



NR 109

State of Wisconsin

DEPARTMENT OF NATURAL RESOURCES

Carroll D. Besadny  
Secretary

BOX 7921  
MADISON, WISCONSIN 53707

IN REPLY REFER TO: \_\_\_\_\_

Received February 26, 1982  
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STATE OF WISCONSIN )  
 )  
DEPARTMENT OF NATURAL RESOURCES ) SS

TO ALL TO WHOM THESE PRESENTS SHALL COME, GREETINGS:

I, Carroll D. Besadny, Secretary of the Department of Natural Resources and custodian of the official records of said Department, do hereby certify that the annexed copy of Natural Resources Board Order No. WQ-38-81 was duly approved and adopted by this Department on December 16, 1981. I further certify that said copy has been compared by me with the original on file in this Department and that the same is a true copy thereof, and of the whole of such original.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the official seal of the Department at General Executive Facility #2 in the City of Madison, this 24<sup>th</sup> day of February, 1982.

Carroll D. Besadny  
Carroll D. Besadny, Secretary

5-1-82

(SEAL)



ORDER OF THE STATE OF WISCONSIN NATURAL RESOURCES BOARD  
REPEALING, RENUMBERING, RENUMBERING AND AMENDING, AMENDING AND  
CREATING RULES

.....  
IN THE MATTER OF repealing ss. NR 109.41(4) and .  
109.53(1)(a)2.a. and (2)(b); renumbering ss. .  
NR 109.04(13) to (17), 109.31(9), 109.53(1)(a)2.b. .  
& c., and 109.72; renumbering and amending ss. .  
109.04(12) and 109.31(4) to (8), 109.53(2)(c), (d) .  
(intro.) & (e); amending ss. NR 108.04(2)(c), .  
109.01, 109.04(1) and (9), 109.11, 109.12, 109.21, .  
109.30(2) & (4), 109.31(2)(a)(intro.), (b) & (3), .  
109.40(1)(intro.), 109.41(2) & (3), 109.53(1)(a) .  
(intro.), (2)(a)(intro.), 109.60(2), 109.61(2), .  
109.70(1)(b)1., 109.80(1), 109.81(4)(a), .  
109.82(intro.), 109.98(1)(a) and (b) and (2)(a) and .  
(b), and 111.01; and creating ss. NR 109.04(12) .  
109.13, 109.14, 109.20(3), 109.22, 109.31(4), .  
109.72(2) and 109.80(4) & (5) of the Wisconsin .  
Administrative Code pertaining to safe drinking water.  
.....

WQ-38-81

Analysis Prepared by Department of Natural Resources

The U.S. Environmental Protection Agency has modified the national drinking water regulations to include requirements for corrosivity monitoring, sodium monitoring including providing the results to health officials, and both monitoring requirements and maximum contaminant levels for a group of four organic chemicals collectively termed "total trihalomethanes". Since the Wisconsin DNR is administering the federal program, adoption of the national regulations for public water systems under the Safe Drinking Water Act is required. The modifications to NR 109 incorporate the federal changes.

Two minor revisions to NR 108 and NR 111 are also proposed. The NR 108 revision deals with the plan submittal requirements for small community water systems. As proposed the current requirement for plan submission by a professional engineer would be dropped.

The NR 111 change clarifies the Department's authority to require improvements at existing public water systems.

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Pursuant to the authority vested in the State of Wisconsin Natural Resources Board by ss. 144.025, 144.04, 162.01, 162.03 and 227.014, Stats., the State of Wisconsin Natural Resources Board hereby repeals, renumbers, renumbers and amends, amends and creates rules interpreting ss. 144.025, 144.04, 162.01 and 162.03, Stats., as follows:

SECTION 1 - NR 108.04(2)(c) is amended to read:

(c) The final plans and specifications shall be submitted under the signature and seal of a professional engineer registered in Wisconsin except as follows:

1. This requirement may be waived at the discretion of the department for certain industrial wastewater facilities not affecting public health. Factors which may be considered include nature and size of the facilities and evidence of the individual's qualifications to design such specialized facilities as may be proposed.

2. This requirement is waived for community water systems which are not municipal water systems, as defined in s. NR 108.02(6), and which are not systems serving subdivisions, as defined in s. 236.02(8), Stats. For community water systems covered by this waiver, plans and specifications for proposed wells may be submitted by a well driller registered in Wisconsin, and for proposed pump installations, including the pump, piping and other appurtenances up to and including the pressure tank, by a pump installer registered in Wisconsin.

SECTION 2 - Section NR 109.01 is amended to read:

NR 109.01 PURPOSE. The purpose of this chapter is to establish minimum standards and ~~methods~~ procedures for the protection of the public health, safety and welfare in the obtaining of safe drinking water. This chapter is adopted ~~pursuant to~~ under the authority granted in chs. 144 and 162, Stats.

Note: See chs. NR 108, 111, 112, and 114, Wis Adm. Code, for other requirements pertaining to public and private drinking water systems.

SECTION 3 - Section NR 109.04(1) and (9) are amended to read:

(1) "Community water system" means a public water system which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents. Any public water system serving 7 or more homes, 10 or more mobile homes, 10 or more apartment units, or 10 or more condominium units shall be considered a community water system unless information is available to indicate that 25 year-round residents will not be served.

(9) "Non-community water system" means a public water system that is not a community water system. A non-community water system typically serves a transient population rather than permanent year-round residents.

SECTION 4 - Section NR 109.04(12) is renumbered to be (13) and amended to read:

~~(12)~~ (13) "Primary drinking-water-standards maximum contaminant levels" means those standards maximum contaminant levels which represent minimum public health standards.

SECTION 5 - Section NR 109.04(12) is created to read:

(12) "Plant" means any facility for the obtainment of potable water, whether from surface water or groundwater sources, for a community water system.

SECTION 6 - Section NR 109.04(13), (14), (15), (16) and (17) are renumbered to be section NR 109.04(14), (15), (16), (17) and (18).

SECTION 7 - Sections NR 109.11 and NR 109.12 are amended to read:

Part I - Primary Maximum Contaminant Standards Levels, Monitoring and Analytical Requirements

NR 109.11 MAXIMUM CONTAMINANT LEVELS FOR INORGANIC CHEMICALS. (1) The maximum contaminant level for nitrate is applicable to both community water systems and non-community water systems, except as provided in sub. (3). The levels for the other inorganic chemicals apply only to community water systems. Compliance with maximum contaminant levels for inorganic chemicals is calculated pursuant to under s. NR 109.12.

(2) The following are the maximum contaminant levels for inorganic chemicals:

Contaminant	Level, milligrams per liter (micrograms per liter in parentheses)
Arsenic -----	0.05 (50 ug/l)
Barium -----	1. (1000 ug/l)
Cadmium -----	0.010 (10 ug/l)
Chromium -----	0.05 (50 ug/l)
Fluoride -----	2.2
Lead -----	0.05 (50 ug/l)
Mercury -----	0.002 (2 ug/l)
Nitrate (as N) -----	10.
Selenium -----	0.01 (10 ug/l)
Silver -----	0.05 (50 ug/l)
Sodium-----	No limit designated*

~~\*The supplier of water should periodically notify local physicians of the sodium content of the water supply in order that the physicians may advise their patients of suitable dietary restrictions.~~

(3) At the discretion of the department, nitrate as nitrogen levels not to exceed 20 mg/l may be allowed in a non-community water system if the supplier of water demonstrates to the satisfaction of the department that:

(a) Such water will not be available to children under 6 months of age; and

(b) There will be continuous posting of the fact that nitrate as nitrogen levels exceed 10 mg/l and the potential health effects of exposure; and

(c) Local and state public health authorities will be notified annually of nitrate as nitrogen levels that exceed 10 mg/l;

(d) A supply of low nitrate (contains less than 10 mg/l nitrate as nitrogen), bacteriologically safe drinking water shall be provided for infants under 6 months of age.

(e) No adverse health effects will result.

NR 109.12 INORGANIC CHEMICAL SAMPLING AND ANALYTICAL REQUIREMENTS. (1)

Samples collected for the purpose of determining compliance with s. NR 109.11 shall be collected at a point on the distribution system representative of water quality at the customer tap.

(2) Analyses for the purpose of determining compliance with s. NR 109.11 are required as follows:

(a) Analyses for all community water systems utilizing surface water sources shall be completed by ~~June-24,-1978~~ before system operation begins. These analyses shall be repeated at yearly intervals determined by the department, but not less than once per year.

(b) Analyses for all community water systems utilizing only groundwater sources shall be completed by ~~June-24,-1979~~ within 90 days after system operation begins. These analyses shall be repeated at three-year intervals determined by the department, but not less than at 3-year intervals.

(c) For non-community water systems ~~whether-supplied-by-surface-or~~ groundwater-sources, analysis for nitrate concentration shall be completed by

June-24,-1979 within 90 days after system operation begins. These analyses shall be repeated at intervals determined by the department.

~~{2}~~(3) If the result of an analysis made ~~pursuant-to-subsection~~ under sub. (1) indicates that the level of any contaminant listed in s. NR 109.11 exceeds the maximum contaminant level, the supplier of water shall report to the department within 7 days and initiate 3 additional analyses at the same sampling point within one month.

~~{3}~~(4) When the average of 4 analyses made ~~pursuant-to-subsection-(2)-of~~ this-section under sub. (3), rounded to the same number of significant figures as the maximum contaminant level for the substance in question, exceeds the maximum contaminant level, the supplier of water shall notify the department ~~pursuant-to~~ under s. NR 109.80 and give notice to the public ~~pursuant-to~~ under s. NR 109.81. Monitoring after the maximum contaminant level is exceeded shall be at a frequency designated by the department and shall continue until the maximum contaminant level has not been exceeded in 2 successive samples (special monitoring thereafter shall be at a frequency designated by the department) or until a monitoring schedule as a condition to a variance, exemption or enforcement action shall become effective.

~~{4}~~(5) The provisions of ~~subsections~~ subs. {2}(3) and {3}(4) ~~of-this~~ section notwithstanding, compliance with the maximum contaminant level for nitrate as nitrogen shall be determined on the basis of the mean of 2 analyses. When a level exceeding the maximum contaminant level for nitrate as nitrogen is found, a second analysis shall be initiated within 24 hours, and if the mean average of the 2 analyses exceeds the maximum contaminant level the supplier of water shall report findings to the department ~~pursuant-to~~ under s. NR 109.80 and shall notify the public ~~pursuant-to~~ under s. NR 109.81.



~~(5) For the initial analysis required by subsection (1)(a), (b) or (c) of this section, data for surface waters acquired within one year prior to the effective date and data for groundwaters acquired within 3 years prior to the effective date of this part may be substituted at the discretion of the department.~~

(6) Analyses conducted to determine compliance with s. NR 109.11 shall be made in accordance with methods approved by the U.S. environmental protection agency. The department shall maintain a current list of approved methods.

SECTION 8 - Sections NR 109.13 and NR 109.14 are created to read:

NR 109.13 SODIUM MONITORING, REPORTING AND NOTIFICATION REQUIREMENTS.

Note: A primary maximum contaminant level has not been established for sodium.

(1) The supplier of water for a community water system shall collect and analyze one sample per plant at a representative point on the distribution system for the determination of sodium concentration; samples will be collected and analyzed annually for systems utilizing surface water sources in whole or in part, and at least every 3 years for systems utilizing solely groundwater sources. The minimum number of samples required to be taken by the system shall be based on the number of plants used by the system, except that multiple wells drawing raw water from a single aquifer may, with department approval, be considered one plant for determining the minimum number of samples. The supplier of water may be required by the department to collect and analyze water samples for sodium more frequently in locations where the sodium content is variable.

(2) The supplier of water shall report to the department the results of the analyses for sodium concentration within the first 10 days of the month following the month in which the sample results were received or within the first 10 days following the end of the required monitoring period as stipulated by the department, whichever is first. If more than annual sampling is required, the supplier shall report the average sodium concentration within 10 days of the month following the month in which the analytical results of the last sample used for the annual average was received.

(3) The supplier of water shall notify appropriate local health officials of the sodium concentration by written notice by direct mail within 3 months of receipt of sample results. A copy of each notice required to be provided by this subsection and a list of health officials notified shall be sent to the department within 10 days of its issuance.

(4) Analyses for sodium shall be performed by the flame photometric method in accordance with the procedures described in "Standard Methods for the Examination of Water and Wastewater," 14th Edition, pp. 250-253; or by Method 273.1, Atomic Absorption-Direct Aspiration or Method 273.2, Atomic Absorption-Graphite Furnace in "Methods for Chemical Analysis of Water and Waste," EMSL, Cincinnati, EPA, 1979; or by Method D1428-64(a) in Annual Book of ASTM Standards, part 31, Water. Copies of these publications are available for inspection at the office of the department of natural resources, the secretary of state's office and the office of the revisor of statutes, and may be obtained for personal use from the U.S. Environmental Protection Agency, Washington, D.C. 20460.

NR 109.14 SPECIAL MONITORING FOR CORROSIVITY CHARACTERISTICS. (1) The supplier of water for a community water system shall collect samples from a representative entry point to the water distribution system for the purpose of analysis to determine the corrosivity characteristics of the water.

(a) The supplier shall collect 2 samples per plant for analysis for each plant using surface water sources wholly or in part or more if required by the department; one sample shall be collected during mid-winter and one during mid-summer. The supplier of the water shall collect one sample per plant for analysis for each plant using groundwater sources or more if required by the department. The minimum number of samples required to be taken by the system shall be based on the number of plants used by the system, except that multiple wells drawing raw water from a single aquifer may, with department approval, be considered one plant for determining the minimum number of samples.

(b) Determination of the corrosivity characteristics of the water shall include measurement of field pH, calcium hardness, alkalinity, temperature, total dissolved solids (total filterable residue), and calculation of the Langelier Index in accordance with sub. (3). The determination of corrosivity characteristics shall only include one round of sampling (2 samples per plant for surface water and one sample per plant for groundwater sources). However, the department may require more frequent monitoring as appropriate. In addition, the department may require monitoring for additional parameters which may indicate corrosivity characteristics, such as sulfates and chlorides. In certain cases, the Aggressive Index may be used instead of the Langelier Index; any request to use the Aggressive Index shall be made in writing to the department, and the department shall make this determination.

(2) The supplier of water shall report to the department the results of the analysis for the corrosivity characteristics within the first 10 days of the month following the month in which the sample results were received. If more frequent sampling is required by the department, the supplier may accumulate the data and shall report each value within the first 10 days of the month following the month in which the analytical results of the last sample were received.

(3) Analyses conducted to determine the corrosivity of the water shall be made in accordance with methods approved by the U.S. environmental protection agency. The department shall maintain a current list of approved methods.

(4) Suppliers of water for community water supply systems shall identify whether the following construction materials are present in their distribution system and report their findings to the department:

(a) Lead from piping, solder, caulking, interior lining of distribution mains, alloys and home plumbing.

(b) Copper from piping and alloys, service lines and home plumbing.

(c) Galvanized piping, service lines and home plumbing.

(d) Ferrous piping materials such as cast iron and steel.

(e) Asbestos cement pipe.

(f) Vinyl lined asbestos cement pipe.

(g) Coal tar lined pipes and tanks.

(5) When the water of a community water system is determined to have a Langelier Index value more corrosive than - 1.0, the supplier of water shall sample the distribution system to determine the presence of corrosion products. Parameters to be evaluated shall be determined by the department and will vary with piping materials used in the distribution system.

(6) If sampling required in sub. (5) indicates the presence of corrosion products, or if the water of a community water system is determined to have a Langelier Index value more corrosive than - 2.0, the department may require the supplier of water to implement corrosion-control measures.

SECTION 9 - Section NR 109.20(3) is created to read:

(3) Total trihalomethanes [the sum of the concentrations of bromodichloromethane, dibromochloromethane, tribromomethane (bromoform), and trichloromethane (chloroform)]. 0.10

SECTION 10 - Section 109.21 is amended to read:

NR 109.21 ORGANIC CHEMICALS OTHER THAN TOTAL TRIHALOMETHANES - SAMPLING AND ANALYTICAL REQUIREMENTS. (1) An analysis of substances for the purpose of determining compliance with ~~NR-109-20~~ s. NR 109.20(1) and (2) shall be made as follows:

(a) For all community water systems utilizing surface water sources, analyses shall be completed ~~by June-24, 1978~~ before system operation begins. Subsequent analyses shall be repeated at intervals specified by the department, but not less than at 3-year intervals. Samples analyzed shall be collected during the period of the year designated by the department as the period when contamination by pesticides is most likely to occur. ~~These analyses shall be repeated at intervals specified by the department, but in no event less frequently than at 3-year intervals.~~

(b) For community water systems utilizing only groundwater sources, analyses shall be completed for those systems specified by the department.

(2) If the result of an analysis made pursuant to subsection under sub.  
(1) ~~of this section~~ indicates that the level of any contaminant listed in s.  
NR 109.20 exceeds the maximum contaminant level, the supplier of water shall  
report to the department within 7 days and initiate 3 additional analyses  
within one month.

(3) When the average of 4 analyses made pursuant to subsection under sub.  
(2) ~~of this section~~, rounded to the same number of significant figures as the  
maximum contaminant level for the substance in question, exceeds the maximum  
contaminant level, the supplier of water shall report to the department  
pursuant to under s. NR 109.80 and give notice to the public pursuant to under  
sub. NR 109.81. Monitoring after ~~public notification~~ the maximum contaminant  
level is exceeded shall be at a frequency designated by the department and  
shall continue until the maximum contaminant level has not been exceeded in 2  
successive samples (special monitoring thereafter shall be at a frequency  
designated by the department) or until a monitoring schedule as a condition to  
a variance, exemption or enforcement action shall become effective.

~~(4) For the initial analysis required by subsections (1)(a) and (b) of~~  
~~this section, data for surface water acquired after June 24, 1976 and data for~~  
~~groundwater acquired after June 24, 1974 may be substituted at the discretion~~  
~~of the department.~~

~~(5) Analyses made to determine compliance with NR 109.20(1) shall be made~~  
~~in accordance with "Method for Organochlorine Pesticides in Industrial~~  
~~Effluents," MBQARL, Environmental Protection Agency, Cincinnati, Ohio,~~  
~~November 28, 1973. Copies of this document are available for inspection at~~  
~~the office of the department of natural resources, the secretary of state's~~  
~~office and the office of the revisor of statutes, and may be obtained for~~

~~personal-use-from-the-U.S.-Environmental-Protection-Agency,-Washington,-D.C.-  
20460-~~

~~(6) Analyses made to determine compliance with NR 109.20(2) shall be  
conducted in accordance with "Methods for Chlorinated Phenoxy Acid Herbicides  
in Industrial Effluents" MDQARL, Environmental Protection Agency, Cincinnati,  
Ohio, November 28, 1973. Copies of this document are available for inspection  
at the office of the department of natural resources, the secretary of state's  
office and the office of the revisor of statutes, and may be obtained for  
personal-use-from-the-U.S.-Environmental-Protection-Agency,-Washington,-D.C.-  
20460-~~

(4) Analysis made to determine compliance with s. NR 109.20(1) shall be  
conducted in accordance with "Methods for Organochlorine Pesticides and  
Chlorophenoxy Acid Herbicides in Drinking Water and Raw Source Water,"  
available from ORD Publications, CERL, EPA, Cincinnati, Ohio 45268; or  
Organochlorine Pesticides in Water," 1977 Annual Book of ASTM Standards, part  
31, Water, Method D3088; or Method 509-A, pp. 555-565; or Gas Chromatographic  
Methods for Analysis of Organic Substances in Water, USGS, Book 5, Chapter  
A-5, pp. 24-39.

(5) Analysis made to determine compliance with s. NR 109.20(2) shall be  
conducted in accordance with "Methods for Organochlorine Pesticides and  
Chlorophenoxy Acid Herbicides in Drinking Water and Raw Source Water,"  
available from ORD Publications, CERL, EPA, Cincinnati, Ohio 46268; or  
"Chlorinated Phenoxy Acid Herbicides in Water," 1977 Annual Book of ASTM  
Standards, part 31, Method D3478; or Method 509-B, pp. 555-5692; or Gas  
Chromatographic Methods for Analysis of Organic Substances in Water, USGS,  
Book 5, Chapter A-5, pp. 24-39. Copies of these publications are available

for inspection at the office of the department of natural resources, the secretary of state's office and the office of the revisor of statutes, and may be obtained for personal use from the U.S. Environmental Protection Agency, Washington, D.C. 20460.

~~(7)~~(6) Other analytical methods, if any, approved by the U.S. environmental protection agency are acceptable. The department shall maintain a list of approved methods.

SECTION 11 - Section NR 109.22 is created to read:

NR 109.22 TOTAL TRIHALOMETHANES - SAMPLING AND ANALYTICAL REQUIREMENTS.

(1) The supplier of water for a community water system which serves a population of 10,000 or more individuals and which adds a disinfectant (oxidant) to the water shall analyze for total trihalomethanes (TTHMs) in accordance with this section. For systems serving 75,000 or more individuals, sampling and analyses shall begin not later than March 31, 1981. For systems serving 10,000 to 74,999 individuals, sampling and analyses shall begin not later than March 31, 1983. For the purpose of this section, the minimum number of samples required to be taken by the system shall be based on the number of plants used by the system except that multiple wells drawing raw water from a single aquifer may, with department approval, be considered one plant for determining the minimum number of samples. All samples required during an established monitoring period shall be collected within a 24-hour period.

(2)(a) For all community water systems utilizing surface water sources in whole or in part, and for all community water systems utilizing only groundwater sources that have not been determined by the department to qualify



for the monitoring requirements of sub. (3), analyses for TTHMs shall be performed at quarterly intervals on at least 4 water samples for each plant used by the system. At least 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 75% percent 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. The results of all analyses per quarter shall be arithmetically averaged and reported to the department within 30 days of the system's receipt of such results. All samples collected shall be used in the computation of the average, unless the analytical results are invalidated for technical reasons. Sampling and analyses shall be conducted in accordance with the methods listed in sub. (5).

(b) The monitoring frequency required by par. (a) may be reduced by the department to a minimum of one sample analyzed for TTHMs per quarter taken at a point in the distribution system reflecting the maximum residence time of the water in the system, upon a determination by the department that the data from at least one year of monitoring in accordance with par. (a) and local conditions demonstrate that TTHM concentrations will be consistently below the maximum contaminant level. If at any time during which the reduced monitoring frequency prescribed under this paragraph applies, the results from any analysis exceed 0.10 mg/l of TTHMs and such results are confirmed by at least one check sample taken promptly after such results are received, or if the system makes any significant change to its source of water or treatment program, the supplier of water shall immediately begin monitoring in accordance with the requirements of par. (a), which monitoring shall continue

for at least one year before the frequency may be reduced again. At the option of the department, a systems's monitoring frequency may be increased above the minimum in those cases where it is necessary to detect variations of TTHM levels within the distribution system.

(3)(a) The supplier of water for a community water system utilizing only groundwater sources may seek to have the monitoring frequency required by sub. (2)(a) reduced to a minimum of one sample for maximum TTHM potential per year for each plant used by the system, taken at a point in the distribution system reflecting maximum residence time of the water in the system. The supplier of water shall submit to the department the results of at least one sample analyzed for maximum TTHM potential for each plant used by the system, taken at a point in the distribution system reflecting the maximum residence time of the water in the system, taken at a point in the distribution system reflecting the maximum residence time of the water in the system. The system's monitoring frequency may only be reduced upon a determination by the department that, based upon the data submitted by the system, the system has a maximum TTHM potential of less than 0.10 mg/l and that, based upon an assessment of the local conditions of the system, the system is not likely to approach or exceed the maximum contaminant level for total TTHMs. The results of all analyses shall be reported to the department within 30 days of the system's receipt of such results. All samples collected shall be used for determining whether the system must comply with the monitoring requirements of sub. (2), unless the analytical results are invalidated for technical reasons. Sampling and analyses shall be conducted in accordance with the methods listed in sub. (5).

(b) If at any time during which the reduced monitoring frequency prescribed under par. (a) applies, the results from any analysis taken by the supplier of water for maximum TTHM potential are equal to or greater than 0.10 mg/l and such results are confirmed by at least one check sample taken promptly after such results are received, the system shall immediately begin monitoring in accordance with the requirements of sub. (2) and such monitoring shall continue for at least one year before the frequency may be reduced again. In the event of any significant change to the system's raw water or treatment program, the supplier of water shall immediately analyze an additional sample for maximum TTHM potential taken at a point in the distribution system reflecting maximum residence time of the water in the system for the purpose of determining whether the system must comply with the monitoring requirements of sub. (2). At the option of the department, monitoring frequencies may be increased above the minimum in those cases where this is necessary to detect variation of TTHM levels within the distribution system.

(4) Compliance with s. NR 109.20(3) shall be determined based on a running annual average of quarterly samples collected by the system as prescribed in sub. (2)(a) or (b). If the average of samples covering any 12 month period exceeds the maximum contaminant level, the supplier of water shall report to the department under s. NR 109.80 and notify the public under s. NR 109.81. Monitoring after the maximum contaminant level is exceeded 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 becomes effective.

(5)(a) Sampling and analyses made under this section shall be conducted by one of the following EPA approved methods:

1. "The Analysis of Trihalomethanes in Drinking Waters by the Purge and Trap Method," Method 501.1, EMSL, EPA, Cincinnati, Ohio.

2. "The Analysis of Trihalomethanes in Drinking Water by Liquid/Liquid Extraction," Method 501.2, EMSL, EPA, Cincinnati, Ohio.

Copies of these publications are available for inspection at the office of the department of natural resources, the secretary of state's office and the office of the revisor of statutes, and may be obtained for personal use from the U.S. Environmental Protection Agency, Washington, D.C. 20460.

(b) Samples for TTHM analysis shall be dechlorinated upon collection to prevent further production of trihalomethanes, according to the procedures described in par. (a)1. and 2.. Samples for maximum TTHM potential should not be dechlorinated, and should be held for 7 days at 25°C (or above) prior to analysis according to the procedures described in par. (a)1. and 2.

(6) Before the supplier of water for a community water system makes any significant modifications to its existing treatment process for the purposes of achieving compliance with s. NR 109.20(3), such supplier shall submit and obtain department approval of a detailed plan setting forth its proposed modification and those safeguards that it will implement to ensure that the bacteriological quality of the drinking water provided by such system will not be adversely affected by such modification. Each system shall comply with the provisions set forth in the department approved plan. At a minimum, a department approved plan shall require the supplier of water for a system modifying its disinfection practice to:

(a) Evaluate the water system for sanitary defects and evaluate the source water for biological quality;

(b) Evaluate its existing treatment practices and consider improvements that will minimize disinfectant demand and optimize finished water quality throughout the distribution system;

(c) Provide baseline water quality survey data of the distribution system. Such data shall include the results from monitoring for coliform and fecal coliform bacteria, fecal streptococci, standard plate counts at 35°C and 20°C, phosphate, ammonia nitrogen and total organic carbon. Virus studies may be required where source waters are heavily contaminated with sewage effluent;

(d) Conduct additional monitoring to assure continued maintenance of optimal biological quality in finished water (example: when chloramines are introduced as disinfectants or when pre-chlorination is being discontinued). Additional monitoring may also be required by the department for chlorate, chlorite and chlorine dioxide if chlorine dioxide is approved as a disinfectant. Standard plate count analyses may also be required by the department as appropriate before and after any modifications; and

(e) Include in the plan provisions to maintain an active disinfectant residual throughout the distribution system at all times during and after the modification.

SECTION 12 - Section NR 109.30(2) and (4) are amended to read:

(2) When the fermentation tube method and 10 milliliter standard portions ~~pursuant to~~ under s. NR 109.31(1) are used, coliform bacteria ~~shall~~ may not be present in any ~~portions-in~~ portion of any sample collected and analyzed ~~pursuant to~~ under s. NR 109.31(2) or (3).

(4) Bacterial plate counts on water distributed to the consumer shall ~~may~~ not exceed 500 organisms per ~~{1}~~ milliliter. When this value is exceeded the department shall determine if the bacterial count is of public health or nuisance significance and may require appropriate action.

SECTION 13 - Section NR 109.31(2)(a)(intro.) is amended to read:

(2)(a) The supplier of water for a community water system shall take water samples for coliform determination at regular ~~time~~ intervals, and in a number proportionate to the population served by the system. Suppliers required to collect multiple samples each month shall sample at geographically representative locations and on dates evenly spaced during the month. In no event shall the sampling frequency be less than as set forth in the following:

SECTION 14 - Section NR 109.31(2)(b) and (3) are amended to read:

(b) Based on a history of no coliform bacterial contamination and on a sanitary survey by the department showing the water system to be supplied solely by a protected groundwater source and free of sanitary defects, a non-municipal community water system serving 25 to 1,000 persons may, with written permission from the department, may reduce this sampling frequency, except that in no case shall it be reduced to less than one per quarter.

(3) The supplier of water for a non-community school water system shall sample for coliform bacteria in each calendar quarter during which the system provides water to the public. ~~Such sampling shall begin by June 24, 1979.~~ If, unless the department, on the basis of a sanitary survey, determines that some other frequency is more appropriate, ~~that frequency shall be the~~

~~frequency-required-under-these-regulations. Such-frequency-shall-be-confirmed or-changed-on-the-basis-of-subsequent-surveys.~~

SECTION 15 - Sections NR 109.31(4), (5) (6), (7) and (8) are renumbered to be s. NR 109.31(5), (6), (7), (8) and (9) and amended to read:

~~(4)~~(5)(a) When a sample collected pursuant-to-subsection under sub. (2) or (3) ~~of-this-section~~ exceeds a maximum contaminant level set forth in s. NR 109.30(1) or (2), the supplier of water shall collect a repeat sample which shall be considered the check sample from the same sampling point within 48 hours.

(b) When the examination of the check sample required in ~~NR-109-31(4)~~ par. (a) shows the presence of coliform organisms, the supplier of water shall:

1. Report to the department within 48 hours; and
2. Initiate an investigation, including the collection within 48 hours and examination of additional check samples from the same point and other sampling points in the area, to define the extent of the problem; and
3. Notify the public in the area affected by the indicated contamination as prescribed in s. NR 109.81, unless the department determines that no health hazard has actually existed.

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(c) The department, at its discretion, may require that additional check samples be collected at a specified frequency from the same sampling point and other sampling points in the area and examined to identify and eliminate suspected health hazards when a sample exceeds a maximum contaminant level pursuant-to under s. NR 109.30(1) or (2), even if the check sample required in ~~NR-109-31(4)~~ par. (a) does not indicate the presence of coliform bacteria.

(d) When the cause of the indicated contamination has been determined and corrected, additional check samples shall be collected at a frequency directed by the department.

(e) The location at which the check sample was taken pursuant to subsection ~~(4)~~ under par. (a) of this section shall may not be eliminated from future sampling without approval of the department.

~~(5)~~ (6) The department may determine that unreliable examination results for a sample collected in a monitoring period pursuant to under s. NR 109.31(2) were caused by factors beyond the control of the water supplier. Such factors could be excessive transit time between collection and examination of the sample, samples being broken in transit, or interference in test results when the membrane filter technique is used. If this is the case, another sample collected immediately upon learning of these results may be used in determining compliance with sampling requirements in s. NR 109.31(2) or (3). However, a single sample may not be attributed to more than one monitoring period.

~~(6)~~ (7) Check samples Samples, samples with unreliable examination results, and special purpose samples, such as those taken to determine whether disinfection practices following water main placement, replacement, or repair have been sufficient, shall may not be used to determine compliance with s. NR 109.31(2) or (3).

~~(7)~~ (8) In addition to sampling from the distribution system, each supplier of water for a system providing chlorination shall obtain at least one sample every 3 months from each well prior to the point of any chemical addition. For waterworks which have more than one well in the same location and utilizing the same aquifer, only one of the wells needs to must be sampled each time on an alternating basis. If a well has a high potential for contamination, the department may, in individual cases, require more frequent sampling.



~~(8)~~(9) At surface water facilities, the bacteriological quality of the water shall be monitored ~~often-enough~~ sufficiently to maintain quality control of the treatment process. Each plant shall establish a schedule which will be subject to review and modification by the department.

Note: Generally, membrane filter or 5 tube fermentation tests and plate counts of the raw, settled and finished water on an established schedule will be necessary to meet this requirement.

SECTION 16 - Section NR 109.31(4) is created to read:

(4) Based on a history of bacteriologically unsafe samples, structural deficiencies, or affected population, the department may require the supplier of water for a non-community water system to monitor for coliform bacteria at specified intervals.

SECTION 17 - Section NR 109.31(9) is renumbered to be s. NR 109.31(10).

SECTION 18 - Section NR 109.40(1)(intro.) is amended to read:

(1) One nephelometric turbidity unit (NTU), as determined by a monthly average ~~pursuant to~~ under s. NR 109.41, except that 5 or fewer turbidity units may be allowed if the supplier of water can demonstrate to the ~~state~~ department that the higher turbidity does not do any of the following:

SECTION 19 - NR 109.41(2) and (3) are amended to read:

(2) Samples shall be taken by suppliers of water for both community water systems and non-community water systems at a representative entry ~~point~~(s) points to the water distribution system at least once per day, for the purpose of making turbidity measurements to determine compliance with s. NR 109.40.

The measurement shall be made by the Nephelometric Method in accordance with the recommendations set forth in "Standard Methods for the Examination of Water and Wastewater," American Public Health Association, 14th Edition, pp. 132-134; or "~~Methods for Chemical Analysis of Water and Wastes,~~" pp. 295-298, ~~Environmental Protection Agency, Office of Technology Transfer, Washington, D.C., 20460, 1974.~~ Method 180.1.1 - Nephelometric Method. Copies of these publications are available for inspection at the office of the department of natural resources, the secretary of state's office and the office of the revisor of statutes, and may be obtained for personal use from, respectively, the American Public Health Association, 1015 Eighteenth St., N.W., Washington, D.C. and the U.S. Environmental Protection Agency, Washington, D.C. 20460.

(3) If the result of a turbidity analysis ~~indicates that~~ exceeds the ~~maximum allowable limit has been exceeded~~ contaminant level, the sampling and measurement shall be confirmed by resampling as soon as practicable and preferably within one hour. If the repeat sample confirms that the maximum ~~allowable limit~~ contaminant level has been exceeded, the supplier of water shall report to the department within 48 hours. The repeat sample shall be the sample used for the purpose of calculating the monthly average. If the monthly average of the daily samples exceeds the maximum ~~allowable limit~~ contaminant level, or if the average of ~~two~~ 2 samples taken on consecutive days exceeds 5 NTU, the supplier of water shall report to the department and notify the public as directed in ss. NR 109.80 and 109.81.

SECTION 20 - NR 109.41(4) is repealed.

SECTION 21 - Section NR 109.53(1)(a)(intro.) is amended to read:

(a) Initial sampling to determine compliance with s. NR 109.50 shall begin ~~by June 24, 1979 and the analysis shall be completed by June 24, 1980~~ within 90 days after system operation begins. Compliance shall be based on the analysis of an annual composite of 4 consecutive quarterly samples or the average of the analyses of 4 samples obtained at quarterly intervals.

SECTION 22 - Section NR 109.53(1)(a)2.a. is repealed.

SECTION 23 - Section NR 109.53(1)(a)2.b. and c. are renumbered to be NR 109.53(1)(b) and (c).

SECTION 24 - NR 109.53(2)(a)(intro.) is amended to read:

(a) ~~By June 24, 1979, systems~~ Systems using surface water sources and serving more than 100,000 persons and such other community water systems as are designated by the department shall be monitored for initial compliance with s. NR 109.51 by analysis of a composite of 4 consecutive quarterly samples or analysis of 4 quarterly samples. Compliance with s. NR 109.51 may be assumed without further analysis if the average annual concentration of gross beta particle activity is less than 50 pCi/l and if the average annual concentrations of tritium and strontium-90 are less than those listed in Table A, provided, that, if both radionuclides are present, the sum of their annual dose equivalents to bone marrow shall may not exceed 4 millirem/year.

SECTION 25 - Section NR 109.53(2)(b) is repealed.

SECTION 26 - Sections NR 109.53(2)(c), (d)(intro.) and (e) are renumbered to be NR 109.53(2)(b), (c)(intro.) and (d) and amended to read:

~~(e)~~(b) After the initial analysis required by ~~subsection-(2)~~ par. (a) suppliers of water shall monitor at least every 4 years following the procedure given in ~~subsection-(2)~~ par. (a).

~~(d)~~(c) ~~By June-24, -1979-~~ The supplier of any community water system designated by the department as utilizing waters subject to contamination by effluents from nuclear facilities shall initiate quarterly monitoring for gross beta particle and iodine-131 radioactivity and annual monitoring for strontium-90 and tritium.

~~(e)~~(d) If the average annual maximum contaminant level for man-made radioactivity set forth in s. NR 109.16 is exceeded, the operator of a community water system shall give notice to the department ~~pursuant-to~~ under s. NR 109.80 and to the public as required by s. NR 109.81. Monitoring at monthly intervals shall be continued until the concentration no longer exceeds the maximum contaminant level or until a monitoring schedule as a condition to a variance, exemption or enforcement action shall become effective.

SECTION 27 - Section NR 109.60(2) is amended to read:

(2) The following are the secondary standards for inorganic chemicals:

Standard	Milligrams per liter (micrograms per liter in parenthesis) - except as noted
Chloride -----	250
Color -----	15 units
Copper -----	1.0 (1,000 ug/l)
<u>Corrosivity -----</u>	<u>Noncorrosive</u>
Foaming agents	
MBAS (Methylene-Blue Active Substances) ---	0.5
Hydrogen Sulfide -----	Not detectable
Iron -----	0.3
Manganese -----	0.05 (50 ug/l)
Odor -----	3 (Threshold No.)
Sulfate -----	250
Total Residue -----	500
Zinc -----	5 (5,000 ug/l)

SECTION 28 - Section NR 109.61(2) is amended to read:

(2) If it is determined by the department that physical ~~and/or~~ or chemical substances or both in excess of those standards contained in s. NR 109.60 are objectionable to an appreciable number of persons and ~~is~~ are detrimental to the public welfare, the department may, on its own motion, require remedial action by the supplier of water to insure that the public receives the highest quality water practicably obtainable.

SECTION 29 - Section NR 109.70(1)(b)1. is amended to read:

1. Submission of the results of daily fluoride tests of samples from the distribution system ~~taken-at-least-once-per-day~~, and

SECTION 30 - Section NR 109.72 is renumbered to be NR 109.72(1).

SECTION 31 - Section NR 109.72(2) is created to read:

(2) All community water systems utilizing surface water sources shall analyze bacteriological samples for in-plant operational control at a laboratory facility approved by the department of health and social services.

SECTION 32 - Section NR 109.80(1) is amended to read:

(1) Except where a shorter reporting period is specified in this chapter, the supplier of water shall report to the department ~~within 40 days following a test, measurement or analysis required to be made by this chapter, the results of that test, measurement or analysis,~~ the results of any test measurement or analysis required by this chapter within:

(a) The first 10 days following the month in which the result is received;

or

(b) The first 10 days following the end of the required monitoring period as stipulated by the department, whichever of these is shortest.

SECTION 33 - Section NR 109.80(4) and (5) are created to read:

(4) The supplier of water, within 10 days of completion of each public notification required under s. NR 109.81, shall submit to the department a representative copy of each type of notice distributed, published, posted, or made available to the persons served by the system or to the media, or both.

(5) Upon the request of the department, the supplier of water shall submit to the department copies of any records required to be maintained under s. NR 109.82 or copies of any documents then in existence which the department is entitled to inspect under the authority of s. 144.09, Stats.

SECTION 34 - Section NR 109.81(4)(a) is amended to read:

(a) Such notification shall be given as immediately after discovery of the failure to comply as practicable unless the department determines that the failure to comply with a maximum contaminant level does not create an imminent hazard to public health. In such case, the additional notification required under this subsection may be given at any time within the time period prescribed for the notice under subsection sub. (1)(b) of this section.

SECTION 35 - Section NR 109.82(intro.) is amended to read:

NR 109.82 RECORD MAINTENANCE. Any owner or operator of a public water system subject to the provisions of this ~~part~~ chapter shall retain on the premises or at a convenient location near the premises the following records:

SECTION 36 - Section NR 109.98(1)(a) and (b) and (2)(a) and (b) are amended to read:

(a) The interim national primary drinking water regulations ~~pursuant to 40-Code-of-Federal-Regulations-141~~ under 40 C.F.R. s. 141 by no later than January 1, ~~1987~~ 1984; and

(b) Any maximum contaminant levels established by this chapter but not contained in the interim national primary drinking water regulations ~~pursuant to 40-Code-of-Federal-Regulations-141~~ under 40 C.F.R. s. 141 by no later than 7 years after the effective date of such maximum contaminant levels.

(a) The interim national drinking water regulations ~~pursuant to 40-Code-of-Federal-Regulations-141~~ under 40 C.F.R. s. 141 by no later than January 1, 1983; and

(b) Any maximum contaminant levels established by this chapter but not contained in the interim national primary drinking water regulations pursuant to ~~to-40-Code-of-Federal-Regulations-141~~ under 40 C.F.R. s. 141 by no later than the 9 years after the effective date of such maximum contaminant levels.

SECTION 37 - Section NR 111.01 is amended to read:

NR 111.01 APPLICABILITY. This chapter governs the general operation, design and construction of community water systems or waterworks. The standards for design and construction shall be considered minimum standards for new facilities and the minimum standards to which existing facilities shall be upgraded when improvements are undertaken. These standards may be imposed on a case-by-case basis to existing facilities when the department determines that a potential health risk exists.

The foregoing rules were approved and adopted by the State of Wisconsin Natural Resources Board on December 16, 1981.

The rules contained herein shall take effect as provided in s. 227.026(1)(intro.), Stats.

Dated at Madison, Wisconsin February 23, 1982

STATE OF WISCONSIN DEPARTMENT OF NATURAL RESOURCES

By Carroll D. Besadny  
Carroll D. Besadny, Secretary

(SEAL)