can be taken within five (5) service connections of the principal sampling point. The same distribution points may be used each month, but there must be a separate point for each distribution sample collected each day.

3. Groundwater supplies collecting five (5) or fewer samples per month may collect all samples on the same day with departmental approval; provided, that the samples are all collected from different points. Other supplies shall collect samples at regular intervals throughout the month.

4. Groundwater supplies under the direct influence of surface water that do not practice filtration must identify a sample point near the first service connection which is one (1) of twenty percent (20%) of all service connections in the entire system that are nearest the water supply treatment facility as measured by water transport time within the distribution system.

5. Supplies should identify at least five (5) sampling taps since these are needed for five (5) routine samples in the month following an unsafe sample.

(B) The monitoring frequency for total coliforms for community water systems is based on the population served by the system as follows except that systems utilizing surface or ground water under the direct influence of surface water and systems practicing iron removal or lime softening must collect at least five (5) samples per month. In addition, the department may require a greater frequency if necessary:

**Total Coliform Monitoring Frequency for
Community Water Systems**

Population Served	Minimum Samples Per Month
25—1000*	1
1001—2500	2
2501—3300	3
3301—4100	4
4101—4900	5
4901—5800	6
5801—6700	7
6701—7600	8
7601—8500	9
8501—12,900	10

Population Served	Minimum Samples Per Month
12,901—17,200	15
17,201—21,500	20
21,501— 25,000	25
25,001—33,000	30
33,001—41,000	40
41,001—50,000	50
50,001—59,000	60
59,001—70,000	70
70,001—83,000	80
83,001—96,000	90
96,001—130,000	100
130,001—220,000	120
220,001—320,000	150
320,001—450,000	180
50,001—600,000	210
600,001—780,000	240
780,001—970,000	270
970,001—1,230,000	300
1,230,001—1,520,000	330
1,520,001—1,850,000	360
1,850,001—2,270,000	390
2,270,001—3,020,000	420
3,020,001—3,960,000	450
3,960,001—more	480

*Includes public water systems which have at least fifteen (15) service connections but serve fewer than twenty-five (25) persons.

(C) The monitoring frequency for total coliforms for noncommunity water systems is as follows, except that the department may require a greater frequency:

1. A noncommunity water system using only groundwater (except groundwater under the direct influence of surface water) and serving one thousand (1000) persons or fewer per day must monitor each calendar quarter that the system provides water to the public, except that the department may reduce this monitoring frequency, in writing, if a sanitary survey or on-site inspection shows that the system is free of sanitary defects. Beginning June 29, 1994, the department cannot reduce the monitoring frequency for a noncommunity water system using only groundwater (except groundwater under the direct influence of surface water) and serving one thousand (1000) persons or fewer per day to less than once per year;

2. A noncommunity water system using only groundwater (except groundwater under the direct influence of surface water) and serving more than one thousand (1000) persons per day during any month must monitor at the same frequency as a like-sized community water system, as specified in subsection (1)(B) of this rule, except that the department may reduce this monitoring frequency, in writing, for any month the system serves less than one thousand (<1000) persons per day.

The department cannot reduce the monitoring frequency to less than once per year. For systems using groundwater under the direct influence of surface water, paragraph (1)(C)4. of this rule applies;

3. A noncommunity water system using surface water, in total or in part, must monitor at the same frequency as a like-sized community water system that uses surface water, as specified in subsection (1)(B) of this rule; and

4. A noncommunity water system using groundwater under the direct influence of surface water must monitor at the same frequency as a like-sized community water system that uses surface water, as specified in subsection (1)(B) of this rule. The system must begin monitoring at this frequency beginning six (6) months after the department determines that the groundwater is under the direct influence of surface water.

(D) The public water system must collect samples at regular time intervals throughout the monitoring period, except that a system which uses groundwater (except groundwater under the direct influence of surface water) and serves four thousand nine hundred (4900) persons or fewer, may collect, with departmental approval, all samples on a single day if they are taken from different sites.

(E) A public water system that uses groundwater under the direct influence of surface water and does not practice filtration must collect at least one (1) sample near the first service connection each day the turbidity level of the source water, measured as specified in 10 CSR 60-5.010(1), exceeds one (1) nephelometric turbidity unit (NTU). This sample must be analyzed for the presence of total coliforms. When one (1) or more turbidity measurements in any day exceeds one (1) NTU, the system must collect this coliform sample within twenty-four (24) hours of the exceedance unless the department determines that the system, for logistical reasons outside its control, cannot have the sample analyzed within thirty (30) hours of collection. Sample results from this coliform monitoring must be included in determining compliance with the maximum contaminant levels (MCLs) for total coliforms in section (7) of this rule.

(F) Special purpose samples, such as those taken to determine whether disinfection practices are sufficient following pipe placement, replacement or repair, shall not be used to determine compliance with the MCL for total coliforms in section (7) of this rule. Repeat samples taken pursuant to section (2) of this rule are not considered special purpose samples and must be used to determine compli-

ance with the MCL for total coliforms in section (7) of this rule.

(2) Repeat Monitoring.

(A) If a routine sample is total coliform-positive, the public water system must collect a set of repeat samples within twenty-four (24) hours of being notified of the positive result. The department may extend the twenty-four (24)-hour limit on a case-by-case basis if the system has a logistical problem in collecting repeat samples that is beyond its control. In the case of an extension, the department must specify how much time the system has to collect the repeat samples. A system which collects more than one (1) routine sample per month must collect no fewer than three (3) repeat samples for each total coliform-positive sample found. A system which collects one (1) routine sample per month or fewer must collect no fewer than four (4) repeat samples for each total coliform-positive sample found.

(B) The system must collect at least one (1) repeat sample from the sampling tap where the original total coliform-positive sample was taken and at least one (1) repeat sample at a tap within five (5) service connections upstream and at least one (1) repeat sample at a tap within five (5) service connections downstream of the original sampling site. If a total coliform-positive sample is at the end of the distribution system, or one (1) away from the end of the distribution system, the department may waive the requirement to collect at least one (1) repeat sample upstream or downstream of the original sampling site except that the total number of repeat samples shall not be reduced.

(C) The system must collect all repeat samples on the same day, except that the department may allow a system with a single service connection to collect the required set of repeat samples over a four (4)-day period or to collect a larger volume repeat sample(s) in one (1) or more sample containers of any size, as long as the total volume collected is at least four hundred milliliters (400 ml) (three hundred milliliters (300 ml) for systems which collect more than one (1) routine sample per month). Systems with more than one (1) service connection, but fewer service connections than the required number of repeat samples, shall collect repeat samples as directed by the department.

(D) If one (1) or more repeat samples in the set is total coliform-positive, the public water system must collect an additional set of repeat samples in the manner specified in subsections (2)(A)—(C) of this rule. The additional samples must be collected within twenty-four (24) hours of being notified of



the positive result, unless the department extends the limit as provided in subsection (2)(A) of this rule. The system must repeat this process until either total coliforms are not detected in one (1) complete set of repeat samples or the system determines that the MCL for total coliforms in section (7) of this rule has been exceeded and notifies the department.

(E) If a system collecting fewer than five (5) routine samples per month has one (1) or more total coliform-positive samples and the department does not invalidate the sample(s) under section (3) of this rule, it must collect at least five (5) routine samples during the next month the system provides water to the public, except that the department may waive this requirement if the following conditions are met (the department cannot waive the requirement for a system to collect repeat samples in subsections (2)(A)—(D) of this rule):

1. The department may waive the requirement to collect five (5) routine samples the next month the system provides water to the public if the department, or an agent approved by the department, performs a site visit before the end of the next month the system provides water to the public. Although a sanitary survey need not be performed, the site visit must be sufficiently detailed to allow the department to determine whether additional monitoring, any corrective action, or both, is needed. The department cannot approve an employee of the system to perform this site visit, even if the employee is an agent approved by the department to perform sanitary surveys; and

2. The department may waive the requirement to collect five (5) routine samples the next month the system provides water to the public if the department has determined why the sample was total coliform-positive and establishes that the system has corrected the problem or will correct the problem before the end of the next month the system serves water to the public. In this case, the department must document this decision to waive the following month's additional monitoring requirement in writing, have it approved and signed by the supervisor of the department official who recommends the decision, and make this document available to the Environmental Protection Agency (EPA) and the public upon request. The written documentation must describe the specific cause of the total coliform-positive sample and what action the system has taken, or will take, to correct this problem. The department cannot waive the requirement to collect five (5) routine samples the next month the system provides water to the public solely on the

grounds that all repeat samples are total coliform-negative. Under this paragraph, a system must still take at least one (1) routine sample before the end of the next month it serves water to the public and use it to determine compliance with the MCL for total coliforms in section (7) of this rule, unless the department has determined that the system has corrected the contamination problem before the system took the set of repeat samples required in subsections (2)(A)—(D) of this rule and all repeat samples were total coliform-negative.

(F) After a system collects a routine sample and before it learns the results of the analysis of that sample, if it collects another routine sample(s) from within five (5) adjacent service connections of the initial sample, and the initial sample, after analysis, is found to contain total coliforms, then the system may count the subsequent sample(s) as a repeat sample instead of as a routine sample.

(G) Results of all routine and repeat samples not invalidated by the department must be included in determining compliance with the MCL for total coliforms in section (7) of this rule.

(3) Invalidation of Total Coliform Samples. A total coliform-positive sample invalidated under this section does not count towards meeting the minimum monitoring requirements of this rule.

(A) The department may invalidate a total coliform-positive sample only if any one (1) of the following conditions is met:

1. The laboratory establishes that improper sample analysis caused the total coliform-positive result;

2. The department, on the basis of the results of repeat samples collected as required by subsections (2)(A)—(D) of this rule, determines that the total coliform-positive sample resulted from a domestic or other nondistribution system plumbing problem. The department cannot invalidate a sample on the basis of repeat sample results unless all repeat samples collected at the same tap as the original total coliform-positive sample are also total coliform-positive, and all repeat samples collected within five (5) service connections of the original tap are total coliform-negative (that is, the department cannot invalidate a total coliform-positive sample on the basis of repeat samples if all the repeat samples are total coliform-negative or if the public water system has only one (1) service connection); or

3. The department has substantial grounds to believe that a total coliform-positive result is due to a circumstance or condition which does not reflect water quality in

the distribution system. In this case, the system must still collect all repeat samples required in subsections (2)(A)—(D) of this rule and then use them to determine compliance with the MCL for total coliforms in section (7) of this rule. To invalidate a total coliform-positive sample under this section, the decision with the rationale for the decision must be documented in writing, and approved and signed by the supervisor of the department official who recommended the decision. The department must make this document available to the EPA and to the public upon request. The written documentation must state the specific cause of the total coliform-positive sample and what action the system has taken, or will take, to correct this problem. The department may not invalidate a total coliform-positive sample solely on the grounds that all repeat samples are total coliform-negative.

(B) A laboratory must invalidate a total coliform sample (unless total coliforms are detected) if the sample produces a turbid culture in the absence of gas production using an analytical method where gas formation is examined (that is, the multiple-tube fermentation (MTF) technique), produces a turbid culture in the absence of an acid reaction in the presence-absence (P-A) coliform test, or exhibits confluent growth or produces colonies too numerous to count with an analytical method using a membrane filter (that is, membrane filter technique (MFT)). When a laboratory invalidates a sample because of this interference, the system must collect another sample from the same location as the original sample within twenty-four (24) hours of being notified of the invalidation and have it analyzed for the presence of total coliform. The system must continue to resample within twenty-four (24) hours and have the samples analyzed until it obtains a valid result. The department may extend the twenty-four (24)-hour limit on a case-by-case basis if the system has a logistical problem in collecting the sample that is beyond its control. In the case of an extension, the department must specify how much time the system has to collect the replacement samples.

(4) Sanitary Surveys.

(A) Public water systems which do not collect five (5) or more routine samples per month must undergo an initial sanitary survey or on-site inspection by June 29, 1994, for community public water systems and June 29, 1999, for noncommunity water systems. After that, systems must undergo another sanitary survey or on-site inspection every five (5) years, except that noncommunity water systems using only protected and

disinfected groundwater, as defined by the department, must undergo subsequent sanitary surveys or on-site inspections at least every ten (10) years after the initial sanitary survey or on-site inspection. The department must review the results of each sanitary survey or on-site inspection to determine whether the existing monitoring frequency is adequate and what additional measure, if any, the system needs to undertake to improve drinking water quality.

(B) Sanitary surveys or on-site inspections must be performed by the department or an agent approved by the department. The system is responsible for ensuring that the sanitary survey or on-site inspection takes place. Agents that can be approved by the department to conduct sanitary surveys include engineers. Agents that can be approved by the department to conduct on-site inspections include, but are not limited to, sanitarians and environmental specialists from other state agencies acting in their official capacity. Reports of sanitary surveys and on-site inspections shall include completed forms approved by the department. Sanitary surveys and on-site inspections shall be done in accordance with criteria established by the department.

(5) Fecal Coliforms/*Escherichia coli* (*E. coli*) Testing.

(A) If any routine or repeat sample is total coliform-positive, the system must analyze that total coliform-positive culture medium to determine if fecal coliforms are present, except that the system may test for *E. coli* in lieu of fecal coliforms. If fecal coliforms or *E. coli* are present, the system must notify the department by the end of the day when the system is notified of the result, unless the system is notified of the result after the department office is closed, in which case the system must notify the department before the end of the next business day.

(B) The department has the discretion to allow a public water system, on a case-by-case basis, to forego fecal coliform or *E. coli* testing on a total coliform-positive sample if that system assumes that the total coliform-positive sample is fecal coliform-positive or *E. coli*-positive. The system must notify the department as specified in subsection (5)(A) of this rule, and the provisions of 10 CSR 60-8.010(1)(A)3. and (7) (B)1. apply, except as provided in subsection (5)(C) of this rule.

(C) The public notice issued under 10 CSR 60-8.010(1)(A)3. and (7)(B)1. may be waived at the discretion of the department when corrective actions have been taken and laboratory results for two (2) consecutive days are negative for total coliform bacteria. The

department, after consideration of the circumstances surrounding a specific incident, may reduce or extend the public notice period for acute violations, as it deems appropriate.

(6) Response to Violation.

(A) A public water system which has exceeded the MCL for total coliforms in section (7) of this rule must report the violation to the department no later than the end of the next business day after it learns of the violation and notify the public in accordance with 10 CSR 60-8.010.

(B) A public water system which has failed to comply with a coliform monitoring requirement, including the sanitary survey requirement, must report the monitoring violation to the department within ten (10) days after the system discovers the violation and notify the public in accordance with 10 CSR 60-8.010(2).

(7) MCLs for Microbiological Contaminants.

(A) The MCL is based on the presence or absence of total coliforms in a sample, rather than coliform density. Public water systems need only determine the presence or absence of total coliforms; a determination of total coliform density is not required.

1. For a system which collects at least forty (40) samples per month, if no more than five percent (5.0%) of the samples collected during a month are total coliform-positive, the system is in compliance with the MCL for total coliforms.

2. For a system which collects fewer than forty (40) samples per month, if no more than one (1) sample collected during a month is total coliform-positive, the system is in compliance with the MCL for total coliforms.

(B) Any fecal coliform-positive repeat sample or *E. coli*-positive repeat sample, or any total coliform-positive repeat sample following a fecal coliform-positive or *E. coli*-positive routine sample constitutes a violation of the MCL for total coliforms. For purposes of the public notification requirements in 10 CSR 60-8.010, this is a violation that may pose an acute risk to health.

(C) A public water system must determine compliance with the MCL for total coliforms in subsections (7)(A) and (B) of this rule for each month in which it is required to monitor for total coliforms.

*AUTHORITY: section 640.100, RSMo (1994). * Original rule filed May 4, 1979, effective Sept. 14, 1979. Amended: Filed April 14, 1981, effective Oct. 11, 1981. Rescinded and readopted:*

Filed Dec. 4, 1990, effective July 8, 1991. Amended: Filed Feb. 1, 1996, effective Oct. 30, 1996.

**Original authority 1939, amended 1978, 1981, 1982, 1988, 1989, 1992, 1993, 1995.*

10 CSR 60-4.030 Maximum Inorganic Chemical Contaminant Levels, Action Levels and Monitoring Requirements

PURPOSE: This rule establishes maximum contaminant levels, action levels and monitoring requirements for inorganic contaminants.

(1) The maximum contaminant or action level listed as follows for inorganic chemicals 1.-17. apply to community water systems. The maximum contaminant or action level listed as follows for inorganic chemicals 1.-9. and 11.-17. apply to nontransient noncommunity water systems. The maximum contaminant or action level listed as follows for inorganic chemicals 13.-15. apply to transient noncommunity water systems:

Contaminant	Maximum Contaminant Level (MCL)
1. Antimony	0.006 mg/l
2. Arsenic	0.05 mg/l
3. Asbestos	7 million fibers/liter (longer than 10 μm in length)
4. Barium	2 mg/l
5. Beryllium	0.004 mg/l
6. Cadmium	0.005 mg/l
7. Chromium	0.1 mg/l
8. Copper	* (See 10 CSR 60-15.010(3)(A).)
9. Cyanide	0.2 mg/l
10. Fluoride	4.0 mg/l
11. Lead	* (See 10 CSR 60-15.010(3)(B).)
12. Mercury	0.002 mg/l
13. Nitrate	10 mg/l (as nitrogen)
14. Nitrite	1 mg/l (as nitrogen)
15. Total Nitrate and Nitrite	10 mg/l (as nitrogen)
16. Selenium	0.05 mg/l
17. Thallium	0.002 mg/l

*Indicates action levels rather than maximum contaminant levels.

(2) Monitoring Frequency.

(A) Asbestos. The frequency of monitoring to determine compliance with the maximum contaminant level (MCL) for asbestos specified in section (1) of this rule shall be conducted as follows:



1. Each community and nontransient noncommunity water system is required to monitor for asbestos during the first three (3)-year compliance period of each nine (9)-year compliance cycle;

2. If monitoring data collected after January 1, 1990, are generally consistent with the requirements of subsection (2)(A) of this rule, then the state may allow systems to use those data to satisfy the monitoring requirement for the initial three (3)-year compliance period;

3. Waivers.

A. The system may apply to the department for a use waiver as described in 10 CSR 60-6.060(2). If the department grants the waiver, the system is not required to monitor while the waiver is effective. A waiver remains in effect until the completion of the three (3)-year compliance period and must be renewed for subsequent compliance periods. Systems not receiving a waiver must monitor in accordance with the provisions of paragraph (2)(A)1. of this rule.

B. The department may grant a waiver based on the potential asbestos contamination of the water source and the use of asbestos-cement pipe for finished water distribution and the corrosive nature of the water;

4. Increased and decreased monitoring.

A. A system that is out of compliance with the MCL as determined in section (6) of this rule shall monitor quarterly beginning in the next quarter after the violation occurs.

B. The department may decrease the quarterly monitoring requirement to the frequency specified in paragraph (2)(A)1. of this rule provided the department has determined that the analytical results for the system are reliably and consistently less than the MCL. In no case can the department make this determination unless a groundwater system takes a minimum of two (2) quarterly samples and a surface (or combined surface/ground) water system takes a minimum of four (4) quarterly samples; and

5. Sample collection.

A. A system vulnerable to asbestos contamination due solely to corrosion of asbestos-cement pipe shall take at least one (1) sample at a tap served by asbestos-cement pipe and under conditions where asbestos contamination is most likely to occur.

B. A system vulnerable to asbestos contamination due solely to source water shall monitor in accordance with the provision of section (4) of this rule.

C. A system vulnerable to asbestos contamination due both to its source water supply and corrosion of asbestos-cement pipe shall take at least one (1) sample at a tap

served by asbestos-cement pipe and under conditions where asbestos contamination is most likely to occur.

(B) Inorganic Chemicals. Community and nontransient noncommunity water systems shall monitor for antimony, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium and thallium as set forth here.

1. Groundwater systems shall take one (1) sample at each sampling point during each three (3)-year compliance period beginning in the initial compliance period. Surface water systems (or combined surface/ground) shall take one (1) sample annually at each sampling point beginning in the initial compliance period.

2. Waivers.

A. The system may apply to the department for a susceptibility waiver as described in 10 CSR 60-6.060(3). If the department grants the waiver, the system is required to take a minimum of one (1) sample while the waiver is effective. The term during which the waiver is effective shall not exceed one (1) nine (9)-year compliance cycle. Systems not receiving a waiver must monitor in accordance with the provisions of paragraph (2)(B)1. of this rule.

B. The department may grant a waiver provided surface water systems have monitored annually for at least three (3) years and groundwater systems have conducted a minimum of three (3) rounds of monitoring. At least one (1) sample shall have been taken since January 1, 1990. Both surface and ground water systems shall demonstrate that all previous analytical results were reliably and consistently less than the MCL. Systems that use a new water source are not eligible for a waiver until three (3) rounds of monitoring from the new source have been completed.

C. In determining the appropriate reduced monitoring frequency, the department shall consider the reported concentrations from all previous monitoring, the degree of variation in reported concentrations and other factors which may affect contaminant concentrations (such as changes in groundwater pumping rates, changes in the system's configuration, changes in the system's operating procedures, or changes in stream flows or characteristics).

D. A decision by the department to grant a waiver shall be made in writing and shall set forth the basis for the determination. The determination may be initiated by the department or upon an application by the public water system. The public water system shall specify the basis for its request. The department shall review and, where appropri-

ate, revise its determination of the appropriate monitoring frequency when the system submits new monitoring data or when other data relevant to the system's appropriate monitoring frequency become available.

E. The department may grant a waiver for monitoring for cyanide, if the department determines that the system is not vulnerable due to lack of proximity to any industrial source of cyanide.

3. Increased and decreased monitoring.

A. Systems which exceed the MCLs as calculated in section (6) of this rule shall monitor quarterly beginning in the next quarter after the violation occurs.

B. The department may decrease the quarterly monitoring requirement to the frequencies specified in paragraph (2)(B)1. of this rule provided it has determined that the analytical results for the system are reliably and consistently below the MCL. In no case can the department make this determination unless a groundwater system takes a minimum of two (2) quarterly samples and a surface water system (or combined surface/ground) takes a minimum of four (4) quarterly samples.

(C) Nitrate. All public water systems (community; nontransient noncommunity; and transient noncommunity) shall monitor to determine compliance with the MCL for nitrate specified in section (1) of this rule. The frequency of monitoring shall be conducted as follows:

1. Groundwater systems.

A. All public water systems (community; nontransient noncommunity; and transient noncommunity) served by groundwater systems shall monitor annually beginning in the initial compliance period.

B. The repeat monitoring frequency for groundwater systems shall be quarterly for at least one (1) year following any one (1) sample in which the concentration is greater than or equal to fifty percent $\geq 50\%$ of the MCL.

C. The department may allow a groundwater system to reduce the sampling frequency to an annual basis after four (4) consecutive quarterly samples are reliably and consistently less than fifty percent ($\leq 50\%$) of the MCL.

D. After a round of quarterly sampling is completed, a system which is monitoring annually shall take subsequent samples during the quarter(s) which previously resulted in the highest analytical result; and

2. Surface water systems.

A. All public water systems (community; nontransient noncommunity; and transient noncommunity) served by a surface

water system shall monitor quarterly beginning in the initial compliance period.

B. The department may allow a surface water system to reduce the sampling frequency to annually if all analytical results from four (4) consecutive quarters are less than fifty percent (<50%) of the MCL.

C. A surface water system shall return to quarterly monitoring if any one (1) sample is greater than or equal to fifty percent (≥50%) of the MCL.

D. After a round of quarterly sampling is completed, a system which is monitoring annually shall take subsequent samples during the quarter(s) which previously resulted in the highest analytical result.

(D) Nitrite. All public water systems (community; nontransient noncommunity; and transient noncommunity) shall monitor to determine compliance with the MCL for nitrite specified in section (1) of this rule. The frequency of monitoring shall be conducted as follows:

1. All public water systems shall take one (1) sample at each sampling point in the initial three (3)-year compliance period;

2. After the initial sample, systems where an analytical result for nitrite is less than fifty percent (<50%) of the MCL shall monitor at the frequency specified by the department; and

3. Repeat monitoring.

A. The repeat monitoring frequency for any water system shall be quarterly for at least one (1) year following any one (1) sample in which the concentration is greater than or equal to fifty percent (≥50%) of the MCL.

B. The department may allow a system to reduce the sampling frequency to annually after determining the analytical results for the system are reliably and consistently less than the MCL.

C. Systems which are monitoring annually shall take each subsequent sample during the quarter(s) which previously resulted in the highest analytical result.

(E) Lead and Copper. All community and nontransient noncommunity water systems are required to monitor for lead and copper (see 10 CSR 60-15.070 for monitoring frequency, requirements and protocol for lead and copper).

(3) Monitoring Requirements.

(A) Each public water system shall monitor at the time designated by the department during each three (3)-year compliance period.

(B) Systems may apply to the department to conduct more frequent monitoring than the

minimum monitoring frequencies specified in this chapter.

(C) The department may require more frequent monitoring than specified in section (2) of this rule or may require confirmation samples for positive and negative results at its discretion.

(4) Monitoring Protocol. For the purpose of determining compliance with MCLs, samples must be collected for analyses as follows:

(A) All public water systems shall take a minimum of one (1) sample at every entry point to the distribution system after any application of treatment which is representative of each source after treatment (called a sampling point) beginning in the initial compliance period;

(B) The system shall take each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant; and

(C) If a system draws water from more than one (1) source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions (that is, when water is representative of all sources being used).

(5) Confirmation Samples.

(A) Where the results of sampling for antimony, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium or thallium indicate an exceedance of the MCL, the department may require that one (1) additional sample be collected as soon as possible after the initial sample was taken (but not to exceed two (2) weeks) at the same sampling point.

(B) Nitrate and Nitrite.

1. Where nitrate or nitrite sampling results indicate an exceedance of the MCL, the system shall take a confirmation sample within twenty-four (24) hours of the system's receipt of notification of the analytical results of the first sample.

2. Systems unable to comply with the twenty-four (24)-hour sampling requirement must immediately notify the consumers served by the area served by the public water system in accordance with 10 CSR 60-8.010(1)(A)3. Systems exercising this option must take and analyze a confirmation sample within two (2) weeks of notification of the analytical results of the first sample.

(C) If a department-required confirmation sample is taken for any contaminant, then the results of the initial and confirmation sample shall be averaged. The resulting average shall be used to determine the system's compliance in accordance with section (6) of this rule.

The department has the discretion to delete results of obvious sampling errors.

(6) Compliance. Compliance with section (1) of this rule shall be determined based on the analytical result(s) obtained at each sampling point.

(A) For systems which are conducting monitoring at a frequency greater than annual, compliance with the MCLs for antimony, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium or thallium is determined by a running annual average at each sampling point. If the average at any sampling point is greater than the MCL, then the system is out of compliance. If any one (1) sample would cause the annual average to be exceeded, then the system is out of compliance immediately. Any sample below the method detection limit shall be calculated at zero (0) for the purpose of determining the annual average.

(B) For systems which are monitoring annually, or less frequently, the system is out of compliance with the MCLs for antimony, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium or thallium if the level of a contaminant at any sampling point is greater than the MCL. If a confirmation sample is required by the department, the determination of compliance will be based on the average of the two (2) samples.

(C) Compliance with the MCLs for nitrate and nitrite is determined based on one (1) sample if the levels of these contaminants is below the MCLs. If the levels exceed the MCLs in the initial sample, a confirmation sample is required in accordance with subsection (5)(B) of this rule and compliance shall be determined based on the average of the initial and confirmation samples.

(D) All community and nontransient noncommunity water systems are required to monitor for lead and copper (see 10 CSR 60-15.070 for compliance requirements if lead and copper action levels are exceeded).

(7) Public Notice. If the result of analyses indicates that the level of antimony, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium or thallium exceeds the MCL, the supplier of water must report to the department within seven (7) days.

(A) When the system is out of compliance for antimony, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium or thallium, as determined by section (6) of this rule, the supplier of water must notify the department as required by 10



CSR 60-7.010 and give public notice as required by 10 CSR 60-8.010.

(B) When the system is out of compliance for nitrate, nitrite or total nitrate and nitrite, as determined by section (6) of this rule, the supplier of water must notify the department as required by 10 CSR 60-7.010 and give public notice as required by 10 CSR 60-8.010.

(C) When the system is out of compliance for lead or copper as determined by 10 CSR 60-15.070, 10 CSR 60-15.080 and 10 CSR 60-15.090, the supplier of water must notify the department as required by 10 CSR 60-7.020 and give public notice as required by 10 CSR 60-8.010.

*AUTHORITY: section 640.100, RSMo (1994). * Original rule filed May 4, 1979, effective Sept. 14, 1979. Amended: Filed April 14, 1981, effective Oct. 11, 1981. Amended: Filed Aug. 4, 1987, effective Jan. 1, 1988. Rescinded and readopted: Filed March 31, 1992, effective Dec. 3, 1992. Amended: Filed Aug. 4, 1992, effective May 6, 1993. Amended: Filed May 4, 1993, effective Jan. 13, 1994. Amended: Filed Feb. 1, 1996, effective Oct. 30, 1996.*

**Original authority 1939, amended 1978, 1981, 1982, 1988, 1989, 1992, 1993, 1995.*

10 CSR 60-4.040 Maximum Synthetic Organic Chemical Contaminant Levels and Monitoring Requirements

PURPOSE: This rule establishes maximum contaminant levels and monitoring requirements for synthetic organic chemical contaminants.

(1) The following are the maximum contaminant levels (MCLs) for synthetic organic chemical contaminants.

Contaminant	Maximum Contaminant Level, Milligrams Per Liter
1. Alachlor	0.002
2. Atrazine	0.003
3. Benzo(a)pyrene	0.0002
4. Carbofuran	0.04
5. Chlordane	0.002
6. Dalapon	0.2
7. Di(2-ethylhexyl) adipate	0.4
8. Dibromochloropropane (DBCP)	0.0002
9. Di(2-ethylhexyl) phthlate	0.006

Contaminant	Maximum Contaminant Level, Milligrams Per Liter
10. Dinoseb	0.007
11. Diquat	0.02
12. Endothall	0.1
13. Endrin	0.002
14. 2,4-D	0.07
15. Ethylene dibromide (EDB)	0.00005
16. Glyphosate	0.7
17. Heptachlor	0.0004
18. Heptachlor epoxide	0.0002
19. Hexachlorobenzene	0.001
20. Hexachlorocyclopentadiene	0.05
21. Lindane	0.0002
22. Methoxychlor	0.04
23. Oxamyl (Vydate)	0.2
24. Picloram	0.5
25. Polychlorinated biphenyls (PCBs)	0.0005 (as determined by Method 508A only)
26. Pentachlorophenol	0.001
27. Simazine	0.004
28. Toxaphene	.003
29. 2,3,7,8-TCDD (Dioxin)	0.00000003
30. 2,4,5-TP (Silvex)	0.05

(2) For the purpose of determining compliance with MCLs, a supplier of water must collect samples of the product water for analysis as follows:

(A) During the initial three (3)-year compliance period, all community and nontransient noncommunity water systems must collect an initial round of four (4) consecutive quarterly samples unless a waiver has been granted by the department. The department will designate the year in which each system samples within this compliance period;

(B) All public water systems shall sample at points in the distribution system representative of each water source or at each entry point to the distribution system. The sampling point will be after the application of treatment, if any. Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant;

(C) If the system draws water from more than one (1) source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions; and

(D) The department may require more frequent monitoring than specified in this section of the rule and may require confirmation

samples for positive or negative results, at its discretion.

(3) If contaminants are not detected during the initial sampling as indicated in section (2) of this rule, systems may decrease their sampling frequency beginning in the next three (3)-year compliance period.

(A) Systems that serve greater than three thousand three hundred (>3,300) persons may reduce their sampling frequencies to two (2) quarterly samples at each sampling point in one (1) year in each compliance period.

(B) Systems that serve less than or equal to three thousand three hundred (≤3,300) persons may reduce their sampling frequencies to one (1) sample in each compliance period.

(4) The department may allow sampling data collected between January 1, 1990 and December 31, 1995, to satisfy the initial base sampling requirements, if the sampling was completed as required by subsections (2)(B) and (C) of this rule.

(5) If contaminants are detected in any sample, then systems must sample quarterly beginning in the next quarter at each sampling point which resulted in a detection.

(A) Groundwater systems must sample a minimum of two (2) quarters and surface water must sample a minimum of four (4) quarters to establish a baseline.

(B) If the MCL is exceeded as described in subsection (5)(E) or (F) of this rule, then systems must sample quarterly beginning in the next quarter. Systems must sample a minimum of four (4) quarters to establish a baseline.

(C) If the baseline indicates a system's analytical results are reliably and consistently below the MCL, the department may reduce the system's sampling frequency to annually. (Annual sampling must be conducted during the quarter which previously yielded the highest analytical result.)

(D) Systems which have three (3) consecutive annual samples with no detection of a contaminant may apply to the department for a waiver.

(E) If a system conducts sampling more frequently than annually, the system will be in violation when the running annual average at any sampling point exceeds the MCL.

(F) If a system conducts sampling annually or on a less frequent basis, the system will be in violation when one (1) sample (or the average of the initial and confirmation samples) at any point exceeds the MCL.

(G) If monitoring results in detection of one (1) or more of certain related contaminants (aldicarb, aldicarb sulfone, aldicarb



sulfoxide and heptachlor, heptachlor epoxide), then subsequent monitoring shall analyze for all related contaminants.

(6) A public water system may apply to the department for a waiver from required sampling. Systems are eligible for reduced monitoring in the initial three (3)-year compliance period. The waiver is effective for one (1) compliance period. It must be renewed in subsequent compliance periods or the system must conduct sampling as required by subsection (2)(A) of this rule.

(A) A public water system may apply to the department for a use waiver for reduced monitoring from required sampling if previous use of the chemical can be ruled out as required by 10 CSR 60-6.060(2).

(B) A public water system may apply to the department for a susceptibility waiver for reduced monitoring contingent on the conduct of a thorough vulnerability assessment as required by 10 CSR 60-6.060(3).

(7) As determined by the department, a confirmation sample may be required for either positive or negative results. If a confirmation sample is used, the compliance determination is based on the average of the results of both the confirmation sample and the initial sample. The department has the discretion to delete results of obvious sampling errors from this calculation.

(8) Any public water system violating MCLs or monitoring and reporting requirements for any of the contaminants listed in section (1) of this rule must notify the department within seven (7) days and give public notice as required by 10 CSR 60-8.010.

(9) Treatment Techniques.

(A) All public water systems shall use treatment techniques in lieu of MCLs for specified contaminants.

(B) Each public water system must certify annually in writing to the department (using third-party or manufacturers' certification) that when acrylamide and epichlorohydrin are used in drinking water systems, the combination (or product) of dose and monomer level does not exceed the levels specified as follows:

Acrylamide = 0.05% dosed at 1 part per million (ppm) (or equivalent)
Epichlorohydrin = 0.01% dosed at 20 ppm (or equivalent)

Certifications can rely on manufacturers or third parties, as approved by the department.

*AUTHORITY: section 640.100, RSMo (1994). * Original rule filed May 4,*

1979, effective Sept. 14, 1979. Amended: Filed April 14, 1981, effective Oct. 11, 1981. Rescinded and readopted: Filed March 31, 1992, effective Dec. 3, 1992. Amended: Filed May 4, 1993, effective Jan. 13, 1994. Amended: Filed Feb. 1, 1996, effective Oct. 30, 1996.

**Original authority 1939, amended 1978, 1981, 1982, 1988, 1989, 1992, 1993, 1995.*

10 CSR 60-4.050 Maximum Turbidity Contaminant Levels and Monitoring Requirements

PURPOSE: This rule establishes maximum contaminant levels and monitoring requirements for turbidity.

(1) The maximum contaminant levels (MCLs) for turbidity, applicable to all public water systems which use surface or ground water under the direct influence of surface water are as follows:

(A) Equal to or less than 0.5 turbidity units in at least ninety-five percent (95%) of the measurements taken each month; and

(B) Five (5) turbidity units in any one (1) confirmed measurement.

(2) The frequency of sampling shall be as set forth in 10 CSR 60-4.080(3).

(3) If the result of a single turbidity measurement exceeds the MCL established in subsection (1)(A), the measurement must be confirmed by resampling, preferably within one (1) hour. The resample result must replace the original sample result for determining compliance with section (1) of this rule.

(4) If any confirmed sample result exceeds five (5) turbidity units, the supplier of water must notify the department by the end of the next business day and give notice as required by 10 CSR 60-8.010.

(5) The department, on a case-by-case basis, may allow a system to operate at an MCL for turbidity of 1.0 turbidity units in at least ninety-five percent (95%) of the measurements taken each month if the following criteria are met: the total percent removal and inactivation of *Giardia lamblia* is ninety-nine and nine-tenths percent (99.9%), required treatment is provided, the treatment facilities are properly operated, none of the treatment units are malfunctioning due to mechanical failure or incorrect construction, the system is in compliance with all of the disinfection requirements of 10 CSR 60-4.055, the treatment facilities are providing ninety-nine per-

cent (99%) *Giardia* cyst removal and the system cannot meet the turbidity MCL of 0.5 turbidity units due to raw water quality, iron, manganese or similar compelling factors. The request to operate at the higher turbidity MCL must be made in writing and be accompanied by an engineering report which includes the results of full scale particle or *Giardia* cyst removal studies, operational test data, water analyses results, a report of the sanitary survey of the treatment facilities and any other information that the department may require to assure that the criteria of this rule are met. Approval of the engineering report is the approval to operate at the higher turbidity MCL.

*AUTHORITY: section 640.100, RSMo (1994). * Original rule filed May 4, 1979, effective Sept. 14, 1979. Amended: Filed April 14, 1981, effective Oct. 11, 1981. Amended: Filed July 12, 1991, effective Feb. 6, 1992. Amended: Filed Feb. 1, 1996, effective Oct. 30, 1996.*

**Original authority 1939, amended 1978, 1981, 1982, 1988, 1989, 1992, 1993, 1995.*

10 CSR 60-4.055 Disinfection Requirements

PURPOSE: This rule establishes minimum disinfectant levels and treatment requirements to assure the inactivation and removal of pathogenic organisms.

Editor's Note: The following material is incorporated into this rule by reference:

1) Guidance Manual for Surface Water System Treatment Requirements (Jefferson City: Missouri Department of Natural Resources, 1992).

In accordance with section 536.013(4), RSMo, the full text of material incorporated by reference will be made available to any interested person at the Office of the Secretary of State and the headquarters of the adopting state agency.

(1) The requirements of this rule apply to primary community and noncommunity public water systems that the department has required to disinfect and to secondary systems with a source of water from a primary water system that the department has required to disinfect, even if the water is obtained through another secondary system.

(A) Water systems using water obtained in whole or in part from a source determined by the department to be surface or ground water under the direct influence of surface water



must install or construct facilities to provide conventional filtration treatment as a required treatment technique within eighteen (18) months of the determination.

(B) Any water system that the department determines to be a groundwater system under the direct influence of surface water may appeal the decision by notifying the department in writing. The appeal must be accompanied by a report prepared by an engineer that confirms that the water system's groundwater source is not directly influenced by surface water. The report must be supported by analytical data prepared by a laboratory that is acceptable to the department. Source sampling must be accomplished during the period the source is most susceptible to surface water influence. The department's approval of the report will result in the water system's source being redefined as groundwater not under the direct influence of surface water.

(C) If at any time in the department's opinion, the quality of a water source appears to have changed to be under the direct influence of surface water, the water system must submit, at the department's written request, an engineer-prepared report that describes the current condition of the water source. If a report is not submitted, the source will be reclassified as groundwater supply under the direct influence of surface water.

(D) The department reserves the authority to make the final determination of whether or not a source is defined as groundwater under the direct influence of surface water.

(E) Primary systems which use water obtained from groundwater not under the direct influence of surface water and which the department requires to disinfect and secondary public water systems do not have to meet the requirements of section (2) of this rule but may be required to provide disinfection detention as deemed necessary by the department. These systems also do not have to submit reports to the department as required by 10 CSR 60-7.010(5) but must maintain the information on file at the system treatment plant or office.

(2) Contact Time and Removal Credit.

(A) Any water system providing required treatment, and existing water systems practicing conventional filtration treatment on February 6, 1992, will be credited with 99.68 percent (2.5 log) *Giardia lamblia* cyst removal and 99.0 percent (2.0 log) virus removal, excluding the disinfection process, provided that they meet the turbidity maximum contaminant levels in 10 CSR 60-4.050. A system may request additional credit for treatment process removal or inactivation of *Giardia lamblia* cysts and viruses by submit-

ting a report prepared by an engineer to the department including studies of *Giardia* cyst and virus removal or inactivation. The department reserves the authority to make the final determination of removal credit.

(B) The residual disinfectant concentration (C) disinfectant contact time (T) values in the *Missouri Guidance Manual for Surface Water System Treatment Requirements, 1992*, must be used for determining the percentage of *Giardia lamblia* cyst and virus removal or inactivation by disinfection.

(C) The percentage of removal and inactivation of *Giardia lamblia* cysts and viruses will be determined as the sum of the percent removals and inactivations of the individual treatment and disinfection processes. The percent removal and inactivation of *Giardia lamblia* cysts must be at least 99.9 percent (3.0 log) and of viruses must be 99.99 percent (4.0 log).

(D) Disinfectant contact time must be determined for each system by evaluations performed as specified in the *Missouri Guidance Manual For Surface Water System Treatment Requirements, 1992*. Results of the evaluations, including the determined disinfectant contact times, must be submitted to the department for review. The evaluation must be submitted within one (1) year of the date that the system is covered by the requirements of this rule.

(3) For any water system adding a disinfectant, only free available chlorine or chloramines will be accepted as the disinfectant entering the distribution system. The residual disinfectant concentration in the water entering the distribution system cannot be less than 0.5 milligrams per liter (mg/l) free available chlorine or 1.0 mg/l chloramines for more than four (4) hours.

(A) Systems using chloramines as the disinfectant residual entering the distribution system must add and mix the chlorine prior to the addition of ammonia.

(B) At the department's discretion, any system may be required to provide breakpoint chlorination or to provide operational test data and other information that the department may require to demonstrate that the system daily meets all of the requirements of section (2) of this rule and all of the other requirements of this section.

(C) At least one (1) application point for chlorine or chloramines must be prior to filtration with a residual maintained through the filters.

(D) Failure to maintain the minimum residual disinfectant concentration as required in this rule is a violation of a treatment technique which requires public notification as

specified in 10 CSR 60-8.010(1) and (7)(B)2.

(E) If at any time the disinfectant residual entering the distribution system falls below the levels established in this section, the system must notify the department as soon as possible but no later than by the end of the next business day. The system must notify the department by the end of the next business day whether or not the disinfectant residual was restored to the levels established in this section within four (4) hours.

(F) The frequency of sampling shall be as set forth in 10 CSR 60-4.080(3).

(4) The residual disinfectant concentration in the distribution system measured as total chlorine or combined chlorine cannot be less than 0.2 mg/l in more than five percent (5%) of the samples each month for any two (2) consecutive months that the system supplies water to the public.

(A) Heterotrophic plate count may be used in lieu of or as a supplement to residual disinfectant concentration analysis.

(B) Water in the distribution system with a heterotrophic bacteria concentration less than or equal to five hundred (500) colonies per milliliter is deemed to have 0.2 mg/l residual disinfectant concentration for the purpose of determining compliance with this rule.

(C) Water in the distribution system with a heterotrophic bacteria concentration of greater than five hundred (>500) colonies per milliliter is deemed to have less than 0.2 mg/l residual disinfectant concentration for the purpose of compliance with this rule.

(D) Failure to maintain the minimum residual disinfectant concentration required in this rule is a violation of a treatment technique which requires public notification as specified in 10 CSR 60-8.010(1) and(7)(B)2.

(E) The residual disinfectant concentration must be measured at least at the same points in the distribution system and at the same time as total coliforms are sampled as specified in 10 CSR 60-4.020. Failure to comply with this subsection is a monitoring violation which requires public notification as specified in 10 CSR 60-8.010(2).

*AUTHORITY: section 640.100, RSMo (1994). * Original rule filed July 12, 1991, effective Feb. 6, 1992. Amended: Filed Feb. 1, 1996, effective Oct. 30, 1996.*

**Original authority 1939, amended 1978, 1981, 1982, 1988, 1989, 1992, 1993, 1995.*

10 CSR 60-4.060 Maximum Radionuclide Contaminant Levels and Monitoring Requirements

PURPOSE: This rule establishes maximum contaminant levels, and sampling and monitoring requirements for radionuclides.

Editor's Note: The secretary of state has determined that the publication of this rule in its entirety would be unduly cumbersome or expensive. The entire text of the material referenced has been filed with the secretary of state. This material may be found at the Office of the Secretary of State or at the headquarters of the agency and is available to any interested person at a cost established by state law.

(1) For radium-226, radium-228 and gross alpha particle radioactivity, the maximum contaminant level (MCL) shall be—

(A) Combining radium-226 and radium-228, five picocurie (5 pCi) per liter. A gross alpha particle activity measurement may be substituted for the required radium-226 and radium-228 analysis, but only if the measured gross alpha particle activity does not exceed five (5) pCi per liter at a confidence level of ninety-five percent (95%) (1.65 r where r is the standard deviation of the net counting rate of the sample). In localities where radium-228 may be present in drinking water, radium-226 or radium-228 analyses, or both, will be required when the gross alpha particle activity exceeds two (2) pCi per liter;

(B) Measuring gross alpha particle activity, including radium-226 but excluding radon and uranium, fifteen (15) pCi per liter. When the gross alpha particle activity exceeds five (5) pCi per liter, the same or an equivalent sample must be analyzed for radium-226. If the concentration of radium-226 exceeds three (3) pCi per liter, the same or an equivalent sample shall be analyzed for radium-228;

(C) Taking samples from representative entry point(s) to the distribution system. In addition, when so ordered by the department, a community water system using two (2) or more sources must monitor each source of water; and

(D) Basing each MCL on either an analysis of a composite of samples taken in four (4) consecutive quarters, or the average of the analyses of four (4) samples obtained at quarterly intervals.

(2) Community water systems must conduct analyses at least once every four (4) years.

(A) When the initial analysis taken in conformance with this section has established

that the average annual concentration is less than half the MCL established by this section, analysis of a single sample may be substituted for the quarterly sampling procedure.

(B) More frequent monitoring than once every four (4) years must be conducted when ordered by the department in the event of possible contamination or when changes in the source, distribution system or treatment processing occur which may increase the concentration of alpha particle radioactivity in the finished water.

(C) A water system must conduct an analysis pursuant to this section within one (1) year of the introduction of a new water source.

(D) If the average annual concentration of radium-228 has been assayed at least once using the quarterly sampling procedure, repeat monitoring after the initial analysis need not include radium-228, except when otherwise ordered by the department. When so ordered by the department, suppliers of water must conduct annual monitoring of any community water system in which the radium-226 concentration exceeds three (3) pCi per liter.

(E) Where a supplier of water utilizing groundwater completes an initial analysis for alpha particle activity and the results show compliance with the MCLs and wells used as a supply source conform to the minimum sanitary features of construction prescribed by the department, the supplier of water may conduct analysis at a frequency determined by the department.

(F) If the MCL for gross alpha particle activity or total radium is exceeded, a supplier of water to a community water system must give notice to the department and must notify the public as required by 10 CSR 60-8.010. Monitoring at quarterly intervals must be continued until the annual average concentration no longer exceeds the MCL or until a monitoring schedule as a condition to a variance, exemption or enforcement action has become effective.

(3) For beta particle and photon radioactivity from man-made radionuclides—

(A) The MCL must be the average annual concentration of beta particle and photon radioactivity from man-made radionuclides which produces an annual dose equivalent to the total body or any internal organ greater than four millirem (4 mrem) per year;

1. The concentration of tritium causing a four (4) mrem per year dose equivalent in the total body must be calculated on the basis of twenty thousand (20,000) pCi per liter. The concentration of strontium-90 causing a four (4) mrem per year dose equivalent in the

bone marrow must be calculated on the basis of eight (8) pCi per liter.

2. The concentration of all other man-made radionuclides causing a four (4) mrem per year total body or organ dose equivalent must be calculated on the basis of a two (2) liter per day drinking water intake using the one hundred sixty-eight (168)-hour data listed in *Maximum Permissible Body Burdens and Maximum Permissible Concentration of Radionuclides in Air or Water for Occupational Exposure, NBS Handbook 69*, August 1963, United States Department of Commerce. If two (2) or more radionuclides are present, the sum of their annual dose equivalent to the total body or to any organ must not exceed four (4) mrem per year;

(B) If the gross beta particle activity exceeds fifty (50) pCi per liter, an analysis of the sample must be performed to identify the major radioactive constituents present and the appropriate organ and total body doses must be calculated to determine compliance with this rule;

(C) These sampling and analysis requirements must apply to all community water systems designated by the department;

(D) Each analysis must be based on either an analysis of a composite of four (4) consecutive quarterly samples or analysis of four (4) quarterly samples. All samples must be taken from a representative entry point(s) to the distribution system of the community water system, as approved by the department;

(E) Community water systems serving one hundred thousand (100,000) or more individuals must conduct repeat analyses at least once every four (4) years starting June 24, 1981. Compliance with this rule may be assumed without repeat analysis if the average annual concentration of gross beta particle activity is less than fifty (50) pCi per liter and if the average annual concentrations of tritium and strontium-90 are less than those prescribed in section (2) of this rule, provided that if both tritium and strontium-90 are present, the sum of their annual dose equivalents to bone marrow does not exceed four (4) mrem per year;

(F) A community water system designated by the department as utilizing water that is contaminated or has the potential to be contaminated by radioactivity may be required to initiate monitoring for gross beta particle and iodine-131 radioactivity, strontium-90 and tritium.

1. As a minimum quarterly monitoring for gross beta particle activity must be based on the analysis of monthly samples or, with the express written permission of the department, a composite of three (3) monthly samples. If the gross beta particle activity in

a sample exceeds fifteen (15) pCi per liter, the same or an equivalent sample must be analyzed for strontium-89 and cesium-134. If the gross beta particle activity exceeds fifty (50) Ci per liter, an analysis of the sample must be performed to identify the major radioactive constituents present and the appropriate organ and total body doses must be calculated to determine compliance.

2. Monitoring for iodine-131 must be conducted by analysis of a composite of samples taken on five (5) consecutive days, which shall be analyzed at least once each quarter. As ordered by the department, more frequent monitoring must be conducted when iodine-131 is identified in the finished water.

3. At least annual monitoring for strontium-90 and for tritium must be conducted by analysis of four (4) samples obtained at quarterly intervals, or with the express written permission of the department, a composite of samples collected in four (4) consecutive quarters; and

(G) If the results of an analysis indicate that the level of any contaminant exceeds the MCL, a supplier of water to a community water system must report to the department and give notice as required by 10 CSR 60-8.010. Monitoring at monthly intervals must be continued until the concentration does not exceed the MCL or until a monitoring schedule as a condition to a variance, exemption or enforcement action shall become effective.

(4) Noncommunity systems must monitor for radionuclides as directed by the department.

AUTHORITY: section 640.100, RSMo (Cum. Supp. 1993). Original rule filed May 4, 1979, effective Sept. 14, 1979. Amended: Filed April 14, 1981, effective Oct. 11, 1981.*

**Original authority 1939, amended 1978, 1981, 1982, 1988, 1989, 1992, 1993.*

10 CSR 60-4.070 Secondary Contaminant Levels and Monitoring Requirements

PURPOSE: This rule establishes maximum contaminant levels and monitoring requirements for secondary contaminants.

(1) The following are the recommended secondary maximum contaminant levels for community and nontransient noncommunity water systems:

Contaminant	Level
Aluminum	0.05—0.2 mg/l
Chloride	250 mg/l

Contaminant	Level
Color	15 color units
Copper	1.0 mg/l
Corrosivity	Noncorrosive
Fluoride	2.0 mg/l
Foaming agents	0.5 mg/l
Iron	0.3 mg/l
Manganese	0.05 mg/l
Odor	3 Threshold Odor number
pH	6.5—8.5
Silver	0.1 mg/l
Sulfate	250 mg/l
Total dissolved solids (TDS)	500 mg/l
Zinc	5 mg/l

(2) Groundwater systems shall take one (1) sample at each sampling point during each three (3)-year compliance period beginning in the compliance period starting January 1, 1993. Surface water systems (or combined surface/ground) shall take one (1) sample annually at each sampling point beginning January 1, 1993. Color, foaming agents and odor should be analyzed at the water system site, as needed.

(3) For community water systems, if the result of analyses indicates that the secondary contaminant level for fluoride is exceeded, the supplier of water must report to the department within seven (7) days and must collect three (3) additional samples from designated sampling points to be submitted for analysis within one (1) month at intervals determined by the department. When the average of the results of four (4) analyses as required by this section exceeds the secondary contaminant level, the supplier of water must notify the department as required by 10 CSR 60-7.010 and give notice as required by 10 CSR 60-8.010(4).

AUTHORITY: section 640.100, RSMo (Cum. Supp. 1993). Original rule filed May 4, 1979, effective Sept. 14, 1979. Amended: Filed April 14, 1981, effective Oct. 11, 1981. Amended: Filed Aug. 4, 1987, effective Jan. 1, 1988. Rescinded and readopted: Filed March 31, 1992, effective Dec. 3, 1992.*

**Original authority 1939, amended 1978, 1981, 1982, 1988, 1989, 1992, 1993.*

10 CSR 60-4.080 Operational Monitoring

PURPOSE: This rule establishes criteria for operation and operational monitoring.

Editor's Note: The following material is incorporated into this rule by reference:

1) *Methods for Chemical Analysis of Water and Wastes, Revised March 1983 (Springfield VA: U.S. Department of Commerce, 1983);*

2) *Standard Methods for the Examination of Water and Wastewater, 18th Edition (Baltimore, MD, Victor Graphics, Inc., 1992).*

In accordance with section 536.013(4), RSMo, the full text of material incorporated by reference will be made available to any interested person at the Office of the Secretary of State and the headquarters of the adopting state agency.

(1) Public water systems utilizing any treatment process must perform sufficient analyses to maintain control of the treatment process, using methods as required by 10 CSR 60-5.010 and as acceptable to the department.

(2) Automatic instrumentation may be used if properly installed, maintained and periodically calibrated against known standards prepared in accordance with *Standard Methods for the Examination of Water and Wastewater 1992*, American Public Health Association, 18th edition, New York, NY or *Methods for Chemical Analysis of Water and Wastes*, Environmental Monitoring Support Laboratory, USEPA, Cincinnati, OH 45268, EPA-600/4-79-020.

(3) Sufficient analyses must be done to assure control of water quality, the following requirements notwithstanding. Continuous monitoring and recording may be used for any operational analysis instead of grab sampling provided that the requirements of section (2) are met. For those analyses where continuous monitoring is required, if there is a failure in the continuous monitoring equipment, grab sampling every two (2) hours of operation may be conducted in lieu of continuous monitoring but for no more than five (5) working days following the failure of the equipment. Applicable analyses and testing frequencies are as follows:



Operational Testing

Test	Frequency	Sample Location	Disinfection	Sequestration	Iron Removal	Zeolite Softening	Clarification	Lime Softening	Fluoride Adjustment
Alkalinity (phenolphthalein and total)	As necessary for control	Raw water					X	X	
	As necessary for control	Entry point to distribution					X	X	
Disinfectant Residual	Continuous ¹	Entry point to distribution			X ⁵		X	X ⁵	
	Daily	Entry point to distribution	X ^{6,7}	X ⁶		X ⁶			
	At time of bacti sampling	Sampling Points	X ^{6,7}	X ⁶	X	X ⁶	X	X	
	Start-up and every 2 hours of operation	Filter influent and effluent					X	X	
	Start-up and every 2 hours of operation	Entry point to distribution			X ⁵		X	X	
	Start-up and every 4 hours of operation	Entry point to distribution			X ⁶				
Fluoride (if fluoride compounds are added)	Daily	Entry point(s) to distribution							X
	Monthly	Representative point in distribution							X
Hardness	Daily	Entry point to distribution				X	X	X	
Iron	Start-up and every 4 hours of operation	Filter influent and effluent			X	X ²	X ²	X ²	
pH	As necessary for control	Entry point to distribution			X		X	X	
	As necessary for control	Raw Water					X		
	Start-up and every 4 hours of operation	Filter effluent			X				
	As necessary for control	Primary & secondary basins						X	



Test	Frequency	Sample Location	Disinfection	Sequestration	Iron Removal	Zeolite Softening	Clarification	Lime Softening	Fluoride Adjustment
Phosphate	As necessary for control	Downstream from point of application		X	X ³	X ³	X ³	X ³	
Sludge concentration ⁴	As necessary for control	Center cone and sludge blowoff and sample taps					X	X	
Temperature ⁵	As necessary for control	Entry point to distribution	X		X		X	X	
Turbidity ⁵	Every 4 hours of plant operation	Entry point to distribution and filter influent			X ⁵		X	X ⁵	

X—Indicates test(s) needed

1—If system serves greater than 3300 population

2—If raw water contains > 0.3 mg/l iron

3—If phosphate compounds are added to the water

4—For facilities utilizing solids contact basins

5—Surface and ground water under the direct influence of surface water

6—Groundwater system not under the direct influence of surface water required to provide disinfection

7—Secondary system required to supplement disinfection or re-disinfect



(4) The department, at its discretion, may conduct routine inspections of any public water system or make other necessary inspections to determine compliance with these rules.

(5) If, after investigation, the department finds that any public water system is incompetently supervised, improperly operated, inadequate, of defective design or if the water fails to meet standards established in these rules, the water supplier must implement changes that may be required by the department.

(6) Every supplier of water to a public water system must disinfect all newly constructed or repaired water distribution mains, finished water storage facilities or wells by methods acceptable to the department before being placed in or returned to service.

(7) All finished water reservoirs must be covered by a permanent, protective material, adequately vented with properly screened openings.

(8) Chemicals, materials and protective coatings used in public water systems must be acceptable to the department.

(9) Public water systems must maintain a minimum positive pressure of twenty pounds per square inch (20 psi) throughout the distribution system under all normal operating conditions.

(10) Within thirty (30) days, public water systems must inform the department of a change of the person in charge of the water system.

(11) A supplier of water that adds fluoride to the water system must submit two (2) samples per month for analyses to the Department of Health Laboratory or another approved laboratory.

*AUTHORITY: section 640.100, RSMo (1994). * Original rule filed May 4, 1979, effective Sept. 14, 1979. Amended: Filed April 14, 1981, effective Oct. 11, 1981. Amended: Filed July 12, 1991, effective Feb. 6, 1992. Amended: Filed Feb. 1, 1996, effective Oct. 30, 1996.*

**Original authority 1939, amended 1978, 1981, 1982, 1988, 1989, 1992, 1993, 1995.*

10 CSR 60-4.090 Maximum Trihalomethane Contaminant Level and Monitoring Requirements

PURPOSE: This rule establishes the maximum contaminant level and

monitoring requirements for total trihalomethanes.

(1) The maximum contaminant level (MCL) for total trihalomethanes (TTHM) is:

Contaminant	Level, Milligrams Per Liter
Total Trihalomethanes	0.10

(2) The MCL for TTHM applies to community water systems which add a disinfectant to the water in any part of the drinking water treatment process and serve ten thousand (10,000) or more persons. Compliance with the MCL is calculated pursuant to section (3).

(3) A supplier of water must collect samples of his/her product water for analyses as follows:

(A) Community water systems must perform sampling at quarterly intervals.

1. Analyses for TTHM shall be performed at quarterly intervals on at least four (4) water samples for each treatment plant used by the system.

2. The minimum number of samples required shall be based on the number of treatment plants used by the system except that multiple wells drawing raw water from a single aquifer, with the department's approval, may be considered one (1) treatment plant for determining the minimum number of samples.

3. Community water systems serving fewer than ten thousand (10,000) persons, at the discretion of the department, may be required to submit fewer samples; and

(B) All samples taken within an established frequency shall be collected within a twenty-four (24)-hour period.

(4) At least twenty-five percent (25%) of the samples shall be taken at locations within the distribution system reflecting the maximum residence time of the water in the system. The remaining shall be taken at representative locations in the distribution system, taking into account the number of persons served, different sources of water and different treatment methods employed.

(5) The results of all analyses per quarter shall be arithmetically averaged and all samples collected shall be used in the computation of the average.

(6) Upon a community water system's written request, the department may reduce the

TTHM analysis monitoring frequency to a minimum of one (1) sample per quarter.

(A) The sample shall be taken at a point in the distribution system that reflects the maximum residence time of the water in the system.

(B) The department shall provide, in writing, a determination that local conditions and data from at least one (1) year of monitoring in accordance with section (3) of this rule demonstrate that TTHM concentrations will be consistently below the MCL.

(C) The supplier of water immediately shall begin monitoring in accordance with the requirements of section (3) of this rule upon finding that—

1. At any time during the reduced monitoring, the results from any analysis for TTHM exceed 0.10 milligrams per liter (mg/l) and the results are confirmed by at least one (1) check sample taken promptly after the results are received; or

2. The system makes any significant change(s) to its source of water or treatment process; and

3. This monitoring shall continue at least one (1) year before the frequency may be reduced again.

(7) Upon the written request of a community water system that utilizes only groundwater sources, the department may allow the water system to substitute a minimum of one (1) sample per year for maximum TTHM potential in place of quarterly sampling for TTHM.

(A) This monitoring frequency applies separately to each treatment plant used in the system.

(B) The sample shall be taken at a point in the distribution system that reflects the maximum residence time of the water in the system.

(C) The department shall provide, in writing, a determination that—

1. The system has a maximum TTHM potential of less than 0.10 mg/l based upon data submitted by the water supplier; and

2. Based upon an assessment of local conditions, the system is not likely to approach or exceed the MCL for TTHM.

(D) A water supplier immediately shall begin monitoring in accordance with the requirements of section (3) of this rule upon finding that—

1. The results from any analysis taken by the water supplier for maximum TTHM potential are equal to or greater than 0.10 mg/l; and

2. The results are confirmed by at least one (1) check sample which was taken promptly after the results were received; and



3. This monitoring shall continue for at least one (1) year before the frequency may be reduced again.

(E) If the system makes any significant change(s) in the raw water or treatment program at any time during the period of reduced monitoring frequency, the water supplier immediately shall collect an additional sample to be analyzed for maximum TTHM potential. The sample shall be taken at a point in the distribution system that reflects the maximum residence time of the water in the system. The results of the analysis shall be used to determine whether the system must comply with the monitoring requirements of section (3) of this rule.

(8) Compliance with section (1) of this rule shall be determined based on a running annual average of quarterly samples collected by the supplier of water as prescribed in section (3). If the average of samples covering any twelve (12)-month period exceeds the MCL, the supplier of water shall report to the department pursuant to 10 CSR 60-7.010 and notify the public pursuant to 10 CSR 60-8.010. Monitoring after public notification shall be at a frequency designated by the department and shall continue until a monitoring schedule as a condition to a variance, exemption or enforcement action shall become effective.

(9) Samples for TTHM shall be dechlorinated upon collection to prevent further production of trihalomethanes. Samples for maximum TTHM potential shall not be dechlorinated and must be held for seven (7) days at twenty-five degrees Celsius (25°C) prior to analysis.

(10) At the option of the department, monitoring frequencies may be increased above the minimum where this is necessary to detect variations of TTHM levels within the distribution system.

(11) Before a community water system makes any significant modifications to its existing treatment process for the purposes of achieving compliance with this rule, the system must obtain departmental approval of its proposed modifications and those safeguards that it will implement to ensure that the microbiological quality of the drinking water served by the system will not be adversely affected by the modifications. At a minimum, the department shall require the system modifying its disinfection practice to—

(A) Evaluate the source water for microbiological quality;

(B) Evaluate its existing treatment practices and consider improvements that will

minimize disinfectant demand and optimize finished water quality throughout the distribution system; and

(C) Conduct additional monitoring and studies as required by the department to assure continued maintenance of optimal biological quality in finished water.

*AUTHORITY: section 640.100, RSMo (1994). * Original rule filed April 14, 1981, effective Oct. 11, 1981. Amended: Filed Feb. 1, 1996, effective Oct. 30, 1996.*

**Original authority 1939, amended 1978, 1981, 1982, 1988, 1989, 1992, 1993, 1995.*

10 CSR 60-4.100 Maximum Volatile Organic Chemical Contaminant Levels and Monitoring Requirements

PURPOSE: This rule establishes maximum contaminant levels and monitoring requirements for volatile organic chemicals.

(1) This rule applies to community and non-transient noncommunity public water systems.

(2) The following are the maximum contaminant levels (MCLs) for volatile organic chemicals (VOCs).

Contaminant	Maximum Contaminant Level, Milligrams Per Liter
(A) Eight (8) original VOCs	
1. Benzene	0.005
2. Carbon tetrachloride	0.005
3. 1,2-dichloroethane	0.005
4. 1,1-dichloroethylene	0.007
5. para-dichlorobenzene	0.075
6. 1,1,1-trichloroethane	0.2
7. Trichloroethylene	0.005
8. Vinyl chloride	0.002
(B) Thirteen (13) VOCs	
1. cis-1,2-dichloroethylene	0.07
2. Dichloromethane	0.005
3. 1,2-dichloropropane	0.005
4. Ethylbenzen	0.7
5. Monochlorobenzene	0.1
6. o-dichlorobenzene	0.6
7. Styrene	0.1
8. Tetrachloroethylene	0.005
9. Toluene	1
10. 1,2,4-Trichlorobenzene	0.07
11. 1,1,2-Trichloroethane	0.005
12. trans-1,2-dichloroethylene	0.1
13. Xylenes (total)	10

(3) For the purpose of determining compliance with MCLs, a supplier of water must collect samples of the product water for analyses as follows:

(A) During the initial three (3)-year compliance, all community and nontransient noncommunity water systems must collect an initial round of four (4) consecutive quarterly samples for each of the contaminants listed in section (2) unless a waiver has been granted by the department. The department will designate the year in which each system samples within this compliance period;

(B) All public water systems shall sample at points in the distribution system representative of each water source or at each entry point to the distribution system. Each sample must be taken at the same sampling point, unless conditions make another sampling point more representative of each source or treatment plant. The sampling point will be after the application of treatment, if any;

(C) If the system draws water from more than one (1) source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions; and

(D) The department may require more frequent monitoring than specified in subsection (3)(A) of this rule and may require confirmation samples for positive and negative results at its discretion.

(4) The department may allow the use of monitoring data collected after January 1, 1988, to satisfy the initial base sampling requirements. If the initial monitoring for all contaminants has been completed by December 31, 1992, in accordance with the requirements of subsections (3)(B) and (C) of this rule, and the system did not detect any contaminants listed in section (2), then the system shall sample annually beginning in the initial compliance period.

(5) If contaminants are not detected during the first three (3)-year compliance period, systems may decrease their sampling frequency beginning in the next year.

(A) Groundwater systems must sample annually. After three (3) years of annual sampling and no previous detection, groundwater systems may reduce their sampling frequency to one (1) sample per compliance period.

(B) Surface water systems must sample annually after the initial sampling period if there are no contaminants detected in the initial sampling.

(6) If contaminants are detected in any sample, then systems must sample quarterly

beginning in the next quarter at each sampling point which resulted in a detection.

(A) Groundwater systems must sample a minimum of two (2) quarters and surface water systems must sample a minimum of four (4) quarters to establish a baseline.

(B) If the MCL is exceeded, as described in subsection (6)(E) or (F) of this rule, then systems must sample quarterly beginning in the next quarter. Systems must sample a minimum of four (4) quarters to establish a baseline.

(C) If the baseline indicates a system's analytical results are reliably and consistently below the MCL, the department may reduce the system's sampling frequency to annually. (Annual sampling must be conducted during the quarter which previously yielded the highest analytical result.)

(D) Systems which have three (3) consecutive annual samples with no detection of a contaminant may apply to the department for a waiver.

(E) If a system conducts sampling more frequently than annually, the system will be in violation when the running annual average at any sampling point exceeds the MCL.

(F) If a system conducts sampling annually or on a less frequent basis, the system will be in violation when one (1) sample (or the average of the initial and confirmation samples) at any sampling point exceeds the MCL.

(7) A public water system may apply to the department for susceptibility waivers from required sampling. Systems are eligible for reduced monitoring in the initial three (3)-year compliance period. Waivers are effective for two (2) compliance periods. The waiver must be renewed in subsequent compliance periods, or the system must conduct sampling as required by section (3) of this rule. A public water system may apply to the department for susceptibility waivers for reduced monitoring contingent on the conduct of a thorough vulnerability assessment as required by 10 CSR 60-6.060(3).

(A) As a condition of the susceptibility waiver, a groundwater system must take one (1) sample at each sampling point during the time the waiver is effective (that is, one (1) sample during two (2) compliance periods or six (6) years) and update its vulnerability assessment by the end of the first compliance period. The department must confirm that the system is not vulnerable.

(B) Surface water systems must sample at a frequency determined by the department. A vulnerability assessment according to 10 CSR 60-6.060(3) must be required in subsequent compliance periods in order for the system to return to its nonvulnerable status.

(C) For the purposes of this section, detection is defined as greater than 0.0005 mg/l.

(8) As determined by the department, confirmation samples may be required for either positive or negative results. If a confirmation sample is used, the compliance determination is based on the average of the results of both the confirmation sample and the initial sample.

(9) Any public water system violating MCLs or monitoring and reporting requirements for any of the contaminants listed in section (2) of this rule must notify the department within seven (7) days and give public notice as required by 10 CSR 60-8.010.

*AUTHORITY: section 640.100, RSMo (1994). * Original rule filed June 2, 1988, effective Aug. 31, 1988. Rescinded and readopted: Filed March 31, 1992, effective Dec. 3, 1992. Amended: Filed May 4, 1993, effective Jan. 13, 1994. Amended: Filed Feb. 1, 1996, effective Oct. 30, 1996.*

**Original authority 1939, amended 1978, 1981, 1982, 1988, 1989, 1992, 1993, 1995.*

10 CSR 60-4.110 Special Monitoring for Unregulated Chemicals

PURPOSE: This rule establishes monitoring requirements for organic chemicals, volatile organic chemicals, and an inorganic chemical, which are unregulated in that they do not have maximum contaminant levels.

(1) This rule applies to community and non-transient noncommunity public water systems.

(2) Unless a waiver has been granted by the department, all public water systems shall conduct a one (1)-time round of sampling. All public water systems shall monitor for the following contaminants:

- (A) Organics—
 1. Aldicarb;
 2. Aldicarb sulfoxide;
 3. Aldicarb sulfone;
 4. Aldrin;
 5. Butachlor;
 6. Carbaryl;
 7. Dicamba;
 8. Dieldrin;
 9. 3-Hydroxycarbofuran;
 10. Methomyl;
 11. Metolachlor;
 12. Metribuzin; and

13. Propachlor;

(B) Inorganics—

- 1. Sulfate.

(3) All public water systems shall monitor at least once for the following contaminants:

(A) All public water systems shall monitor for the following contaminants:

- 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. 1,1-Dichloropropene;
- 15. 1,3-Dichloropropane;
- 16. 1,3-Dichloropropene;
- 17. 2,2-Dichloropropane;
- 18. 1,1,1,2-Tetrachloroethane;
- 19. 1,1,2,2-Tetrachloroethane; and
- 20. 1,2,3-Trichloropropane; and

(B) The department will determine which water systems shall monitor for the following chemicals:

- 1. Bromochloromethane;
- 2. n-Butylbenzene;
- 3. Dichlorodifluoromethane;
- 4. Fluorotrichloromethane;
- 5. Hexachlorobutadiene;
- 6. Isopropylbenzene;
- 7. p-Isopropyltoluene;
- 8. Naphthalene;
- 9. n-Propylbenzene;
- 10. sec-Butylbenzene;
- 11. tert-Butylbenzene;
- 12. 1,2,3-Trichlorobenzene;
- 13. 1,2,4-Trimethylbenzene; and
- 14. 1,3,5-Trimethylbenzene.

(4) All public water systems shall sample at points in the distribution system representative of each water source or at entry points to the distribution system. The sampling point will be after the application of treatment. The minimum number of samples is four consecutive quarterly samples per water source for the organic chemicals listed under subsection (2)(A) of this rule, and one (1) sample per water source for the inorganic chemical listed under subsection (2)(B) of this rule. Sampling must be completed no later than the end of the initial three (3)-year compliance period and results reported to the department. Each sample must be taken at the same sampling point unless conditions make another



sampling point more representative of each source or treatment plant.

(5) If the system draws water from more than one (1) source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions.

(6) A public water system may apply to the department for a waiver from the required sampling in section (3) for either organics or inorganics. All public water systems must conduct a one (1) time round of sampling.

(A) A public water system may apply to the department for a use waiver for reduced monitoring from required organics sampling as required by 10 CSR 60-6.060(2) if previous use of the chemical can be ruled out or a public water system may apply to the department for a susceptibility waiver for reduced monitoring from required organics sampling contingent on the conduct of a thorough vulnerability assessment as required by 10 CSR 60-6.060(3).

(B) A public water system may apply to the department for susceptibility waivers for reduced monitoring from required inorganic sampling contingent on the conduct of a thorough vulnerability assessment as required by 10 CSR 60-6.060(3). Only data collected after January 1, 1990, will be considered in making this assessment.

(C) A public water system serving fewer than one hundred fifty (150) service connections shall be treated as complying with the monitoring requirement if the owner or operator sends a letter to the department specifying that their system is available for sampling. This letter must be sent to the department no later than January 1, 1994.

(7) As determined by the department, confirmation samples may be required for either positive or negative results.

*AUTHORITY: section 640.100, RSMo (1994). * Original rule filed June 2, 1988, effective Aug. 31, 1988. Rescinded and readopted: Filed March 31, 1992, effective Dec. 3, 1992. Amended: Filed May 4, 1993, effective Jan. 13, 1994. Amended: Filed Feb. 1, 1996, effective Oct. 30, 1996.*

**Original authority 1939, amended 1978, 1981, 1982, 1988, 1989, 1992, 1993, 1995.*