Chapter NR 809

SAFE DRINKING WATER

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NR 809.01 Purpose. The purpose of this chapter is to establish minimum standards and procedures for the protection of the public health, safety and welfare in the obtaining of safe drinking water. This chapter is adopted under the authority granted in s. 281.12 and ch. 280, Stats.

Note: See chs. NR 108, 114, 811 and 812 for other requirements pertaining to public and private drinking water systems.

History: Cr. Register, February, 1978, No. 266, eff. 3–1–78; am. Register, April, 1982, No. 316, eff. 5–1–82; renum. from NR 109.01, Register, July, 1993, No. 451, eff. 8–1–93; corrections made under s. 13.93 (2m) (b) 7., Stats., Register, October, 1997, No. 502.

NR 809.02 Departmental justification. (1) Where the department exercises discretion allowed under this chapter to require a public water system owner or operator to perform construction, repairs, monitoring or other activities which would necessitate expenditure of resources, the department shall explain in writing the reasons for the requirements.

(2) A decision by the department to grant a waiver shall be made in writing and shall set forth the basis for the determination. The waiver determination may be initiated by the department or upon an application by the owner or operator of a public water system.

History: Cr. Register, July, 1993, No. 451, eff. 8–1–93; renum. to be (1), cr. (2), Register, August, 1994, No. 464, eff. 9–1–94.

NR 809.03 Applicability. The provisions of this chapter shall apply to all new and existing public water systems as defined in this chapter.

History: Cr. Register, February, 1978, No. 266, eff. 3–1–78; renum. from NR 109.03, Register, July, 1993, No. 451, eff. 8–1–93.

NR 809.04 Definitions. (1) "Action level" is the concentration of lead or copper in water which determines, in some cases, the treatment requirements that a water system is required to complete.

(2) "Best available technology" or "BAT" means the best technology treatment techniques, or other means which the U.S. environmental protection agency finds, after examination for effi-

cacy under field conditions and not solely under laboratory conditions, are available, taking cost into consideration.

(3) "Coagulation" means a process using coagulant chemicals and mixing by which colloidal and suspended materials are destabilized and agglomerated into flocs.

(4) "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.

(5) "Compliance cycle" means the 9–year calendar year cycle during which public water systems shall monitor. Each compliance cycle consists of 3, 3–year compliance periods. The first compliance cycle begins January 1, 1993 and ends December 31, 2001; the second begins January 1, 2002 and ends December 31, 2010; the third begins January 1, 2011 and ends December 31, 2019.

(6) "Compliance period" means a 3–year calendar year period within a compliance cycle. Each compliance cycle has 3, 3–year compliance periods. Within the first compliance cycle, the first compliance period runs from January 1, 1993 to December 31, 1995; the second from January 1, 1996 to December 31, 1998; the third from January 1, 1999 to December 31, 2001.

(7) "Comprehensive performance evaluation" or "CPE" means a thorough review and analysis of a treatment plant's performance–based capabilities and associated administrative, operation and maintenance practices. It is conducted to identify factors that may be adversely impacting a plant's capability to achieve compliance and emphasizes approaches that can be implemented without significant capital improvements. For purposes of compliance with this chapter, the comprehensive performance evaluation shall consist of least the following components: Assessment of plant performance; evaluation of major unit processes; identification and prioritization of performance limiting factors; assessment of the applicability of comprehensive technical assistance; and preparation of a CPE report.

(8) "Confirmed presence" means the presence of coliform bacteria in a water sample confirmed by a total coliform–positive repeat sample.

(9) "Confluent growth" means a continuous bacterial growth covering the entire filtration area of a membrane filter, or a portion thereof, in which bacterial colonies are not discrete.

(10) "Conventional filtration treatment" means a series of processes including coagulation, flocculation, sedimentation, and filtration resulting in substantial particulate removal.

(11) "CT" or "CTcalc" is the product of "residual disinfectant concentration" (C) in mg/l determined before or at the first customer, and the corresponding "disinfectant contact time" (T) in minutes, i.e., "C" x "T". If a public water system applies disinfectants at more than one point prior to the first customer, it shall determine the CT of each disinfectant sequence before or at the first customer, to determine the total percent inactivation or "total inactivation ratio." The inactivation ratio for a single disinfectant sequence is:

$$\frac{CTcalc}{CT_{99.9}}$$

where "$CT_{99.9}$" is the CT value required for 99.9% (3 log) inactivation of *Giardia lamblia cysts.* The sum of the inactivation ratios, or total inactivation ratio for a series of disinfection sequences is:

$$\frac{\Sigma\,(CTcalc)}{CT_{99.9}}$$

and is calculated by adding together the inactivation ratio for each disinfection sequence. In determining the total inactivation ratio, the public water system owner or operator shall determine the residual disinfectant concentration of each sequence and corresponding contact time before any subsequent disinfection application points. A total inactivation ratio equal to or greater than 1.0 is assumed to provide a 3 log inactivation of *Giardia lamblia cysts.*

(12) "Contaminant" means any physical, chemical, biological, or radiological substance or matter in water.

(13) "Corrosion inhibitor" means a substance capable of reducing the corrosivity of water toward metal plumbing materials, especially lead and copper, by forming a protective film on the interior surface of those materials.

(14) "Department" means the department of natural resources.

(15) "Diatomaceous earth filtration" means a process resulting in substantial particulate removal in which:

(a) A precoat cake of diatomaceous earth filter media is deposited on a support membrane (septum); and

(b) While the water is filtered by passing through the cake on the septum, additional filter media known as body feed is continuously added to the feed water to maintain the permeability of the filter cake.

(16) "Direct filtration" means a series of processes including coagulation and filtration but excluding sedimentation resulting in substantial particulate removal.

(17) "Disinfectant contact time" ("T" in CT calculations) means the time in minutes that it takes for water to move from the point of disinfectant application or the previous point of disinfectant residual measurement to a point before or at the point where residual disinfectant concentration ("C") is measured. Where only one "C" is measured, "T" is the time in minutes that it takes for water to move from the point of disinfectant application to a point before or where residual disinfectant concentration ("C") is measured. Where more than one "C" is measured, "T" is:

(a) For the first measurement of "C", the time in minutes that it takes for water to move from the first or only point of disinfectant application to a point before or at the point where the first "C" is measured; and

(b) For subsequent measurements of "C", the time in minutes that it takes for water to move from the previous "C" measurement point to the "C" measurement point for which the particular "T" is being calculated. Disinfectant contact time in pipelines shall be calculated based on "plug flow" by dividing the internal volume of the pipe by the maximum hourly flow rate through the pipe. Disinfectant contact time within mixing basins and storage reservoirs shall be determined by tracer studies or other department approved equivalent demonstration.

(18) "Disinfection" means a process which inactivates pathogenic organisms in water by chemical oxidants or equivalent agents.

(19) "Disinfection profile" means a summary of daily *Giardia lamblia* inactivation through the treatment plant. The procedure for developing a disinfection profile is contained in s. NR 809.775.

(20) "Domestic or other non–distribution system plumbing problem" means a coliform contamination problem in a public water system with more than one service connection that is limited to the specific service connection from which the coliform–positive sample was taken.

(21) "Dose equivalent" means the product of the absorbed dose for ionizing radiation and such factors as account for differences in biological effectiveness due to the type of radiation and

its distribution in the body as specified by the international commission on radiological units and measurements (ICRU).

(22) "Enhanced coagulation" means the addition of sufficient coagulant for improved removal of disinfection byproduct precursors by conventional filtration treatment.

(23) "Enhanced softening" means the improved removal of disinfection byproduct precursors by precipitative softening.

(24) "Effective corrosion inhibitor residual" means a concentration sufficient to form a protective coating on the interior walls of a pipe.

(25) "Entry point" means a location in the water system after treatment or chemical addition, if any, but prior to the distribution system. A sample collected in the distribution system may be considered an entry point sample if the department has determined it is more representative of the water sources.

(26) "Environmental protection agency" or "EPA" means the agency of the United States federal government ultimately responsible for establishing and enforcing national primary drinking water regulations.

(27) "Filter profile" means a graphical representation of individual filter performance, based on continuous turbidity measurements or total particle counts versus time for an entire filter run, from startup to backwash inclusively, that includes an assessment of filter performance while another filter is being backwashed.

(28) "Filtration" means a process for removing particulate matter from water by passage through porous media.

(29) "First draw sample" means a one–liter sample of tap water that has been standing in plumbing pipes at least 6 hours and is collected without flushing the tap.

(30) "Flocculation" means a process to enhance agglomeration or collection of smaller floc particles into larger, more easily settleable particles through gentle stirring by hydraulic or mechanical means.

(31) "GAC10" means granular activated carbon filter beds with an empty–bed contact time of 10 minutes based on average daily flow and a carbon reactivation frequency of every 180 days.

(32) "Gross alpha particle activity" means the total radioactivity due to alpha particle emission as inferred from measurements on a dry sample.

(33) "Gross beta particle activity" means the total radioactivity due to beta particle emission as inferred from measurements on a dry sample.

(34) "Ground water under the direct influence of surface water" means any water beneath the surface of the ground with:

(a) Occurrence of insects or other macroorganisms, algae or large diameter pathogens such as *Giardia lamblia,* in greater than or equal to 10% of representative source water samples collected over a period of 6 months, immediately prior to the first or only point of disinfectant application, or

(b) Evidence of relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH which closely correlate to climatological or surface water conditions.

(35) "Initial compliance period" means the first full 3–year compliance period which begins at least 18 months after promulgation of the federal regulations. For monitoring contaminants in ss. NR 809.11 (2) (b) and 809.20 (1) (b), the initial compliance period means January 1993 – December 1995 for systems with 150 or more service connections and January 1996 – December 1998 for systems having fewer than 150 service connections.

(36) "Haloacetic acids (five)" or "HAA5" means the sum of the concentrations in milligrams per liter of the haloacetic acid compounds (monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid and dibromoacetic acid), rounded to 2 significant figures after addition.

(37) "Large water system" means, for the purpose of monitoring lead and copper, a water system that serves more than 50,000 persons.

(38) "Lead service line" means a service line made of lead which connects the water main to the building inlet and any lead pigtail, gooseneck or other fitting which is connected to such lead line.

(39) "*Legionella*" means a genus of bacteria, some species of which have caused a type of pneumonia called Legionnaires disease.

(40) "Man–made beta particle and photon emitters" means all radionuclides emitting beta particles and/or photons listed in Maximum Permissible Body Burdens and Maximum Permissible Concentration of Radionuclides in Air or Water for Occupational Exposure, NBS Handbook 69, except the daughter products of thorium–232, uranium–235 and uranium–238.

(41) "Maximum contaminant level" or "MCL" means the maximum permissible level of a contaminant in water which is delivered to any user of a public water system.

(42) "Maximum contaminant level goal" or "MCLG" means the maximum level of a contaminant in drinking water at which no known or anticipated adverse affect on the health of persons would occur, and which allows an adequate margin of safety. Maximum contaminant level goals are non–enforceable health goals.

(43) "Maximum residual disinfectant level" or "MRDL" means a level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap without an unacceptable possibility of adverse health effects.

(44) "Maximum residual disinfectant level goal" or "MRDLG" means the maximum level of a disinfectant added for water treatment at which no known or anticipated adverse effect on the health of persons would occur, and which allows an adequate margin of safety. MRDLGs are nonenforceable health goals and do not reflect the benefit of the addition of the chemical for control of waterborne microbial contaminants.

(45) "Medium–size water system" means, for the purpose of monitoring lead and copper, a water system that serves greater than 3,300 and less than or equal to 50,000 persons.

(46) "Near the first service connection" means at one of the 20% of all service connections in the entire system that are nearest the water supply treatment facility or water supply source, as measured by water transport time within the distribution system.

(47) "Non–community water system" means a public water system that is not a community water system. A non–community water system is either a non–transient, non–community water system or a transient non–community water system.

(48) "Non–transient non–community water system" means a non–community water system that regularly serves at least 25 of the same persons over 6 months per year. Examples of non–transient non–community water systems include those serving schools, day care centers and factories.

(49) "Optimal corrosion control treatment" means the corrosion control treatment that minimizes the lead and copper concentrations at users' taps while insuring that the treatment does not cause the water system to violate any national primary drinking water regulations as listed in part 141 of the code of federal regulations (CFR) 40.

(50) "Person" means an individual, corporation, company, association, cooperative, trust, institution, partnership, state, municipality, or federal agency.

(51) "Picocurie (pCi)" means that quantity of radioactive material producing 2.22 nuclear transformations per minute.

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

(53) "Point–of–disinfectant application" is the point where the disinfectant is applied and water downstream of that point is not subject to recontamination by surface runoff.

(54) "Point–of–entry treatment device" is a water treatment device applied to the drinking water entering a house or building for the purpose of reducing contaminants in the drinking water distributed throughout the house or building.

(55) "Point–of–use treatment device" is water treatment device applied to a single tap used for the purpose of reducing contaminants in drinking water at that one tap.

(56) "Primary maximum contaminant levels" means those maximum contaminant levels which represent minimum public health standards.

(57) (a) "Public water system" or "system" means a system for the provision to the public of water for human consumption through pipes or other constructed conveyances, if the system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year. A public water system is either a "community water system" or a "non–community water system".

(b) Systems include the following:

1. Any collection, treatment, storage, and distribution facilities under control of the operator of the system and used primarily in connection with the system, and

2. Any collection or pretreatment storage facilities not under the system's control which are used primarily in connection with the system.

(c) The term does not include any "special irrigation district."

Note: The definition of public water system as regulated by this chapter is broader and includes more water systems than those governed by the public service commission under its definition of a public utility in ch. 196, Stats.

(58) "Rem" means the unit of dose equivalent from ionizing radiation to the total body or any internal organ or organ system. A "millirem" (mrem) is 1/1000 of a rem.

(59) "Repeat compliance period" means any subsequent compliance period after the initial compliance period.

(60) "Residual disinfectant concentration" ("C" in CT calculations) means the concentration of disinfectant measured in mg/l in a representative sample of water.

(61) "Running annual average" means the sum of 1, 2, 3 or 4 calendar quarter sample results divided by 4. The first sample may be the average of the initial and confirmation sample results. If more than 4 calendar quarters of samples have been collected in more than 4 consecutive calendar quarters, the results from the 4 most recent quarters shall be used. If multiple compliance samples are collected in a single calendar quarter, the sample which yielded the highest concentration shall be used to calculate the running annual average.

(62) "Sanitary survey" means an on–site inspection of the water source, facilities, equipment, operation and maintenance of a public water system for the purpose of evaluating the adequacy of such source, facilities, equipment, operation and maintenance for producing and distributing safe drinking water.

(63) "Secondary drinking water standards" means those standards for aesthetic parameters which represent minimum public welfare concerns but do not represent health standards.

(64) "Service line sample" means a one–liter sample of water that has been standing for at least 6 hours in a service line.

(65) "Single family structure" means a building constructed as a single–family residence that is currently used as either a residence or a place of business.

(66) "Sedimentation" means a process for removal of solids before filtration by gravity or separation.

(67) "Slow sand filtration" means a process involving passage of raw water through a bed of sand at low velocity (generally less than 0.4 m/h) resulting in substantial particulate removal by physical and biological mechanisms.

(68) "Small water system" means, for the purposes of monitoring lead and copper, a water system that serves 3,300 persons or fewer.

(69) "Special irrigation district" means an irrigation district in existence prior to May 18, 1994 that provides primarily agricultural service through a piped water system with only incidental residential or similar use where the system or the residential or similar users of the system are supplied with water that meets all maximum contaminant levels of subch. I.

(70) "Surface water" means all water which is open to the atmosphere and subject to surface runoff.

(71) "System with a single service connection" means a system which supplies drinking water to consumers via a single line.

(72) "Surface water systems" means public water systems using surface water or ground water under the direct influence of surface water as a source and that are subject to the requirements of 40 CFR 141, subpart H which contains the national primary drinking water regulations.

(73) "Supplier of water" or "water supplier" means any person who owns or operates a public water system.

(74) "SUVA" means specific ultraviolet absorption at 254 nanometers (nm).

Note: SUVA is an indicator of the humic content of water. It is a calculated parameter obtained by dividing a sample's ultraviolet absorption at a wavelength of 254 nm (UV_{254}) (measured in m^{-1}) by its concentration of dissolved organic carbon (DOC) (in mg/L).

(75) "Total organic carbon" or "TOC" means total organic carbon in mg/L measured using heat, oxygen, ultraviolet irradiation, chemical oxidants or combinations of these oxidants that convert organic carbon to carbon dioxide, rounded to 2 significant figures.

(76) "Supplier of water" means any person who owns or operates a public water system.

(77) "Too numerous to count" means that the total number bacterial colonies exceeds 200 on a 47–mm diameter membrane filter used for coliform detection.

(78) "Transient non–community water system" means a non–community water system that serves at least 25 people at least 60 days of the year. Examples of transient non–community water systems include those serving taverns, motels, restaurants, churches, campgrounds and parks.

(79) "Waterborne disease outbreak" means the significant occurrence of acute infectious illness, epidemiologically associated with the ingestion of water from a public water system which is deficient in treatment or is supplied from a contaminated source, as determined by the department or other local or state agency.

(80) "Virus" means a virus of fecal origin which is infectious to humans by waterborne transmission.

History: Cr. Register, February, 1978, No. 266, eff. 3–1–78; am. (1) and (9), renum. (12) to (17) to be (13) to (18) and am. (13), cr. (12), Register, April, 1982, No. 316, eff. 5–1–82; renum. (1) to (18) to be (2) to (9), (11), (13) to (15), (18) to (23) and am. (9) and (11), cr. (1), (10), (12), (16) and (17), Register, August, 1989, No. 404, eff. 9–1–89; renum. (1) to (23) to be (3), (6), (9), (15), (18), (19), (22) to (24), (26) to (30), (32) to (36), (38), (39), (44) and (44m), cr. (2), (4), (5), (7), (8), (10) to (14), (16), (17), (20), (21), (25), (31), (37), (40) to (43) and (45) to (47), Register, March, 1991, No. 423, eff. 4–1–91; renum. (1) to (47) to be (2) to (4), (7) to (9), (12), (10), (14) to (19), (23), (25), (13), (26), (28), (32), (27), (33), (34), (37), (35), (38), (39), (41), (42), (44), (43), (45) to (48), (51), (49), (53), (54), (57), (58), (60) to (66) and am. (10), (16) (b), (34), (38) and (39), cr. (1), (5), (6), (12), (20) to (22), (24), (29) to (31), (36), (40), (50), (52), (55), (56), (59) and (63), Register, July, 1993, No. 451, eff. 8–1–93; am. (29), Register, August, 1994, No. 464, eff. 9–1–94; **renum. (7) to (66) to be (8) to (18), (20), (21), (24) to (26), (28) to (30), (32) to (35), (37) to (42), (45) to (68), (70), (71), (76), (78), (77), (79) and (80) and am. (57), cr. (7), (19), (22), (23), (27), (31), (36), (43), (44), (69), (72) to (75), Register, December, 2000, No. 540, eff. 1–1–01.**

NR 809.05 Coverage. This chapter shall apply to each public water system, unless the public water system meets all of the following conditions:

(1) Consists only of distribution and storage facilities (and does not have any collection or treatment facilities); and

(2) Obtains all of its water from, but is not owned or operated by, a public water system to which such regulations apply; and

(3) Does not sell water to any person; and

(4) Is not a carrier which conveys passengers in interstate commerce.

History: Cr. Register, February, 1978, No. 266, eff. 3–1–78; am. (1), Register, March, 1991, No. 423, eff. 4–1–91; renum. from NR 109.05, Register, July, 1993, No. 451, eff. 8–1–93.

Subchapter I — Maximum Contaminant Levels, Monitoring and Analytical Requirements

NR 809.09 Maximum contaminant level goals for primary contaminants. (1) Maximum contaminant level goals (MCLGs) are zero for the following contaminants:

Giardia lamblia
Cryptosporidium
Legionella
Total Coliforms
Fecal Coliforms
Escherichia coli
Lead

(2) Maximum contaminant level goals (MCLGs) which are less than the MCLs are as follows:

Contaminants	MCLG in (mg/L)
Acrylamide	0.00001
Alachlor	0.0004
Benzene	0.001
Benzo[a]pyrene	0.000002
Carbon tetrachloride	0.0003
Chlordane	0.00003
Dibromochloropropane	0.00003
Di(2–ethylhexyl)phthalate	0.003
1,2–Dichloroethane	0.0004
1,2–Dichloropropane	0.0005
Epichlorohydrin	0.004
Ethylene Dibromide	0.0000004
Heptachlor	0.000008
Heptachlor Epoxide	0.000004
Hexachlorobenzene	0.00002
Pentachlorophenol	0.0003
Polychlorinated biphenyls (PCBs)	0.000005
2,3,7,8–TCDD (Dioxin)	2×10^{-10}
Tetrachloroethylene	0.0007
Thallium	0.0005
Toxaphene	0.00003
1,1,2–Trichloroethane	0.003
Trichloroethylene	0.003
Vinyl chloride	0.000015

(3) MCLGs which equal the MCLs are as follows:

Contaminant	MCL in mg/L
Atrazine, total chlorinated residue[1]	0.003
Antimony	0.006
Asbestos	7 Million fibers/L (longer than 10 micrometers)
Barium	2
Beryllium	0.004
Cadmium	0.005
Carbofuran	0.04
Chromium	0.1
Copper	1.3
Cyanide (as free Cyanide)	0.2
2,4–D	0.07
Dalapon	0.2
o–Dichlorobenzene	0.6
para–Dichlorobenzene	0.075
1,1–Dichloroethylene	0.007
cis–1,2–Dichloroethylene	0.07
trans–1,2–Dichloroethylene	0.1
Dichloromethane	0.005
Di(2–ethylhexyl)adipate	0.4
Dinoseb	0.007
Diquat	0.02
Endothall	0.1
Endrin	0.002
Ethylbenzene	0.7
Fluoride	4.0
Glyphosate	0.7
Hexachlorocyclopentadiene	0.05
Lindane	0.0002
Mercury	0.002
Methoxychlor	0.04
Monochlorobenzene	0.1
Nickel	0.1
Nitrate	10 (as Nitrogen)
Nitrite	1 (as Nitrogen)
Nitrate + Nitrite	10 (as Nitrogen)
Oxamyl	0.2
Picloram	0.5
Selenium	0.05
Simazine	0.004
Styrene	0.1
Toluene	1
1,2,4–Trichlorobenzene	0.07
1,1,1–Trichloroethane	0.2
2,4,5–TP	0.05
Xylenes (Total)	10

[1] Atrazine, total chlorinated residue includes atrazine and its metabolites, diaminoatrazine, diethylatrazine and deisopropylatrazine.

(4) If a contaminant is not detected in a sample and if the limit of detection is higher than the MCLG, the MCLG shall be considered not to have been exceeded.

(5) Notwithstanding any other provisions of this chapter, if a contaminant listed in sub. (2) is detected at a concentration above the MCLG but below the MCL for that contaminant, the following shall apply:

(a) The system owner or operator shall collect a confirmation sample to verify the presence of the contaminant, unless collected by the department.

(b) Based upon verified results and following a determination by the department on the need for further action as specified in par. (c), the system owner or operator shall provide public information to its customers indicating the analytical results achieved and the health effects of ingesting the substance at the concentration found.

(c) The department may require the system owner or operator to prepare and submit a report which:

1. Assesses the cause and significance of the problem, and

2. Analyzes the cost, effectiveness and feasibility of alternatives for treating the water or developing alternative water sources.

(d) If, based on the conclusions of the report if required under par. (c), the department determines that action is necessary to protect public health, it may require the system owner or operator to treat or replace the water source.

History: Cr. Register, August, 1989, No. 404, eff. 9–1–89; am. (1), Register, March, 1991, No. 423, eff. 4–1–91; renum. from NR 109.09, Register, July, 1993, No. 451, eff. 8–1–93; am. (1) to (3), Register, August, 1994, No. 464, eff. 9–1–94.

NR 809.10 Applicability of primary maximum contaminant levels to water sources. Except as otherwise allowed in this chapter, no water source exceeding any primary maximum contaminant level in this chapter may be connected to a public water system unless blending or treatment is provided such that the primary maximum contaminant level is not exceeded upon entry to the distribution system.

History: Cr. Register, August, 1989, No. 404, eff. 9–1–89; renum. from NR 109.10 and am. Register, July, 1993, No. 451, eff. 8–1–93.

NR 809.11 Inorganic chemical maximum contaminant levels. (1) (a) The maximum contaminant levels for nitrate and nitrite are applicable to both community water systems and non–community water systems, except as provided in sub. (3).

(b) The maximum contaminant levels for arsenic and fluoride only apply to community water systems.

(c) The maximum contaminant levels for antimony, asbestos, barium, beryllium, cadmium, chromium, cyanide, mercury, nickel, selenium and thallium apply to community water systems and non–transient, non–community water systems.

(d) Compliance with maximum contaminant levels for inorganic chemicals is calculated under s. NR 809.12.

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

(a) Contaminant	MCL in mg/L
Arsenic	0.05
Asbestos	7 Million fibers/liter (longer than 10 um)
Barium	2
Cadmium	0.005
Chromium	0.1
Fluoride	4.0
Mercury	0.002
Nitrate	10 (as Nitrogen)
Nitrite	1 (as Nitrogen)
Total NitrateNitrite	10 (as Nitrogen)
Selenium	0.05
(b) Contaminant	**MCL in mg/L**
Antimony	0.006
Beryllium	0.004
Cyanide (as free Cyanide)	0.2
Nickel	0.1
Thallium	0.002

Note: Water systems having fewer than 150 service connections begin monitoring for the contaminants listed in par. (b) in the January 1, 1996-December 31, 1998 compliance period.

(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.

(4) (a) The following are the BATs available for achieving compliance with the maximum contaminant levels for the inorganic contaminants listed in sub. (2), except for arsenic and fluoride:

Contaminant	BAT(s)
Antimony	2,7
Asbestos	2,3,8
Barium	5,6,7,9
Beryllium	1,2,5,6,7
Cadmium	2,5,6,7
Chromium	2,5,6[2],7
Cyanide	5,7,10
Mercury	2[1],4,6[1],7[1]
Nickel	5,6,7
Nitrate	5,7,9
Nitrite	5,7
Selenium	1,2[3],6,7,9
Thallium	1,5

[1]BAT only if influent Hg concentration

[2]BAT for Chromium III only.

[3]BAT for Selenium IV only.

Key to BATs in Table:

1 = Activated Alumina

2 = Coagulation/Filtration

3 = Direct and Diatomite Filtration

4 = Granular Activated Carbon

5 = Ion Exchange

6 = Lime Softening

7 = Reverse Osmosis

8 = Corrosion Control

9 = Electrodialysis

10 = Oxidation (Chlorine)

(b) A public water system owner or operator may use an alternative treatment not listed in par. (a) if it is demonstrated to the department, using pilot studies or other means, that the alternative treatment is sufficient to achieve compliance with the MCLs in sub. (2).

History: Cr. Register, February, 1978, No. 266, eff. 3–1–78; am. Register, April, 1982, No. 316, eff. 5–1–82; am. (1) and (2), Register, August, 1989, No. 404, eff. 9–1–89; renum. from NR 109.11 and am. (1) and (2), Register, July, 1993, No. 451, eff. 8–1–93; am. (1) (c), (2) and (4) (a), Register, August, 1994, No. 464, eff. 9–1–94.

NR 809.12 Inorganic chemical sampling and analytical requirements. Monitoring for the contaminants listed in s. NR 809.11 for the purposes of determining compliance with the maximum contaminant levels shall be conducted as follows:

(1) (a) Groundwater sources shall be sampled at every entry point to the distribution system which is representative of each well after treatment beginning in the initial compliance period. Each sample shall be taken at the same entry point unless conditions make another sampling location more representative of each source after treatment.

(b) Surface water sources or combined surface water and groundwater sources shall be sampled at every point of entry to the distribution system after any application of treatment, or in the distribution system at a point which is representative of each source after treatment beginning in the initial compliance period. Each sample shall be taken at the same entry point unless conditions make another sampling location more representative of each source after treatment.

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

(2) The frequency of monitoring to determine compliance with the maximum contaminant level for asbestos specified in s. NR 809.11 (2) shall be conducted as follows:

(a) Each community and non–transient, non–community water system is required to monitor for asbestos during the first 3–year compliance period of each 9–year compliance cycle beginning in the compliance period starting January 1, 1993.

(b) If the owner or operator of the system believes it is not vulnerable to either asbestos contamination in its source water or due to corrosion of asbestos–cement pipe, or both, it may apply to the department for a waiver of the monitoring requirement in par. (a). If the department grants the waiver, the system is not required to monitor.

(c) The department may grant a waiver based on a consideration of the following factors:

1. Potential asbestos contamination of the water source, and

2. The use of asbestos–cement pipe for finished water distribution and the corrosive nature of the water.

(d) A waiver remains in effect until the completion of the 3–year compliance period. Systems not receiving a waiver shall monitor in accordance with the provisions of par. (a).

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

(f) A system vulnerable to asbestos contamination due solely to source water shall monitor in accordance with the provisions in sub. (1).

(g) A system vulnerable to asbestos contamination due both to its source water supply and corrosion of asbestos–cement pipe shall take one sample at a tap served by asbestos–cement pipe and under conditions where asbestos contamination is most likely to occur.

(h) A system which exceeds the MCL as determined in s. NR 809.12 (9) shall monitor quarterly beginning in the next quarter after the violation occurred. The department may decrease the quarterly monitoring requirement to one sample as specified in par. (a) provided the department has determined that the system is reliably and consistently below the maximum contaminant level. In no case may the department make this determination unless a groundwater system takes a minimum of 2 quarterly samples and a surface water system or a combined surface water and groundwater system takes a minimum of 4 quarterly samples.

(i) If monitoring data collected after January 1, 1990 are generally consistent with the requirements of this subsection, then the department may allow system owners to use that data to satisfy the monitoring requirement for the initial compliance period beginning January 1, 1993.

(3) Each community water system and non–transient non–community water system owner or operator shall monitor for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium and thallium as follows:

(a) Groundwater sources shall be sampled at each entry point during each compliance period. Suppliers of water having surface water sources or combined surface water and groundwater sources shall take one sample annually at each entry point.

(b) The system owner or operator may apply to the department for a waiver from the monitoring frequencies specified in par. (a). The department may grant a waiver for monitoring of cyanide, provided that the system is not vulnerable to contamination because there is no industrial source of cyanide.

(c) A condition of the waiver shall require the collection of a minimum of one sample while the waiver is effective. The term during which the waiver is effective may not exceed 9 years.

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

(e) In determining the appropriate reduced monitoring frequency, the department shall consider:

1. Reported concentrations from all previous monitoring;

2. The degree of variation in reported concentrations; and

3. 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.

(f) Systems which exceed the MCLs as calculated in sub. (9) shall be monitored quarterly beginning in the next quarter after the violation occurred. The department may decrease the quarterly monitoring requirement to the frequencies specified in pars. (a) and (b) provided it has determined that the system is reliably and consistently below the maximum contaminant level. In no case may the department make this determination unless a groundwater system takes a minimum of 2 quarterly samples and a surface water system takes a minimum of 4 quarterly samples.

(4) All public water system owners or operators shall monitor to determine compliance with the MCL for nitrate specified in s. NR 809.11 (2) as follows:

(a) Community water systems and non–transient non–community water systems served by groundwater systems shall be monitored annually; systems served by surface water shall monitor quarterly.

(b) Transient non–community water systems shall be monitored annually.

(c) For community and non–transient non–community water systems, the repeat monitoring frequency for groundwater systems shall be quarterly for at least one year following any one sample in which the concentration is greater than or equal to 5 mg/L nitrate as nitrogen. The department may reduce a groundwater system's sampling frequency to annual after 4 consecutive quarterly samples are reliably and consistently less than the MCL.

(d) The department may reduce a surface water system's sampling frequency to annual if all analytical results from 4 consecutive quarters are less than 5 mg/L nitrate as nitrogen. A surface water system shall return to quarterly monitoring if any one sample is greater than or equal to 5 mg/L nitrate.

(e) After the initial round of quarterly sampling is completed, any community or non–transient non– community water system which is monitoring annually shall take subsequent samples during the quarter which previously resulted in the highest analytical result.

(5) All public water system owners and operators shall monitor to determine compliance with the MCL for nitrite specified in s. NR 809.11 (2) as follows:

(a) All public water systems owners or operators shall take one sample at each entry point in the compliance period specified by the department.

(b) After the initial sample, systems where an analytical result for nitrite is less than 0.5 mg/L nitrate as nitrogen shall monitor at the frequency specified by the department. Notwithstanding par. (c), the frequency may not exceed 1 sample per year.

(c) The repeat monitoring frequency shall be quarterly for at least one year following any one sample in which the concentration of nitrite is greater than or equal to 0.5 mg/L nitrite as nitrogen. The department may reduce the sampling frequency to annual after determining the concentration is reliably and consistently less than the MCL. Each subsequent annual sample shall be taken during the quarter which previously resulted in the highest analytical result.

(6) (a) The department may require the collection of a confirmation sample where sample results indicate an exceedance of the MCL for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium or thallium. The confirmation sample shall be collected as soon as possible after the initial sample results were received, but not exceeding 2 weeks, at the same entry point.

(b) Where nitrate or nitrite sampling results indicate an exceedance of the MCL, the system shall take a confirmation sample within 24 hours of the system's receipt of notification of the analytical results of the first sample. Systems unable to comply with the 24–hour sampling requirement shall immediately notify the consumers served by the public water system in accordance with s. NR 809.81. Systems exercising this option shall take and analyze a confirmation sample within 2 weeks of notification of the analytical results of the first sample.

(c) If the department requires a confirmation sample for any contaminant, the results of the initial and confirmation samples shall be averaged. The resultant average shall be used to determine the system's compliance in accordance with sub. (9). The department may delete results of obvious sampling errors, or may require the collection of additional samples to determine whether the result is or is not in error.

(7) The department may require more frequent monitoring than specified in subs. (2), (3), (4) and (5) and may require confirmation samples for positive and negative results at its discretion.

(8) Systems may apply to the department to conduct more frequent monitoring than the minimum monitoring frequencies specified in this section.

(9) (a) Compliance with s. NR 809.11 shall be determined based on the analytical results obtained at each entry point. Any contaminant listed in s. NR 809.11 which is detected shall be quantified.

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

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

(d) Compliance with the MCLs for nitrate, nitrite or combined nitrate and nitrite is determined based on one sample if the levels of these contaminants are below the MCLs. If the levels exceed a MCL in the initial sample, a confirmation sample is required in accordance with sub. (6) (b). Compliance shall be determined based on the average of the initial and confirmation samples.

(e) If a public water system has a distribution system separable from other parts of the distribution system with no interconnections, the department may allow the system to give public notice to only the area served by that portion of the system which is out of compliance.

(10) Each public water system shall monitor during the month, quarter or year designated by the department during each compliance period.

(11) Analyses conducted to determine compliance with s. NR 809.11 shall be made in accordance with methods listed in s. NR 809.725 (1), Table A.

(12) Sample collection for the inorganic contaminants under s. NR 809.11 (2) shall be conducted using the sample preservation, containers and maximum holding time procedures specified in s. NR 809.725 (1), Table F.

(13) Analyses under this section shall only be conducted by laboratories that have received certification under ch. NR 149 or approval by EPA.

(14) (a) The department may reduce the total number of samples a system shall analyze by allowing the use of compositing. Compositing shall only be permitted for entry points within a single system. Composite samples from a maximum of 5 entry points are allowed, provided that the detection limit of the method used for analysis is less than one–fifth of the MCL.

(b) Compositing of samples shall be done in the laboratory.

(c) If the concentration in the composite sample is greater than or equal to one–fifth of the MCL of any inorganic contaminant, a follow–up sample shall be taken from each entry point included in the composite and analyzed within 14 days. These samples shall be analyzed for the contaminants which exceeded one–fifth of the MCL in the composite sample.

(d) If duplicates of the original sample taken from each entry point used in the composite are available and the holding time listed in s. NR 809.725 (1) Table F has not been exceeded, the system may use these instead of resampling. The duplicates shall be analyzed and the results reported to the department within 14 days of the composite analysis.

Note: Detection limits for each analytical method are listed in 40 CFR Part 141.23.

History: Cr. Register, February, 1978, No. 266, eff. 3–1–78; am. Register, April, 1982, No. 316, eff. 5–1–82; am. (3) and (4), cr. (7), Register, August, 1989, No. 404, eff. 9–1–89; am. (6), Register, March, 1991, No. 423, eff. 4–1–91; renum. from NR 109.12, r. and recr. Register, July, 1993, No. 451, eff. 8–1–93; am. (3) (intro.), (a) and (b), (6) (a), (9) (b) and (c), (12) and (13), cr. (14), Register, August, 1994, No. 464, eff. 9–1–94; am. (1) (a) and (b), (3) (a) and (b), (9) (b), Register, October, 1997, No. 502, eff. 11–1–97; am. (3) (a), (4) (a) and (b), (5) (a) and (13), Register, December, 2000, No. 540, eff. 1–1–01.

NR 809.13 Sodium monitoring, reporting and notification requirements. (1) The supplier of water for a community water system shall collect and analyze one sample per plant at the entry point to 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 as prescribed in s. NR 809.725 (1), Table E.

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

History: Cr. Register, April, 1982, No. 316, eff. 5–1–82; r. and recr. (4), Register, March, 1991, No. 423, eff. 4–1–91; renum. from NR 109.13, am. (1), Register, July, 1993, No. 451, eff. 8–1–93.

NR 809.14 Corrosivity monitoring — special 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 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 listed in s. NR 809.725 (1), Table E.

(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.

History: Cr. Register, April, 1982, No. 316, eff. 5–1–82; am. (3), Register, March, 1991, No. 423, eff. 4–1–91; renum. from NR 109.14, Register, July, 1993, No. 451, eff. 8–1–93.

NR 809.20 Synthetic organic contaminant maximum contaminant levels and BATS. (1) The following maximum contaminant levels for organic contaminants apply to

community water systems and non–transient non–community water systems.

(a) Contaminant	MCL (mg/L)
Alachlor	0.002
Atrazine	0.003
Carbofuran	0.04
Chlordane	0.002
Dibromochloropropane	0.0002
2,4–D	0.07
Endrin	0.002
Ethylene Dibromide	0.00005
Heptachlor	0.0004
Heptachlor epoxide	0.0002
Lindane	0.0002
Methoxychlor	0.04
Polychlorinated biphenyls (PCBs)	0.0005
Pentachlorophenol	0.001
Toxaphene	0.003
2,4,5–TP	0.05

(b) Contaminant	MCL (mg/L)
Benzo[a]pyrene	0.0002
Dalapon	0.2
Di(2–ethylhexyl)adipate	0.4
Di(2–ethylhexyl)phthalate	0.006
Dinoseb	0.007
Diquat	0.02
Endothall	0.1
Glyphosate	0.7
Hexachlorobenzene	0.001
Hexachlorocyclopentadiene	0.05
Oxamyl	0.2
Picloram	0.5
Simazine	0.004
2,3,7,8–TCDD (Dioxin)	$3x10^{-8}$

Note: Water systems having fewer than 150 service connections begin monitoring for the contaminants listed in par. (b) in the January 1, 1996 – December 31, 1998 compliance period.

(2) The following are the BATs available for achieving compliance with the maximum contaminant levels for the organic chemicals listed in sub. (1):

(a) Central treatment using granular activated carbon, except for glyphosate,

(b) Packed tower aeration for dibromochloropropane, di(2–ethylhexyl)adipate, ethylene dibromide, and hexachlorocyclopentadiene and,

(c) Oxidation for glyphosate.

(3) A public water system owner or operator may use an alternative treatment not listed in sub. (2) if it is demonstrated to the department, using pilot studies or other means, that the alternative treatment is sufficient to achieve compliance with the MCLs in sub. (1).

History: Cr. Register, February, 1978, No. 266, eff. 3–1–78; cr. (3), Register, April, 1982, No. 316, eff. 5–1–82; am. title and (1) (intro.), r. (3), Register, August, 1989, No. 404, eff. 9–1–89; renum. from NR 109.20, r. and recr. Register, July, 1993, No. 451, eff. 8–1–93; am. Register, August, 1994, No. 464, eff. 9–1–94; am. (2) (b), Register, October, 1997, No. 502, eff. 11–1–97.

NR 809.21 Synthetic organic contaminant sampling and analytical requirements. (1) Owners or operators of community and non–transient non–community water systems shall monitor for the synthetic organic contaminants listed in s. NR 809.20 for the purposes of determining compliance with the maximum contaminant levels as follows:

(a) Groundwater sources shall be sampled at every entry point to the distribution system which is representative of each well after treatment. Each sample shall be taken at the same entry point unless conditions make another sampling location more representative of each source or treatment plant.

(b) Surface water sources or combined surface water and groundwater sources shall be sampled at each entry point to the distribution system after treatment, or at points in the distribution system that are representative of each source after treatment. Each sample shall be taken at the same entry point unless conditions make another sampling location more representative of each source or treatment plant.

(c) If the system draws water from more than one source and the sources are combined before distribution, the system shall be sampled at an entry point to the distribution system during periods of normal operating conditions when water representative of all sources is being used.

(2) (a) Each community and non–transient, non–community water system shall take 4 consecutive quarterly samples for each contaminant listed in s. NR 809.20 every 3 years beginning with the initial compliance period.

Note: For the contaminants in s. NR 809.20 (1) (b), the initial compliance period is January 1993 – December 1995 for systems with 150 or more service connections and January 1996 – December 1998 for systems having fewer than 150 service connections.

(b) Systems serving more than 3,300 persons which do not detect a contaminant in the initial compliance period may reduce the sampling frequency to a minimum of 2 quarterly samples in one year during each repeat compliance period.

(c) Systems serving fewer than or equal to 3,300 persons which do not detect a contaminant in the initial compliance period may reduce the sampling frequency to a minimum of one sample during each repeat compliance period.

(3) Each community and non–transient non–community water system may apply to the department for a waiver from the requirements of sub. (2). A system shall reapply for a waiver for each compliance period.

(4) The department may grant a waiver after evaluating the following factors:

(a) Knowledge of previous use including transport, storage or disposal of the contaminant within the watershed or zone of influence of the system. If a determination by the department reveals no previous use of the contaminant within the watershed or zone of influence, a waiver may be granted.

(b) If previous use of the contaminant is unknown or it has been used previously, then the following factors shall be used to determine whether a waiver is granted:

1. Previous analytical results.

2. The proximity of the system to a potential point or non–point source of contamination. Point sources include spills and leaks of chemicals at or near a water treatment facility or at manufacturing, distribution, or storage facilities, or from hazardous and municipal waste landfills and other waste handling or treatment facilities. Non–point sources include the use of pesticides to control insect and weed pests on agricultural areas, forest lands, home and gardens, and other land application uses.

3. The environmental persistence and transport of the pesticide or PCBs.

4. How well the water source is protected against contamination due to such factors as depth of the well and the type of soil and the integrity of the well casing.

5. Elevated nitrate levels at the water supply source.

6. Use of PCBs in equipment used in the production, storage or distribution of water such as pumps, transformers, etc.

(5) (a) If an organic contaminant listed in s. NR 809.20 is detected as defined by sub. (6) in any sample, then the system

owner or operator shall monitor quarterly at each entry point which resulted in a detection.

(b) The department may decrease the quarterly monitoring requirement specified in par. (a) provided it has determined that the system is reliably and consistently below the MCL. In no case may the department make this determination unless a groundwater system takes a minimum of 2 quarterly samples and a surface water system takes a minimum of 4 quarterly samples.

(c) After the department determines the system is reliably and consistently below the MCL, the department may allow the system to monitor annually. Systems which monitor annually shall monitor during the quarter that previously yielded the highest analytical results.

(d) Systems which have 3 consecutive annual samples with no detection of a contaminant may apply to the department for a waiver as specified in sub. (3).

(e) If monitoring results in detection of one or more of certain related contaminants such as heptachlor and heptachlor epoxide, then subsequent monitoring shall analyze for all related contaminants.

(6) Detection as used in this section shall be defined as greater than or equal to the following concentrations for each contaminant.

Contaminant	Detection Limit (mg/L)
1. Alachlor	0.0002
2. Atrazine	0.0001
3. Benzo[a]pyrene	0.00002
4. Carbofuran	0.0009
5. Chlordane	0.0002
6. 2,4-D	0.0001
7. Dalapon	0.001
8. Dibromochloropropane	0.00002
9. Di(2-ethylhexyl)adipate	0.006
10.Di(2-ethylhexyl)phthalate	0.006
11.Dinoseb	0.0002
12.Diquat	0.0004
13.Endothall	0.009
14.Endrin	0.00001
15.Ethylene dibromide	0.00001
16.Glyphosate	0.006
17.Heptachlor	0.00004
18.Heptachlor epoxide	0.00002
19.Hexachlorobenzene	0.0001
20.Hexachlorocyclopentadiene	0.0001
21.Lindane	0.00002
22.Methoxychlor	0.0001
23.Oxamyl	0.002
24.Picloram	0.0001
25.Polychlorinated biphenyls (PCBs as decachlorobiphenyls)	0.0001
26.Pentachlorophenol	0.00004
27.Simazine	0.00007
28.Toxaphene	0.001
29.2,3,7,8-TCDD (Dioxin)	0.000000005
30.2,4,5-TP	0.0002

(7) (a) If an organic contaminant listed in s. NR 809.20 is detected at a level exceeding the MCL in any sample, then the system owner or operator shall take a confirmation sample at each entry point which exceeded a MCL.

(b) Systems which exceed a MCL listed in s. NR 809.20 as determined by sub. (10) shall monitor quarterly. After a minimum of 4 quarterly samples show the system is in compliance and the department determines the system is reliably and consistently below the MCL as specified in sub. (10), the system shall monitor at the frequency specified in sub. (5) (c).

(8) The department may require a confirmation sample for positive or negative results. If a confirmation sample is required by the department, the result shall be averaged with the first sampling result and the average used for the compliance determination as specified by sub. (10). The department may delete results of obvious sampling errors from this calculation, or may require additional samples to determine whether the result is or is not in error.

(9) (a) The department may reduce the total number of samples a system shall analyze by allowing the use of compositing. Composite samples from a maximum of 5 entry points are allowed, provided that the detection limit of the method used for analysis is less than one-fifth of the MCL. Compositing is only permitted at entry points within a single system. Compositing of samples shall be done in the laboratory and analyzed within 14 days of sample collection.

(b) If the concentration in the composite sample detects one or more contaminants listed in s. NR 809.20, then a follow-up sample shall be taken and analyzed for each contaminant detected within 14 days from each entry point included in the composite.

(c) If duplicates of the original sample taken from each entry point used in the composite are available, the system may use these duplicates instead of resampling. The duplicate shall be analyzed and the results reported to the department within 14 days of collection.

(10) (a) Compliance with the MCLs specified in s. NR 809.20 shall be determined based on the analytical results obtained at each entry point.

(b) For systems which are conducting monitoring more frequently than annual, compliance is determined by a running annual average of all samples taken at each entry point. If the annual average of any entry point is greater than the MCL, then the system is out of compliance. If the initial sample or a subsequent sample would cause the annual average to be exceeded, then the system is out of compliance immediately.

(c) If monitoring is conducted annually or less frequently, the system is out of compliance if the level of a contaminant at any entry point is greater than the MCL. Compliance shall be based on the average value of the initial sample and the confirmation sample.

(d) Any contaminant listed in s. NR 809.20 that is detected shall be quantified. Any sample below the reported method detection limit shall be calculated at zero for the purposes of determining the averages in pars. (b) and (c).

(e) If a public water system has a distribution system separable from other parts of the distribution system with no interconnections, the department may allow the system to give public notice to only that portion of the system which is out of compliance.

(11) Analysis for the organic contaminants listed in s. NR 809.20 shall be conducted using the methods prescribed in s. NR 809.725 (1), Table B.

(12) Analysis for PCBs shall be conducted as follows:

(a) Each system which monitors for PCBs shall analyze each sample using either Method 505 or Method 508 as specified in s. NR 809.725 (1), Table B.

(b) If one or more of 7 PCB Aroclors are detected as designated in this paragraph in any sample analyzed using Methods 505 and

508, the sample shall be reanalyzed using Method 508A to quantitate PCBs as decachlorobiphenyl.

Aroclor	Detection limit (mg/L)
1016	0.00008
1221	0.02
1232	0.0005
1242	0.0003
1248	0.0001
1254	0.0001
1260	0.0002

(c) Compliance with the PCB MCL shall be determined based upon the quantitative results of analyses using Method 508A.

(13) Analyses under this section shall only be conducted by laboratories that have received certification under ch. NR 149 or approval by EPA.

(14) If monitoring data collected after January 1, 1990 are generally consistent with the requirements of s. NR 809.21, then the department may allow systems to use that data to satisfy the monitoring requirements for the initial compliance period beginning January 1, 1993.

(15) The department may increase the required monitoring frequency, where necessary, to detect variations within the system. Examples of variations include fluctuations in concentration due to seasonal use or changes in water source.

(16) The department may determine compliance or initiate enforcement action based upon analytical results and other information complied by their sanctioned representatives and agencies.

(17) Each public water system shall monitor during the month, quarter or year designated by the department within each compliance period.

History: Cr. Register, February, 1978, No. 266, eff. 3–1–78; am., Register, April, 1982, No. 316, eff. 5–1–82; am. (4) and (5), Register, December, 1982, No. 324, eff. 1–1–83; am. title, (3) and (5), Register, August, 1989, No. 404, eff. 9–1–89; am. (4), r. (5) and (6), Register, March, 1991, No. 423, eff. 4–1–91; renum. from NR 109.21, r. and recr. Register, July, 1993, No. 451, eff. 8–1–93; am. (2) (a), (6), (9) (a) and (13), Register, August, 1994, No. 464, eff. 9–1–94; am. (9) (b), Register, October, 1997, No. 502, eff. 11–1–97; **am. (13), Register, December, 2000, No. 540, eff. 1–1–01.**

NR 809.22 Total trihalomethane maximum contaminant level. The maximum contaminant level of 0.10 mg/L for total trihalomethanes, the sum of the concentrations of bromodichloromethane, dibromochloromethane, tribromomethane (bromoform), and trichloromethane (chloroform), applies to community water systems using surface water or ground water under the direct influence of surface water which serve a population of 10,000 people or more until December 16, 2001. This level applies to community water systems that use only ground water not under the direct influence of surface water and serve a population of 10,000 people or more until December 16, 2003. After December 16, 2003, this section is no longer applicable.

Note: Compliance with the maximum contaminant level for total trihalomethanes is calculated pursuant to s. NR 809.23.

History: Cr. Register, August, 1989, No. 404, eff. 9–1–89; renum. from NR 109.22 and am., Register, July, 1993, No. 451, eff. 8–1–93; **r. and recr., Register, December, 2000, No. 540, eff. 1–1–01.**

NR 809.23 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 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% 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 system'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 moni-

toring 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 809.22 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 809.80 and notify the public under s. NR 809.81. 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 under s. NR 809.91, conditional waiver under s. NR 809.90 or enforcement action becomes effective.

(5) Sampling and analyses made under this section shall be conducted as prescribed in s. NR 809.725 (1), Table B.

(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 809.22, 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) 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 prechlorination 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.

History: Cr. Register, April, 1982, No. 316, eff. 5–1–82; renum. to be NR 809.23 and am. (4), Register, August, 1989, No. 404, 9–1–89; r. and recr. (5), am. (6) (intro.), Register, March, 1991, No. 423, eff. 4–1–91; renum. from NR 109.23, Register, July, 1993, No. 451, eff. 8–1–93; **am. (1), Register, December, 2000, No. 540, eff. 1–1–01.**

NR 809.24 Volatile organic contaminant maximum contaminant levels and BATS. (1) The following maximum contaminant levels for volatile organic (VOC) contaminants apply to community water systems and non–transient, non–community water systems.

Contaminant	MCL (mg/L)
Benzene	0.005
Vinyl chloride	0.0002
Carbon tetrachloride	0.005
1,2–Dichloroethane	0.005
Trichloroethylene	0.005
1,1–Dichloroethylene	0.007
1,1,1–Trichloroethane	0.20
para–Dichlorobenzene	0.075
cis–1,2–Dichloroethylene	0.07
trans–1,2–Dichloroethylene	0.1
Dichloromethane	0.005
1,2–Dichloropropane	0.005
Ethylbenzene	0.7
Monochlorobenzene	0.1
o–Dichlorobenzene	0.6
Styrene	0.1
Tetrachloroethylene	0.005
Toluene	1
1,2,4–Trichlorobenzene	0.07
1,1,2–Trichloroethane	0.005
Xylenes (total)	10

(2) The following are the BATs available for achieving compliance with the maximum contaminant level for the volatile organic chemicals listed in sub. (1):

(a) Central treatment using packed tower aeration, and

(b) Central treatment using granular activated carbon, except for vinyl chloride and dichloromethane.

(3) A public water system owner or operator may use an alternative treatment not listed in sub. (2) if it is demonstrated to the department, using pilot studies or other means, that the alternative treatment is sufficient to achieve compliance with the MCLs in sub. (1).

History: Cr. Register, August, 1989, No. 404, eff. 9–1–89; renum. from NR 109.24 and am. (1) and (2) (a), cr. (3), Register, July, 1993, No. 451, eff. 8–1–93; am. (1) and (2) (b), Register, August, 1994, No. 464, eff. 9–1–94; am. (2) (a), Register, October, 1997, No. 501, eff. 11–1–97.

NR 809.25 Volatile organic contaminant sampling and analytical requirements. (1) Owners or operators of community and non–transient non–community water systems shall monitor for the contaminants listed in s. NR 809.24 for purposes of determining compliance with the maximum contaminant levels as follows:

(a) Groundwater sources shall be sampled at every entry point to the distribution system which is representative of each well after treatment. Each sample shall be taken at the same entry point unless conditions make another sampling location more representative of each source, treatment plant, or within the distribution system.

(b) Surface water sources or combined surface water and groundwater sources shall be sampled at each entry point to the distribution system after treatment or at points in the distribution system that are representative of each source after treatment. Each sample shall be taken at the same entry point unless conditions make another sampling location more representative of each source, treatment plant or within the distribution system.

(c) If the system draws water from more than one source and the sources are combined before distribution, the system shall be sampled at an entry point to the distribution system during periods of normal operating conditions when water representative of all sources is being used.

(2) Each community and non–transient non–community water system owner or operator shall take 4 consecutive quarterly

samples for each VOC contaminant specified in s. NR 809.24 during each compliance period, beginning with the initial compliance period.

(3) If the initial monitoring for VOC contaminants listed in s. NR 809.24 as allowed in sub. (19) has been completed by December 31, 1992 and the analysis did not detect any VOC contaminant specified in s. NR 809.24, then the system owner or operator shall take one sample annually beginning January 1, 1993.

(4) After a minimum of 3 years of annual sampling, the department may allow groundwater systems with no previous detection of any VOC contaminant specified in s. NR 809.24 to take one sample during each compliance period.

(5) Each community and non–transient groundwater system which does not detect a VOC contaminant specified in s. NR 809.24 may apply to the department for a waiver from the requirements of subs. (3) and (4) after completing the initial monitoring. For the purposes of this section, detection is defined as >0.0005 mg/l, except for vinyl chloride for which detection is defined as >0.0003 mg/L. A waiver shall be effective for no more than 6 years or 2 compliance periods.

(6) The department may grant a waiver after evaluating the following factors:

(a) Knowledge of previous use including transport, storage or disposal of the contaminant within the watershed or zone of influence of the system. If a determination by the department reveals no previous use of the contaminant within the watershed or zone of influence, a waiver may be granted.

(b) If previous use of the contaminant is unknown or it has been used previously, then the following factors shall be used to determine whether a waiver is granted.

1. Previous analytical results.

2. The proximity of the system to potential point or non–point source of contamination. Point sources include spills and leaks of chemicals at or near a water treatment facility or at manufacturing, distribution or storage facilities, or from hazardous and municipal waste landfills and other waste handling or treatment facilities.

3. The environmental persistence and transport of the contaminants.

4. The number of persons served by the public water system and the proximity of a smaller system to a larger system.

5. How well the water source is protected against contamination such as whether it is a surface or groundwater system. Groundwater systems shall consider factors such as depth of the well, the type of soil and wellhead protection. Surface water systems shall consider watershed protection.

(7) As a condition of the waiver a groundwater system shall take one sample at each entry point during the time the waiver is effective, and update its vulnerability assessment considering the factors listed in sub. (6). Based on this vulnerability assessment, the department shall reconfirm that the system is non–vulnerable. If the department does not make this reconfirmation within 3 years of the initial determination, then the waiver is invalidated and the system is required to sample annually as specified in sub. (3).

(8) Each community and non–transient non–community surface water system which does not detect a contaminant specified in s. NR 809.24 may apply to the department for a waiver from the requirements of sub. (3) after completing initial monitoring. Systems meeting this criteria shall be determined by the department to be non–vulnerable based on a vulnerability assessment during each compliance period. Each system receiving a waiver shall sample at the frequency specified by the department.

(9) If vinyl chloride is detected at a level exceeding 0.0003 mg/L, or other VOC contaminant specified in s. NR 809.24 is detected at a level exceeding 0.0005 mg/1 in any sample, then:

(a) The system shall monitor quarterly at each entry point which resulted in a detection.

(b) The department may decrease the quarterly monitoring requirement specified in par. (a) provided it has determined that the system is reliably and consistently below the MCL. In no case may the department make this determination unless a groundwater system takes a minimum of 2 quarterly samples and a surface water system takes a minimum of 4 quarterly samples.

(c) If the department determines that the system is reliably and consistently below the MCL, the department may allow the system to monitor annually. Systems which monitor annually shall monitor during the quarter which previously yielded the highest analytical result.

(d) Systems which have 3 consecutive annual samples with no detection of a contaminant may apply to the department for a waiver as specified in sub. (5).

(10) If a VOC contaminant specified in s. NR 809.24 is detected at a level exceeding the MCL in any sample, then:

(a) The system shall take a confirmation sample at each entry point which exceeded a MCL.

(b) A system which exceeds a MCL listed in s. NR 809.24 as determined under sub. (13) shall monitor quarterly. After a minimum of 4 consecutive quarterly samples which show the system is in compliance as specified in sub. (13), and the department determines that the system is reliably and consistently below the maximum contaminant level, the system may monitor at the frequency and time specified in sub. (9) (c).

(11) The department may require a confirmation sample for positive or negative results. The department may delete results of sampling errors from any compliance calculation, or may require the collection of additional samples to determine whether the result is or is not in error. When a confirmation sample is required, the result shall be averaged with the first sampling result and the average used for the compliance determination as specified in sub. (13).

(12) (a) The department may reduce the total number of samples a system shall analyze by allowing the use of compositing. Compositing shall only be permitted for entry points within a single system. Composite samples from a maximum of 5 entry points are allowed, provided that the detection limit of the method used for analysis is less than one–fifth of the MCL.

(b) Compositing of samples shall be done in the laboratory and analyzed within 14 days of sample collection according to the procedures in s. NR 809.725 (2) and (3).

(c) If the concentration in the composite sample is greater than 0.0003 mg/L for vinyl chloride or 0.0005mg/L for any other contaminant listed under s. NR 809.24, then a follow–up sample shall be taken and analyzed for each contaminant detected within 14 days from each entry point included in the composite.

(d) If duplicates of the original sample taken from each sampling point used in the composite are available, the system may use these instead of resampling. The duplicate shall be analyzed and the results reported to the department within 14 days of collection.

(13) (a) Compliance with the VOC MCLs specified in s. NR 809.24 shall be determined based on the analytical results obtained at each entry point.

(b) For systems which are conducting monitoring more frequently than annually, compliance is determined by a running annual average of all samples taken at each entry point. If the annual average of any entry point is greater than the MCL, the system is out of compliance. If the initial sample or a subsequent sample would cause the annual average to exceed the MCL, the system is out of compliance immediately.

(c) If monitoring is conducted annually, or less frequently, the system is out of compliance if the level of a contaminant at any entry point is greater than the MCL. Compliance shall be based on the average value of this sample and the confirmation sample.

(d) Any contaminant listed in s. NR 809.24 that is detected shall be quantified. Any sample below the reported method detection limit shall be calculated at zero for the purposes of determining the averages in pars. (b) and (c).

(e) If a public water system has a distribution system separable from other parts of the distribution system with no interconnections, the department may allow the system to give public notice to only that area served by that portion of the system which is out of compliance.

(14) The department may increase monitoring requirements when necessary to detect contaminant variations within a system.

(15) Analyses under this section shall be conducted using the methods prescribed in s. NR 809.725 (1), Table B. Samples shall be collected using the containers, preservative and holding times specified in s. NR 809.725 (1), Table G.

(16) Analyses under this section shall only be conducted by laboratories that have received certification by EPA or certified under ch. NR 149.

(17) Each certified laboratory shall determine the method detection limit (MDL) at which it is capable of detecting VOCs as defined under 40 Code of Federal Regulations, Part 136, Appendix B. The maximum acceptable MDL is 0.0005 mg/L for all VOCs except vinyl chloride, which is 0.0003 mg/L. These are the detection concentrations for purposes of this section.

(18) The department may increase monitoring requirements when necessary to detect contaminant variations within a system.

(19) The department may allow the use of monitoring data collected after January 1, 1988 for purposes of monitoring compliance. If the data are generally consistent with the other requirements in this section, the department may use a single sample rather than 4 quarterly samples to satisfy the initial monitoring requirement of sub. (2).

(20) Each public water system shall monitor during the month, quarter or year designated by the department within each compliance period.

(21) The department may determine compliance or initiate enforcement action based upon analytical results and other information compiled by their sanctioned representatives and agencies.

History: Cr. Register, August, 1989, No. 404, eff. 9–1–89; am. (7) (a) 3. and (b) 3., (c), (8), r. and recr. (9), Register, March, 1991, No. 423, eff. 4–1–91; renum. from NR 109.25, r. and recr. Register, July, 1993, No. 451, eff. 8–1–93; am. (12) (a), Register, August, 1994, No. 464, eff. 9–1–94; am. (2), (12) (c), (16) and (17), Register, October, 1997, No. 502, eff. 11–1–97.

NR 809.26 Special monitoring, reporting, and public notification for selected organic contaminants and sulfate. (1) (a) Suppliers of water having community or non–transient, non–community water systems shall monitor for the contaminants listed in par. (e) by the date specified in Table 1:

Table 1 –
Monitoring Schedule by System Size

Number of persons served	Monitoring to begin no later than–
Over 10,000	Jan. 1, 1988
3,300 to 10,000	Jan. 1, 1989
Less than 3,300	Jan. 1, 1991

[1] A trihalomethane (THM). Monitoring results for total THMs required under s. NR 809.23 do not comply with this section because the samples are collected in the distribution system.

(b) Surface water systems shall be sampled at points in the distribution system representative of each water system source or at entry points to the distribution system after any application of treatment. The minimum number of samples is one year of quarterly samples per water source.

(c) Groundwater systems shall be sampled at points of entry to the distribution system representative of each well after any application of treatment. The minimum number of samples is one sample per entry point to the distribution system.

(d) The department may require confirmation and follow–up samples for positive or negative results.

(e) Suppliers of water having community water systems or non–transient, non–community water systems shall monitor for the following contaminants at the discretion of the department:

Chloroform[1]
Bromoform[1]
Chlorodibromomethane[1]
Bromodichloromethane[1]
Bromobenzene
Bromomethane
Chloromethane
Chloroethane
o–Chlorotoluene
p–Chlorotoluene
Dibromomethane
m–Dichlorobenzene
1,1–Dichloropropene
1,1–Dichloroethane
1,3–Dichloropropane
2,2–Dichloropropane
1,3–Dichloropropene
1,1,1,2–Tetrachloroethane
1,1,2,2–Tetrachloroethane
1,2,3–Trichloropropane
1,2,4–Trimethylbenzene
1,2,3–Trichlorobenzene
n–Propylbenzene
n–Butylbenzene
Napthalene
Hexachlorobutadiene
1,3,5–Trimethylbenzene
p–Isopropyltoluene
Isopropylbenzene
Tert–butylbenzene
Sec–butylbenzene
Fluorotrichloromethane
Dichlorodifluoromethane
Bromochloromethane

(f) Analysis under this section shall be conducted using the methods prescribed in s. NR 809.725 (1), Table B.

(g) Analysis under this section shall only be conducted by laboratories that have received approval by the U.S. environmental protection agency or are certified under ch. NR 149.

(h) Public water systems may use monitoring data collected any time after January 1, 1983 to meet the requirements for unregulated monitoring, provided that the monitoring program was consistent with the requirements of this section.

(i) Suppliers of water having a community water system or a non–transient, non–community water system shall repeat the monitoring required in this subsection as specified by the department.

(2) (a) The requirements of this subsection only apply to the contaminants listed in sub. (1).

(b) Any supplier of water having a community water system or non–transient, non–community water system who is required to monitor under sub. (1) shall send a copy of the results of such monitoring within 30 days of receipt and any public notice under par. (c) to the department.

(c) The supplier of water shall notify persons served by the system of the availability of the results of sampling under sub. (1) by including a notice in the first set of water bills issued by the system

after the receipt of the results or written notice within 3 months. The notice shall identify a person and supply the telephone number to contact for information on the monitoring results.

(3) Monitoring for sulfate and the contaminants listed in par. (e) shall be conducted as follows:

(a) Suppliers of water for community and non–transient, non–community water systems shall take 4 consecutive quarterly samples at each entry point for the organic contaminants listed in par. (e) and report the results to the department.

(b) Suppliers of water for community or non–transient, non–community water systems shall take one sample at each entry point for sulfate and report the results to the department.

(c) Each community and non–transient non–community water system owner may apply to the department for a waiver from the requirements of pars. (a) and (b).

(d) The department may grant a waiver from the requirements of par. (a) based on the criteria specified in s. NR 809.21 (4). The department may grant a waiver from the requirement of par. (b) if previous analytical results indicate contamination would not occur, provided this data was collected after January 1, 1990.

(e) Groundwater sources shall be sampled at every entry point to the distribution system which is representative of each well after treatment. Each sample shall be taken at the same entry point unless conditions make another sampling location more representative of each source or treatment plant.

(f) Surface water sources or combined surface water and groundwater sources shall be sampled at each entry point to the distribution system after treatment or at points in the distribution system that are representative of each source after treatment. Each sample shall be taken at the same entry point unless conditions make another sampling location more representative of each source or treatment plant.

(g) If the system draws water from more than one source and the sources are combined before distribution, the system shall be sampled at an entry point to the distribution system during periods of normal operating conditions when water representative of all sources is being used.

(h) The department may require a confirmation sample for positive or negative results.

(i) The department may reduce the total number of samples a system shall analyze by allowing the use of compositing. Compositing shall only be permitted at entry points within a single system. Composite samples from a maximum of 5 entry points are allowed. Compositing of samples shall be done in the laboratory and the composite sample shall be analyzed within 14 days of collection.

(j) List of unregulated organic contaminants
Aldrin
Aldicarb
Aldicarb Sulfoxide
Aldicarb Sulfone
Butachlor
Carbaryl
Dicamba
Dieldrin
3–Hydroxycarbofuran
Methomyl
Metolachlor
Metribuzin
Propachlor

(L) Instead of performing the monitoring required by this subsection, a community water system or non– transient non–community water system serving fewer than 150 service connections may send a letter to the department stating that the system is available for sampling. This letter shall be sent to the department by January 1, 1994. The system may not send such samples to the department unless requested to do so by the department.

(4) Analyses under this section shall be conducted using the methods prescribed in s. NR 809.725 (1), Tables A and B.

(5) In lieu of MCLs and monitoring for acrylamide and epichlorohydrin, the following treatment techniques and reporting are required. Each public water system shall certify annually in writing to the department using third party or manufacturer's 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:

(a) Acrylamide = 0.05% dosed at 1 ppm or equivalent.

(b) Epichlorohydrin = 0.01% dosed at 20 ppm or equivalent. Suppliers of water may rely on certification from manufacturers or third parties, as approved by the department

History: Cr. Register, August, 1989, No. 404, eff. 9–1–89; r. and recr. (1) (g), Register, March, 1991, No. 423, eff. 4–1–91; renum. from NR 109.26 and am. (1) (e), r. (1) (f), renum. (1) (g) to (k) to be (1) (f) to (j) and am. (1) (f), (g) and (j), cr. (3) to (5), Register, July, 1993, No. 451, eff. 8–1–93; am. (12) (a), Register, August, 1994, No. 464, eff. 9–1–94; correction in (3) (d) made under s. 13.93 (2m) (b) 7., Stats., Register, October, 1997, No. 501; **am. (1) (e), (3) (intro.), (a) and (b), r. (1) (i), renum. (1) (j) to be (1) (i) and am., Register, December, 2000, No. 540, eff. 1–1–01.**

NR 809.30 Microbiological contaminant maximum contaminant levels. The following are the maximum contaminant levels for coliform bacteria applicable to public water systems.

(1) The maximum contaminant level (MCL) for coliform bacteria is based on the presence or absence of total coliforms in a sample.

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

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

(2) 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 s. NR 809.81, this is a violation that may pose an acute risk to health.

(3) The water supplier for a public water system shall determine compliance with the MCL for total coliforms in subs. (1) and (2) for each period in which the system is required to monitor for total coliforms.

(4) The supplier of water shall initiate definitive action to identify the cause of the positive bacteriological sample results and to eliminate potential health hazards which may exist in the system when monitoring pursuant to s. NR 809.31 (1) or (2) shows the presence of any coliform organisms.

(5) If heterotrophic bacterial plate counts on water distributed to the consumer exceed 500 organisms per milliliter the department shall determine if the bacterial count is of public health or nuisance significance and may require appropriate action.

(6) The following are best technology, treatment techniques, or other means available for achieving compliance with the maximum contaminant level for total coliforms in subs. (1) and (2):

(a) Protection of wells from coliform contamination by appropriate placement and construction;

(b) Maintenance of a disinfectant residual throughout the distribution system;

(c) Proper maintenance of the distribution system including appropriate pipe replacement and repair procedures, main flushing programs, proper operation and maintenance of storage tanks

and reservoirs, and continual maintenance of positive water pressure in all parts of the distribution system;

(d) Filtration and disinfection of surface water, or disinfection of ground water using strong oxidants such as chlorine, chlorine dioxide or ozone; or

(e) The development and implementation of a department approved wellhead protection program.

Note: The basic purpose of a wellhead protection program is to restrict potentially polluting activities near wells and well fields and within recharge areas of aquifers supplying water to these wells. In general, activities are more restricted close to the well and less so farther away.

History: Cr. Register, February, 1978, No. 266, eff. 3–1–78; am. (2) and (4), Register, April, 1982, No. 316, eff. 5–1–82; correction in (intro.) made under s. 13.93 (2m) (b) 7., Stats., Register, October, 1985, No. 358; am. (intro.) and (4), Register, August, 1989, No. 404, eff. 9–1–89; r. and recr. Register, March, 1991, No. 423, eff. 4–1–91; renum. from NR 109.30, Register, July, 1993, No. 451, eff. 8–1–93.

NR 809.31 Microbiological contaminant sampling and analytical requirements. (1) ROUTINE MONITORING. (a) Suppliers of water for public water systems shall collect total coliform samples at sites which are representative of water throughout the distribution system according to a written sample siting plan. These plans are subject to department review and revision.

(b) 1. Water suppliers for community water systems shall take water samples for coliform determination at regular 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. Except as specified in subd. 2., the minimum sampling frequency shall be as set forth in the following:

Population served:	Minimum number of samples per month
25 to 1,000 (Not serving a municipality)	1
25 to 1,000 (Serving a municipality)	2
1,001 to 2,500	2
2,501 to 3,300	3
3,301 to 4,100	4
4,101 to 4,900	5
4,901 to 5,800	6
5,801 to 6,700	7
6,701 to 7,600	8
7,601 to 8,500	9
8,501 to 12,900	10
12,901 to 17,200	15
17,201 to 21,500	20
21,501 to 25,000	25
25,001 to 33,000	30
33,001 to 41,000	40
41,001 to 50,000	50
50,001 to 59,000	60
59,001 to 70,000	70
70,001 to 83,000	80
83,001 to 96,000	90
96,001 to 130,000	100
130,001 to 220,000	120
220,001 to 320,000	150
320,001 to 450,000	180
450,001 to 600,000	210
600,001 to 780,000	240
780,001 to 970,000	270
970,001 to 1,230,000	300
1,230,001 to 1,520,000	330
1,520,001 to 1,850,000	360
1,850,001 to 2,270,000	390
2,270,001 to 3,020,000	420
3,020,001 to 3,960,000	450
3,960,001 or more	480

2. 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 ground water 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, reduce this sampling frequency, except that in no case shall it be reduced to less than one per calendar quarter.

(c) The supplier of water for a non–community school or a non–transient non–community water system shall sample for coliform bacteria in each calendar quarter during which the system provides water to the public, unless the department, on the basis of a sanitary survey conducted in the past 5 years, or other factors, determines that more frequent monitoring is appropriate.

(d) The monitoring frequency for total coliforms for non–community water systems, notwithstanding par. (c), is as follows:

1. A non–community water system using only ground water and serving 1,000 persons per day or fewer shall monitor each calendar quarter that the system provides water to the public, except that the department may reduce the monitoring frequency, in writing, if a sanitary survey shows that the system is free of sanitary defects. In no case may the monitoring frequency be reduced to less than once per year.

2. A non–community water system using only ground water and serving on average more than 1,000 persons per day for any month shall monitor at the same frequency as a like–sized community water system, as specified in par. (b) 1., except that the department may reduce the monitoring frequency, in writing, for any month the average daily population served is less than 1,000 persons per day.

3. A non–community water system using ground water under the direct influence of surface water as defined in s. NR 809.04, in total or in part, shall monitor at the same frequency as a like–sized community municipal system, as specified in par. (b) 1. The system shall begin monitoring at this frequency beginning 6 months after the department determines that the ground water source is under the direct influence of surface water.

(c) Public water systems shall collect samples at regular time intervals throughout the month, except that a system which uses ground water and serves 1,000 persons or fewer, may collect all required samples on a single day if they are taken from different sites.

(f) Special purpose samples such as those taken to determine whether disinfection practices are sufficient following pipe placement, replacement or repair, may not be used to determine compliance with the MCL for total coliforms in s. NR 809.30. Repeat samples taken pursuant to sub. (2) are not considered special purpose samples, and shall be used to determine compliance with the MCL for total coliforms in s. NR 809.30.

(g) A public water system that uses groundwater under the direct influence of surface water as defined in s. NR 809.04 (27), and does not provide filtration in compliance with s. NR 809.76, shall collect at least one sample in the distribution system near the first service connection each day one or more turbidity measurements of the source water obtained as specified in s. NR 809.78 (1) (b), exceeds 1 NTU. This sample shall be analyzed for the presence of total coliforms. The system owner or operator shall collect this coliform sample within 24 hours of the first exceedance unless the department determines that the system, for logistical reasons beyond its control, cannot have the sample analyzed within 30 hours of collection. Results from this coliform monitoring shall be included in determining compliance with the MCL for total coliforms in s. NR 809.30.

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

(b) The water supplier shall collect at least one repeat sample from the sampling tap where the original total coliform–positive sample was taken, and at least one repeat sample at a tap within 5 service connections upstream and at least one repeat sample at a tap within 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 away from the end of the distribution system, the department may waive the requirement to collect at least one repeat sample upstream or downstream of the original sampling site.

(c) The water supplier shall 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 4 day period or to collect a larger volume repeat sample in one or more sample containers of any size, as long as the total volume collected is at least 400 ml (300 ml for systems which collect more than one routine sample/month.)

(d) If one or more repeat samples in the set is total coliform–positive, the public water supplier shall collect an additional set of repeat samples in the manner specified in pars. (a) to (c). The additional set of samples shall be collected within 24 hours of being notified of the positive result, unless the department extends the limit as provided in par. (a). The water supplier shall repeat this process until either total coliforms are not detected in one complete set of repeat samples or the system determines that the MCL for total coliforms in s. NR 809.30 has been exceeded and notifies the department as specified in s. NR 809.80 (2).

(e) If a water supplier collecting fewer than 5 routine samples/month has one or more total coliform–positive samples and the department does not invalidate the samples under sub. (3), the supplier shall collect at least 5 routine samples during the next month the system provides water to the public, except that the department may waive this requirement if the conditions of subd. 1. or 2. are met. The requirement for a water supplier to collect repeat samples in pars. (a) to (d) is not waivable.

1. The department may waive the requirement to collect 5 routine samples the next month the system provides water to the public if 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 shall be sufficiently detailed to allow the department to determine whether additional monitoring or any corrective action is needed.

2. The department may waive the requirement to collect 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 water supplier 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 decision to waive the following month's additional monitoring requirement will be documented in writing, signed by a qualified department official, and made available to the public. The written documentation shall describe the specific cause of the total coliform–positive sample and what action the water supplier has taken or will take to correct this problem. The requirement to collect 5 routine samples the next month the system provides water to the public is not waivable solely on the grounds that all repeat samples are total coliform–negative. The system owner or operator shall still collect at least one 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 s. NR 809.30, unless the department has determined that the system corrected the contamination problem before the system collected the set of repeat samples required in pars. (a) to (d) and all repeat samples were total coliform negative.

(f) After a water supplier collects a routine sample and before learning the results of the analysis of that sample, if the water supplier collects another routine sample from within 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 as a repeat sample instead of as a routine sample.

(g) Results of all routine and repeat samples not invalidated by the department shall be included in determining compliance with the MCL for total coliforms in s. NR 809.30 and the minimum routine requirements of this section.

(3) INVALIDATION OF TOTAL COLIFORM SAMPLES. (a) A total coliform–positive sample invalidated under this subsection does not count towards meeting the minimum monitoring requirements of this section.

(b) The department may invalidate a total coliform–positive sample only if the conditions of subd. 1., 2. or 3. are met.

1. The certified 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 sub. (2) (a) to (d), determines that the total coliform–positive sample resulted from a domestic or other non–distribution system plumbing problem. No sample may be invalidated by the department 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 5 service connections of the original tap are total coliform–negative (e.g., the department will not 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 service connection.)

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 owner or operator shall still collect all repeat samples required under sub. (2) (a) to (d), and use them to determine compliance with the MCL for total coliforms in s. NR 809.30. To invalidate a total coliform–positive sample under this paragraph, the decision with the rationale for the decision shall be documented in writing, approved by a qualified department official and available to the public for inspection. The document shall state the specific cause of the total coliform–positive sample, and what action the system owner or operator 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.

(c) A laboratory shall 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 (e.g., the Multiple Tube Fermentation Technique), produces a turbid culture in the absence of an acid reaction in the Presence–Absence Coliform Test, or exhibits confluent growth or produces colonies too numerous to count with an analytical method using a membrane filter (e.g., Membrane Filter Technique). If a laboratory invalidates a sample because of such interference, the system owner or operator shall collect another sample from the same location as the original sample within 24 hours of being notified of the interference problem, and have it analyzed for the presence of total coliforms. The system owner or operator shall continue to re–sample within 24 hours and have the samples analyzed until it obtains a valid result. The department may waive the 24 hour time limit on a case–by–case basis.

(4) FECAL COLIFORMS/ESCHERICHIA COLI (E. COLI) TESTING. (a) If any routine or repeat sample is total coliform–positive, the system owner or operator shall 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 owner or operator shall notify the department by the end of the day when the system is notified of the test result, unless the system is notified of the result after normal department business hours, in which case the system owner or operator shall notify the department before the end of the next business day.

(b) The department may allow a public water system, on a case–by–case basis, to forgo fecal coliform or E. Coli testing on a total coliform–positive sample if that system owner or operator assumes that the total coliform–positive sample is fecal coliform–positive or E. Coli–positive. Accordingly, the system owner or operator shall notify the department as specified in par. (a) and the provisions of s. NR 809.30 (2) apply.

(5) ANALYTICAL METHODOLOGY. (a) The standard sample volume required for total coliform analysis, regardless of analytical method used, is 100 ml.

(b) Public water system owners or operators need only determine the presence or absence of total coliforms; a determination of total coliform density is not required.

Note: The coliform density may, however, be helpful in selecting a remedial option.

(c) Beginning January 1, 2001, samples collected to determine compliance with s. NR 809.30 (1) shall be analyzed by the enzyme substrate test method.

(d) The department may approve, on a case–by–case basis, other methods as prescribed in s. NR 809.725 (1), Table C for use in determining compliance with s. NR 809.30 (1).

(6) SANITARY SURVEYS. (a) Public water systems shall undergo a sanitary survey every 5 years, except that non–community water systems using only protected and disinfected ground water, as determined on a case–by–case basis by the department, shall undergo a sanitary survey at least every 10 years after the initial sanitary survey. The department will review the results of each sanitary survey to determine whether the existing monitoring frequency is adequate and what additional measures, if any, the system needs to undertake to improve drinking water quality.

(b) Sanitary surveys shall be performed by the department or an agent approved by the department. If the department requests a system owner to have a sanitary survey performed, the system owner is responsible for ensuring the survey is completed.

(7) (a) When a sample collected under subs. (1) to (4) exceeds a maximum contaminant level in s. NR 809.30 (1) or (2), the supplier of water shall report the violation to the department no later than the end of the next business day after it learns of the violation, and shall provide public notice of the violation in accordance with s. NR 809.81.

(b) A public water supplier who has failed to comply with a coliform monitoring requirement, shall report the monitoring violation to the department within 10 days after discovering the violation, and notify the public as specified in s. NR 809.81.

(8) In addition to sampling from the distribution system, each supplier of water for a system providing disinfection 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 may 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.

(9) At surface water facilities, the microbiological quality of the water shall be monitored 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 heterotrophic plate counts of the raw, settled and finished water on an established schedule will be necessary to meet this requirement.

(10) At all waterworks which have a potential for high total bacteria levels because of the water quality, the method of treatment, chemical addition or other cause, the department may require heterotrophic plate counts pursuant to an established schedule. Analyses shall be conducted in accordance with the analytical requirements in s. NR 809.725 (1), Table C.

History: Cr. Register, February, 1978, No. 266, eff. 3–1–78; am. (2) (a) (intro.) and (b) and (3), renum. (4) to (9) to be (5) to (10) and am. (5) to (9), cr. (4), Register, April, 1982, No. 316, eff. 5–1–82; am. (7), Register, December, 1982, No. 324, eff. 1–1–83; am. (5) (a), (b) (intro.) and 2., (c) and (10), Register, August, 1989, No. 404, eff. 9–1–89; r. and recr. Register, March, 1991, No. 423, eff. 4–1–91; renum. from NR 109.31 and am. (1) (b) 1., (c), (d) 1., (2) (c) 2., (g), (3) (a), (b) 1., (5) (c) and (10), cr. (1) (g), Register, July, 1993, No. 451, eff. 8–1–93; am. (2) (d), Register, August, 1994, No. 464, eff. 9–1–94; **am. (1) (d) 1. and 2., (5) (c) and (6) (a), cr. (5) (d), Register, December, 2000, No. 540, eff. 1–1–01.**

NR 809.40 Turbidity maximum contaminant levels. **History:** Cr. Register, February, 1978, No. 266, eff. 3–1–78; am. (1) (intro.), Register, April, 1982, No. 316, eff. 5–1–82; am. (intro.) Register, March, 1991, No. 423, eff. 4–1–91; renum. from NR 109.40, Register, July, 1993, No. 451, eff. 8–1–93; **r. Register, December, 2000, No. 540, eff. 1–1–01.**

NR 809.41 Turbidity sampling and analytical requirements. History: Cr. Register, February, 1978, No. 266, eff. 3–1–78; am. (2) and (3), r. (4), Register, April, 1982, No. 316, eff. 5–1–82; am. (2), Register, December, 1982, No. 324, eff. 1–1–83; r. and recr. Register, March, 1991, No. 423, eff. 4–1–91; renum. from NR 809.41 and am. (2), Register, July, 1993, No. 451, eff. 8–1–93; **r. Register, December, 2000, No. 540, eff. 1–1–01.**

NR 809.50 Radium–226, radium–228 and gross alpha particle radioactivity maximum contaminant levels. The following are the maximum contaminant levels for radium–226, radium–228, and gross alpha particle radioactivity:

(1) Combined radium–226 and radium–228 — 5 pCi/l.

(2) Gross alpha particle activity (including radium–226 but excluding radon and uranium) — 15 pCi/l.

Note: Sections NR 809.50 through NR 809.52 are identical to the radioactivity standards of the department of health and social services in ch. HSS 157, Wis. Adm. Code, and to the National Interim Primary Drinking Water Regulations, 40 Code of Federal Regulations 141. These sections are adopted pursuant to s. 140.56 (2), Stats.

History: Cr. Register, February, 1978, No. 266, eff. 3–1–78; renum. from NR 109.50, Register, July, 1993, No. 451, eff. 8–1–93.

NR 809.51 Beta particle and photon radioactivity from man–made radionuclides maximum contaminant levels. (1) The average annual concentration of beta particle and photon radioactivity from man–made radionuclides in drinking water shall not produce an annual dose equivalent to the total body or any internal organ greater than 4 millirem/year.

(2) Except for the radionuclides listed in Table A, the concentration of man–made radionuclides causing 4 mrem total body or organ dose equivalents shall be calculated on the basis of a 2 liter per day drinking water intake using the 168 hour data listed in "Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air or Water for Occupational Exposure", NBS Handbook 69 as amended August, 1963, U.S. Department of Commerce. 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 Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. If 2 or more radionuclides are present, the sum of their annual dose equivalent to the total body or to any organ shall not exceed 4 millirem/year.

Table A. —
Average annual concentrations assumed to produce a total body or organ dose of 4 mrem/yr.

Radionuclide	Critical Organ	pCi per liter
Tritium	Total body	20,000
Strontium–90	Bone marrow	8

Note: Sections NR 809.50 through 809.52 are identical to the radioactivity standards of the department of health and social services in ch. HSS 157, Wis. Adm. Code, and to the National Interim Primary Drinking Water Regulations, 40 CFR 141. These sections are adopted pursuant to s. 140.56 (2), Stats.

History: Cr. Register, February, 1978, No. 266, eff. 3–1–78; renum. from NR 109.51, Register, July, 1993, No. 451, eff. 8–1–93.

NR 809.52 Analytical methods for radioactivity. (1) Analyses conducted to determine compliance with ss. NR 809.50 and 809.51 shall be made in accordance with approved methods listed in s. NR 809.725 (1), Table D.

Note: Sections NR 809.50 to 809.52 are identical to the radioactivity standards of the department of health and social services in ch. HSS 157, Wis. Adm. Code, and to the National Interim Primary Drinking Water Regulations, 40 CFR 141. These sections are adopted pursuant to s. 140.56 (2), Stats.

History: Cr. Register, February, 1978, No. 266, eff. 3–1–78; r. and recr. Register, March, 1991, No. 423, eff. 4–1–91; renum. from NR 109.52 and am. (1), Register, July, 1993, No. 451, eff. 8–1–93.

NR 809.53 Radioactivity monitoring frequency for community water systems. (1) MONITORING REQUIREMENTS FOR GROSS ALPHA PARTICLE ACTIVITY, RADIUM–226 AND RADIUM–228. (a) Initial sampling to determine compliance with s. NR 809.50 shall begin 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.

1. A gross alpha particle activity measurement may be substituted for the required radium–226 and radium–228 analysis, provided that the measured gross alpha particle activity does not exceed 5 pCi/l at a confidence level of 95% (1.65 where is the standard deviation of the net counting rate of the sample). In localities where radium–228 may be present in drinking water, the department may require radium–226 and/or radium–228 analyses when the gross alpha particle activity exceeds 2 pCi/l.

2. When the gross alpha particle activity exceeds 5 pCi/l, the same or an equivalent sample shall be analyzed for radium–226. If the concentration of radium–226 exceeds 3 pCi/l the same or an equivalent sample shall be analyzed for radium–228.

(b) Suppliers of water shall monitor at least once every 4 years following the procedure required by par. (a). At the discretion of the department, when an annual record taken in conformance with par. (a) has established that the average annual concentration is less than half the maximum contaminant levels established by s. NR 809.50, analysis of a single sample may be substituted for the quarterly sampling procedure required by par. (a).

1. More frequent monitoring shall be conducted when ordered by the department in the vicinity of mining or other operation which may contribute alpha particle radioactivity to either surface or ground water sources of drinking water.

2. A supplier of water shall monitor in conformance with par. (a) within one year of the introduction of new water source for a community water system. More frequent monitoring shall be conducted when ordered by the department in the event of possible contamination or when changes in the distribution system or treatment processing occur which may increase the concentration of radioactivity in finished water.

3. A community water system using 2 or more sources having different concentrations of radioactivity shall monitor source water, in addition to water from the consumer service outlet, when required by the department.

4. Monitoring for compliance with s. NR 809.50 after the initial period need not include radium–228 except when required by the department, provided, that the average annual concentration of radium–228 has been assayed at least once using the quarterly sampling procedure required by par. (a).

5. Suppliers of water shall conduct annual monitoring of any community water system in which the radium–226 concentration exceeds 3 pCi/l, when required by the department.

(c) If the average annual maximum contaminant level for gross alpha particle activity or total radium as set forth in s. NR 809.50 is exceeded, the supplier of water having a community water system shall give notice to the department pursuant to s. NR 809.80 and notify the public as required by s. NR 809.81. Monitoring at quarterly intervals shall be continued until the annual average concentration no longer exceeds the maximum contaminant level or until a monitoring schedule as a condition to a variance under s. NR 809.91, conditional waiver under s. NR 809.90 or enforcement action shall become effective. Special monitoring thereafter shall be at a frequency designated by the department.

(2) MONITORING REQUIREMENTS FOR MAN–MADE RADIOACTIVITY IN COMMUNITY WATER SYSTEMS. (a) 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 809.51 by analysis of a composite of 4 consecutive quarterly samples or analysis of 4 quarterly samples. Compliance with s. NR 809.51 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 may not exceed 4 millirem/year.

1. If the gross beta particle activity exceeds 50 pCi/l, an analysis of the sample must be performed to identify the major radioactive constituents present and the appropriate organ and total body doses shall be calculated to determine compliance with s. NR 809.51.

2. Suppliers of water shall conduct additional monitoring, as required by the department to determine the concentration of man–made radioactivity in principal watersheds designated by the department.

3. At the discretion of the department, suppliers of water utilizing only ground waters may be required to monitor for man–made radioactivity.

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

(c) 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.

1. Quarterly monitoring for gross beta particle activity shall be based on the analysis of monthly samples or the analysis of a composite of 3 monthly samples. The former is recommended. If the gross beta particle activity in a sample exceeds 15 pCi/l, the same or an equivalent sample shall be analyzed for strontium–89 and cesium–134. If the gross beta particle activity exceeds 50 pCi/l, an analysis of the sample must be performed to identify the major radioactive constituents present and the appropriate organ and total body doses shall be calculated to determine compliance with s. NR 809.51.

2. For iodine–131, a composite of 5 consecutive daily samples shall be analyzed once each quarter. As required by the department, more frequent monitoring shall be conducted when iodine–131 is identified in the finished water.

3. Annual monitoring for strontium–90 and tritium shall be conducted by means of the analysis of a composite of 4 consecutive quarterly samples or analysis of 4 quarterly samples.

4. The department may allow the substitution of environmental surveillance data taken in conjunction with a nuclear facility for direct monitoring of man–made radioactivity by the supplier of water where the department determines such data is applicable to a particular community water system.

(d) If the average annual maximum contaminant level for man–made radioactivity set forth in s. NR 809.51 is exceeded, the operator of a community water system shall give notice to the department under s. NR 809.80 and to the public as required by s. NR 809.81. 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.

History: Cr. Register, February, 1978, No. 266, eff. 3–1–78; am. (1) (a) (intro.) and (2) (a) (intro.), r. (1) (a) 2.a., renum. (1) (a) 2.b. and c. to be (1) (b) and (c), r. (2) (b), renum. (2) (c), (d), (intro.) and (e) to be (2) (b), (c), (intro.) and (d) and am., Register, April, 1982, No. 316, eff. 5–1–82; am. (1) (c), Register, August, 1989, No. 404, eff. 9–1–89; renum. from NR 109.53, Register, July, 1993, No. 451, eff. 8–1–93; correction in (2) (d) made under s. 13.93 (2m) (b) 7., Stats., Register, October, 1997, No. 502.

Subchapter II — Control of Lead and Copper

NR 809.541 General requirements. (1) APPLICABILITY AND EFFECTIVE DATES. (a) The requirements of this subchapter constitute the state primary drinking water regulations for lead and copper. Unless otherwise indicated, each of the provisions of this subchapter applies to community water systems and non–transient, non–community water systems.

(2) SCOPE. These regulations establish a treatment technique that includes requirements for corrosion control treatment, source water treatment, lead service line replacement and public education. These requirements are triggered, in some cases, by lead and copper action levels measured in samples collected at consumers' taps.

(3) LEAD AND COPPER ACTION LEVELS. (a) The lead action level is exceeded if the concentration of lead in more than 10% of tap water samples collected during any monitoring period conducted in accordance with s. NR 809.547 is greater than 0.015 mg/L i.e., if the "90th percentile" lead level is greater than 0.015 mg/L.

(b) The copper action level is exceeded if the concentration of copper in more than 10% of tap water samples collected during any monitoring period conducted in accordance with s. NR 809.547 is greater than 1.3 mg/L, i.e., if the "90th percentile" copper level is greater than 1.3 mg/L.

(c) The 90th percentile lead and copper levels shall be computed as follows:

1. The results of all lead or copper samples taken during a monitoring period shall be placed in ascending order from the sample with the lowest concentration to the sample with the highest concentration. Each sampling result shall be assigned a number, ascending by single integers beginning with the number 1 for the sample with the lowest contaminant level. The number assigned to the sample with the highest contaminant level shall be equal to the total number of samples taken.

2. The number of samples taken during the monitoring period shall be multiplied by 0.9.

3. For water systems serving fewer than 100 people that collect 5 samples per monitoring period, the 90th percentile is computed by taking the average of the highest and second highest concentrations.

4. The contaminant concentration in the numbered sample yielded by the calculation in subd. 2. is the 90th percentile contaminant level.

(4) CORROSION CONTROL TREATMENT REQUIREMENTS. (a) All water system owners or operators shall install and operate optimal corrosion control treatment as defined in s. NR 809.04.

(b) Any water system that complies with the applicable corrosion control treatment requirements specified by the department under ss. NR 809.542 and 809.543 shall be deemed in compliance with the treatment requirement contained in par. (a).

(5) SOURCE WATER TREATMENT REQUIREMENTS. Any system exceeding the lead or copper action level shall implement all applicable source water treatment requirements specified by the department under s. NR 809.544.

(6) LEAD SERVICE LINE REPLACEMENT REQUIREMENTS. Any system exceeding the lead action level after implementation of applicable corrosion control and source water treatment requirements shall complete the lead service line replacement requirements contained in s. NR 809.545.

(7) PUBLIC EDUCATION REQUIREMENTS. Any system exceeding the lead action level shall implement the public education requirements contained in s. NR 809.546. Any system exceeding the copper action level shall annually provide public education on the health effects of copper using language in s. NR 809.81 (5) (eu), and information on reducing exposure to copper in drinking water similar to s. NR 809.546.

(8) MONITORING AND ANALYTICAL REQUIREMENTS. (a) Tap water monitoring for lead and copper, monitoring for water quality parameters, and source water monitoring for lead and copper shall be completed in compliance with ss. NR 809.548 and 809.549. The analyses shall be conducted using methods as prescribed in s. NR 809.725 (1), Table A.

(b) The department may allow the use of previously collected monitoring data for the purposes of monitoring if the data were

collected and analyzed in accordance with the requirements of this subchapter.

(9) REPORTING REQUIREMENTS. System owners or operators shall report to the department any information required by the treatment provisions of this subchapter and s. NR 809.55.

(10) RECORDKEEPING REQUIREMENTS. System owners or operators shall maintain records in accordance with s. NR 809.82.

(11) VIOLATION OF NATIONAL PRIMARY DRINKING WATER REGULATIONS. Failure to comply with the applicable requirements of ss. NR 809.541 to 809.549, 809.725, 809.80, and 809.82., including requirements established by the department pursuant to these provisions, shall constitute a violation of the state primary drinking water regulations for lead or copper, or both.

(12) PREMISE OWNER NOTIFICATION OF LEAD AND COPPER RESULTS. System owners or operators shall provide owners or occupants of all premises used in the lead and copper monitoring program the analytical results of all samples collected at that site. If sample results at a sample location exceed 15 *ug*/L for lead and 1300 *ug*/L for copper, system owners or operators must inform premise owners or occupants of health effects and measures necessary to lower lead or copper levels.

History: Cr. Register, July, 1993, No. 451, eff. 8–1–93; am. (7) and (12), Register, October, 1997, eff. 11–1–97.

NR 809.542 Applicability of corrosion control treatment steps for small, medium and large–size water systems. (1) CORROSION CONTROL TREATMENT REQUIREMENTS. System owners or operators shall complete the applicable corrosion control treatment requirements described in s. NR 809.543 by the deadlines established.

(a) The owner or operator of a large system shall complete the corrosion control treatment steps specified in sub. (4), unless the system is deemed to have optimized corrosion control under sub. (2) (b) or (c).

(b) The owner or operator of a small system and a medium–size system shall complete the corrosion control treatment steps specified in sub. (5), unless the system is deemed to have optimized corrosion control under sub. (2) (a), (b) or (c).

(2) DETERMINATION OF OPTIMUM CORROSION CONTROL. A system is deemed to have optimized corrosion control and is not required to complete the applicable corrosion control treatment steps if the system satisfies one of the following criteria:

(a) A small or medium–size water system is deemed to have optimized corrosion control if the system meets the lead and copper action levels during each of 2 consecutive 6–month monitoring periods conducted in accordance with s. NR 809.547.

(b) Any water system may be deemed by the department to have optimized corrosion control treatment if the system owner or operator demonstrates to the satisfaction of the department that it has conducted activities equivalent to the corrosion control steps applicable to the system under this section. If the department makes this determination, it shall provide the system with written notice explaining the basis for its decision and shall specify the water quality control parameters representing optimal corrosion control in accordance with s. NR 809.543 (6). A system owner or operator shall provide the department with the following information in order to support a determination under this subsection:

1. The results of all test samples collected for each of the water quality parameters in s. NR 809.543 (3) (c);

2. A report explaining the test methods used by the water system owner or operator to evaluate the corrosion control treatments listed in s. NR 809.543 (3) (a), the results of all tests conducted, and the basis for the system owner or operator's selection of optimal corrosion control treatment;

3. A report explaining how corrosion control has been installed and how it is being maintained to insure minimal lead and copper concentrations at consumers' taps; and

4. The results of tap water samples collected in accordance with s. NR 809.547 at least once every 6 months for one year after corrosion control has been installed.

(c) Any water system is deemed to have optimized corrosion control if it submits results of tap water monitoring conducted in accordance with s. NR 809.547 and source water monitoring conducted in accordance with s. NR 809.549 that demonstrates for 2 consecutive 6–month monitoring periods that the difference between the 90th percentile tap water lead level computed under s. NR 809.541 (3) (c), and the highest source water lead concentration, is less than 5 ug/l.

(3) CRITERIA FOR CLASSIFYING CORROSION CONTROL TREATMENT STUDIES FOR SMALL AND MEDIUM–SIZE SYSTEMS. Any small or medium–size water system owner or operator that is required to complete the corrosion control steps due to the exceedance of the lead or copper action level may cease completing the treatment steps whenever the system meets both action levels during each of 2 consecutive monitoring periods conducted pursuant to s. NR 809.547 and the results are submitted to the department. If any such water system thereafter exceeds the lead or copper action level during any monitoring period, the system owner or operator shall recommence completion of the applicable treatment steps, beginning with the first treatment step which was not previously completed in its entirety. The department may require a system owner or operator to repeat treatment steps previously completed by the system owner or operator where the department determines that this is necessary to implement properly the treatment requirements. The department shall notify the system owner or operator in writing of such a determination and explain the basis for its decision. A small or medium–size water system shall implement corrosion control treatment steps in accordance with sub. (5), including a system deemed to have optimized corrosion control under sub. (2) (a), whenever it exceeds the lead or copper action level.

(4) TREATMENT STEPS AND DEADLINES FOR LARGE SYSTEMS. Except as provided in sub. (2) (b) and (c), owners or operators of large systems shall complete the following corrosion control treatment steps by the indicated dates:

(a) Step 1: The system owner or operator shall conduct initial monitoring during 2 consecutive 6–month monitoring periods by January 1, 1993.

(b) Step 2: The system owner or operator shall complete corrosion control studies and submit option for optimal corrosion control treatment to the department by July 1, 1994.

(c) Step 3: The department shall approve optimal corrosion control treatment by January 1, 1995.

(d) Step 4: The system owner or operator shall install optimal corrosion control treatment by January 1, 1997.

(e) Step 5: The system owner or operator shall complete follow–up sampling by January 1, 1998.

(f) Step 6: The department shall review installation of treatment and approve optimal water quality control parameters by July 1, 1998.

(g) Step 7: The system owner or operator shall operate in compliance with the department–approved optimal water quality control parameters and continue to conduct tap sampling.

(5) TREATMENT STEPS AND DEADLINES FOR SMALL AND MEDIUM–SIZE SYSTEMS. Except as provided in sub. (2), owners or operators of small and medium–size systems shall complete the following corrosion control treatment steps by the indicated time periods:

(a) Step 1: The system owner or operator shall conduct initial tap sampling until the system either exceeds the lead or copper action level or becomes eligible for reduced monitoring under s. NR 809.547 (4) (d). The owner or operator of a system that exceeds the lead or copper action level shall recommend optimal

corrosion control treatment within 6 months after it exceeds one of the action levels.

(b) Step 2: Within 12 months after a system exceeds the lead or copper action level, the department shall require the system owner or operator to perform corrosion control studies.

(c) Step 3: If the department requires a system owner or operator to perform corrosion control studies under step 2, the system owner or operator shall complete the studies within 18 months after the department requires the studies be conducted.

(d) Step 4: If the system owner or operator has performed corrosion control studies under step 2, the department shall review and determine adequacy of system's optimal corrosion control treatment within 6 months after completion of step 3.

(e) Step 5: The system owner or operator shall install optimal corrosion control treatment within 24 months after the department approves the treatment.

(f) Step 6: The system owner or operator shall complete follow–up sampling within 36 months after the department approves optimal corrosion control treatment.

(g) Step 7: The department shall review the system's installation of treatment and approve optimal water quality control parameters within 6 months after completion of step 6.

(h) Step 8: The system owner or operator shall operate in compliance with the department–approved optimal water quality control parameters and continue to conduct tap sampling.

History: Cr. Register, July, 1993, No. 451, eff. 8–1–93; am. (4) (b) and (c), Register, August, 1994, No. 464, eff. 9–1–94; am. (3), Register, October, 1997, No. 502, eff. 11–1–97.

NR 809.543 Description of corrosion control treatment requirements. Each system owner or operator shall complete the following corrosion control treatment requirements which are applicable to their system under s. NR 809.542.

(1) SYSTEM OWNER OR OPERATOR RECOMMENDATION REGARDING CORROSION CONTROL TREATMENT. Based upon the results of lead and copper tap monitoring and water quality parameter monitoring, owners or operators of small and medium–size water systems exceeding the lead or copper action level shall recommend installation of one or more of the corrosion control treatments listed in sub. (3) (a) which the system owner or operator believes constitutes optimal corrosion control for that system. The department may require the system owner or operator to conduct additional water quality parameter monitoring in accordance with s. NR 809.548 (2) to assist the department in reviewing the system owner or operator's recommendation. In no case, may the time period for installation of optimal corrosion control treatment on a small or medium–size system exceed the schedule as listed in s. NR 809.542 (5) (a) to (h).

(2) DEPARTMENT DECISION TO REQUIRE STUDIES OF CORROSION CONTROL TREATMENT BY SMALL AND MEDIUM–SIZE SYSTEMS. The department may require the owner or operator of any small or medium–size system that exceeds the lead or copper action level to perform corrosion control studies under sub. (3) to identify optimal corrosion control treatment for the system.

(3) PERFORMANCE OF CORROSION CONTROL STUDIES. (a) Any public water system owner or operator performing corrosion control studies shall evaluate the effectiveness of each of the following treatments, and, if appropriate, combinations of the following treatments to identify the optimal corrosion control treatment for that system:

1. Alkalinity and pH adjustment;
2. Calcium hardness adjustment; and
3. The addition of a phosphate or silicate based corrosion inhibitor at a concentration sufficient to maintain an effective residual concentration in all test tap samples.

(b) The water system owner or operator shall evaluate each of the corrosion control treatments listed in par. (a) using either pipe rig/loop tests, metal coupon tests, partial–system tests, or analyses based on documented analogous treatments with other systems of similar size, water chemistry and distribution system configuration.

(c) The water system owner or operator shall measure the following water quality parameters in any tests conducted before and after evaluating the corrosion control treatments listed in par. (a):

1. Lead;
2. Copper;
3. pH;
4. Alkalinity;
5. Calcium;
6. Conductivity;
7. Orthophosphate (when an inhibitor containing a phosphate compound is used);
8. Silicate (when an inhibitor containing a silicate compound is used);
9. Water temperature.

(d) The water system owner or operator shall identify all chemical or physical constraints that limit or prohibit the use of a particular corrosion control treatment and document such constraints with at least one of the following:

1. Data and documentation showing that a particular corrosion control treatment has adversely affected other water treatment processes when used by another water system with comparable water quality characteristics; or
2. Data and documentation demonstrating that the water system owner or operator has previously attempted to evaluate a particular corrosion control treatment and has found that the treatment is ineffective or adversely affects other water quality treatment processes, or both

(e) The water system owner or operator shall evaluate the effect of the chemicals used for corrosion control treatment on other water quality treatment processes.

(f) On the basis of an analysis of the data generated during each evaluation, the water system owner or operator shall recommend to the department in writing the treatment option that the corrosion control studies indicate constitutes optimal corrosion control treatment for that system. The water system owner or operator shall provide a rationale for its recommendation along with all supporting documentation specified in pars. (a) to (e).

(4) DEPARTMENT EVALUATION OF OPTIMAL CORROSION CONTROL TREATMENT. (a) Based upon consideration of available information including, where applicable, studies performed under sub. (3) and a system owner or operator's recommended treatment alternative, the department shall either approve the corrosion control treatment option recommended by the system owner or operator, or designate alternative corrosion control treatments from among those listed in sub. (3) (a). When approving optimal treatment, the department shall consider the effects that additional corrosion control treatment will have on water quality parameters and on other water quality treatment processes.

(b) The department shall notify the system owner or operator of its decision on optimal corrosion control treatment in writing and explain the basis for this determination. If the department requests additional information to aid its review, the water system owner or operator shall provide the information.

(5) INSTALLATION OF OPTIMAL CORROSION CONTROL. Each system owner or operator shall properly install and operate throughout its distribution system the optimal corrosion control treatment approved by the department under sub. (4).

(6) DEPARTMENT REVIEW OF TREATMENT. The department shall evaluate the results of all lead and copper tap samples and water quality parameter samples submitted by the water system owner or operator and determine whether the system owner or operator has properly installed and operated the optimal corrosion control treatment approved by the department in sub. (4). Upon reviewing the results of tap water and water quality parameter monitoring by

the system owner or operator, both before and after the system owner or operator installs optimal corrosion control treatment, the department shall establish ranges for water quality parameters.

(7) APPROVAL OF OPTIMAL WATER QUALITY CONTROL PARAMETERS. The department shall review system owner or operator recommendations and select the values for the applicable water quality control parameters listed in sub. (3) which reflect optimal corrosion control treatment for the system. The department may specify values for additional water quality control parameters to reflect optimal corrosion control for the system. The department shall notify the water system owner in writing of these determinations and explain the basis for its decision. At a minimum, the department shall establish:

(a) A minimum value or a range of values for pH measured at each entry point to the distribution system;

(b) A minimum pH value, measured in all tap samples. The value shall be equal to or greater than 7.0, unless the water system owner provides information to indicate that meeting a pH level of 7.0 is not technologically feasible or is not necessary for the system to optimize corrosion control;

(c) If a corrosion inhibitor is used, a minimum concentration or a range of concentrations for the inhibitor, measured at each entry point to the distribution system and in all tap samples, that the department determines is necessary to protect the interior walls of the pipes of the distribution system from corrosion;

(d) If alkalinity is adjusted as part of optimal corrosion control treatment, a minimum concentration or a range of concentrations for alkalinity, measured at each entry point to the distribution system and in all tap samples;

(e) If calcium carbonate stabilization is used as part of corrosion control, a minimum concentration or a range of concentrations for calcium, measured in all tap samples.

(8) CONTINUED OPERATION AND MONITORING. All system owners or operators shall maintain water quality parameter values at or above minimum values or within ranges approved by the department under sub. (6) in each sample collected under s. NR 809.548 (4). If the water quality parameter value of any sample is below the minimum value or outside the range approved by the department, then the system is out of compliance with this subchapter. As specified in s. NR 809.548 (4), the system owner or operator may take a confirmation sample for any water quality parameter value no later than 3 days after the first sample. If a confirmation sample is taken, the result shall be averaged with the first sampling result and the average shall be used for any compliance determinations under this subsection. The department has the discretion to delete results of obvious sampling errors from this calculation.

(9) MODIFICATION OF DEPARTMENT TREATMENT DECISIONS. Upon its own initiative or in response to a request by a water system owner or operator or other interested party, the department may modify its determination of the optimal corrosion control treatment under sub. (4) or optimal water quality control parameters under sub. (6). A request for modification by a system owner or operator or other interested party shall be in writing, explain why the modification is appropriate, and provide supporting documentation. The department may modify its determination where it concludes that such change is necessary to ensure that the system owner or operator continues to optimize corrosion control treatment. A revised determination shall be made in writing, set forth the new treatment requirements, explain the basis for the department's decision, and provide an implementation schedule for completing the treatment modifications.

(10) TREATMENT DECISIONS BY EPA IN LIEU OF THE DEPARTMENT. The EPA regional administrator may review treatment determinations made by the department under sub. (4), (6) or (8) and issue federal treatment determinations consistent with the requirements of those subsections where the regional administrator finds that:

(a) The department has failed to issue a treatment determination by the applicable deadlines contained in s. NR 809.542,

(b) The department has abused its discretion in a substantial number of cases or in cases affecting a substantial population, or

(c) The technical aspects of the department's determination would be indefensible in an expected federal enforcement action taken against a system owner or operator.

History: Cr. Register, July, 1993, No. 451, eff. 8–1–93.

NR 809.544 Source water treatment requirements.

(1) DEADLINES FOR COMPLETING SOURCE WATER TREATMENT STEPS. System owners or operators shall complete the applicable source water monitoring and treatment requirements by the following deadlines:

(a) Step 1: A system exceeding the lead or copper action level shall complete lead and copper source water monitoring and when necessary propose an optimal treatment alternative to the department within 6 months after exceeding the lead or copper action level.

(b) Step 2: The department shall make a determination regarding proposed source water treatment within 6 months after receipt of proposed treatment alternatives under step 1.

(c) Step 3: If the department approves installation of source water treatment, the system owner or operator shall install the treatment within 24 months after completion of step 2.

(d) Step 4: The system owner or operator shall complete follow–up tap water monitoring and source water monitoring within 36 months after completion of step 2.

(e) Step 5: The department shall review the system's installation and operation of source water treatment and specify maximum permissible source water levels within 6 months after completion of step 4.

(f) Step 6: The system owner or operator shall operate in compliance with the department–specified maximum permissible lead and copper source water levels and continue source water monitoring.

(2) DESCRIPTION OF SOURCE WATER TREATMENT REQUIREMENTS. (a) *System treatment recommendation.* Any owner or operator of a system that exceeds the lead or copper action level shall recommend in writing to the department the installation and operation of one of the source water treatments listed in par. (b). A system owner or operator may recommend that no treatment be installed based upon a demonstration that source water treatment is not necessary to minimize lead and copper levels at users' taps.

(b) *Department determination regarding source water treatment.* The water system owner or operator shall complete an evaluation of the results of all source water samples collected by the water system owner or operator to determine whether source water treatment is necessary to minimize lead or copper levels and the evaluation shall be submitted to the department. If the department determines that treatment is needed, the department shall either approve installation and operation of the source water treatment recommended by the system owner or operator, if any, or require the installation and operation of another source water treatment from among the following: ion exchange, reverse osmosis, lime softening or coagulation/filtration. If the department requests additional information to aid in its review, the water system owner or operator shall provide the information by the date specified by the department in its request. The department shall notify the system owner or operator in writing of its determination and set forth the basis for its decision.

(c) *Installation of source water treatment.* Each system owner or operator shall properly install and operate the source water treatment approved by the department under par. (b).

(d) *Department review of source water treatment and specification of maximum permissible source water levels.* The department shall review the source water samples taken by the water sys-

tem owner or operator both before and after the system owner or operator installs source water treatment, and determine whether the system owner or operator has properly installed and operated the source water treatment approved by the department. Based upon its review, the department shall establish the maximum permissible lead and copper concentrations for finished water entering the distribution system. Levels shall reflect the contaminant removal capability of the treatment properly operated and maintained. The department shall notify the system owner or operator in writing and explain the basis for its decision.

(e) *Continued operation and maintenance.* Each water system owner or operator shall maintain lead and copper levels below the maximum permissible concentrations established by the department at each sampling point monitored in accordance with s. NR 809.549. The system is out of compliance with this paragraph if the level of lead or copper at any sampling point is greater than the maximum permissible concentration approved by the department.

(f) *Modification of department treatment decisions.* Upon its own initiative or in response to a request by a water system owner or operator or other interested party, the department may modify its determination of the source water treatment under par. (b), or maximum permissible lead and copper concentrations for finished water entering the distribution system under par. (d). A request for modification by a system owner or operator or other interested party shall be in writing, explain why the modification is appropriate, and provide supporting documentation. The department may modify its determination where it concludes that such change is necessary to ensure that the system owner or operator continues to minimize lead and copper concentrations in source water. A revised determination shall be made in writing, set forth the new treatment requirements, explain the basis for the department's decision, and provide an implementation schedule for completing the treatment modifications.

(g) *Treatment decisions by EPA in lieu of the department.* The EPA regional administrator may review treatment determinations made by the department under par. (b), (d) or (f) and issue federal treatment determinations consistent with the requirements of those paragraphs where the administrator finds that:

1. The department has failed to issue a treatment determination by the applicable deadlines contained in s. NR 809.544 (1),

2. The department has abused its discretion in a substantial number of cases or in cases affecting a substantial population, or

3. The technical aspects of the department's determination would be indefensible in an expected federal enforcement action taken against a system owner or operator.

History: Cr. Register, July, 1993, No. 451, eff. 8–1–93.

NR 809.545 Lead service line replacement requirements. (1) System owners or operators with water systems that fail to meet the lead action level in tap samples taken pursuant to s. NR 809.547 (4) (b), after installing corrosion control or source water treatment, or both, whichever sampling occurs later, shall replace lead service lines in accordance with the requirements of this section. If a system is in violation of s. NR 809.542 or 809.544 for failure to install source water or corrosion control treatment, the department may require the system owner or operator to commence lead service line replacement under this section after the date by which the system owner or operator was required to conduct monitoring under s. NR 809.547 (4) (b) has passed.

(2) A system owner or operator shall replace annually at least 7% of the initial number of lead service lines in its distribution system. The initial number of lead service lines is the number of lead lines in place at the time the replacement program begins. The system owner or operator shall identify the initial number of lead service lines in its distribution system based upon a materials evaluation, including the evaluation required under s. NR 809.547 (1). The first year of lead service line replacement shall begin on the date the action level was exceeded in tap sampling referenced in sub. (1).

(3) A system owner or operator is not required to replace an individual lead service line if the lead concentration in all service line samples from that line, taken pursuant to s. NR 809.547 (2) (c), is less than or equal to 0.015 mg/L.

(4) A water system owner or operator shall replace the entire service line, up to the building inlet, unless he or she demonstrates to the satisfaction of the department under sub. (5), that he or she controls less than the entire service line. In such cases, the system owner or operator shall replace the portion of the line which the department determines is under the system owner or operator's control. The system owner or operator shall notify the user served by the line that the system owner or operator will replace the portion of the service line under his or her control and shall offer to replace the building owner's portion of the line, but is not required to bear the cost of replacing the building owner's portion of the line. For buildings where only a portion of the lead service line is replaced, the water system owner or operator shall inform the residents that the system owner or operator will collect a first flush tap water sample after partial replacement of the service line is completed if the residents so desire. In cases where the residents accept the offer, the system owner or operator shall collect the sample and report the results to the residents within 14 days after the sample was collected.

(5) A water system owner or operator is presumed to control the entire lead service line, up to the building inlet, unless the system owner or operator demonstrates to the satisfaction of the department, in a letter submitted under s. NR 809.55 (5) (d), that it does not have any of the following forms of control over the entire line, as defined by state statutes, municipal ordinances, public service contracts or other applicable legal authority: authority to set standards for construction, repair or maintenance of the line; authority to replace, repair or maintain the service line; or ownership of the service line. The department shall review the information supplied by the system owner or operator and determine whether the system owner or operator controls less than the entire service line and, in such cases, shall determine the extent of the system owner or operator's control. The department's determination shall be in writing and explain the basis for its decision.

(6) The department shall require a system owner or operator to replace lead service lines on a shorter schedule than that required by this section, taking into account the number of lead service lines in the system, where such a shorter replacement schedule is feasible. The department shall make this determination in writing and notify the system owner or operator of its finding within 6 months after the system owner or operator is triggered into lead service line replacement based on monitoring referenced in sub. (1).

(7) Any system owner or operator may cease replacing all lead service lines whenever lead service line samples collected pursuant to s. NR 809.547 (2) (b) meet the lead action level during each of 2 consecutive monitoring periods and the system owner or operator submits the results to the department. If the lead service line samples in any such water system thereafter exceeds the lead action level, the system owner or operator shall recommence replacing lead service lines, pursuant to sub. (2).

(8) To demonstrate compliance with subs. (1) to (4), a system owner or operator shall report to the department the information specified in s. NR 809.55 (5).

History: Cr. Register, July, 1993, No. 451, eff. 8–1–93.

NR 809.546 Public education and supplemental monitoring requirements. The owner or operator of a water system that exceeds the lead action level based on tap water samples collected in accordance with s. NR 809.547 shall deliver the public education materials contained in subs. (1) and (2) in accordance with the requirements in sub. (3).

(1) CONTENT OF WRITTEN MATERIALS. A water system owner or operator shall include the following text in all of the printed materials it distributes through its lead public education program.

Any additional information presented by a system owner or operator shall be consistent with the information below and be in plain English that can be understood by laypersons.

(a) The United States environmental protection agency (EPA) and [insert name of water supplier] are concerned about lead in your drinking water. Although most homes have very low levels of lead in their drinking water, some homes in the community have lead levels above the EPA action level of 15 parts per billion (ppb), or 0.015 milligrams of lead per liter of water (mg/L). Under federal law we are required to have a program in place to minimize lead in your drinking water by [insert date when corrosion control will be completed for your system]. This program includes corrosion control treatment, source water treatment, and public education. We are also required to replace each lead service line that we control if the line contributes lead concentrations of 15 ppb or more after we have completed the comprehensive treatment program. If you have any questions about how we are carrying out the requirements of the lead regulation please give us a call at [insert water system's phone number]. This brochure explains the simple steps you can take to protect you and your family by reducing your exposure to lead in drinking water.

(b) Lead is a common metal found throughout the environment in lead–based paint, air, soil, household dust, food, certain types of pottery porcelain and pewter and water. Lead can pose a significant risk to your health if too much of it enters your body. Lead builds up in the body over many years and can cause damage to the brain, red blood cells and kidneys. The greatest risk is to young children and pregnant women. Amounts of lead that won't hurt adults can slow down normal mental and physical development of growing bodies. In addition, a child at play often comes into contact with sources of lead contamination — like dirt and dust — that rarely affect an adult. It is important to wash children's hands and toys often, and to try to make sure they only put food in their mouths.

(c) 1. Lead in drinking water, although rarely the sole cause of lead poisoning, can significantly increase a person's total lead exposure, particularly the exposure of infants who drink baby formulas and concentrated juices that are mixed with water. The EPA estimates that drinking water can make up 20% or more of a person's total exposure to lead.

2. Lead is unusual among drinking water contaminants in that it seldom occurs naturally in water supplies like rivers and lakes. Lead enters drinking water primarily as a result of the corrosion, or wearing away, of materials containing lead in the water distribution system and household plumbing. These materials include lead–based solder used to join copper pipe, brass and chrome plated brass faucets, and in some cases, pipes made of lead that connect your house to the water main (service lines). In 1986, congress banned the use of lead solder containing greater than 0.2% lead, and restricted the lead content of faucets, pipes and other plumbing materials to 8.0%.

3. When water stands in lead pipes or plumbing systems containing lead for several hours or more, the lead may dissolve into your drinking water. This means the first water drawn from the tap in the morning, or later in the afternoon after returning from work or school, can contain fairly high levels of lead.

(d) 1. Despite our best efforts mentioned earlier to control water corrosivity and remove lead from the water supply, lead levels in some homes or buildings can be high. To find out whether you need to take action in your own home, have your drinking water tested to determine if it contains excessive concentrations of lead. Testing the water is essential because you cannot see, taste or smell lead in drinking water. Some local laboratories that can provide this service are listed at the end of this booklet. For more information on having your water tested, please call [insert phone number of water system].

2. If a water test indicates that the drinking water drawn from a tap in your home contains lead above 15 ppb, then you should take the following precautions:

a. Let the water run from the tap before using it for drinking or cooking any time the water in a faucet has gone unused for more than 6 hours. The longer water resides in your home's plumbing the more lead it may contain. Flushing the tap means running the cold water faucet until the water gets noticeably colder, usually about 15–30 seconds. If your house has a lead service line to the water main, you may have to flush the water for a longer time, perhaps one minute, before drinking. Although toilet flushing or showering flushes water through a portion of your home's plumbing system, you still need to flush the water in each faucet before using it for drinking or cooking. Flushing tap water is a simple and inexpensive measure you can take to protect your family's health. It usually uses less than one or 2 gallons of water and costs less than [insert a cost estimate based on flushing 2 times a day for 30 days] per month. To conserve water, fill a couple of bottles for drinking water after flushing the tap, and whenever possible use the first flush water to wash the dishes or water the plants. If you live in a high–rise building, letting the water flow before using it may not work to lessen your risk from lead. The plumbing systems have more, and sometimes larger pipes than smaller buildings. Ask your landlord for help in locating the source of the lead and for advice on reducing the lead level.

b. Try not to cook with, or drink water from the hot water tap. Hot water can dissolve more lead more quickly than cold water. If you need hot water, draw water from the cold tap and heat it on the stove.

c. Remove loose lead solder and debris from the plumbing materials installed in newly constructed homes, or homes in which the plumbing has recently been replaced, by removing the faucet strainers from all taps and running the water from 3 to 5 minutes. Thereafter, periodically remove the strainers and flush out any debris that has accumulated over time.

d. If your copper pipes are joined with lead solder that has been installed illegally since it was banned in Wisconsin on September 24, 1984, notify the plumber who did the work and request that he or she replace the lead solder with lead–free solder. Lead solder looks dull gray, and when scratched with a key looks shiny. In addition, notify the department of natural resources about the violation.

e. Determine whether or not the service line that connects your home or apartment to the water main is made of lead. The best way to determine if your service line is made of lead is by either hiring a licensed plumber to inspect the line or by contacting the plumbing contractor who installed the line. You can identify the plumbing contractor by checking the city's record of building permits which should be maintained in the files of the [insert name of department that issues building permits]. A licensed plumber can at the same time check to see if your homes' plumbing contains lead solder, lead pipes or pipe fittings that contain lead. The public water system that delivers water to your home should also maintain records of the materials located in the distribution system. If the service line that connects your dwelling to the water main contributes more than 15 ppb to drinking water, after our comprehensive treatment program is in place, we are required to replace the line. If the line is only partially controlled by the [insert name of the city, county, or water system that controls the line], we are required to provide you with information on how to replace your portion of the service line, and offer to replace that portion of the line at your expense and take a follow–up tap water sample within 14 days of the replacement. Acceptable replacement alternatives include copper, steel, iron and plastic pipes.

f. Have an electrician check your wiring. If grounding wires from the electrical system are attached to your pipes, corrosion

may be greater. Check with a licensed electrician or your local electrical code to determine if your wiring can be grounded elsewhere. DO NOT attempt to change the wiring yourself because improper grounding can cause electrical shock and fire hazards.

3. The steps described in subd. 2. will reduce the lead concentrations in your drinking water. However, if a water test indicates that the drinking water coming from your tap contains lead concentrations in excess of 15 ppb after flushing, or after we have completed our actions to minimize lead levels, then you may want to take the following additional measures:

a. Purchase or lease a home treatment device. Home treatment devices are limited in that each unit treats only the water that flows from the faucet to which it is connected, and all of the devices require periodic maintenance and replacement. Devices such as reverse osmosis systems or distillers can effectively remove lead from your drinking water. Some activated carbon filters may reduce lead levels at the tap, however all lead reduction claims should be investigated. Be sure to check the actual performance of a specific home treatment device before and after installing the unit.

b. Purchase bottled water for drinking and cooking.

4. You can consult a variety of sources for additional information. Your family doctor or pediatrician can perform a blood test for lead and provide you with information about the health effects of lead. State and local government agencies that can be contacted include:

a. [insert the name of city or county department of public utilities] at [insert phone number] can provide you with information about your community's water supply, and a list of local laboratories that have been certified by EPA for testing water quality;

b. [insert the name of city of county department that issues building permits] at [insert phone number] can provide you with information about building permit records that should contain the names of plumbing contractors that plumbed your home; and

c. [insert the name of the state department of public health] at [insert phone number] or the [insert the name of the city or county health department] at [insert phone number] can provide you with information about the health effects of lead and how you can have your child's blood tested.

5. The following is a list of some state approved laboratories in your area that you can call to have your water tested for lead. [Insert names and phone numbers of at least 2 laboratories].

(2) CONTENT OF BROADCAST MATERIALS. A water system owner or operator shall include the following information in all public service announcements submitted under its lead public education program to television and radio stations for broadcasting:

(a) Why should everyone want to know the facts about lead and drinking water? Because unhealthy amounts of lead can enter drinking water through the plumbing in your home. That's why I urge you to do what I did. I had my water tested for [insert free or $ per sample]. You can contact the [insert the name of the city or water system] for information on testing and on simple ways to reduce your exposure to lead in drinking water.

(b) To have your water tested for lead, or to get more information about this public health concern, please call [insert the phone number of the city or water system owner or operator].

(3) DELIVERY OF A PUBLIC EDUCATION PROGRAM. (a) In communities where a significant proportion of the population speaks a language other than English, public education materials shall be communicated in the appropriate languages.

(b) The owner or operator of a community water system that fails to meet the lead action level on the basis of tap water samples collected in accordance with s. NR 809.547 shall, within 60 days:

1. Insert notices in each customer's water utility bill containing the information in par. (a), along with the following alert on the water bill itself in large print:

"SOME HOMES IN THIS COMMUNITY HAVE ELEVATED LEAD LEVELS IN THEIR DRINKING WATER. LEAD CAN POSE A SIGNIFICANT RISK TO YOUR HEALTH. PLEASE READ THE ENCLOSED NOTICE FOR FURTHER INFORMATION."

2. Submit the information in sub. (1) to the editorial departments of the major daily and weekly newspapers circulated throughout the community.

3. Deliver pamphlets and/or brochures that contain the public education materials in sub. (1) (b) and (d) to facilities and organizations, including the following:

a. Public schools and/or local school boards;

b. City or county health department;

c. Women, Infants, and Children and/or Head Start Program(s) whenever available;

d. Public and private hospitals and/or clinics;

e. Pediatricians;

f. Family planning clinics; and

g. Local welfare agencies.

4. Submit the public service announcement in sub. (2) to at least 5 of the radio and television stations with the largest audiences that broadcast to the community served by the water system.

(c) A community water system owner or operator shall repeat the tasks contained in par. (b) 1. to 3. every 12 months, and the tasks contained in par. (b) 4. every 6 months for as long as the system exceeds the lead action level.

(d) Within 60 days after it exceeds the lead action level, a non–transient, non–community water system owner or operator shall deliver the public education materials contained in sub. (1) (a), (b) and (d) as follows:

1. Post informational posters on lead in drinking water in a public place or common area in each of the buildings served by the system; and

2. Distribute informational pamphlets and/or brochures on lead in drinking water to each person served by the non–transient, non–community water system.

(e) A non–transient, non–community water system owner or operator shall repeat the tasks contained in par. (d) at least once during each calendar year in which the system exceeds the lead action level.

(f) A water system owner or operator may discontinue delivery of public education materials if the system has met the lead action level during the most recent 6–month monitoring period conducted pursuant to s. NR 809.547. Such a system owner or operator shall recommence public education in accordance with this section if it subsequently exceeds the lead action level during any monitoring period.

(4) SUPPLEMENTAL MONITORING AND NOTIFICATION OF RESULTS. A water system that fails to meet the lead action level on the basis of tap samples collected in accordance with s. NR 809.547 shall offer to sample the tap water of any customer who requests it. The system owner or operator is not required to pay for collecting or analyzing the sample, nor is the system owner or operator required to collect and analyze the sample itself.

History: Cr. Register, July, 1993, No. 451, eff. 8–1–93.

NR 809.547 Monitoring requirements for lead and copper in tap water. (1) SAMPLE SITE LOCATION. (a) By the applicable date for commencement of monitoring under sub. (4) (a), each water system owner or operator shall complete a materials evaluation of its distribution system in order to identify a pool of targeted sampling sites that meet the requirements as specified in pars. (c) to (f), and which is sufficiently large to ensure that the water system owner or operator can collect the number of lead and copper tap samples required in sub. (3). All sites from which first draw samples are collected shall be selected from this pool of tar-

geted sampling sites. Sampling sites may not include faucets that have point–of–use or point–of–entry treatment devices designed to remove inorganic contaminants.

(b) A water system owner or operator shall use the information on lead, copper and galvanized steel that it is required to collect under s. NR 809.14 (4) when conducting a materials evaluation. When an evaluation of the information collected pursuant to s. NR 809.14 (4) is insufficient to locate the requisite number of lead and copper sampling sites that meet the targeting criteria in this subsection, the water system owner or operator shall review the following sources of information in order to identify a sufficient number of sampling sites. In addition, the system owner or operator shall seek to collect such information where possible in the course of its normal operations, e.g., checking service line materials when reading water meters or performing maintenance activities:

1. All plumbing codes, permits and records in the files of the building department which indicate the plumbing materials that are installed within publicly and privately owned structures connected to the distribution system;

2. All inspections and records of the distribution system that indicate the material composition of the service connections that connect a structure to the distribution system; and

3. All existing water quality information, which includes the results of all prior analyses of the system or individual structures connected to the system, indicating locations that may be particularly susceptible to high lead or copper concentrations.

(c) The sampling sites selected for a community water system's sampling pool, "tier 1 sampling sites", shall consist of single family structures that:

1. Contain copper pipes with lead solder installed after 1982 or contain lead pipes; or

2. Are served by a lead service line. When multiple–family residences comprise at least 20% of the structures served by a water system, the system may include these types of structures in its sampling pool, or both.

(d) Any community water system with insufficient tier 1 sampling sites shall complete its sampling pool with"tier 2 sampling sites", consisting of buildings, including multiple–family residences that:

1. Contain copper pipes with lead solder installed after 1982 or contain lead pipes; or

2. Are served by a lead service line, or both.

(e) Any community water system with insufficient tier 1 and tier 2 sampling sites shall complete its sampling pool with "tier 3 sampling sites", consisting of single family structures that contain copper pipes with lead solder installed before 1983.

(f) The sampling sites selected for a non–transient non–community water system, "tier 1 sampling sites", shall consist of buildings that:

1. Contain copper pipes with lead solder installed after 1982 or contain lead pipes; or

2. Are served by a lead service line, or both

(g) A non–transient, non–community water system with insufficient tier 1 sites that meet the targeting criteria in par. (f) shall complete its sampling pool with sampling sites that contain copper pipes with lead solder installed before 1983.

(h) Water system owners or operators whose sampling pool does not consist exclusively of tier 1 sites shall demonstrate in a letter submitted to the department under s. NR 809.55 (1) (d) why a review of the information listed in par. (b) was inadequate to locate a sufficient number of tier 1 sites. Any owner or operator of a community water system which includes tier 3 sampling sites in its sampling pool shall demonstrate in such a letter why they were unable to locate a sufficient number of tier 1 and tier 2 sampling sites.

(i) Any water system owner or operator whose distribution system contains lead service lines shall draw 50% of the samples collected during each monitoring period from sites that contain lead pipes, or copper pipes with lead solder, and 50% of those samples from sites served by a lead service line. A water system owner or operator who cannot identify a sufficient number of sampling sites served by a lead service line shall demonstrate in a letter submitted to the department under s. NR 809.55 (1) (f) why the system owner or operator was unable to locate a sufficient number of such sites. Such a water system owner or operator shall collect first draw samples from all of the sites identified as being served by such lines.

(2) SAMPLE COLLECTION METHODS. (a) All tap samples for lead and copper collected in accordance with this subchapter, with the exception of lead service line samples collected under s. NR 809.545 (3) shall be first draw samples.

(b) Each first–draw tap sample for lead and copper shall be one liter in volume and have stood motionless in the plumbing system of each sampling site for at least 6 hours.

(c) If the sample is not acidified immediately after collection, then the sample shall stand in the original container for at least 16 hours after acidification.

1. First–draw samples from residential housing shall be collected from the cold–water kitchen tap or bathroom sink tap.

2. First–draw samples from a non–residential building shall be collected at an interior tap from which water is typically drawn for consumption.

3. For systems that conduct business 24 hours per day, a first draw sample shall represent water that has been standing in the pipes for the longest time possible.

4. First–draw samples may be collected by the system owner or operator or the system may allow residents to collect first–draw samples after instructing the residents of the sampling procedures specified in this paragraph. To avoid problems of residents handling nitric acid, acidification of first–draw samples may be done up to 14 days after the sample is collected.

5. If a system owner or operator allows residents to perform sampling, the system owner or operator may not challenge, based on alleged errors in sample collection, the accuracy of sampling results.

(cm) Each service line sample shall be one liter in volume and have stood motionless in the lead service line for at least 6 hours. Lead service line samples shall be collected in one of the following 3 ways:

1. At the tap after flushing the volume of water between the tap and the lead service line. The volume of water shall be calculated based on the interior diameter and length of the pipe between the tap and the lead service line;

2. Tapping directly into the lead service line; or

3. If the sampling site is a building constructed as a single–family residence, allowing the water to run until there is a significant change in temperature which would be indicative of water that has been standing in the lead service line.

(d) A water system owner or operator shall collect each first–draw tap sample from the same sampling site from which it collected a previous sample. If for any reason the water system owner or operator cannot gain entry to a sampling site in order to collect a follow–up tap sample, the system owner or operator may collect the follow–up tap sample from another sampling site in its sampling pool as long as the new site meets the same targeting criteria, and is within reasonable proximity of the original site.

(3) NUMBER OF SAMPLES. Water system owners or operators shall collect at least one sample during each monitoring period specified in sub. (4) from the number of sites listed in the following column titled"standard monitoring". A system owner or operator conducting reduced monitoring under sub. (4) (d) may collect one sample from the number of sites specified in the second fol-

lowing column during each monitoring period specified in sub. (4) (d).

System Size (# People Served)	# of sites (Standard Monitoring)	# of sites (Reduced Monitoring)
>100,000	100	50
10,001–100,000	60	30
3,301 to 10,000	40	20
501 to 3,300	20	10
101 to 500	10	5
≤ 100	5	5

(4) TIMING OF MONITORING. (a) *Initial tap sampling.* The first 6–month monitoring period for small, medium and large–size systems shall begin on the following dates:

System Size (# People Served)	First six–month Monitoring Period Begins On
>50,000	January 1, 1992
3,301 to 50,000	July 1, 1992
≤3,300	July 1, 1993

1. The owners and operators of all large systems shall monitor during 2 consecutive 6–month periods.

2. The owners and operators of all small and medium–size systems shall monitor during each 6–month monitoring period until:

a. The system exceeds the lead or copper action level and is therefore required to implement the corrosion control treatment requirements under s. NR 809.542, in which case the system owner or operator shall continue monitoring in accordance with par. (b), or

b. The system meets the lead or copper action levels during 2 consecutive 6–month monitoring periods, in which case the system owner or operator may reduce monitoring in accordance with par. (d).

(b) *Monitoring after installation of corrosion control and source water treatment.* 1. Any large system with optimal corrosion control treatment installed pursuant to s. NR 809.542 (4) (d) shall be monitored during 2 consecutive 6–month periods by the date specified in s. NR 809.542 (4) (e).

2. Any small or medium–size system with optimal corrosion control treatment installed pursuant to s. NR 809.542 (5) (e) shall be monitored during 2 consecutive 6–month monitoring periods by the date specified in s. NR 809.542 (5) (f).

3. Any system owner or operator that installs source water treatment pursuant to s. NR 809.544 (1) (c) shall monitor during 2 consecutive 6–month monitoring periods by the date specified in s. NR 809.544 (1) (d).

(c) *Monitoring after the department specifies water quality parameter values for optimal corrosion control.* After the department approves the values for water quality control parameters under s. NR 809.543 (6), the system owner or operator shall monitor during each subsequent 6–month monitoring period, with the first monitoring period to begin on the date the department specifies the optimal values under s. NR 809.543 (6).

(d) *Reduced monitoring.* 1. The owner or operator of a small or medium–size water system that meets the lead and copper action levels during each of 2 consecutive 6–month monitoring periods may reduce the number of samples in accordance with sub. (3), and reduce the frequency of sampling to once per year.

2. Any water system owner or operator that maintains the range of values for the water quality control parameters reflecting optimal corrosion control treatment specified by the department under s. NR 809.543 (6) during each of 2 consecutive 6–month monitoring periods may request that the department allow the system owner or operator to reduce the frequency of monitoring to once per year and to reduce the number of lead and copper samples in accordance with sub. (3). The department shall review the information submitted by the water system owner or operator and shall make its decision in writing, setting forth the basis for its determination. The department shall review, and where appropriate, revise its determination when the system owner or operator submits new monitoring or treatment data, or when other data relevant to the number and frequency of tap sampling becomes available.

3. The owner or operator of a small or medium–size water system that meets the lead and copper action levels during 3 consecutive years of monitoring may reduce the frequency of monitoring for lead and copper from annually to once every 3 years. Any owner or operator of a water system that maintains the range of values for the water quality control parameters reflecting optimal corrosion control treatment specified by the department under s. NR 809.543 (6) during 3 consecutive years of monitoring may request that the department allow the system owner or operator to reduce the frequency of monitoring from annually to once every 3 years. The department shall review the information submitted by the water system owner or operator and shall make its decision in writing, setting forth the basis for its determination. The department shall review, and where appropriate, revise its determination when the water supplier submits new monitoring or treatment data, or when other data relevant to the number and frequency of tap sampling becomes available.

4. A water system owner or operator that reduces the number and frequency of sampling shall collect these samples from sites included in the pool of targeted sampling sites identified in sub. (1). System owners or operators sampling annually or less frequently shall conduct the lead and copper tap sampling during the months of June, July, August or September.

5. Water suppliers for a small or medium–size water system subject to reduced monitoring that exceeds the lead or copper action level shall resume sampling in accordance with par. (c) and collect the number of samples specified for standard monitoring under sub. (3). Such a system owner or operator shall also conduct water quality parameter monitoring in accordance with s. NR 809.548 (2), (3) or (4) during the monitoring period in which the action level was exceeded. Any water system subject to reduced monitoring frequency that fails to operate within the range of values for the water quality control parameters specified by the department under s. NR 809.543 (6) shall resume tap water sampling in accordance with par. (c) and collect the number of samples specified for standard monitoring under sub. (3).

(5) ADDITIONAL MONITORING BY SYSTEM OWNER OR OPERATORS. The results of any monitoring conducted in addition to the minimum requirements of this section shall be considered by the system owner or operator and the department in making any determinations, i.e., calculating the 90th percentile lead or copper level, under this subchapter.

History: Cr. Register, July, 1993, No. 451, eff. 8–1–93; correction in (2) made under s. 13.93 (2m) (b) 1., Stats., Register, October, 1997, No. 502; correction in (2) made under s. 13.93 (2m) (b) 1., Stats., am. (2) (c), Register, October, 1997, No. 502, eff. 11–1–97.

NR 809.548 Monitoring requirements for water quality parameters. Owners or operators of all large systems, and of all small and medium–size systems that exceed the lead or copper action level, shall monitor water quality parameters in addition to lead and copper in accordance with this section. The requirements of this section are summarized in the table at the end of this section.

(1) GENERAL REQUIREMENTS. (a) *Sample collection methods.* 1. Tap samples shall be representative of water quality throughout the distribution system taking into account the number of persons served, the different sources of water, the different treatment methods employed by the system owner or operator, and seasonal variability. Tap sampling under this section is not required to be

conducted at taps targeted for lead and copper sampling under s. NR 809.547 (1).

2. Samples collected at the entry points to the distribution system shall be from locations representative of each source after treatment. If a system draws water from more than one source and the sources are combined before distribution, the system owner or operator shall sample at an entry point to the distribution system during periods of normal operating conditions, i.e., when water is representative of all sources being used.

(b) *Number of samples.* 1. System owners or operators shall collect 2 tap samples for applicable water quality parameters during each monitoring period specified under subs. (2) to (5) from the following number of sites.

System Size (# People Served)	# of Sites For Water Quality Parameters
>100,000	25
10,001–100,000	10
3,301 to 10,000	3
501 to 3,300	2
101 to 500	1
≤100	1

2. Water suppliers shall collect 2 samples for each applicable water quality parameter at each entry point to the distribution system during each monitoring period specified in sub. (2). During each monitoring period specified in subs. (3) to (5), system owners or operators shall collect one sample for each applicable water quality parameter at each entry point to the distribution system.

(2) INITIAL SAMPLING. Owners or operators of all large water systems shall measure the applicable water quality parameters as specified below at taps and at each entry point to the distribution system during each 6–month monitoring period specified in s. NR 809.547 (4) (a). Owners or operators of all small and medium–size systems shall measure the applicable water quality parameters at the locations specified below during each 6–month monitoring period specified in s. NR 809.547 (4) (a) during which the system exceeds the lead or copper action level.

(a) At taps:

1. pH;

2. Alkalinity;

3. Orthophosphate, when an inhibitor containing a phosphate compound is used;

4. Silica, when an inhibitor containing a silicate compound is used;

5. Calcium;

6. Conductivity; and

7. Water temperature.

(b) At each entry point to the distribution system: all of the applicable parameters listed in par. (a).

(3) MONITORING AFTER INSTALLATION OF CORROSION CONTROL. The owner or operator of any large system which installs optimal corrosion control treatment pursuant to s. NR 809.542 (4) (d) shall measure the water quality parameters at the following locations and frequencies during each 6–month monitoring period specified in s. NR 809.547 (4) (b) 1. The owner or operator of any small or medium–size system which installs optimal corrosion control treatment shall conduct such monitoring during each 6–month monitoring period specified in s. NR 809.547 (4) (b) 2. in which the system exceeds the lead or copper action level.

(a) At taps, 2 samples for:

1. pH;

2. Alkalinity;

3. Orthophosphate, when an inhibitor containing a phosphate compound is used;

4. Silica, when an inhibitor containing a silicate compound is used;

5. Calcium, when calcium carbonate stabilization is used as part of corrosion control.

(b) At each entry point to the distribution system, one sample every 2 weeks (bi–weekly) for:

1. pH;

2. When alkalinity is adjusted as part of optimal corrosion control, a reading of the dosage rate of the chemical used to adjust alkalinity and the alkalinity concentration; and

3. When a corrosion inhibitor is used as part of optimal corrosion control, a reading of the dosage rate of the inhibitor used and the concentration of orthophosphate or silica, whichever is applicable.

(4) MONITORING AFTER THE DEPARTMENT SPECIFIES WATER QUALITY PARAMETER VALUES FOR OPTIMAL CORROSION CONTROL. After the department specifies the values for applicable water quality control parameters reflecting optimal corrosion control treatment under s. NR 809.543 (6), water system owners or operators for all large systems shall measure the applicable water quality parameters in accordance with sub. (3) during each monitoring period specified in s. NR 809.547 (4) (c). Water system owners or operators for any small or medium–size system shall conduct such monitoring during each monitoring period specified in s. NR 809.547 (4) (c) in which the system exceeds the lead or copper action level. The system owner or operator may take a confirmation sample for any water quality parameter value no later than 3 days after the first sample. If a confirmation sample is taken, the result shall be averaged with the first sampling result and the average shall be used for any compliance determinations under s. NR 809.543 (7). The department has discretion to delete results of obvious sampling errors from this calculation.

(5) REDUCED MONITORING. (a) Any water system that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment during each of 2 consecutive 6–month monitoring periods under sub. (4) shall continue monitoring at the entry points to the distribution system as specified in sub. (3) (b). Such system may collect 2 tap samples for applicable water quality parameters from the following reduced number of sites during each 6–month monitoring period.

(# People Served) System Size	Reduced # of Sites for Water Quality Parameters
>100,000	10
10,001 to 100,000	7
3,301 to 10,000	3
501 to 3,300	2
101 to 500	1
≤100	1

(b) Any water system that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment specified by the department under s. NR 809.543 (6) during 3 consecutive years of monitoring may reduce the frequency with which it collects the number of tap samples for applicable water quality parameters specified in par. (a) from every 6 months to annually.

(c) Any water system that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment specified by the department under s. NR 809.543 (6) during 3 consecutive years of annual monitoring may reduce the frequency with which it collects the number of tap samples for applicable water quality parameters specified in par. (a) from annually to every 3 years.

(d) A water system owner or operator that conducts sampling annually shall collect these samples evenly throughout the year so as to reflect seasonal variability.

(e) Any owner or operator that has a water system subject to reduced monitoring frequency that fails to operate within the range of values for the water quality parameters specified by the department under s. NR 809.543 (6) shall resume tap water sampling in accordance with the number and frequency requirements in sub. (3).

(6) ADDITIONAL MONITORING BY SYSTEM OWNER OR OPERATORS. The results of any monitoring conducted in addition to the minimum requirements of this section shall be considered by the system and the department in making any determinations, i.e., determining concentrations of water quality parameters, under this section or s. NR 809.543.

History: Cr. Register, July, 1993, No. 451, eff. 8–1–93; am. (intro.), Register, October, 1997, No. 502, eff. 11–1–97.

NR 809.549 Monitoring requirements for lead and copper in source water. (1) SAMPLE LOCATION, COLLECTION METHODS AND NUMBER OF SAMPLES. (a) The owner or operator of a water system that fails to meet the lead or copper action level on the basis of tap samples collected in accordance with s. NR 809.547 shall collect lead and copper source water samples in accordance with the requirements regarding sample location, number of samples and collection methods specified in s. NR 809.12 (1) (a) to (c). The timing of sampling for lead and copper shall be in accordance with subs. (2) and (3), and not dates specified in s. NR 809.12 (1) (a) and (b).

(b) Where the results of sampling indicate an exceedance of maximum permissible source water levels established under s. NR 809.544 (2) (d), the department may require that one additional sample be collected as soon as possible after the initial sample was taken, but not to exceed 2 weeks, at the same sampling point. If a department–required confirmation sample is taken for lead or copper, then the results of the initial and confirmation sample shall be averaged in determining compliance with the department–specified maximum permissible levels. Any sample value below the detection limit shall be considered to be zero. Any value above the detection limit but below 5 ug/l, shall be considered as the measured value.

(2) MONITORING FREQUENCY AFTER SYSTEM EXCEEDS TAP WATER ACTION LEVEL. Any owner or operator of a system that exceeds the lead or copper action level at the tap shall collect one source water sample from each entry point to the distribution system within 6 months after the exceedance.

(3) MONITORING FREQUENCY AFTER INSTALLATION OF SOURCE WATER TREATMENT. Any system owner or operator which installs source water treatment pursuant to s. NR 809.544 (1) (b) shall collect an additional source water sample from each entry point to the distribution system during 2 consecutive 6–month monitoring periods by the deadline specified in s. NR 809.544 (1) (d).

(4) MONITORING FREQUENCY AFTER DEPARTMENT SPECIFIES MAXIMUM PERMISSIBLE SOURCE WATER LEVELS OR DETERMINES THAT SOURCE WATER TREATMENT IS NOT NEEDED. (a) A system owner or operator shall monitor at the frequency specified below in cases where the department specifies maximum permissible source water levels under s. NR 809.544 (2) (d) or determines that the system owner or operator is not required to install source water treatment under s. NR 809.544 (2) (b).

1. An owner or operator of a water system using only groundwater shall collect samples once during the 3–year compliance period in effect when the applicable department determination under par. (a) is made. System owners or operators shall collect samples once during each subsequent compliance period.

2. An owner or operator of a water system using surface water, or a combination of surface and groundwater, shall collect samples once during each year, the first annual monitoring period to begin on the date on which the applicable department determination under par. (a) is made.

(b) A system owner or operator is not required to conduct source water sampling for lead or copper, or both if the system meets the action level for the specific contaminant in tap water samples during the entire source water sampling period applicable to the system under par. (a) 1. or 2.

(5) REDUCED MONITORING FREQUENCY. (a) A water system using only groundwater which demonstrates that finished drinking water entering the distribution system has been maintained below the maximum permissible lead or copper concentrations or both specified by the department in s. NR 809.544 (2) (d) during at least 3 consecutive compliance periods under sub. (4) (a) may reduce the monitoring frequency for lead or copper or both to once during each 9–year compliance cycle.

(b) A water system using surface water, or a combination of surface and groundwater which demonstrates that finished drinking water entering the distribution system has been maintained below the maximum permissible lead and copper concentrations specified by the department in s. NR 809.544 (2) (d) for at least 3 consecutive years may reduce the monitoring frequency in sub. (4) (a) to once during each 9–year compliance cycle.

(c) A water system that uses a new source of water is not eligible for reduced monitoring for lead or copper or both until concentrations in samples collected from the new source during 3 consecutive monitoring periods are below the maximum permissible lead and copper concentrations specified by the department in s. NR 809.544 (1) (e).

History: Cr. Register, July, 1993, No. 451, eff. 8–1–93; am. (1) (a), Register, October, 1997, No. 502, eff. 11–1–97.

NR 809.55 Reporting requirements. All water system owners or operators shall report all of the following information to the department in accordance with this section:

(1) REPORTING REQUIREMENTS FOR TAP WATER MONITORING FOR LEAD AND COPPER AND FOR WATER QUALITY PARAMETER MONITORING. (a) All lead samples that are detected shall be quantified. Any sample below the method detection limit shall be calculated at zero for the purposes of determining compliance with s. NR 809.541 (3) (c).

(b) All copper samples that are detected shall be quantified. Any sample below the method detection limit shall be calculated as zero for the purposes of determining compliance with s. NR 809.541 (3) (c).

(c) A water system owner or operator shall report the following information for all tap water samples within the first 10 days following the end of each applicable monitoring period specified in ss. NR 809.547, 809.548 and 809.549, i.e., every 6–months, annually, or every 3 years.

1. The results of all tap samples for lead and copper including the location of each site and the criteria under s. NR 809.547 (1) (c), (d), (e), (f) or (g) under which the site was selected for the system's sampling pool;

2. A certification that each first draw sample collected by the water system is one–liter in volume and, to the best of their knowledge, has stood motionless in the service line, or in the interior plumbing of a sampling site, for at least 6 hours;

3. Where residents collected samples, a certification that each tap sample collected by the residents was taken after the water system owner or operator informed them of proper sampling procedures specified in s. NR 809.547 (2) (b);

4. The 90th percentile lead and copper concentrations measured from among all lead and copper tap water samples collected during each monitoring period;

5. With the exception of initial tap sampling conducted pursuant to s. NR 809.547 (4) (a), the system owner or operator shall designate any site which was not sampled during previous monitoring periods, and include an explanation of why sampling sites have changed;

6. The results of all tap samples for pH and, where applicable, alkalinity, calcium, conductivity, temperature and orthophosphate or silica collected under s. NR 809.548 (2) to (5);

7. The results of all samples collected at the entry points to the distribution system for applicable water quality parameters under s. NR 809.548 (2) to (5).

(d) By the applicable date in s. NR 809.547 (4) (a) for commencement of monitoring, the owner or operator of each community water system that does not complete its targeted sampling pool with tier 1 sampling sites meeting the criteria in s. NR 809.547 (1) (c) shall send a letter to the department justifying its selection of tier 2 or tier 3 or both sampling sites under s. NR 809.547 (1) (d) or (e) or both.

(e) By the applicable date in s. NR 809.547 (4) (a) for commencement of monitoring, the owner or operator of each non-transient, non-community water system which does not complete its sampling pool with tier 1 sampling sites meeting the criteria in s. NR 809.547 (1) (f) shall send a letter to the department justifying its selection of sampling sites under s. NR 809.547 (1) (g).

(f) By the applicable date in s. NR 809.547 (4) (a) for commencement of monitoring, the owner or operator of each water system with lead service lines that is not able to locate the number of sites served by such lines required under s. NR 809.547 (1) (i) shall send a letter to the department demonstrating why they were unable to locate a sufficient number of such sites based upon the information listed in s. NR 809.547 (1) (b).

(g) Each water system owner or operator that requests that the department reduce the number and frequency of sampling shall provide the information required under s. NR 809.547 (4) (d).

(2) SOURCE WATER MONITORING REPORTING REQUIREMENTS. (a) A water system owner or operator shall report the sampling results for all source water samples collected in accordance with s. NR 809.549 within the first 10 days following the end of each source water monitoring period, i.e., annually, per compliance period, per compliance cycle specified in s. NR 809.549.

(b) With the exception of the first round of source water sampling conducted pursuant to s. NR 809.549 (2), the system owner or operator shall specify any site which was not sampled during previous monitoring periods, and include an explanation of why the sampling point has changed.

(3) CORROSION CONTROL TREATMENT REPORTING REQUIREMENTS. By the applicable dates under s. NR 809.542, system owners or operators shall report the following information:

(a) For owners or operators of systems demonstrating that they have already optimized corrosion control, information required in s. NR 809.542 (2) (b) or (c).

(b) For owners or operators of systems required to optimize corrosion control, their recommendation regarding optimal corrosion control treatment under s. NR 809.543 (1).

(c) For owners or operators of systems required to evaluate the effectiveness of corrosion control treatments under s. NR 809.543 (3), the information required by that section.

(d) For owners or operators of systems required to install optimal corrosion control approved by the department under s. NR 809.543 (4), a letter certifying that the system owner or operator has completed installing that treatment.

(4) SOURCE WATER TREATMENT REPORTING REQUIREMENTS. By the applicable dates in s. NR 809.544, system owners or operators shall provide the following information to the department:

(a) If required under s. NR 809.544 (2) (a), their recommendation regarding source water treatment;

(b) For system owners or operators required to install source water treatment under s. NR 809.544 (2) (b), a letter certifying that the system owner or operator has completed installing the treatment approved by the department within 24 months after the department approved the treatment.

(5) LEAD SERVICE LINE REPLACEMENT REPORTING REQUIREMENTS. System owners or operators shall report the following information to the department to demonstrate compliance with the requirements of s. NR 809.545:

(a) Within 12 months after a system exceeds the lead action level in sampling referred to in s. NR 809.545 (1), the system owner or operator shall demonstrate in writing to the department that materials evaluations were conducted, including the evaluation in s. NR 809.547 (1), to identify the initial number of lead service lines in the distribution system, and shall provide the department with the system owner or operator's schedule for replacing annually at least 7% of the initial number of lead service lines in the distribution system.

(b) Within 12 months after a system exceeds the lead action level in sampling referred to in s. NR 809.545 (1), and every 12 months thereafter, the system owner or operator shall demonstrate to the department in writing that the system owner or operator has either:

1. Replaced in the previous 12 months at least 7% of the initial lead service lines, or a greater number of lines specified by the department under s. NR 809.545 (6), in its distribution system, or

2. Conducted sampling which demonstrates that the lead concentration in all service line samples from an individual line, taken pursuant to s. NR 809.547 (2) (cm), is less than or equal to 0.015 mg/L. In such cases, the total number of lines replaced or which meet the criteria in s. NR 809.545 (2) shall equal at least 7% of the initial number of lead lines identified under sub. (1), or the percentage specified by the department under s. NR 809.545 (6).

(c) The annual letter submitted to the department under par. (b) shall contain the following information:

1. The number of lead service lines scheduled to be replaced during the previous year of the system's replacement schedule;

2. The number and location of each lead service line replaced during the previous year of the system's replacement schedule;

3. If measured, the water lead concentration and location of each lead service line sampled, the sampling method and the date of sampling.

(d) As soon as practicable, but in no case later than 3 months after a system exceeds the lead action level in sampling referred to in s. NR 809.545 (1), any system owner or operator seeking to rebut the presumption that it has control over the entire lead service line pursuant to s. NR 809.545 (4) shall submit a letter to the department describing the legal authority, e.g., state statutes, municipal ordinances, public service contracts or other applicable legal authority, which limits the system owner or operator's control over the service lines and the extent of the system owner or operator's control.

(6) PUBLIC EDUCATION PROGRAM REPORTING REQUIREMENTS. By December 31st of each year, any water system that is subject to the public education requirements in s. NR 809.546 shall submit a letter to the department demonstrating that the system owner or operator has delivered the public education materials that meet the content requirements in s. NR 809.546 (1) and (2) and the delivery requirements in s. NR 809.546 (3). This information shall include a list of all the newspapers, radio stations, television stations, facilities and organizations to which the system owner or operator delivered public education materials during the previous year. The water system owner or operator shall submit the letter required by this subsection annually for as long as it exceeds the lead action level.

(7) REPORTING OF ADDITIONAL MONITORING DATA. Any system owner or operator who collects sampling data in addition to that required by this subchapter shall report the results to the department within the first 10 days following the end of the applicable

monitoring period under ss. NR 809.547, 809.548 and 809.549 during which the samples are collected.

History: Cr. Register, July, 1993, No. 451, eff. 8–1–93; correction made in (3) (a) and (5) (b) 2., made under s. 13.93 (2m) (b) 7., Stats., am. (7), Register, October, 1997, No. 502, eff. 11–1–97.

Subchapter III — Maximum Contaminant Levels, Maximum Residual Disinfectant Levels, Monitoring, Analytical Requirements and Control of Disinfection Byproducts and Disinfection Residuals

NR 809.561 Maximum contaminant levels (MCLs) for disinfection byproducts, maximum residual disinfectant levels (MRDLs) and best available treatment. **(1)** MAXIMUM CONTAMINANT LEVELS. When the MCLs for total trihalomethanes lapse as provided in s. NR 809.22, the maximum contaminant levels (MCLs) for disinfection byproducts shall be:

Disinfection byproduct	Milligrams per liter
Total trihalomethanes (TTHM)	0.080
Haloacetic acids (five) (HAA5)	0.060
Bromate	0.010
Chlorite	1.0

(2) MAXIMUM RESIDUAL DISINFECTANT LEVELS. The maximum residual disinfectant levels (MRDLs) for disinfection byproducts shall be:

Residual Disinfectant levels	Milligrams per liter
Chlorine	4.0 (as Cl_2)
Chloramines	4.0 (as Cl_2)
Chlorine dioxide	0.8 (as ClO_2)

(3) BEST AVAILABLE TREATMENT. The department, pursuant to 42 USC 300g–1 and related regulations applicable to public water systems, identifies the following as the best available treatment technology, treatment techniques or other means available for achieving compliance with the maximum contaminant levels for disinfection byproducts identified in sub. (1):

Disinfectant byproduct	Best available treatment
TTHM	Enhanced coagulation or enhanced softening or GAC10, with chlorine as the primary and residual disinfectant.
HAA5	Enhanced coagulation or enhanced softening or GAC10, with chlorine as the primary and residual disinfectant.
Bromate	Control of ozone treatment process to reduce production of bromate.
Chlorite	Control of treatment processes to reduce disinfectant demand and control of disinfection treatment processes to reduce disinfectant levels.

History: Cr. Register, December, 2000, No. 540, eff. 1–1–01.

NR 809.562 General requirements. **(1)** The following requirements establish criteria under which community water systems (CWSs) and nontransient, noncommunity water systems (NTNCWSs) which add a chemical disinfectant to the water in any part of the drinking water treatment process shall modify their practices to meet MCLs and MRDLs in s. NR 809.561(1) and (2), respectively, and shall meet the treatment technique requirements for disinfection byproduct precursors in s. NR 809.561(3). Transient noncommunity water systems (TNCWSs) that use chlorine dioxide as a disinfectant or oxidant shall modify their practices to meet the MRDL for chlorine dioxide in s. NR 809.561(2) according to the criteria established as follows.

(2) MCLs have been established for TTHM and HAA5 and treatment technique requirements for disinfection byproduct precursors to limit the levels of known and unknown disinfection byproducts which may have adverse health effects. These disinfection byproducts may include chloroform, bromodichloromethane, dibromochloromethane, bromoform, dichloroacetic acid, and trichloroacetic acid.

(3) Unless otherwise noted, all public drinking water systems shall comply with the requirements of this subchapter as follows:

(a) All systems serving 10,000 or more persons that are CWSs or NTNCWSs and that are supplied by a surface water source or by a ground water source under the direct influence of surface water shall comply with this subchapter beginning December 16, 2001.

(b) Systems serving fewer than 10,000 persons that are CWSs or NTNCWSs and that are supplied by a surface water source or by a ground water source under the direct influence of surface water and all systems using only ground water not under the direct influence of surface water shall comply with this subchapter beginning December 16, 2003.

(c) Systems serving 10,000 or more persons that are transient NCWSs and use chlorine dioxide as a disinfectant or oxidant and are supplied by a surface water source or by a ground water source under the direct influence of surface water shall comply with any requirements for chlorine dioxide and chlorite in this subchapter beginning December 16, 2001.

(d) Systems that are transient NCWS and use chlorine dioxide as a disinfectant or oxidant and that serve fewer than 10,000 persons and are supplied by a surface water source or by a ground water source under the direct influence of surface water or that are systems using only ground water not under the direct influence of surface water shall comply with any requirements for chlorine dioxide and chlorite in this subchapter beginning December 16, 2003.

(e) CWS and NTNCW systems installing GAC or membrane technology to comply with this subchapter may apply to the department for an extension of up to 24 months past the dates in par. (a) but not beyond December 16, 2003. In granting the extension, the department shall set a schedule for compliance and may specify any interim measures that the system shall take. Failure to meet the schedule or interim treatment requirements constitutes a violation of a national primary drinking water regulation.

(4) Each CWS and NTNCWS regulated under s. NR 809.561 shall be operated by qualified personnel who meet the requirements specified in ch. NR 114, subch. III and are included in a department register of qualified operators.

(5) Notwithstanding the MRDLs in s. NR 809.561 (2), systems may increase in the distribution system residual disinfectant levels of chlorine or chloramines, but not chlorine dioxide, to a level and for a time necessary to protect public health, to address specific microbiological contamination problems caused by circumstances such as, but not limited to, distribution line breaks, storm run–off events, source water contamination events or cross–connection events.

(6) The owner or operator of a public water system shall provide public notification in compliance with s. NR 809.81 when the MCL or MRDL or disinfectant residual is exceeded.

(7) CWS that detect TTHM above 0.080 mg/l, but below the MCL in s. NR 809.561 (1), as an annual average, monitored and calculated under the provisions of s. NR 809.565, shall provide copies of health effects language prescribed in ss. NR 809.81 and 809.835 to the users of the CWS.

History: Cr. Register, December, 2000, No. 540, eff. 1–1–01.

NR 809.563 Analytical requirements. **(1)** Systems shall use only the analytical methods specified in this section, or otherwise approved by the department or EPA for monitoring under this subchapter, to demonstrate compliance with the

requirements of this subchapter. The methods specified in this section are effective for use in compliance monitoring as of February 16, 1999.

(2) The analytical methods required for testing under this subchapter are contained in s. NR 809.725 (1), Table I.

(3) Systems shall measure disinfection byproducts by the methods, as modified by the footnotes, prescribed in Table 1. Samples shall be collected using the containers, preservative and holding times specified in s. NR 809.725 (1), Table G.

Table 1–Approved Methods for Disinfectant Byproduct Compliance Monitoring

Methodology[2]	EPA Meth.	Standard Method	Byproduct measured[1]			
			TTHM	HAA5	Chlorite[4]	Bromate
P&T/GC/ElCD& PID	502.2		X			
P&T/GC/MS	524.25		X			
LLE/GC/ECD	551. 1		X			
LLE/GC/ECD		6251 B		X		
SPE/GC/ECD	552.2			X		
LLE/GC/ECD	552.2			X		
Amperometric Titration[3]		4500–ClO_2E			X	
IC	300.0				X	
IC	300.1				X	X

[1] X indicates method is approved for measuring specified disinfection byproduct.

[2] P&T = purge and trap; GC = gas chromatography; ElCD = electrolytic conductivity detector; PID = photoionization detector; MS = mass spectrometer; LLE = liquid/liquid extraction; ECD = electron capture detector; SPE = solid phase extractor; IC = ion chromatography.

[3] If TTHMs are the only analytes being measured in the sample, then a PID is not required.

[4] Amperometric titration may be used for routine daily monitoring of chlorite at the entrance to the distribution system, as prescribed in s. NR 809.565 (4) (a) 1. Ion chromatography shall be used for routine monthly monitoring of chlorite and additional monitoring of chlorite in the distribution system, as prescribed in s. NR 809.565 (4) (a) 2. and 3.

(4) Laboratories that are certified by the department or EPA shall conduct the analysis under this section for disinfection byproducts.

(a) To receive certification to conduct analyses for the contaminants in this subchapter, a laboratory shall carry out annual analyses of performance evaluation samples approved by the department or EPA.

(b) When analyzing performance evaluation samples, the laboratory shall achieve quantitative results within the acceptance limit on a minimum of 80% of the analytes included in each PE sample.

(c) The acceptance limit shall be the 95% confidence interval calculated around the mean of the PE study data between a maximum and minimum acceptance limit of +/–50% and +/–15% of the study mean.

(5) A person approved by the department or EPA shall measure residual disinfectant concentration.

(6) Systems shall measure residual disinfectant concentrations for free chlorine, combined chlorine (chloramines), and chlorine dioxide by the methods listed in Table 2. Systems may also measure residual disinfectant concentrations for chlorine, chloramines and chlorine dioxide by using N,N–diethly–p–phenylenediamine (DPD) colorimetric test kits.

Table 2–Standard Methods for measuring residual disinfectant concentrations.

Methodology	Standard Method	ASTM method	Residual Measured[1]			
			Free chlorine	Combined chlorine	Total chlorine	Chlorine dioxide
Amperometric Titration	4500–CL D	D 1253–86	X	X	X	
Low Level Amperometric Titration	4500–CL E				X	
DPD Ferrous Titrimetric	4500–CL F		X	X	X	
DPD Colorometric	4500–CL G		X	X	X	
Syringaldazine (FACTS)	4500-CL H		X			
Iodometric Electrode	4500–CL I				X	
DPD	4500–ClO_2 D					X
Amperometric Method II	4500–ClO_2 E					X

[1] X indicates method is approved for measuring specified disinfectant residual.

(7) Systems required to analyze for additional analytical methods parameters not included in subs. (3) and (6) shall have these parameters analyzed by a person approved by the department or EPA using the following methods:

(a) *Alkalinity.* For measuring alkalinity use the methods allowed in s. NR 809.725 Table E.

(b) *Bromide.* For measuring bromide use EPA Method 300.0 or EPA Method 300.1.

(c) *Total Organic Carbon (TOC).* For measuring total organic carbon, use Standard Method 5310 B (High–Temperature Combustion Method) or Standard Method 5310 C (Persulfate–Ultraviolet or Heated–Persulfate Oxidation Method) or Standard Method 5310 D (Wet–Oxidation Method).

1. TOC samples may not be filtered prior to analysis.

2. TOC samples shall either be analyzed or shall be acidified to achieve pH less than 2.0 by minimal addition of phosphoric or

sulfuric acid as soon as practical after sampling, not to exceed 24 hours.

3. Acidified TOC samples shall be analyzed within 28 days.

(d) *Specific ultraviolet absorbance (SUVA).* SUVA is equal to the UV absorption at 254nm (UV_{254}) measured in m^{-1} divided by the dissolved organic carbon (DOC) concentration measured as mg/L.

1. In order to determine SUVA, it is necessary to separately measure UV_{254} and DOC.

2. When determining SUVA, systems shall use the methods stipulated in par. (e) to measure DOC and the method stipulated in par. (f) to measure UV_{254} SUVA shall be determined on water prior to the addition of disinfectants or oxidants, or both, by the system.

3. DOC and UV_{254} samples used to determine a SUVA value shall be taken at the same time and at the same location.

(e) *Dissolved organic carbon (DOC).* For measuring dissolved organic carbon, use Standard Method 5310 B (High–Temperature Combustion Method) or Standard Method 5310 C (Persulfate–Ultraviolet or Heated–Persulfate Oxidation Method) or Standard Method 5310 D (Wet–Oxidation Method). Prior to analysis, DOC samples shall be filtered through a 0.45 m.m pore–diameter filter. Water passed through the filter prior to filtration of the sample shall serve as the filtered blank. This filtered blank shall be analyzed using procedures identical to those used for analysis of the samples and shall meet the following criteria: DOC < 0.5 mg/L. DOC samples shall be filtered through the 0.45 m.m pore–diameter filter prior to acidification. DOC samples shall either be analyzed or shall be acidified to achieve pH less than 2.0 by minimal addition of phosphoric or sulfuric acid as soon as practical after sampling, not to exceed 48 hours. Acidified DOC samples shall be analyzed within 28 days.

(f) *Ultraviolet absorption at 254 nm (UV_{254}).* For measuring ultaviolet absorption at 254 nm, use Method 5910 B (Ultraviolet Absorption Method). UV absorption shall be measured at 253.7 nm (may be rounded off to 254 nm). Prior to analysis, UV_{254} samples shall be filtered through a 0.45 mm pore–diameter filter. The pH of UV_{254} samples may not be adjusted. Samples shall be analyzed as soon as practical after sampling, not to exceed 48 hours.

(g) *pH.* For measuring pH, use any method allowed in s. NR 809.725 Table E.

History: Cr. Register, December, 2000, No. 540, eff. 1–1–01.

NR 809.565 Monitoring requirements. (1) General requirements under this subchapter for analytical requirements, determining maximum contaminant levels, conducting monitoring and control of disinfection byproducts are as follows:

(a) Systems shall take all samples during normal operating conditions.

(b) Systems may consider multiple wells drawing water from a single aquifer as one treatment plant for determining the minimum number of TTHM and HAA5 samples required, on a case–by–case basis with department approval.

(c) Failure to monitor in accordance with the monitoring plan required under sub. (7) is a monitoring violation.

(d) Failure to monitor shall be treated as a violation for the entire period covered by the annual average where compliance is based on a running annual average of monthly or quarterly samples or averages and the system's failure to monitor makes it impossible to determine compliance with MCLs or MRDLs.

(e) Systems may use only data collected under the provisions of this subchapter or the information collection rule (ICR) or s. NR 809.775 to qualify for reduced monitoring.

(2) Systems shall monitor at the following frequency and locations for TTHMs and HAA5 disinfection byproducts:

(a) Systems serving at least 10,000 persons which are supplied by a surface water source or by a ground water source under the direct influence of surface water shall collect and have analyzed 4 water samples per quarter per treatment plant.

1. At least 25% of all samples collected each quarter at each treatment plant shall be at locations representing the maximum residence time in the system.

2. The remaining samples shall be taken in the distribution system at locations representing average residence time in the system and representative of the entire distribution system, taking into account the number of people served, different sources of water and different treatment methods.

(b) Systems serving from 500 to 9,999 persons which are supplied by a surface water source or by a ground water source under the direct influence of surface water shall collect and have analyzed one water sample per quarter per treatment plant. The samples shall be collected at locations representing the maximum residence time in the system.

(c) Systems serving fewer than 500 people which are supplied by a surface water source or by a ground water source under the direct influence of surface water shall collect one sample per treatment plant annually. The samples shall be collected during the month with the warmest water temperature at locations representing the maximum residence time in the system.

(d) Systems using chemical disinfection, using only groundwater not under the direct influence of surface water, and serving at least 10,000 people shall collect one sample per treatment plant per quarter. The sample or samples shall be collected at the location representing the maximum residence time in the system.

(e) Systems using chemical disinfection, using only groundwater not under the direct influence of surface water, and serving fewer than 10,000 people shall collect one sample per treatment plant annually. The sample shall be collected during the month with the warmest water temperature, at locations representing the maximum residence time, in the system.

(2m) If a sample or the average of samples, if more than one sample is taken, exceeds the MCL for TTHMs or HAA5 disinfection byproducts, the system shall collect quarterly samples until the system meets the requirements of reduced monitoring in sub. (3).

(3) Systems may reduce monitoring for TTHMs and HAA5s as follows, except as otherwise provided:

(a) Surface water systems or ground water systems under the direct influence of surface water with an annual average of TTHM of ≤0.040 mg/L and HAA5 ≤0.030 mg/L with an annual average TOC concentration of ≤ 4.0 mg/L, before any treatment may reduce monitoring to the following:

1. A system serving at least 10,000 people may reduce monitoring to one sample per quarter per treatment plant so long as the sample is taken at a location representing maximum residence time in the system.

2. A system serving from 500 to 9,999 people may reduce monitoring to one sample per year per treatment plant so long as the sample is taken at a location representing maximum residence time in the system during the month of warmest water temperature.

3. A system serving less than 500 people may not reduce monitoring to less than one sample during the month of warmest water temperature per treatment plant per year.

(b) Systems using only groundwater not under the direct influence of surface water using chemical disinfection with an annual average of TTHM of ≤ 0.040 mg/L and HAA5 ≤ 0.030 mg/L may reduce sampling to the following:

1. Systems serving at least 10,000 people may reduce monitoring to one sample per year per treatment plant during the month of warmest water temperature at a location representing maximum residence time in the system.

2. Systems serving fewer than 10,000 people may reduce monitoring to one sample per treatment plant per 3 year monitor-

ing cycle during the month of warmest water temperature at a location representing maximum residence time in the system. The reduced monitoring will begin on January 1 following the quarter in which the system first qualifies for reduced monitoring.

(c) Systems on a reduced monitoring schedule may remain on that reduced schedule as long as the average of all samples taken in the year, for systems which shall monitor quarterly, or the result of the sample, for systems which shall monitor no more frequently than annually, is no more than 0.060 mg/L and 0.045 mg/L for TTHMs and HAA5, respectively. Systems that do not meet these levels shall resume monitoring at the frequency identified in sub. (2) in the quarter immediately following the quarter in which the system exceeds 0.060 mg/L and 0.045 mg/L for TTHMs and HAA5, respectively.

(d) The department may return a system to routine monitoring at the department's discretion.

(4) Systems shall monitor at the following frequency and locations for chlorite and bromate disinfection byproducts:

(a) *Chlorite.* Community and nontransient noncommunity water systems using chlorine dioxide, for disinfection or oxidation, shall conduct monitoring for chlorite as follows:

1. Routine daily monitoring. Systems shall take daily samples at the entrance to the distribution system. For any daily sample that exceeds the chlorite MCL, the system shall take additional samples in the distribution system the following day at the locations required by subd. 3. in addition to the sample required at the entrance to the distribution system.

2. Routine monthly monitoring. Systems shall take a 3–sample set each month in the distribution system. The system shall take one sample at each of the following locations: near the first customer, at a location representative of average residence time, and at a location reflecting maximum residence time in the distribution system. Any additional routine sampling shall be conducted in the same manner, as 3–sample sets, at the specified locations. The system may use the results of additional monitoring conducted under subd. 3. to meet the requirement for monitoring in this subdivision.

3. Additional monitoring. On each day following a routine sample monitoring result that exceeds the chlorite MCL at the entrance to the distribution system, the system shall take 3 chlorite distribution system samples at the following locations: as close to the first customer as possible, in a location representative of average residence time, and as close to the end of the distribution system as possible, reflecting maximum residence time in the distribution system.

4. Reduced monitoring. Chlorite monitoring at the entrance to the distribution system required by subd. 1. may not be reduced. Chlorite monitoring in the distribution system required by subd. 2. may be reduced to one 3–sample set per quarter after one year of monitoring where no individual chlorite sample taken in the distribution system under subd. 2. has exceeded the chlorite MCL and the system has not been required to conduct monitoring under subd. 3. The system may remain on the reduced monitoring schedule until either any of the 3 individual chlorite samples taken quarterly in the distribution system under subd. 2. exceeds the chlorite MCL or the system is required to conduct monitoring under subd. 3., at which time the system shall revert to routine monitoring.

(b) *Bromate.* 1. Routine monitoring. Community and nontransient noncommunity systems using ozone, for disinfection or oxidation, shall take one sample per month for each treatment plant in the system using ozone. Systems shall take samples monthly at the entrance to the distribution system while the ozonation system is operating under normal conditions.

2. Reduced monitoring. Systems required to analyze for bromate may reduce monitoring from monthly to once per quarter, if the system demonstrates that the average source water bromide concentration is less than 0.05 mg/L based upon representative monthly bromide measurements for one year. The system may remain on reduced bromate monitoring until the running annual average source water bromide concentration, computed quarterly, is 0.05 mg/L or greater based upon representative monthly measurements. If the running annual average source water bromide concentration is equal to or greater than 0.05 mg/L, the system shall resume routine monitoring required by subd. 1.

(5) Systems shall monitor at the following frequency and locations for disinfectant residuals:

(a) *Chlorine and chloramines.* Systems shall perform routine monitoring by measuring the residual disinfectant level at the same points in the distribution system and at the same time as total coliforms are sampled, as specified in s. NR 809.31. Surface water systems may use the results of residual disinfectant concentration sampling conducted under s. NR 809.78 (1) (f) for unfiltered systems or s. NR 809.78 (2) (c) for systems that filter, in lieu of taking separate samples. Monitoring may not be reduced.

(b) *Chlorine dioxide.* 1. Routine monitoring. Community, nontransient noncommunity, and transient noncommunity water systems that use chlorine dioxide for disinfection or oxidation shall take daily samples at the entrance to the distribution system. For any daily sample that exceeds the MRDL, the system shall take samples in the distribution system the following day at the locations required by subd. 2., in addition to the sample required at the entrance to the distribution system.

2. Additional monitoring. On each day following a routine sample monitoring result that exceeds the MRDL, the system shall take 3 chlorine dioxide distribution system samples. If chlorine dioxide or chloramines are used to maintain a disinfectant residual in the distribution system, or if chlorine is used to maintain a disinfectant residual in the distribution system and there are no disinfection addition points after the entrance to the distribution system, i.e., no booster chlorination, the system shall take 3 samples as close to the first customer as possible, at intervals of at least 6 hours. If chlorine is used to maintain a disinfectant residual in the distribution system and there are one or more disinfection addition points after the entrance to the distribution system, i.e., booster chlorination, the system shall take one sample at each of the following locations: as close to the first customer as possible, in a location representative of average residence time, and as close to the end of the distribution system as possible, reflecting maximum residence time in the distribution system.

3. Reduced monitoring. Chlorine dioxide monitoring may not be reduced.

(6) Systems shall monitor at the following frequency and locations for disinfection byproduct precursors (DBPP):

(a) *Routine monitoring.* 1. Systems which use conventional filtration treatment and are supplied by a surface water source or by a ground water source under the direct influence of surface water shall monitor each treatment plant for TOC no later than the point of combined filter effluent turbidity monitoring and representative of the treated water.

2. All systems required to monitor under subd. 1. shall also monitor for TOC in the source water prior to any treatment at the same time as monitoring for TOC in the treated water.

Note: These samples, source water and treated water, are referred to as paired samples.

3. At the same time as the source water sample is taken, all systems shall monitor for alkalinity in the source water prior to any treatment. Systems shall take one paired sample and one source water alkalinity sample per month per plant at a time representative of normal operating conditions and influent water quality.

(b) *Reduced monitoring.* Systems which use conventional filtration treatment and are supplied by a surface water source or by a ground water source under the direct influence of surface water and which have an average treated water TOC of less than 2.0 mg/L for 2 consecutive years, or less than 1.0 mg/L for one

year, may reduce monitoring for both TOC and alkalinity to one paired sample and one source water alkalinity sample per plant per quarter. The system shall revert to routine monitoring in the month following the quarter when the annual average treated water TOC ≥ 2.0 mg/L.

(7) Systems required to analyze for bromate may reduce bromate monitoring from monthly to once per quarter, if the system demonstrates that the average source water bromide concentration is less than 0.05 mg/L based upon representative monthly measurements for one year. The system shall continue bromide monitoring to remain on reduced bromate monitoring.

(8) Each system required to monitor under this subchapter shall develop and implement a monitoring plan, and shall maintain the plan and make it available for inspection by the department and the general public no later than 30 days following the applicable compliance dates in s. NR 809.562 (3).

(a) Systems which are supplied by a surface water source or by a ground water source under the direct influence of surface water and which serve more than 3300 people shall submit a copy of the monitoring plan to the department no later than the date of the first report required under s. NR 809.567. The department may also require any other public water system to submit a monitoring plan. After review, the department may require changes in any plan elements.

(b) The plan shall include at least the following elements:

1. Specific locations and schedules for collecting samples for any parameters included in this subchapter.

2. How the system will calculate compliance with MCLs, MRDLs and treatment techniques.

3. If approved for monitoring as a consecutive system, or if providing water to a consecutive system, under s. NR 809.73, the sampling plan shall reflect the entire distribution system.

History: Cr. Register, December, 2000, No. 540, eff. 1–1–01.

NR 809.566 Compliance requirements. (1) GENERAL REQUIREMENTS. The general requirements for compliance with this subchapter are as follows:

(a) Where compliance is based on a running annual average of monthly or quarterly samples or an annual average and the system fails to monitor for TTHM, HAA5 or bromate, this failure to monitor shall be treated as a monitoring violation for the entire period covered by the annual average.

(b) Where compliance is based on a running annual average of monthly or quarterly samples or averages and the system's failure to monitor makes it impossible to determine compliance with MRDLs for chlorine and chloramines, failure to monitor shall be treated as a monitoring violation for the entire period covered by the annual average.

(c) All samples taken and analyzed under the provisions of this subchapter shall be included in determining compliance, even if that number is greater than the minimum required.

(d) If, during the first year of monitoring under s. NR 809.565, any individual quarter's average will cause the running annual average of that system to exceed the MCL, the system is out of compliance at the end of that quarter.

(2) DISINFECTION BYPRODUCTS. (a) *TTHMs and HAA5s.* Compliance for TTHMs and HAA5s shall be based one of the following:

1. For systems monitoring quarterly, compliance with MCLs in s. NR 809.561 (1) shall be based on a running annual arithmetic average, computed quarterly, of quarterly arithmetic averages of all samples collected by the system as prescribed bys. NR 809.565 (2) to (3). If the running annual arithmetic average of quarterly averages covering any consecutive 4–quarter period exceeds the MCL, the system is in violation of the MCL and shall notify the public pursuant to s. NR 809.81, in addition to reporting to the department pursuant to s. NR 809.567. If a public water system fails to complete 4 consecutive quarters of monitoring, compliance with the MCL for the last 4–quarter compliance period shall be based on an average of the available data.

2. For systems monitoring less frequently than quarterly, compliance with MCLs in s. NR 809.561 (1) shall be based on an average of samples taken that year under the provisions of s. NR 809.565 (2) to (3). If the average of these samples exceeds the MCL, the system shall increase monitoring to once per quarter per treatment plant. Systems on a reduced monitoring schedule whose annual average exceeds the MCL shall revert to routine monitoring immediately. These systems may not be considered in violation of the MCL until they have completed one year of routine monitoring and that year's annual average exceeds the MCL.

(b) *Bromate.* Compliance for bromate shall be based on a running annual arithmetic average, computed quarterly, of monthly samples or, for months in which the system takes more than one sample, the average of all samples taken during the month, collected by the system as prescribed by s. NR 809.565 (4) (b). If the average of samples covering any consecutive 4–quarter period exceeds the MCL, the system is in violation of the MCL and shall notify the public pursuant to s. NR 809.81, in addition to reporting to the department pursuant to s. NR 809.567. If a public water system fails to complete 12 consecutive months monitoring, compliance with the MCL for the last 4–quarter compliance period shall be based on an average of the available data.

(c) *Chlorite.* Compliance for chlorite shall be based on an arithmetic average of each 3–sample set taken in the distribution system as prescribed by ss. NR 809.565 (4) (a) 2. and 3. If the arithmetic average of any 3–sample set exceeds the MCL, the system is in violation of the MCL and shall notify the public pursuant to s. NR 809.81, in addition to reporting to the department pursuant to s. NR 809.567.

(3) DISINFECTANT RESIDUALS. (a) *Chlorine and chloramines.* 1. Compliance shall be based on a running annual arithmetic average, computed quarterly, of monthly averages of all samples collected by the system under s. NR 809.565 (5) (a). If the average of quarterly averages covering any consecutive 4–quarter period exceeds the MRDL, the system is in violation of the MRDL and shall notify the public pursuant to s. NR 809.81, in addition to reporting to the department pursuant to s. NR 809.567.

2. In cases where systems switch between the use of chlorine and chloramines for residual disinfection during the year, compliance shall be determined by including together all monitoring results of both chlorine and chloramines in calculating compliance. Reports submitted pursuant to s. NR 809.567 shall clearly indicate which residual disinfectant was analyzed for each sample.

(b) *Chlorine dioxide.* Compliance shall be based on consecutive daily samples collected by the system under s. NR 809.565 (5) (b).

1. A system has an acute violation of the MRDL for chlorine dioxide when any daily sample taken at the entrance to the distribution system exceeds the MRDL and on the following day one or more of the 3 samples taken in the distribution system exceeds the MRDL. If both exceedances occur, the system is in violation of the MRDL and shall take immediate corrective action to lower the level of chlorine dioxide below the MRDL and shall notify the public pursuant to the procedures for acute health risks in s. NR 809.81 (1) (a) 3. Failure to take samples in the distribution system the day following an exceedance of the chlorine dioxide MRDL at the entrance to the distribution system shall also be considered an MRDL violation and the system shall notify the public of the violation in accordance with the provisions for acute violations under s. NR 809.81 (1) (a) 3.

2. A system has a nonacute violation for chlorine dioxide when any 2 consecutive daily samples taken at the entrance to the distribution system exceed the MRDL and all distribution system samples taken are below the MRDL. A system with a nonacute violation shall take corrective action to lower the level of chlorine

dioxide below the MRDL at the point of sampling and shall notify the public pursuant to the procedures for nonacute health risks in s. NR 809.81 (1) (a) 1. and 2. Failure to monitor at the entrance to the distribution system the day following an exceedance of the chlorine dioxide MRDL at the entrance to the distribution system is also an MRDL violation and the system shall notify the public of the violation in accordance with the provisions for nonacute violations under s. NR 809.81 (1) (a) 1. and 2.

(4) DISINFECTION BYPRODUCT PRECURSORS (DBPP). Compliance with disinfection byproduct precursors shall be determined as specified in s. NR 809.569 (1). Systems may begin monitoring to determine whether Step 1 TOC removals can be met 12 months prior to the compliance date for the system. This monitoring is not required and failure to monitor during this period is not a violation. However, any system that does not monitor during this period, and then determines in the first 12 months after the compliance date that it is not able to meet the Step 1 requirements in s. NR 809.569 (1) (b) and therefore applies for alternate minimum TOC removal (Step 2) requirements, is not eligible for retroactive approval of alternate minimum TOC removal (Step 2) requirements as allowed pursuant to s. NR 809.569 (1) (c) and is in violation. Systems may apply for alternate minimum TOC removal (Step 2) requirements any time after the compliance date.

History: Cr. Register, December, 2000, No. 540, eff. 1–1–01.

NR 809.567 Reporting and recordkeeping requirements. (1) REPORTING REQUIREMENTS. Systems required to sample quarterly or more frequently shall report to the department within 10 days after the end of each quarter in which samples were collected, not withstanding the provisions of s. NR 809.563. Systems required to sample less frequently than quarterly shall report to the department within 10 days after the end of each monitoring period in which samples were collected.

(2) DISINFECTION BYPRODUCTS. Systems monitoring for disinfection byproducts shall report the information specified in the following:

(a) Systems monitoring TTHM and HAA5 under the requirements of s. NR 809.565 (2) on a quarterly or more frequent basis shall report all of the following:

1. The number of samples taken during the last quarter.

2. The location, date and result of each sample taken during the last quarter.

3. The arithmetic average of all samples taken in the last quarter.

4. The annual arithmetic average of the quarterly arithmetic averages for the last 4 quarters.

5. Whether the MCL was exceeded.

(b) Systems monitoring TTHMs and HAA5s under the requirements of s. NR 809.565 (2) less frequently than quarterly but at least annually shall report all of the following:

1. The number of samples taken during the last year.

2. The location, date and result of each sample taken during the last quarter.

3. The arithmetic average of all samples taken over the last year.

4. Whether the MCL was exceeded.

(c) Systems monitoring TTHMs and HAA5s under the requirements of s. NR 809.565 (2) less frequently than annually shall report all of the following:

1. The location, date and result of the last sample taken.

2. Whether the MCL was exceeded.

(d) Systems monitoring chlorite under the requirements of s. NR 809.565 (4) (a) shall report all of the following:

1. The number of samples taken each month for the last 3 months.

2. The location, date and result of each sample taken during the last quarter.

3. For each month in the reporting period, the arithmetic average of all samples taken in the month.

4. Whether the MCL was exceeded, and in which month it was exceeded.

(e) Systems monitoring bromate under the requirements of s. NR 809.565 (4) (b) shall report all of the following:

1. The number of samples taken during the last quarter.

2. The location, date and result of each sample taken during the last quarter.

3. The arithmetic average of the monthly arithmetic averages of all samples taken in the last year.

4. Whether the MCL was exceeded.

(3) DISINFECTANTS. Systems monitoring for disinfectants shall report the information specified in the following:

(a) Systems monitoring chlorine or chloramines under the requirements of s. NR 809.565 (5) (a) shall report all of the following:

1. The number of samples taken during each month of the last quarter.

2. The monthly arithmetic average of all samples taken in each month for the last 12 months.

3. The arithmetic average of all monthly averages for the last 12 months.

4. Whether the MRDL was exceeded.

(b) Systems monitoring chlorine dioxide under the requirements of s. NR 809.565 (5) (b) shall report all of the following information:

1. The dates, results and locations of samples taken during the last quarter.

2. Whether the MRDL was exceeded.

3. Whether the MRDL was exceeded in any 2 consecutive daily samples and whether the resulting violation was acute or nonacute.

(4) DISINFECTION BYPRODUCT PRECURSORS, ENHANCED COAGULATION OR ENHANCED SOFTENING SYSTEMS. Systems containing disinfection byproduct precursors or using enhanced coagulation or enhanced softening, shall report the information specified in the following:

(a) Systems monitoring monthly or quarterly for TOC under the requirements of s. NR 809.565 (6) and required to meet the enhanced coagulation or enhanced softening requirements in s. NR 809.569 (1) (b) or (c) shall report all of the following:

1. The number of paired samples of source water and treated water, both prior to continuous disinfection, taken during the last quarter.

2. The location, date and result of each paired sample and associated alkalinity taken during the last quarter.

3. For each month in the reporting period that paired samples were taken, the arithmetic average of the percent reduction of TOC for each paired sample and the required TOC percent removal.

4. Calculations for determining compliance with the TOC percent removal requirements, as provided in s. NR 809.569 (3).

5. Whether the system is in compliance with the enhanced coagulation or enhanced softening percent removal requirements in s. NR 809.569 (1) for the last 4 quarters.

(b) Systems monitoring monthly or quarterly for TOC under the requirements of s. NR 809.565 (6) and meeting one or more of the alternative compliance criteria in s. NR 809.569 (2) (b) or (c) shall report all of the following:

1. The alternative compliance criterion that the system is using.

2. The number of paired samples taken during the last quarter.

3. The location, date and result of each paired sample and associated alkalinity taken during the last quarter.

4. The running annual arithmetic average based on monthly averages or quarterly samples of source water TOC for systems meeting a criterion in s. NR 809.569 (2) (b) 1. and 3. or of treated water TOC for systems meeting the criterion in s. NR 809.569 (2) (b) 2.

5. The running annual arithmetic average based on monthly averages or quarterly samples of source water SUVA for systems meeting the criterion in s. NR 809.569 (2) (b) 6. or of treated water SUVA for systems meeting the criterion in s. NR 809.569 (2) (b) 7.

6. The running annual average of source water alkalinity for systems meeting the criterion in s. NR 809.569 (2) (b) 3. and 4. and of treated water alkalinity for systems meeting the criterion in s. NR 809.569 (2) (c) 1.

7. The running annual average for both TTHM and HAA5 for systems meeting the criterion in s. NR 809.569 (2) (b) 3., 4., and 5.

8. The running annual average of the amount of magnesium hardness removal (as CaCO mg/L) for systems meeting the criterion in s. NR 809.567 (2) (c) 2.

9. Whether the system is in compliance with the particular alternative compliance criterion in s. NR 809.569 (2) (b) and (c).

History: Cr. Register, December, 2000, No. 540, eff. 1–1–01.

NR 809.569 Treatment technique for control of disinfection byproduct (DBP) precursors. For systems using conventional treatment which are supplied by a surface water source or by a ground water source under the direct influence of surface water, the department identifies enhanced coagulation or enhanced softening as treatment techniques to control the level of disinfection byproduct precursors in drinking water and distribution systems. Treatment technique requirements for DBP precursors shall comply with the following:

(1) ENHANCED COAGULATION AND ENHANCED SOFTENING PERFORMANCE REQUIREMENTS. (a) Systems using enhanced coagulation or enhanced softening shall achieve the percent reduction of TOC specified in par. (b) between the source water and the combined filter effluent, unless the department approves a system's request for alternate minimum TOC removal (Step 2) requirements under par. (c).

(b) Required Step 1 TOC reductions, indicated in the following table, are based upon specified source water parameters measured in accordance with s. NR 809.563 (7). Systems practicing softening are required to meet the Step 1 TOC reductions in the far–right column, source water alkalinity >120 mg/L, for the specified source water TOC:

Step 1 Required Removal of TOC by Enhanced Coagulation and Enhanced Softening for Surface Water Systems Using Conventional Treatment [1,2]

Source water TOC, mg/l	Source water alkalinity, mg/L as CaO_3		
	0 – 60 %	≤ 60 – 120 %	> 120% [3]
>2.0–4.0	35.0	25.0	15.0
>4.0–8.0	45.0	35.0	25.0
>8.0	50.0	40.0	30.0

[1] Systems meeting at least one of the conditions in sub. (2) (b)1. to 7. are not required to operate with enhanced coagulation.

[2] Softening systems meeting one of the alternative compliance criteria in sub. (2) (c) are not required to operate with enhanced softening.

[3] Systems practicing softening shall meet the TOC removal requirements in this column.

(c) Systems using conventional treatment which are supplied by a surface water source or by a ground water source under the direct influence of surface water which cannot achieve the Step 1 TOC removals required by par. (b) due to water quality parameters or operational constraints shall apply to the department, within 3 months of failure to achieve the TOC removals required by par. (b), for approval of alternative minimum TOC (Step 2) removal requirements submitted by the system. If the department approves the alternative minimum TOC removal (Step 2) requirements, the department may make those requirements retroactive for the purposes of determining compliance. Until the department approves the alternate minimum TOC removal (Step 2) requirements, the system shall meet the Step 1 TOC removals contained in par. (b).

(d) Applications made to the department by enhanced coagulation systems for approval of alternative minimum TOC removal (Step 2) requirements under par. (c) shall include, as a minimum, results of bench– or pilot–scale testing conducted under subd. 1. and used to determine the alternate enhanced coagulation level.

1. Alternate enhanced coagulation level shall be determined to be coagulation at a coagulant dose and pH as determined by the method described in this subdivision and subds. 2. to 5. such that an incremental addition of 10 mg/L of alum (as aluminum), or equivalent amount of ferric salt, results in a TOC removal of ≤ 0.3 mg/ L. The percent removal of TOC at this point on the "TOC removal versus coagulant dose" curve shall be determined to be the minimum TOC removal required for the system. Once approved by the department, this minimum requirement supersedes the minimum TOC removal required by the table in par. (b). This requirement will be effective until the department approves a new value based on the results of a new bench– and pilot–scale test. Failure to achieve department–set alternative minimum TOC removal levels is a violation of this chapter and the federal national primary drinking water regulations.

2. Bench– or pilot–scale testing of enhanced coagulation shall be conducted by using representative water samples and adding 10 mg/L increments of alum (as aluminum), or equivalent amounts of ferric salt, until the pH is reduced to a level less than or equal to the enhanced coagulation Step 2 target pH shown in the following table:

Enhanced Coagulation Step 2 Target pH

Alkalinity (mg/L as CaCO)	Target pH
0–60	5.5
>60–120	6.3
>120–240	7.0
>240	7.5

3. For waters with alkalinity of less than 60 mg/L for which addition of small amounts of alum or equivalent addition of iron coagulant drives the pH below 5.5 before significant TOC removal occurs, the system shall add necessary chemicals to maintain the pH between 5.3 and 5.7 in samples until the TOC removal of 0.3 mg/L per 10 mg/L alum added (as aluminum), or equivalent addition of iron coagulant, is reached.

4. The system may operate at any coagulant dose or pH necessary, consistent with other NPDWRs, to achieve the minimum TOC percent removal approved under par. (c).

5. If the TOC removal is consistently less than 0.3 mg/L of TOC per 10 mg/L of incremental alum dose (as aluminum) at all dosages of alum, or equivalent addition of iron coagulant, the water is deemed to contain TOC not amenable to enhanced coagulation. The system may then apply to the department for a waiver of enhanced coagulation requirements.

(2) CONVENTIONAL FILTRATION TREATMENT. (a) Systems using conventional filtration treatment which are supplied by a surface water source or by a ground water source under the direct influence of surface water shall operate with enhanced coagulation or enhanced softening to achieve the TOC percent removal levels specified in sub. (1) unless the system meets at least one of the alternative compliance criteria listed in par. (b) or (c).

(b) Systems using conventional filtration treatment which are supplied by a surface water source or by a ground water source under the direct influence of surface water may use the alternative compliance criteria in subds. 1. to 6. to comply with this section in lieu of complying with sub. (1). Systems shall still comply with monitoring requirements in s. NR 809.565 (6).

1. The system's source water TOC level, measured according to s. NR 809.563 (7) (c), is less than 2.0 mg/L, calculated quarterly as a running annual average.

2. The system's treated water TOC level, measured according to s. NR 809.563 (7) (c), is less than 2.0 mg/L, calculated quarterly as a running annual average.

3. The system's source water TOC level, measured as required by s. NR 809.563 (7) (c), is less than 4.0 mg/L, calculated quarterly as a running annual average; the source water alkalinity, measured according to s. NR 809.563 (7) (a), is greater than 60 mg/L (as CaCO), calculated quarterly as a running annual average; and either the TTHM and HAA5 running annual averages are no greater than 0.040 mg/L and 0.030 mg/L, respectively; or prior to the effective date for compliance in s. NR 809.562 (3), the system has made a clear and irrevocable financial commitment not later than the effective date for compliance in s. NR 809.562 (3) to use of technologies that will limit the levels of TTHMs and HAA5 to no more than 0.040 mg/L and 0.030 mg/L, respectively.

4. Systems shall submit evidence of a clear and irrevocable financial commitment, in addition to a schedule containing milestones and periodic progress reports for installation and operation of appropriate technologies, to the department for approval not later than the effective date for compliance in s. NR 809.562 (3).

a. These technologies shall be installed and operating not later than June 16, 2005.

b. Failure to install and operate these technologies by the date in the approved schedule will constitute a violation of this chapter and the national primary drinking water regulations.

5. The TTHM and HAA5 running annual averages are no greater than 0.040 mg/L and 0.030 mg/L, respectively, and the system uses only chlorine for primary disinfection and maintenance of a residual in the distribution system.

6. The system's source water SUVA, prior to any treatment and measured monthly according to s. NR 809.563 (7) (d), is less than or equal to 2.0 L/mg–m, calculated quarterly as a running annual average.

7. The system's finished water SUVA, measured monthly according to s. NR 809.563 (7) (d), is less than or equal to 2.0 L/mg–m, calculated quarterly as a running annual average.

(c) Systems practicing enhanced softening that cannot achieve the TOC removals required by sub. (1) (b) may use the alternative compliance criteria in subds. 1. and 2. in lieu of complying with sub. (1) (b). Systems shall still comply with monitoring requirements in s. NR 809.565 (6).

1. Softening that results in lowering the treated water alkalinity to less than 60 mg/L (as CaCO), measured monthly according to s. NR 809.563 (7) (a) and calculated quarterly as a running annual average.

2. Softening that results in removing at least 10 mg/L of magnesium hardness (as CaCO), measured monthly and calculated quarterly as an annual running average.

(3) COMPLIANCE CALCULATIONS. (a) Systems which are supplied by a surface water source or by a ground water source under the direct influence of surface water, other than those identified in sub. (2) (b) or (c) shall comply with requirements contained in sub. (1) (b). Systems shall calculate compliance quarterly, beginning after the system has collected 12 months of data, by determining an annual average using the following method:

1. Determine actual monthly TOC percent removal, by using the following equation: (treated water TOC/source water TOC) x 100 = percent TOC removal.

2. Determine the required monthly TOC percent removal from either the table in sub. (1) (b) or from sub. (1) (c).

3. Divide the value in subd. 1. by the value in subd. 2.

4. Add together the results of subd. 3. for the last 12 months and divide by 12.

5. If the value calculated in subd. 4. is less than 1.00, the system is not in compliance with the TOC percent removal requirements.

(b) Systems may use the provisions in subds. 1. to 5. in lieu of the calculations in par. (a) 1. to 5. to determine compliance with TOC percent removal requirements.

1. In any month that the system's treated or source water TOC level, measured according to s. NR 809.563 (7) (c), is less than 2.0 mg/L, the system may assign a monthly value of 1.0, in lieu of the value calculated in par. (a) 3. when calculating compliance under the provisions of par. (a).

2. In any month that a system practicing softening removes at least 10 mg/L of magnesium hardness (as $CaCO_3$), the system may assign a monthly value of 1.0 in lieu of the value calculated in par. (a) 3. when calculating compliance under the provisions of par. (a).

3. In any month that the system's source water SUVA, prior to any treatment and measured according to s. NR 809.563 (7) (d), is $\leq$ 2.0 L/mg–m, the system may assign a monthly value of 1.0, in lieu of the value calculated in par. (a) 3. when calculating compliance under the provisions of par. (a).

4. In any month that the system's finished water SUVA, measured according to s. NR 809.563 (7) (d), is $\leq$ 2.0 L/mg–m, the system may assign a monthly value of 1.0 in lieu of the value calculated in par. (a) 3. when calculating compliance under the provisions of par. (a).

5. In any month that a system practicing enhanced softening lowers alkalinity below 60 mg/L as $CaCO_3$, the system may assign a monthly value of 1.0, in lieu of the value calculated in par. (a) 3. when calculating compliance under the provisions of par. (a).

(c) Systems which are supplied by a surface water source or by a ground water source under the direct influence of surface water and which are using conventional treatment may also comply with the requirements by meeting the criteria in sub. (2) (b) or (c).

History: Cr. Register, December, 2000, No. 540, eff. 1–1–01.

Subchapter IV — Secondary Chemical and Physical Standards and Monitoring Requirements

NR 809.60 Secondary inorganic chemical and physical standards. (1) Waters containing inorganic chemicals in quantities above the limits contained in this section are not hazardous to health but may be objectionable to an appreciable number of persons.

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

Standard	Milligrams per liter
Aluminum	0.05 to 0.2
Chloride	250
Color	15 units
Copper	1.0
Corrosivity	Noncorrosive
Fluoride*	2.0
Foaming agents	0.5
MBAS (Methylene–Blue Active Substances)	
Hydrogen Sulfide	not detectable
Iron	0.3
Manganese	0.05
Odor	3 (Threshold No.)
Silver	0.1
Sulfate	250
Total Residue	500
Zinc	5

Note: The primary maximum contaminant level for fluoride is contained in s. NR 809.11.

(3) The secondary standards contained in this section apply to all public water systems. Compliance with these standards shall be calculated in accordance with s. NR 809.61.

(4) COMPLIANCE WITH THE SECONDARY DRINKING WATER STANDARD AND PUBLIC NOTIFICATION FOR FLUORIDE. Suppliers of water having community water systems that exceed the secondary maximum contaminant level for fluoride as determined by the last single sample taken in accordance with the requirement of s. NR 809.12, but do not exceed the maximum contaminant level for fluoride as specified in s. NR 809.11, shall provide the notice prescribed in s. NR 809.81 (5) (i) to all billing units annually, all new billing units at the time service begins and annually to the department and the department of health and social services.

History: Cr. Register, February, 1978, No. 266, eff. 3–1–78; am. (2), Register, April, 1982, No. 316, eff. 3–1–82; am. (2), cr. (4), Register, August, 1989, No. 404, eff. 9–1–89; renum. from NR 109.60 and am. (2), Register, July, 1993, No. 451, eff. 8–1–93.

NR 809.61 Sampling and analytical requirements for secondary standards. (1) If the department receives complaints regarding the aesthetic quality of the water the supplier of water may be required to implement a monitoring program to determine compliance with s. NR 809.60.

(2) If it is determined by the department that physical or chemical substances or both in excess of those standards contained in s. NR 809.60 are objectionable to an appreciable number of persons and 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.

(3) The department may require that laboratory test results submitted to the department under this section be performed by a laboratory certified or registered under subchs. I, III, and V of ch. NR 149.

History: Cr. Register, February, 1978, No. 266, eff. 3–1–78; am. (2), Register, April, 1982, No. 316, eff. 4–1–82; cr. (3), Register, April, 1986, No. 364, eff. 8–28–86; renum. from NR 109.61, Register, July, 1993, No. 451, eff. 8–1–93.

Subchapter V — Miscellaneous Chemical Monitoring Requirements, Raw Surface Water Standards, Certified Laboratories and Approved Methods for Safe Drinking Water Analysis.

NR 809.70 General requirements. Public water systems shall meet applicable minimum monitoring requirements stated in this chapter. The department may increase monitoring requirements of any section of this chapter, if the department deems such an increase is necessary to protect public health, safety and welfare. The department may decrease the monitoring requirements of any section of this chapter, if the department determines that such a decrease will not adversely affect protection of public health, safety or welfare.

History: Cr. Register, March, 1991, No. 423, eff. 4–1–91; renum. from NR 109.70, Register, July, 1993, No. 451, eff. 8–1–93.

NR 809.705 Additional requirements for systems which chlorinate or fluoridate water. (1) FLUORIDE. (a) The supplier of water for a community water system artificially fluoridating the water shall establish a monitoring program in order to maintain the fluoride concentration within the range of 1.0 to 1.5 milligrams per liter as recommended by the dental health section of the department of health and social services for optimum dental benefits.

(b) The monitoring program shall include:

1. Submission of the results of daily fluoride tests of samples from the distribution system, and

2. One sample per month taken from a representative location in the distribution system and submitted to the state laboratory of hygiene.

Note: For waterworks with large distribution systems and multiple sources, more than one fluoride test per day may be necessary to assure proper feed rates. See NR 811.54 (5) for testing equipment requirements. Exceptions to the daily fluoride test requirement may be approved by the department if it is demonstrated that the optimum fluoride concentration in par. (a) will be maintained by a reduced monitoring program.

(c) The sample submitted to the state laboratory of hygiene shall be a portion of a split sample so that the operator can determine the fluoride concentration with the operator's equipment and compare it to the state laboratory results. The fluoride concentration obtained by the operator shall be noted on the data sheet prior to submission to the state laboratory.

(2) CHLORINE. The suppliers of water for all waterworks which chlorinate water shall test chlorine residuals at locations and intervals necessary to control the chlorination process. At ground water supplies, the chlorine residual of a sample from a representative location in the distribution system shall be checked at least twice per week. Waterworks having surface water treatment plants shall determine the chlorine residual in the plant effluent at least every 2 hours and in the distribution system at least daily in representative locations. Where water quality changes rapidly, residuals shall be tested at more frequent intervals as specified by the department and in those individual cases, continuous monitoring equipment may be required if the department determines it is necessary to protect public health. Chlorine residual testing is required when bacteriological samples are taken.

History: Cr. Register, February, 1978, No. 266, eff. 3–1–78; am. (1) (b)1., Register, April, 1982, No. 316, eff. 5–1–82; renum. from NR 809.70 and am. (2), Register, March, 1991, No. 423, eff. 4–1–91; renum. from NR 109.705, Register, July, 1993, No. 451, eff. 8–1–93.

NR 809.71 Raw surface water standards. The intake water shall be the highest quality reasonably available and which, with appropriate treatment and adequate safeguards, will meet the drinking water standards in this chapter.

History: Cr. Register, February, 1978, No. 266, eff. 3–1–78; am. Register, March, 1991, No. 423, eff. 4–1–91; renum. from NR 109.71, Register, July, 1993, No. 451, eff. 8–1–93.

NR 809.72 Laboratories. (1) For the purpose of compliance with ss. NR 809.12, 809.13, 809.14, 809.21, 809.23, 809.25, 809.26, 809.547 and 809.549, samples shall be analyzed at the state laboratory of hygiene, at a laboratory facility acceptable to the U.S. environmental protection agency, or at a laboratory certified for the safe drinking water test category under ch. NR 149. For the purpose of compliance with ss. NR 809.31, 809.52 and 809.78, bacteriological and radiological samples shall be analyzed at a laboratory facility certified or approved by the department of agriculture, trade and consumer protection, or at a laboratory facility acceptable to the U.S. environmental protection agency.

(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 agriculture, trade and consumer protection.

History: Cr. Register, February, 1978, No. 266, eff. 3–1–78; renum. to be (1), cr. (2), Register, April, 1982, No. 316, eff. 5–1–82; am. (1), Register, April, 1986, No. 364, eff. 8–28–86; am. (1), Register, August, 1989, No. 404, eff. 9–1–89; am. (1), Register, March, 1991, No. 423, eff. 4–1–91; renum. from NR 109.72 and am. (1), Register, July, 1993, No. 451, eff. 8–1–93;corrections made under s. 13.93 (2m) (b) 6., Stats., Register, October, 1997, No. 502.

NR 809.725 Approved analytical methods for safe drinking water analyses. (1) Only the following analytical methods are approved for analysis by this chapter:

TABLE A
Approved Methodology for Primary Inorganic Contaminants

Parameter and Methodology	Reference (Method Number)			
	EPA[1]	ASTM[2]	SM[3]	Other[4]
Antimony				
Atomic absorption; furnace technique	–	–	3113B	–
Atomic absorption; platform furnace	200.9[2]	–	–	–
Inductively Coupled Plasma; Mass Spectrometry (ICP/MS)	200.8[2]	–	–	–
Atomic absorption; gaseous hydride[9]	–	D3697–92	–	–
Asbestos				
Transmission Electron Microscopy	100.1[9]	–	–	–
Transmission Electron Microscopy	100.2[10]	–	–	–
Arsenic				
Atomic absorption; platform furnace	200.9[2]	–	–	–
Atomic absorption; furnace technique	–	D2972-93C	3113 B	–
Atomic absorption; gaseous hydride	–	D2972–93B	3114 B	
Inductively Coupled Plasma (ICP)	200.7[2]	–	3120 B	–
ICP/MS	200.8[2]	–	3120 B	–
Barium				
Atomic absorption; direct aspiration	–	–	3111 D	–
Atomic absorption; furnace technique	–	–	3113 B	–
ICP	200.7[2]	–	3120 B	–
ICP/MS	200.8[2]	–	–	–
Beryllium				
Atomic absorption; furnace technique	–	D3645–93B	3113 B	–
Atomic absorption; platform furnace	200.9[2]	–	–	–
ICP	200.7[2]	–	3120 B	–
ICP/MS	200.8[2]	–	–	–
Cadmium				
Atomic absorption; furnace technique[6]	–	–	3113 B	–
Atomic absorption; platform furnace	200.9[2]	–	–	–
ICP	200.7[2]	–	–	–
ICP/MS	200.8[2]	–	–	–
Copper				
Atomic absorption; furnace technique	–	D1688–90C	3113 B	–
Atomic absorption; direct aspiration	–	D1688–90A	3111 B	–
ICP	200.7[2]	–	3120 B	–
ICP/MS	200.8[2]	–	–	–
Atomic absorption; platform furnace	200.9[2]	–	–	–
Chromium				
Atomic absorption; furnace technique	–	–	3113 B	–
Atomic absorption; platform furnace	200.9[2]	–	–	–
ICP	200.7[2]	–	3120 B	–
ICP/MS	200.8[2]	–	–	–
Cyanide				
Manual Distillation, followed by	–	–	4500–CN–C	–
Spectrophotometric, Amenable		D2036–91B	4500–CN–G	–
Spectrophotometric, Manual	–	D2036–91A	4500–CN–E	–
Semi–automated	335.4[6]	–	–	–
Selective Electrode	–	–	4500–CN–F	–
Fluoride				
Ion Chromatography	300.0[6]	D4327-91	4110B	–

Parameter and Methodology	Reference (Method Number) EPA[1]	ASTM[2]	SM[3]	Other[4]
Manual distillation Colorimetric SPADNS;	–	–	4500–F– B, D	–
Manual electrode	–	D1179–93B	4500–F– C	–
Automated Alizarin fluoride blue; with distillation	–	–	4500–F– E,	129–71W[11]
Automated ion selective electrode	–	–	–	380–75WE[11]
Lead				
Atomic absorption; furnace technique	–	D3559–90D	3113 B	–
ICP/MS	200.8[2]	–	–	–
Atomic absorption; platform furnace	200.9[2]	–	–	–
Mercury				
Manual cold vapor technique[9]	245.1[2]	D3223–91	3112 B	–
Automated cold vapor technique[9]	245.2[1]	–	–	–
ICP/MS	200.8[2]	–	–	–
Nickel				
Atomic absorption; direct aspiration	–	–	3111 B	–
Atomic absorption; furnace technique	–	–	3113 B	–
Atomic absorption; platform furnace	200.9[2]	–	–	–
ICP	200.7[2]	–	3120 B	–
ICP/MS	200.8[2]	–	–	–
Nitrate				
Manual cadmium reduction	–	D3867–90B	4500–NO_3–E	–
Automated cadmium reduction	353.2[6]	D3867–90A	4500–NO_3–F	–
Ion selective electrode	–	–	4500–NO_3–D	601[7]
Ion Chromatography	300.0	D4327–91	4110B	B–1011[8]
Nitrite				
Spectrophotometric	–	–	4500–NO_2–B	–
Automated cadmium reduction	353.2[6]	D3867–90A	4500–NO_3 F	–
Manual cadmium reduction	–	D3867–90B	4500–NO_3 E	–
Ion chromatography	300.0	D4327–91	4110B	B–1011[8]
Selenium				
Atomic absorption; gaseous hydride	–	D3859–93A	3114 B	–
ICP/MS	200.8[2]	–	–	–
Atomic absorption; platform furnace	200.9[2]	–	–	–
Atomic absorption; furnace technique	–	D3859–93B	3113 B	–
Thallium				
Atomic absorption; platform furnace	200.9[2]	–	–	–
ICP/MS	200.8[2]	–	–	–
Turbidity				
Nephelometric	180.1[6]	–	2130 B	–
Great Lakes Instruments	–	–	–	Method 2[5]

[1]Method 245.2 is available from US EPA, EMSL, Cincinnati, OH 45268. The identical methods were formerly in "Methods for Chemical Analysis of Water and Wastes", (EPA–600/4–79–020), March 1983, Available at National Technical Information Services, PB84–128677, 5285 Port Royal Road, Springfield, VA 22161.

[2] "Methods for the Determination of Metals in Environmental Samples–Supplement I", ORD Publications, EPA/600/R–94–111 May, 1994. Available from National Technical Information Service, Order #PB94–184942, 5285 Port Royal Road, Springfield, VA 22161.

[3]The procedures shall be done in accordance with the "Annual Book of ASTM Standards", 1994,Vols 11.01 and 11.02. American Society for Testing and Material. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U. S. C. 552 (a) and 1 CFR Part 51. Copies may be obtained from the American Society for Testing Material, 1916 Race Street, Philadelphia, Pennsylvania, 19103. Copies may be inspected at EPA's Drinking Water Docket, 401 M Street, SW, Washington, DC 20460; or at the Office of the Federal Register, 800 North Capitol Street, NW., Suite 700, Washington, DC.

[4]The procedures shall be done in accordance with the "Standard Methods for the Examination of Water and Wastewater", 18th Edition, American Public Health Association, American Water Works Association, 1992. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U. S. C. 552 (a) and 1 CFR Part 51. Copies may be obtained from the American Public Health Association, 1015 Fifteenth Street, N.W., Washington, D.C., 20005. Copies may be inspected at EPA's Drinking Water Docket, 401 M Street, SW, Washington, DC 20460; or at the Office of the Federal Register, 800 North Capitol Street, NW., Suite 700, Washington DC.

[5]GLI Method 2, "Turbidity", November 2, 1992, Great Lakes Instruments, Inc., 8855 North 55th Street, Milwaukee, Wisconsin, 53223.

[6] "Methods for the Determination of Inorganic Substances in Environmental Samples", EPA–600/R–93–100, August 1993, Available at NTIS, PB94–121811.

[7]"The procedure shall be done in accordance with the Technical Bulletin 601 "Standard Method of Test for Nitrate in Drinking Water", July 1994, PN 221890–001, Analytical Technology, Inc. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U. S. C. 552 (a) and 1 CFR Part 51. Copies may be obtained from ATI Orion, 529 Main Street, Boston, MA 02129. Copies may be inspected at EPA's Drinking Water Docket, 401 M Street, SW, Washington, DC 20460; or at the Office of the Federal Register, 800 North Capitol Street, NW, Suite 700, Washington, DC.

[8]"Waters Test Method for the Determination of Nitrite/Nitrate in Water Using Single Column Ion Chromatography", Method B–1011, Millipore Corporation, Waters Chromatography Division, 34 Maple Street, Milford, MA 01757.

[9]Method 100.1, "Analytical Method for Determination of Asbestos Fibers in Water", EPA–600/4–83–043, September 1983, U.S. EPA, Environmental Research Laboratory, Athens, GA 30613. Available at NTIS, PB83–260471.

[10]Method 100.2, "Determination Of Asbestos Structures over 10–um In Length In Drinking Water", EPA–600/R–94–134, June 1994. Available at NTIS, PB94–201902.

[11]"The procedures shall be done in accordance with the Industrial Method No. 129–71 W, "Fluoride in Water and Wastewater', December 1972, and Method No. 380–75WE, "Fluoride in Water and Wastewater", February 1976, Technicon Industrial Systems. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U. S. C. 552 (a) and 1 CFR Part 51,. Copies may be obtained from the Technicon Industrial Systems, Tarrytown, NY 10591. Copies may be inspected at EPA's Drinking Water Docket, 401 M Street, SW Washington, DC 20460; or at the Office of the Federal Register, 800 North Capitol Street, NW, Suite 700, Washington, DC.

TABLE B
SDWA Approved Methodology for Organic Contaminants

Contaminant	Reference (Method Number) EPA[1,7]
Regulated Parameters:	
Synthetic Organic Compounds (SOCs)	
Alachlor	505[6], 507, 525.2,508.1
Atrazine	505[6], 507, 525.2,508.1
Benzo[a]pyrene	550, 550.1, 525.2
Carbofuran	531.1,6610[5]
Chlordane	505, 508, 525.2,508.1
Dalapon	515.1,552.1
Di(2–ethylhezyl)adipate	506, 525.2
Di(2–ethylhexyl)phthalate	506, 525.2
Dinoseb	515.1,515.2,555
Diquat	549.1
2,4–D	515.1, 515.2, 555
Endothall	548.1
Endrin	505, 508, 525.2, 508.1
Ethylene Dibromide (EDB)	504.1, 551
Glyphosate	547, 6651[4]
Heptachlor	505, 508, 525.2, 508.1
Heptachlor Epoxide	505, 508, 525.2, 508.1
Hexachlorobenzene	505, 508, 525.2, 508.1
Hexachlorocyclopetadiene	505, 525.2, 508,508.1
Lindane	505, 508, 525.2, 508.1
Methoxychlor	505, 508, 525.2, 508.1
Oxamyl (Vydate)	531.1, 6610[5]
Picloram	515.1, 515.2, 555
Polychlorinated Biphenyls	508A[2]
Pentachlorophenal	515.1, 515.2, 525.2, 555
Total Trihalomethanes (ITHM)	502.2, 524.2, 551
Simazine	505[6], 507, 525.2, 508.1
Toxaphene	505, 508, 525.2
2,3,7,8–TCDD (Dioxin)	1613[3]
2,4,5–TP (Silvex)	515.1, 515.2, 555
Volatile Organic Chemical (VOCs)	
Benzene	502.2, 524.2
Carbon Tetrachloride	502.2, 524.2,551
Chlorobenzene	502.2, 524.2
Dibromochloropropane (DBCP)	504.1, 551
1,2–Dichlorobenzene	502.2, 524.2
1,4–Dichlorobenzene	502.2, 524.2
1,2–Dichloroethane	502.2, 524.2
cis–Dichloroethylene	502.2, 524.2
trans–Dichloroethylene	502.2, 524.2
Dichloromethane	502.2, 524.2
1,2–Dichloropropane	502.2, 524.2
Ethylbenzene	502.2, 524.2
Styrene	502.2, 524.2
Tetrachloroethylene	502.2, 524.2, 551
1, 1, 1–Trichloroethane	502.2, 524.2, 551
Trichloroethylene	502.2, 524.2, 551
Toluene	502.2, 524.2
1, 2, 4–Trichlorobenzene	502.2, 524.2
1, 1–Dichloroethylene	502.2, 524.2
1, 1, 2–Trichloroethane	502.2, 524.2
Vinyl Chloride	502.2, 524.2
Xylenes (total)	502.2, 524.2
Unregulated Parameters	
Aldicarb	531.1, 6610[5]
Aldicarb sulfone	531.1, 6610[5]
Aldicarb Sulfoxide	531.1, 6610[5]
Aldrin	505, 508, 525.2, 508.1
Butachlor	507, 525.2
Carbaryl	531.1, 6610
Dicamba	515.1, 555, 515.2
Dieldrin	505, 508, 525.2, 508.1
3–Hydroxcarbofuran	531.1, 6610[5]
Methomyl	531.1, 6610[5]
Metolachlor	507, 525.2, 508.1
Metribuzin	507, 525.2, 508.1
Propachlor	507, 525.2, 508.1

[1]Procedures for Methods 502.2, 505, 507, 508, 508A, 515.1 and 531.1 are in "Methods for the Determination of Organic Compounds in Drinking Water", EPA–600/4–88/039, December 1988, Revised, July 1991, Methods 506, 547, 550, 550.1 are in "Methods for the Determination of Organic Compounds in Drinking Water, Supplement I", EPA–600/4–90/020, July 1990. Methods 515.2, 524.2, 548.1, 549.1, 552.1 and 555 are in "Methods for the Determination of Organic Compounds in Drinking Water, Supplement II", EPA–600/R–92–129, August 1992. These documents are available from the National Technical Information Service (NTIS), U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161 as publications NTIS PB91–231480, PB91–146027, and PB92–207703. The toll–free number is 1–800–336–4700.

[2]Method 505 or 508 can be used as a screen for PCBs. Method 508A shall be used to quantitate PCBs as decachlorobiphenyl if detected in Method 505 or 508. PCBs are qualitatively identified as Aroclors and measured for compliance purposes as decachlorobiphenyl.

[3]Method 1613, "Tetra– through Octa– Chlorinated Dioxins and Furons by Isotope Dilution. HRGC/HRMS, EPA–821/B–94/005, October 1994, Method 1613 can be used to measure 2, 3, 7, 8–TCDD (dioxin). This method is available from National Technical Information Service, NTIS PB95–104774.

[4]Method 6651 shall be followed in accordance with the "Standard Methods for the Examination of Water and Wastewater", 18th Edition, 1992, American Public Health Association. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552 (a) and 1 CFR Part 51. Copies may be obtained from the American Public Health Association, 1015 Fifteenth Street, N.W., Washington, D.C., 20005. Copies may be inspected at EPA's Drinking Water Docket, 401 M Street, SW, Washington, DC 20460; or at the office of the Federal Register, 800 North Capitol Street, NW, Suite 700, Washington, DC.

[5]Method 6610 shall be followed in accordance with the "Supplement to the 18th edition of Standard Methods for the Examination of Water and Wastewater", 1994, American Public Health Association. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552 (a) and 1 CFR Part 51. Copies may be obtained from the American Public Health Association, 1015 Fifteenth Street, N.W., Washington, D.C., 2005. Copies may be inspected at EPA's Drinking Water Docket, 401 M Street, SW, Washington, DC 20460; or at the Office of the Federal Register, 800 North Capitol Street, NW, Suite 700, Washington, D.C.

[6]A nitrogen–phosphorus detector should be substituted for the electron capture detector in Method 505 (or other approved method should be used) to determine alachlor, atrazine and simizine, if lower detection limits are required.

[7]EPA Methods 504.1, 508.1, and 525.2 are available from US EPA EMSL, Cincinnati, OH 45268. The phone number is (513) 569–7586.

TABLE C
SDWA Approved Methodology for Microbiological Measurements

	Methodology	Standard Methods (18th Edition[1])
Total Coliform Bacteria[8]	Multiple tube fermentation[3,4,5]	9221 A,B,C
	Membrane	9222 A,B,C
	Minimal Media ONPG–MUG Test[7]	9223
	Chromogenic/Fluorogenic[10]	see footnote 10
	Presence – Absence (P–A) Coliform Test[5,6]	9221D
Fecal Coliform,	Fecal Coliform Multiple Tube(MPN)[9] Tests	9221E
	Fecal Coliform Membrane Filter (MF) Procedure	9222D
Escherichia coli	EC Medium + MUG[7]	908C (pp. 879)
	Nutrient Agar + MUG[7]	908B (pp. 874)
	Minimal Medium + MUG (MMO–MUG)[5,7]	908C or908D, (pp. 878–882)
Heterotrophic Plate Count[2]	Pour Plate Method	9215B

[1]Except where noted, all methods refer to the "Standard Methods for the Examination of Water and Wastewater", 18th Edition, American Public Health Association, American Water Works Association, Water Pollution Control Federation, 1992.
[2]The time from sample collection to initiation of analysis may not exceed 8 hours. Sample must be iced.
[3]Lactose broth, as commercially available, may be used in lieu of lauryl tryptse broth, if the system conducts at least 25 parallel tests between this medium and lauryl tryptose broth using the water normally tested, and this comparison demonstrates that the false–positive rate for total coliforms, using lactose broth, is less than 10 percent.
[4]If inverted tubes are used to detect gas production, the media should cover these tubes at least one–half to two–thirds after the sample is added.
[5]No requirement exists to run the completed phase on 10 percent of all total coliform–positive confirmed tubes.
[6]Six–times formulation strength may be used if the medium is filter–sterilized rather than autoclaved.
[7]The ONPG–MUG Test is also known as the Autoanalysis Colilert System.
[8]The time from sample collection to imitation of analysis should not exceed 30 hours. If the laboratory analyzes the sample between 30 and 48 hours after collection results are indicated as possibly invalid.
[9]A–1 broth may be held up to three months in a tightly closed screwcap tube at 4°C.
[10]This is also known as the Colisure Test. The Colisure Test must be incubated for 28 hours before examining the results. If an examination if the results at 28 hours is not convenient, the results may be examined at any time between 28 and 48 hours. A description of the Colisure Test may be obtained from the Millipore Corp., Technical Services Department, 80 Ashby Road, Bedford, MA 01730.

TABLE D
SDWA Approved Methodology for Radiological Measurements
Reference (method or page number)

Parameter	Method	EPA[1]	EPA[2]	EPA[3]	EPA[4]	SM[5]	ASTM[6]	USGS[7]	DOE[8]	Others
Naturally Occurring:								R–1120–76	—	
Gross alpha[11] & beta	Evaporation	900	p1	00–01	p1	302, 7110 B		R–1120–76	—	
Gross alpha[11]	co–precipitation	—		00–02		7110 C	—	—	—	
Radium 226	Radon emanation, Radiochemical	903.1 903.0	P 16 p13	Ra–04 Ra–03	p19	7500–Ra C 304,305, 7500–Ra B	D 3454–91 D 2460–90	R–1141–76 R–1140–76	Ra–05	N.Y.[9]
Radium 228	Radiochemical	904.0	P 24	Ra-05	p19	304,7500 Ra D	—	R–1142–76	—	N.Y.[9] N.J.[10]
Uranium[12]	Radiochemical Fluorometric	908.0 908.1				7500-UB 7500–UC (17th Ed)	D2907–91	R–1180–76 R–1181–76 R–1182–76	U–04 U–2	
	Alpha spectrometry	—		00–07	p33	7500–UC (18th or 19th Ed)	D3972–90	—	—	
	Laser Phosphorimetry	—				–	D5174–91			
Man–Made:										
Radioactive						303,7500–	—			
Strontium – 89,90	Radiochemical	905.0	p 29	Sr–04	p65	Sr B	—	R1160–76	Sr–01 Sr–02	
Tritium	Liquid Scintillation	906.0	p 34	H–02	p 87	306, 7500–3H B		D 4107-91	R 1171–76	—
Radioactive Cesium –	Radiochemical, Gamma ray spectrophotometry	901.0 901.1	p 4		p 92	7500–Cs B 7120 (19th Ed.)	D 2459–72 D 3649–91	— R–1110–76	4.5.2.3	
Radioactive Iodine	Radiochemical, Gamma ray spectrophotometry	902.0 901.1	P 6 p 9		p 92	7500–I B 7500–I C 7500–I D 7120 (19th Ed)	D 3649–91 D 4785–88	—	4.5.2.3	
Gamma Emitters	Gamma ray spectrometry	901.1 902.0 901.0			p 92	7120 (19th Ed.) 7500–Cs B 7500–I B	D 3649–91 D 4785–88	—	4.5.2.3	

[1]"Prescribed Procedures for Measurement of Radioactivity in Drinking Water", EPA–600/4–80/032. August, 1980. Available from the EMSL, Office of Research and Development, U.S. EPA, 26 W. Martin Luther King Drive, Cincinnati, Ohio, 45268.
[2]"Interim Radiochemical Methodology for Drinking Water", EPA 600/4–75/008 (revised), March 1976, Available at NTIS, ibid PB 253258.
[3]"Radiochemistry Procedures Manual", EPA 520/5–84/006, December 1987, Available at NTIS, ibid, PB 84–215581.
[4]"Radiochemical Analytical Procedures for Analysis of Environmental Samples", March 1979, Available at NTIS, ibid, EMSL LV 053917
[5]"Standard Methods for the Examination of Water and Wastewater", 13th Edition, 17th, 18th, 19th Editions, 1971, 1989, 1992, 1995, Available at APHA, 1015 Fifteenth Street, N.W. Washington, D.C. 20005. All methods are in the 17th, 18th and 19th editions except 7500–U C Flurometric Uranium was discontinued after the 17th Edition. 7120 Gamma Emitters is only in the 19th Edition and 302, 303, 304, 305 and 306 are only in the 13th Edition.
[6]Annual Book of ASTM Standards, Vol. 11.02, 1994. Available at American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428.
[7]"Methods for Determination of Radioactive Substances in Water and Fluvial Sediments", Chapter A5 in Book 5 of Techniques of Water Resources Investigations of the United States Geological Survey, 1997. Available at U.S. Geological Survey (USGS) Information Services, Box 25286 Federal Center, Denver, CO 80225–0425.
[8]"EML Procedures Manual", 27th Edition, Volume 1, 1990. Available at the Environmental Measurements Laboratory, U.S. Department of Energy (DOE), 376 Hudson Street, New York, NY 10014–3621.
[9]"Determination of Ra–226 and Ra–228 (Ra–02)", January 1980, Revised June 1982. Available at Radiological Sciences Institute Center for Laboratories and Research, New York State Department of Health, Empire State Plaza, Albany, NY 12201.
[10]"Determination of Radium 228 in Drinking Water", August 1980. Available at State of New Jersey, Department of Environmental Protection, Division of Environmental Quality, Bureau of Radiation and Inorganic Analytical Services, 9 Ewing Street, Trenton, N.J. 08625.
[11]Natural uranium and thorium–230 or approved as gross alpha calibration standards for gross alpha with co-precipitation and evaporation methods, americium–241 is approved with co–precipitation methods.
[12]If uranium (U) is determined by mass a 0.67 pCi/g of uranium conversion factor must be used. This conservative factor is based on the 1:1 activity ratio of U–234 to U–238 that is characteristic of naturally occurring uranium.

TABLE E
SDWA Approved Methodology for Physical Parameters, Residual Chlorine, Sodium, Corrosivity, and Secondary Contaminants

Parameter and Method	EPA[2]	Standard Methods[3]	ASTM[4]	USGS[5]	Other
Alkalinity–Titrimetric		2320B	D1067–92(B)	I–1030–85	–
Aluminum – Total[6], Digestion, followed by:					
Atomic absorption (AA); direct aspiration		3111D			–
Atomic absorption (AA); graphite furnace		3113 B		–	–
Inductively–coupled plasma (ICP)	200.7	3120 B	–	–	–
Inductively–coupled plasma; mass spectrometry (ICP/MS)	200.8	–	–	–	–
Atomic absorption (AA); platform furnace	200.9	–	–	–	–
Calcium					
EDTA titrimetric		3500-Ca D	D511–93(A)	–	–
AA; direct aspiration	–	3111 B	D511–93(B)	–	–
ICP	200.7	3120 B	–	–	–
Chloride					
Potentiometric	–	4500-Cl– D	–	–	–
Ion Chromatography	300.0[1]	4110	D4327–91	–	–
Chlorine dioxide residual					
Amperometric	–	4500–ClO_2 C or E	–	–	–
DPD	–	4500–ClO_2 D	–	–	–
Color					
Colorimetric, Pt–Co	–	2120 B	–	–	–
Combined chlorine					
Amperometric titration		4500–Cl D			
DPD Ferrous titrimetric		4500–Cl F			
DPD Colorimetric		4500–Cl G			
Corrosivity					
Langelier Index	–	2330	–	–	–
Aggressive Index	–	–	–	–	C400–77[7]
Foaming Agents (MBAS)					
Colorimetric		5540 C	–	–	–
Free chlorine residual[11]					
Colorimetric or ferrous titrimetric DPD	–	4500–Cl G or F	–	–	–
Amperometric		4500–Cl D	D 1253–86	–	–
Syringaldazine		4500–Cl H		–	–
Total Chlorine					
Amperometric titration	–	4500–Cl D	D 1253–86	–	–
Amperometric titration (low level)	–	4500–Cl E		–	–
DPD Ferrous titrimetric	–	4500–Cl F		–	–
DPD Colorimetric	–	4500–Cl G		–	–
Iodometric Electrode	–	4500-Cl I		–	–
Iron – Total[6], Digestion, followed by:					
AA; direct aspiration		3111 B			
AA; graphite furnace	200.9	3111 B	–	–	–
ICP	200.7	3120 B	–	–	–
Manganese – Total[6], Digestion, followed by:					
AA; direct aspiration		3111 B			
AA; graphite furnace	200.9	3113 B	–	–	–

Parameter and Method	EPA[2]	Standard Methods[3]	ASTM[4]	USGS[5]	Other
ICP	200.7	3113 B	–	–	–
Inductively–coupled plasma; mass spectrometry	200.8	–	–	–	–
(ICP/MS)	–	–	–	–	–
Odor – Threshold Odor		2150 B	–	–	–
Orthophosphate, Unfiltered, no digestion or hydrolysis					
Colorimetric, automated, ascorbic acid	365.1[1]	4500–P F	–	–	–
Colorimetric, ascorbic acid		4500–P E	D515–88(A)	–	–
Colorimetric, phosphomolybdate; automated segment flow automated discrete	–	–	–	I–1601–85 I–2601–90 I–2598–85	–
Ion chromatography	300.0A[1]	4110	D4327–91	–	–
Ozone					
Indigo Method	–	4500-O_3B	–	–	
pH					
Electrometric	–	4500–H^+–B	D1293–84	–	–
Silica					
Colorimetric, molybdate blue	–	–	–	I–1700–85	–
Automated–segmented flow:	–	–	–	I–2700–85	–
Colorimetric		–	D859–88	–	–
Molybodosilicate	–	4500–Si D	–	–	–
Heteropoly blue	–	4500–Si E	–	–	–
Automated method for molybdate–reactive silica	–	4500–Si F	–	–	–
ICP	200.7	3120 B	–	–	–
Sodium – Total[6], Digestion, followed by:					
AA; direct aspiration	–	3111 B	–	–	–
ICP	200.7	–	–	–	–
Silver – Total[6], Digestion, followed by:					
AA; direct aspiration	–	3111 B	–	I–3720–85	–
AA; graphite furnace	–	3113 B	–	–	–
AA; platform furnace	200.9	–	–	–	–
ICP	200.7	3120 B	–	–	–
ICP/MS	200.8	–	–	–	–
Sulfate					–
Spectrophotometric	375.2[1]	–	4500-SO_4–F		–
Gravimetric	–	–	4500–SO_4–C, D		–
Ion chromatography	300.0[1]	D4327–91	4110		–
Temperature, Thermometric	–	2550 B	–	–	–
Total Filterable Residue (TDS), gravimetric	–	2540 C	–	–	–
Zinc – Total[6], Digestion followed by:					
AA; direct aspiration	–	3111 B	–	–	–
ICP	200.7	3120 B	–	–	–
ICP/MS	200.8	–	–	–	–

[1]"Methods for the Determination of Inorganic Substances in Environmental Samples", EPA–600/R–93–100, August 1993, Available at NTIS, Order #PB94–12811, 5285 Port Royal Road, Springfield, VA 22161.

[2]Unless otherwise noted, methods are in "Methods for the Determination of Metals in Environmental Samples – Supplement I", EPA-600/R–94/111, May 1994. Available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161. PB94–184942

[3]"Standard Methods for the Examination of Water and Wastewater", American Public Health Association, American Water Works Association, Water Pollution Control Federation, 18th edition, 1989, 1015 Fifteenth Street, N.W., Washington, D.C. 20005.

[4]"Annual Book of ASTM Standards, Vols. 11.01 and 11.02, 1994. Available from the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103. The same method in the current edition may be used if the date of method revision is the same as the 1991 edition.

[5]Available from Books and Open–File reports Section, U.S. Geological Survey, Federal Center, Box 25425, Denver, CO. 80225–0425.

[6]Samples that contain less than 1 NTU (nephelometric turbidity unit) and are properly preserved (conc. HNO_3 to pH < 2) may be analyzed directly without digestion) for total metals, otherwise, digestion is required. Turbidity must be measured on the preserved samples just prior to the initiation of metal analysis. When digestion is required the total recoverable technique as defined in the method must be used.

[7]"AWWA Standards for Asbestos – Cement Pipe, 4 in. through 16 in. for Water and Other Liquids", AWWA C400–77, Revision of C400–75. Available from the AWWA, 6666 West Quincy Avenue, Denver Colorado, 80235.

[11]Residual disinfectant concentrations for free chlorine and combined chlorine may also be measured by using DPD colorimetric test kits if approved by the department.

TABLE F
Sample Preservation Requirements and Holding Times for Inorganic Parameters

Parameter	Preservation[1]	Container[2]	Holding Time[3]
Asbestos	Cool, 4C	P or G	
METALS			
Aluminum	HNO_3	P or G	6 months
Antimony	HNO_3	P or G	6 months
Arsenic	HNO_3	P or G	6 months
Barium	HNO_3	P or G	6 months
Beryllium	HNO_3	P or G	6 months
Cadmium	HNO_3	P or G	6 months
Copper	HNO_3	P or G	6 months
Chromium	HNO_3	P or G	6 months
Iron	HNO_3	P or G	6 months
Lead	HNO_3	P or G	6 months
Manganese	HNO_3	P or G	6 months
Mercury	HNO_3	P or G	28 days
Nickel	HNO_3	P or G	6 months
Selenium	HNO_3	P or G	6 months
Silver	HNO_3	P or G	6 months
Thallium	HNO_3	P or G	6 months
Zinc	HNO_3	P or G	6 months
GENERAL CHEMISTRY PARAMETERS			
Bromate	50 mg/L Ethylenediamine EDA	P or G	28 days
Chloride	None	P or G	28 days
Chlorite	50 mg/L EDA, Cool to 4°C for EPA Method 300.1 Cool to 4°C for EPA Method 300	P or G	14 days (300.1) Immediately (300)
Color	Cool, 4°C	P or G	48 hours
Cyanide	Cool, 4°C+NaOH to pH>12 NaOH to pH>12 0.6 g Ascorbic acid[5]	P or G	14 days
Fluoride	None	P or G	28 days
Foaming Agents	Cool,4°CC	P or G	48 hours
Nitrate (as N)			
Chlorinated	Cool, 4°C	P or G	14 days
Non–Chlorinated	Cool, 4°C	P or G	14 days
Nitrite (as N)	Cool, 4°C OR Conc. H_2SO_4 to pH<2	P or G	48 hours
Nitrate + Nitrite	Cool, 4°C OR Conc. H_2SO_4 to pH<2	P or G	14 days
Odor	Cool, 4°C	G	48 hours
pH	None	P or G	Analyze Immediately
Solids (TDS)	Cool, 4°C	P or G	7 days
Sulfate	Cool, 4°C	P or G	28 days
Turbidity	Cool, 4°C	P or G	48 hours

[1]If HNO_3 cannot be used because of shipping restrictions, sample may be initially preserved by icing and immediately shipping it to the laboratory. Upon receipt in the laboratory, the sample must be acidified with conc HNO^3 to pH < 2. At time of analysis, sample container should be thoroughly rinsed with 1:1 HNO_3; washings should be added to sample.

[2]P = plastic, hard or soft, G = glass, hard or soft.

[3]In all cases, samples should be analyzed as soon after collection as possible.

[4]These samples should never be frozen.

[5]Ascorbic acid should only be used in the presence of residual chlorine

TABLE G
Sample Preservation Requirements and Holding Times for Organic Parameters

Parameter/Method	Preservation	Container	HOLDING TIME Sample	HOLDING TIME Extract
502.1,502.2,503.1	Sodium Thiosulfate (3 mg) or Ascorbic Acid (25 mg), Cool, 4°C, HCl pH < 2	40 mL, G[1]	14 days	--
504	Sodium Thiosulfate (3 mg), Cool, 4°C, HCl pH < 2	40 mL, G[1]	28 days	Analyze immediately
505	Sodium Thiosulfate (3 mg), Cool, 4°C	40 mL, G[1]	14 days (Heptachlor=7 days)	Analyze immediately
506	Sodium Thiosulfate (60 mg), Cool, 4°C, dark	1L, Amber G[2]	14 days	4°C, dark, 14 days
507	Sodium Thiosulfate (80 mg), Cool, 4°C	1L, Amber G[2]	14 days (see method for exceptions)	4°C, dark, 14 days
508	Sodium Thiosulfate (80 mg), Cool, 4°C	1L, G[2]	7 days (see method for exceptions)	4°C, dark 14 days
508A	Cool, 4°C	1L, G[2]	14 days	30 days
515.1	Sodium Thiosulfate (80 mg), Cool, 4°C	1L, Amber G[2]	14 days	4°C, dark, 28 days
524.1, 524.2	Ascorbic Acid (25 mg), HCl pH < 2,Cool, 4°C,	40 mL, G[1]	14 days	–
525.1	Sodium Sulfite (40–50 mg) or Sodium Arsenite (40–50 mg) Cool, 4°C, HCl pH < 2	1L, G[1]	7 days	30 days
531.1	Monochloroacetic acid pH < 3, Sodium Thiosulfate (80 mg), Cool, 4°C	60 mL, G[1]	Freeze –10°C, 28 days	–
547	Sodium Thiosulfate (100 mg/L), Cool, 4°C	60 mL, G[1]	14 days (18 mo. frozen)	–
548	Cool, 4°C	60 mL, G[1]	7 days	1 day
549	Sodium Thiosulfate (100 mg/L), H2SO4 pH < 2, Cool, 4°C, dark	1L, High Density Amber PVC or Silanized Amber Glass	7 days	21 days
550, 550.1	Sodium Thiosulfate (100 mg/L), Cool, 4°C, HCl pH < 2	1L, Amber G[2]	7 days	4°C, dark, 40 days
551.1	Ammonium chloride Sodium sulfite (100 mg/L), Cool, 4°C, HCl pHt 4.5–5.0	60 mL[2]	4°C, 14 days	–10°C, 14 days
552.2	Ammonium chloride (10 mg/L), Cool 4°C	100 mL, Amber G[2]	14 days 4°C	7 days 4°,C 14 days –10°C
1613	Sodium Thiosulfate (80 mg), Cool, 4°C, dark	1L, Amber G[2]	–	40 days

[1]Teflon–lined septa.
[2]Teflon–lined cap.

TABLE H
Sample Preservation Requirements and Holding Times for Microbiological and Radiological Parameters

Parameter/Method	Preservation	Container	HOLDING TIME Sample	HOLDING TIME Extract
Coliform, E.Coli, Fecal Coliform	Cool, < 10°, Sodium Thiosulfate		30 hours	
Heterotrophs	Room temperature or Cool 4°		6 hours or 24 hours	100 mL
All Radionuclides except the following	HNO_3 or HCl pH < 2	1L, P or G	1 year	
Radon 222	none	30 mL, G[1]	4 days	
Cesium	HCl to pH < 2	1L, P or G	1 year	
Iodine	none	1L, P or G	7 days	
Tritium	none	1L, P or G	1 year	

[1]Teflon lined septa required.

TABLE I
SDWA Approved Methodology for Disinfectant Byproducts and Disinfectant Residuals

Parameter	Reference (method number)		
	EPA[1,2]	Standard Methods[3]	ASTM[4]
Disinfectant Byproducts			
TTHM	502.2, 524.2, 551.1		–
HAA5	552.2	6251 B	
Chlorite	300.0, 300.1	4500–ClO_2	
Bromate	300.1		
Disinfectant Residuals			
Free Chlorine		4500–CL D, 4500–CL F,4500–CL G, 4500–CL H	D 1253–86
Combined Chlorine		4500–CL D,4500–CL F, 4500–CL G	
Total Chlorine		4500–CL D, 4500–CL E, 4500–CL F, 4500–CL G, 4500–CL I	D 1253–86
Chlorine Dioxide		4500–CLO_2 D, 4500–CLO_2 E	

[1] EPA Method 552.1 is in Methods for the Determination of Organic Compounds in Drinking Water–Supplement II, USEPA, August 1992, EPA/600/R–92/129 (available through National Information Technical Service (NTIS), PB92–207703). EPA Methods 502.2, 524.2, 551.1, and 552.2 are in Methods for the Determination of Organic Compounds in Drinking Water–Supplement III, USEPA, August 1995, EPA/600/R–95/131. (available through NTIS, PB95–261616).

[2] EPA Method 300.0 is in Methods for the Determination of Inorganic Substances in Environmental Samples, USEPA, August 1993, EPA/600/R–93/100. (available through NTIS, PB94–121811). EPA Method 300.1is titled USEPA Method 300.1, Determination of Inorganic Anions in Drinking Water by Ion Chromatography, Revision 1.0, USEPA, 1997, EPA/600/R–98/118 (available through NTIS, PB98–169196); also available from: Chemical Exposure Research Branch, Microbiological & Chemical Exposure Assessment Research Division, National Exposure Research Laboratory, U.S. Environmental Protection Agency, Cincinnati, OH 45268,Fax Number: 513–569–7757, Phone number: 513–569–7586.

[3] Standard Methods 4500–Cl D, 4500–Cl E, 4500–Cl F, 4500–Cl G, 4500–Cl H, 4500–Cl I, 4500–ClO_2D, 4500–ClO_2 B, 6251 B, and 5910 B shall be followed in accordance with Standard Methods for the Examination of Water and Wastewater, 19th Edition, American Public Health Association, 1995; copies may be obtained from the American Public Health Association, 1015 Fifteenth Street, NW, Washington, DC 20005. Standard Methods 5310 B, 5310 C, and 5310 D shall be followed in accordance with the Supplement to the 19th Edition of Standard Methods for the Examination of Water and Wastewater, American Public Health Association, 1996; copies may be obtained from the American Public Health Association, 1015 Fifteenth Street, NW, Washington, DC 20005

[4] ASTM Method D 1253-86 shall be followed in accordance with the Annual Book of ASTM Standards, Volume 11.01, American Society for Testing and Materials, 1996 edition; copies may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohoken, PA 19428.

(2) The following procedure is to be used for compositing VOC samples prior to GC analysis.

(a) Add 5 ml or equal larger amounts of each sample, up to 5 samples are allowed, to a 25 ml glass syringe. Special precautions shall be made to maintain zero headspace in the syringe.

(b) The samples shall be cooled at 4C during this step to minimize volatilization losses.

(c) Mix well and draw out a 5 ml aliquot for analysis.

(d) Follow sample introduction, purging and desorption steps described in the method.

(e) If fewer than 5 samples are used for compositing, a proportionately smaller syringe may be used.

(3) The following procedure is to be used to composite VOC samples prior to GC/MS analysis.

(a) Inject 5–ml or equal larger amounts of each aqueous sample, up to 5 samples are allowed, into a 25–ml purging device using the sample introduction technique described in the method.

(b) The total volume of the sample in the purging device shall be 25 ml.

(c) Purge and desorb as described in the method.

History: Cr. Register, March, 1991, No. 423, eff. 4–1–91; renum. from NR 109.725, r. and recr. (1) Tables A to E, cr. (1) Tables F to H, (2) and (3), Register, July, 1993, No. 451, eff. 8–1–93; am. (1) Table A, Register, August, 1994, No. 464, eff. 9–1–94; am. Tables A, B, C, D, E, F, Register, October, 1997, No. 502, eff. 11–1–97; **am. Table E, F, and G, cr. Table I, Register, December, 2000, No. 540, eff. 1–1–01.**

NR 809.73 Monitoring of consecutive public water systems. When a public water system supplies water to one or more other public water systems, the department may modify the monitoring requirements imposed by this chapter to the extent that the interconnection of the systems justifies treating them as a single system for monitoring purposes. Any modified monitoring shall be conducted pursuant to a schedule specified by the department and concurred in by the administrator of the U.S. environmental protection agency.

History: Cr. Register, February, 1978, No. 266, eff. 3–1–78; renum. from NR 109.73, Register, July, 1993, No. 451, eff. 8–1–93.

NR 809.74 Sampling and analytical requirements for other chemicals. (1) If the department determines that the public health, safety or welfare requires testing for chemical or physical constituents in water which are not contained in this chapter the department may order such testing as it deems necessary.

(a) The department shall provide public notice and an opportunity for public hearing within 90 days after any order under this subsection.

(b) Hearings under this subsection shall be class 1 hearings and shall be held in accordance with ch. 227, Stats.

(c) Such testing shall be done at a laboratory certified or registered under ch. NR 149 as the department may require on a case–by–case basis.

(2) Testing for other constituents shall be performed at water systems as determined necessary by the department for design and control of treatment processes for contaminants which may affect public health or welfare. Such testing shall be done at a laboratory certified or registered under ch. NR 149 as the department may require on a case–by–case basis.

History: Cr. Register, February, 1978, No. 266, eff. 3–1–78; cr. (1) (c), am. (2), Register, April, 1986; renum. from NR 109.74, Register, July, 1993, No. 451, eff. 8–1–93.

Subchapter VI — Filtration and Disinfection

NR 809.75 General requirements. (1) These regulations establish criteria under which filtration is required as a treatment technique for public water systems supplied by a surface water source or a groundwater source under the direct influence of surface water. Direct influence shall be determined for individual sources by the department. The department determination of direct influence may be based on site–specific measurements of water quality characteristics such as those stated in s. NR 809.04 (24) or documentation of well construction characteristics and geology with field evaluation. These regulations also establish requirements for treatment techniques in lieu of maximum contaminant levels for *Giardia lamblia*, viruses, heterotrophic plate count bacteria, *Legionella, Cryptosporidium* and turbidity. Treatment technique requirements apply to every public water system which utilizes surface water or ground water under the direct

influence of surface water and the requirements consist of installing and properly operating water treatment processes which reliably achieve:

(a) At least 99.99% (3 log) removal or inactivation of *Giardia lamblia* cysts between a point where the raw water is not subject to recontamination by surface water runoff and a point downstream before or at the first customer; and

(b) At least 99.99% (4 logs) removal of inactivation of viruses between a point where the raw water is not subject to recontamination by surface water runoff and a point downstream before or at the first customer.

(2) A public water system using a surface water source or a ground water under the direct influence of surface water is considered to be in compliance with the requirements of sub. (1) if it meets the filtration requirements in s. NR 809.76 and the disinfection requirements in s. NR 809.77, or it meets the criteria for avoiding filtration in s. NR 809.755 and it meets the disinfection requirements in s. NR 809.77.

(3) Each public water system using a surface water source or a ground water under the direct influence of surface water shall be operated by qualified personnel who meet the requirements specified by the department.

(4) After December 17, 2001, systems serving at least 10,000 people shall install and operate water treatment processes that will reliably achieve all of the following:

(a) At least 99% (2 log) removal of *Cryptosporidium* between a point where the raw water is not subject to recontamination by surface water runoff and a point downstream before or at the first customer for filtered systems, or *Cryptosporidium* control under the watershed control system for unfiltered systems.

(b) Compliance with the profiling and benchmark requirements under the requirements in s. NR 809.775.

History: Cr. Register, March, 1991, No. 423, eff. 4–1–91; renum. from NR 109.70 and am. (1) (b) and (2), Register, July, 1993, No. 451, eff. 8–1–93; **am. (1) (intro.), cr. (4), Register, December, 2000, No. 540, eff. 1–1–01.**

NR 809.755 Criteria for avoiding filtration. A public water system that uses ground water under the direct influence of surface water as a water supply source shall meet all of the conditions of subs. (1) and (2), and is subject to sub. (3), unless the department has determined, in writing, that filtration is required. If the department determines in writing, before December 30, 1991, that filtration is required, the system owner shall install filtration and shall meet the criteria for filtered systems specified in ss. NR 809.77 and 809.78. Within 18 months of the failure of a public water system using a ground water source under the direct influence of surface water to meet any one of the requirements of subs. (1) and (2), the system owner shall install filtration and shall meet the criteria for filtered systems specified in ss. NR 809.77 and 809.78.

(1) SOURCE WATER QUALITY CONDITIONS. (a) The fecal coliform concentration shall be equal to or less than 20/100ml, or the total coliform concentration shall be equal to or less than 100/100 ml, measured as specified in s. NR 809.725 (1) Table C, in representative samples of the source water immediately prior to the first or only point of disinfectant application in at least 90% of the measurements made for the 6 previous months that the system served water to the public on an ongoing basis. If a system measures both fecal and total coliforms, the fecal coliform criterion, but not the total coliform criterion, in this paragraph shall be met.

(b) The turbidity level may not exceed 5 NTU, measured as specified in s. NR 809.725 (1) Table A, in representative samples of the source water immediately prior to the first or only point of disinfectant application unless:

1. The department determines that any such event was caused by circumstances that were unusual and unpredictable; and

2. There have not been more than 2 events in the past 12 months the system served water to the public, or more than 5 events in the past 120 months the system served water to the public, in which the turbidity level exceeded 5 NTU. An "event" is a series of consecutive days during which at least one turbidity measurement each day exceeds 5 NTU.

(2) SITE-SPECIFIC CONDITIONS. (a) 1. The public water system shall meet the disinfection requirements of s. NR 809.77 (1) (a) at least 11 of the 12 previous months that the system served water to the public, on an ongoing basis, unless the system fails to meet the requirements during 2 of the 12 previous months that the system served water to the public, and the department determines that at least one of these failures was caused by circumstances that were unusual and unpredictable.

2. The public water system shall meet the requirements of s. NR 809.77 (1) (b) at all times the system serves water to the public.

3. The public water system shall meet the requirements of s. NR 809.77 (1) (c) at all times the system serves water to the public unless the department determines that any such failure was caused by circumstances that were unusual and unpredictable.

4. The public water system shall meet the requirements of s. NR 809.77 (1) (d) on an ongoing basis unless the department determines that failure to meet these requirements was not caused by a deficiency in treatment of the source water.

(b) The public water system shall maintain a department approved well head protection program which minimizes the potential for contamination by *Cryptosporidium, Giardia lamblia* cysts and viruses in the source water. The department shall determine whether the well head protection program is adequate to meet this goal. At a minimum, the program shall:

1. Characterize the watershed hydrology, hydrogeology and land ownership;

2. Identify watershed characteristics and activities which may have an adverse effect on source water quality; and

3. Monitor the occurrence of activities which may have an adverse effect on source water quality.

(c) The public water system is subject to an annual on–site inspection to assess the well head protection program and disinfection treatment process. Either the department or a party approved by the department shall conduct the on–site inspection. The inspection shall be conducted by competent individuals and shall include:

1. A review of the effectiveness of the watershed control program;

2. A review of the physical condition of the source intake and how well it is protected;

3. A review of the system's equipment maintenance program to ensure there is low probability for failure of the disinfection process;

4. An inspection of the disinfection equipment for physical deterioration;

5. A review of operating procedures;

6. A review of data records to ensure that all required tests are being conducted and recorded and disinfection is effectively practiced; and

7. Identification of any improvements which are needed in the equipment, system maintenance and operation, or data collection.

8. A review of the adequacy of the watershed control program to limit potential contamination by *Cryptosporidium* including: comprehensiveness of the watershed review, the effectiveness of the system's program to monitor and control detrimental activities occurring in the watershed, and the extent to which the water system has maximized land ownership or controlled land use, or both, within the watershed.

(d) The public water system may not have been identified as a source of a waterborne disease outbreak, or if it has been so identified, the system shall be modified sufficiently to prevent another such occurrence, as determined by the department.

(e) The public water system shall comply with the maximum contaminant level (MCL) for total coliforms in s. NR 809.30 at least 11 months of the previous 12 months that the system served water to the public, on an ongoing basis, unless the department determines that failure to meet this requirement was not caused by a deficiency in treatment of the source water.

(f) The public water system shall comply with the requirements for trihalomethanes in s. NR 809.22 until December 31, 2001. After December 31, 2001, the system shall comply with the requirements for total trihalomethanes, haloacetic acids (five), bromate, chlorite, chlorine, chloramines and chlorine dioxide in s. NR 809.561.

(3) TREATMENT TECHNIQUE VIOLATIONS. (a) A system that fails to meet any one of the criteria in subs. (1) and (2), and which the department has determined in writing that filtration is required, is in violation of a treatment technique requirement.

(b) A system that has not installed filtration is in violation of a treatment technique if:

1. The turbidity level in a representative sample of the source water immediately prior to the first or only point of disinfection application exceeds 5 NTU; or

2. The system is identified as a source of a waterborne disease outbreak.

(4) ADDITIONAL CIRCUMSTANCES WHEN FILTRATION WOULD BE REQUIRED. The department may require a public water system to install filtration even when the system meets the requirements of subs. (1) and (2) if other water quality characteristics or site specific conditions present a threat to public health which could not be eliminated by disinfection alone.

History: Cr. Register, March, 1991, No. 423, eff. 4–1–91; renum. from NR 109.755 and am. (1) (a) and (b) (intro.), Register, July, 1993, No. 451, eff. 8–1–93; am. (2) (f) and (3) (a), Register, December, 2000, No. 540, eff. 1–1–01.

NR 809.76 Filtration requirements. Public water systems that use a surface water source shall provide filtration which complies with the requirements of sub. (1) and meets the disinfection criteria for filtered systems specified in s. NR 809.77 (2). Public water systems that use a ground water source under the direct influence of surface water shall provide filtration which complies with the specifications of sub. (1), (2), (3), (4) or (5) and meets the disinfection criteria for filtered systems specified in s. NR 809.77 within 18 months of the date that a source is determined to be under the direct influence of surface water, whichever is later. Failure to meet any requirement of this section is a treatment technique violation.

(1) CONVENTIONAL FILTRATION TREATMENT. (a) For systems using conventional filtration, the turbidity level of representative samples of a system's filtered water shall be less than or equal to 0.5 NTU in at least 95% of the measurements taken each month, measured as specified in s. NR 809.725 (1), Table E. Beginning January 1, 2002, the turbidity level of filtered water of a system serving at least 10,000 people and using conventional filtration shall be less than or equal to 0.3 NTU in at least 95% of the measurements taken each month, measured as specified in s. NR 809.725 (1), Table E.

(b) The turbidity level of representative samples of a system's filtered water may not exceed 5 NTU, measured as specified in s. NR 809.725 (1) Table E. Beginning January 1, 2002, the turbidity level of filtered water of a system serving at least 10,000 people and using conventional filtration shall at no time exceed 1 NTU, measured as specified in s. NR 809.725 (1) Table E.

(c) To determine compliance with par. (a), turbidity measurements shall be performed on representative samples of filtered water at least every 4 hours that the system serves water to the public.

(d) In lieu of the requirements of par. (c), turbidity measurements from a continuous reading and recording turbidity monitoring device shall be recorded at predetermined 4 hour intervals to determine compliance with par. (a). The highest turbidity measurement recorded at any time during the day shall be reported under s. NR 809.80 (6) (a) 1.

(e) A system that uses lime softening may acidify representative samples prior to analysis if using an approved protocol.

(2) DIRECT FILTRATION. (a) For systems using direct filtration, the turbidity level of representative samples of a system's filtered water shall be less than or equal to 0.5 NTU in at least 95% of the measurements taken each month, measured as specified in s. NR 809.725 (1), Table E. The department may approve a turbidity limit up to 1 NTU if the water supplier provides the department with documentation which reliably indicates the system achieves at least 99.9% removal or inactivation of *Giardia lamblia* cysts at a turbidity level above 0.5 NTU at least 95% of the time that the system delivers water to the public. Beginning January 1, 2002, the turbidity level of filtered water of a system serving at least 10,000 people and using direct filtration shall be less than or equal to 0.3 NTU in at least 95% of the measurements taken each month, measured as specified in s. NR 809.725 (1), Table E.

(b) The turbidity level of representative samples of a system's filtered water may not exceed 5 NTU, measured as specified in s. NR 809.725 (1), Table E. Beginning January 1, 2002, the turbidity level of filtered water of a system serving at least 10,000 people and using direct filtration shall at no time exceed 1 NTU, measured as specified in s. NR 809.725 (1), Table E.

(3) SLOW SAND FILTRATION. (a) For systems using slow sand filtration, the turbidity level of representative samples of a system's filtered water shall be less than or equal to 1 NTU in at least 95% of the measurements taken each month, measured as specified in s. NR 809.725 (1), Table E.

(b) The turbidity level of representative samples of a system's filtered water may not exceed 5 NTU, measured as specified in s. NR 809.725 (1), Table E.

(4) DIATOMACEOUS EARTH FILTRATION. (a) For systems using diatomaceous earth filtration, the turbidity level of representative samples of a system's filtered water shall be less than or equal to 1 NTU in at least 95% of the measurements taken each month, measured as specified in s. NR 809.725 (1), Table E.

(b) The turbidity level of representative samples of a system's filtered water may not exceed 5 NTU, measured as specified in s. NR 809.725 (1), Table E.

(5) OTHER FILTRATION TECHNOLOGIES. A public water system supplier may use a filtration technology not listed in subs. (1) to (4) if the supplier demonstrates to the department, using pilot studies or other means, that the alternative filtration technology, in combination with disinfection treatment that meets the requirements of s. NR 809.78, consistently achieves 99.9% removal or inactivation of *Giardia lamblia* cysts and 99.99% removal or inactivation of viruses, and 99% removal of *Cryptosporidium* oocysts, and the department approves the use of the filtration technology. For each approval, the department will set turbidity performance requirements that the system shall meet at least 95% of the time at a level that consistently achieves 99.9% removal or inactivation of *Giardia lamblia* cysts, 99.9% removal or inactivation of viruses, and 99% removal of *Cryptosporidium* oocysts. The department may set other performance requirements to assure the integrity of the technology.

History: Cr. Register, March, 1991, No. 423, eff. 4–1–91; renum. from NR 109.76 and am., Register, July, 1993, No. 451, eff. 8–1–93; cr. (1) (c) and (d), Register, August, 1994, No. 464, eff. 9–1–94; am. (intro.), (1), (2) and (5), Register, December, 2000, No. 540, eff. 1–1–01.

NR 809.765 Filtration sampling requirements. (1) Monitoring requirements for systems using filtration treatment. In addition to monitoring required by s. NR 809.76, a public water system serving at least 10,000 people and using conventional or direct filtration shall conduct continuous monitoring of turbidity for each individual filter using a method approved in s. NR 809.725 (1) and shall calibrate turbidimeters using the proce-

dure specified by the manufacturer. Systems shall record the results of individual filter monitoring every 15 minutes.

(2) If there is a failure in the continuous monitoring equipment, the system shall conduct grab sampling every 4 hours in lieu of continuous monitoring, until the turbidimeter is repaired and back on–line. A system has a maximum of 5 working days after failure to repair the equipment or is in violation.

History: Cr. Register, December, 2000, No. 540, eff. 1–1–01.

NR 809.77 Disinfection requirements. A system that uses ground water under the direct influence of surface water and does not provide filtration treatment shall provide disinfection treatment specified in sub. (1) within 18 months after the department determines that the ground water source is under the influence of surface water. A system that filters and uses surface water or ground water under the direct influence of surface water as a source shall provide the disinfection treatment specified in sub. (2) when filtration is installed. Failure to meet any requirement of this section is a treatment technique violation.

(1) DISINFECTION REQUIREMENTS FOR PUBLIC WATER SYSTEMS THAT DO NOT PROVIDE FILTRATION. (a) The disinfection treatment shall be sufficient to ensure at least 99.9% (3 log) inactivation of *Giardia lamblia* cysts and 99.99% (4 log) inactivation of viruses, every day the system serves water to the public, except any one day each month. Each day a system serves water to the public, the water supplier shall calculate the CT value from the system's treatment parameters using the procedure specified in s. NR 809.78 (2), and determine whether this value is sufficient to achieve the specified inactivation rates for *Giardia lamblia* cysts and viruses. Systems using a disinfectant other than chlorine shall demonstrate to the department through on–site challenge studies or other information that the system is achieving required minimum inactivation rates.

(b) The disinfection system shall have either redundant components, including an auxiliary power supply with automatic start–up and alarm to ensure that disinfectant application is maintained continuously while water is being delivered to the distribution system, or automatic shut–off of water delivery to the distribution system whenever there is less than 0.2 mg/l of residual disinfectant concentration in the water. If the department determines that automatic shut–off of delivery of water to the distribution system would cause an unreasonable risk to health or property, the system shall have redundant components.

(c) The residual disinfectant concentration in the water entering the distribution system, measured as specified in s. NR 809.725 (1), Table E, may not be less than 0.2 mg/l for more than 4 hours.

(d) 1. The residual disinfectant concentration in the distribution system, measured as total chlorine, combined chlorine, or chlorine dioxide, as specified in s. NR 809.725 (1) Table E, may not be undetectable in more than 5% of the samples each month, for any 2 consecutive months that the system serves water to the public. Water in the distribution system with a heterotrophic bacteria concentration less than or equal to 500/ml, measured as heterotrophic plate count (HPC) as specified in s. NR 809.725 (1), Table C, is deemed to have a detectable disinfectant residual for purposes of determining compliance with this requirement. Thus, the value "V" in the following formula cannot exceed 5% in one month for any 2 consecutive months.

$V = c + d + e/a + b \times 100$

where:

a = number of instances where the residual disinfectant concentration is measured;

b = number of instances where the residual disinfectant concentration is not measured but heterotrophic bacteria plate count (HPC) is measured;

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

d = number of instances where no residual disinfectant concentration is detected and where the HPC is > 500/ml; and

e = number of instances where the residual disinfectant concentration is not measured and HPC is > 500/ml.

2. If the department determines, based on site specific considerations, that a system has no means for having a sample transported and analyzed for HPC by a certified laboratory under the requisite time and temperature conditions required in s. NR 809.725 (1), Table C, and that the system is providing adequate disinfection in the distribution system, the requirements of subd. 1. do not apply.

(2) DISINFECTION REQUIREMENTS FOR PUBLIC WATER SYSTEMS WHICH PROVIDE FILTRATION. Each public water system that provides filtration treatment shall provide disinfection treatment as follows:

(a) Disinfection treatment shall be sufficient to ensure that the total treatment processes of that system achieve at least 99.9% (3 log) inactivation or removal of *Giardia lamblia* cysts and at least 99.99% (4 log) inactivation or removal of viruses, as determined by the department.

(b) The residual disinfectant concentration in the water entering the distribution system, measured as specified in s. NR 809.725 (1), Table E, may not be less than 0.2 mg/l for more than 4 hours.

(c) 1. The residual disinfectant concentration in the distribution system, measured as total chlorine, combined chlorine or chlorine dioxide, as specified in s. NR 809.725 (1), Table E, may not be undetectable in more than 5% of the samples each month, for any 2 consecutive months that the system serves water to the public. Water in the distribution system with a heterotrophic bacteria concentration less than or equal to 500/ml, measured as heterotrophic plate count (HPC) as specified in s. NR 809.725 (1), Table C, is deemed to have a detectable disinfectant residual for purposes of determining compliance with this requirement. Thus, the value "V" in the following formula may not exceed 5% in one month, for any 2 consecutive months.

$V = c + d + e/a + b \times 100$

where:

a = number of instances where the residual disinfectant concentration is measured;

b = number of instances where the residual disinfectant concentration is not measured but heterotrophic bacteria plate count (HPC) is measured;

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

d = number of instances where no residual disinfectant concentration is detected and where the HPC is > 500/ml; and

e = number of instances where the residual disinfectant concentration is not measured and HPC is > 500/ml.

2. If the department determines, based on site specific considerations, that a system has no means for having a sample transported and analyzed for HPC by a certified laboratory under the requisite time and temperature conditions required in s. NR 809.725 (1), Table C, and that the system is providing adequate disinfection in the distribution system, the requirements of subd. 1. do not apply.

(3) The department may require continuous disinfection of public water systems using ground water not under the direct influence of surface water if it determines that an existing or potential public health threat to the water system warrants such a

requirement. Additional treatment including disinfectant contact time may be required by the department on a case–by–case basis.

(a) The following conditions, as well as other conditions, are considered by the department to be existing or potential water system public health threats:

1. A public water system history of microbiological contamination in the water source or distribution system by either coliform or noncoliform bacteria.

2. The presence of color in raw water from a well serving a public system.

3. Inadequate construction, i.e. construction which does not meet current requirements of ch. NR 811 or 812, of a well which serves a public water system.

(b) Disinfectant treatment required under this section shall meet the requirements of sub. (1).

History: Cr. Register, March, 1991, No. 423, eff. 4–1–91; renum. from NR 109.77 and am. (intro.), (1) (c), (d), (2) (b) and (c), Register, July, 1993, No 451, eff. 8–1–93; correction in (3) (a) 3. made under s. 13.93 (2m) (b) 7., Stats., Register, August, 1994, No. 464; **am. (intro.), Register, December, 2000, No. 540, eff. 1–1–01.**

NR 809.775 Disinfection profiling and benchmarking. (1) DETERMINATION OF SYSTEMS REQUIRED TO PROFILE. A public water system serving at least 10,000 people shall determine its TTHM annual average using the procedure in par. (a) and its HAA5 annual average using the procedure in par. (b). The annual average is the arithmetic average of the quarterly averages of 4 consecutive quarters of monitoring.

(a) The TTHM annual average shall be the annual average during the same period as is used for the HAA5 annual average.

1. Those systems that collected disinfection byproduct data under the provisions of the information collection rule shall use the results of the samples collected during the last 4 quarters of required monitoring under the information collection rule.

2. Those systems that use "grandfathered" HAA5 occurrence data that meet the provisions of par. (b) 2. shall use TTHM data collected at the same time under the provisions of ss. NR 809.22 and 809.23.

3. Those systems that use HAA5 occurrence data that meet the provisions of par. (b) 3. a. shall use TTHM data collected at the same time under the provisions of ss. NR 809.22 and 809.23.

(b) The HAA5 annual average shall be the annual average during the same period as is used for the TTHM annual average.

1. Those systems that collected data under the provisions of the information collection rule shall use the results of the samples collected during the last 4 quarters of required monitoring under the information collection rule.

2. Those systems that have collected 4 quarters of HAA5 occurrence data that meets the routine monitoring sample number and location requirements for TTHM in ss. NR 809.22 and 809.23 and handling and analytical method requirements of the information collection rule may use those data to determine whether the requirements of this section apply.

3. Those systems that have not collected 4 quarters of HAA5 occurrence data that meets the provisions of either subd. 1. or 2. by March 16, 1999 shall either:

a. Conduct monitoring for HAA5 that meets the routine monitoring sample number and location requirements for TTHM in ss. NR 809.22 and 809.23 and handling and analytical method requirements of the information collection rule to determine the HAA5 annual average and whether the requirements of sub. (2) apply. This monitoring shall be completed so that the applicability determination can be made no later than March 31, 2000, or

b. Comply with all other provisions of this section as if the HAA5 monitoring had been conducted and the results required compliance with sub. (2).

(c) The system may request that the department approve a more representative annual data set than the data set determined under par. (a) or (b) for the purpose of determining applicability of the requirements of this section.

(d) The department may require that a system use a more representative annual data set than the data set determined under par. (a) or (b) for the purpose of determining applicability of the requirements of this section.

(e) The system shall submit data to the department on the schedule in subds. 1. to 5.

1. Those systems that collected TTHM and HAA5 data under the provisions of the information collection rule, as required by pars. (a) 1. and (b) 1., shall submit the results of the samples collected during the last 12 months of required monitoring under the information collection rule not later than December 31, 1999.

2. Those systems that have collected 4 consecutive quarters of HAA5 occurrence data that meets the routine monitoring sample number and location for TTHM in ss. NR 809.22 and 809.23 and handling and analytical method requirements of the information collection rule, as allowed by pars. (a) 2. and (b) 2., shall submit those data to the department not later than April 16, 1999. Until the department has approved the data, the system shall conduct monitoring for HAA5 using the monitoring requirements specified under subd. 3.

3. Those systems that conduct monitoring for HAA5 using the monitoring requirements specified by pars. (a) 3. and (b) 3. a., shall submit TTHM and HAA5 data not later than March 31, 2000.

4. Those systems that elect to comply with all other provisions of this section as if the HAA5 monitoring had been conducted and the results required compliance with this section, as allowed under par. (b) 3. b., shall notify the department in writing of their election not later than December 31, 1999.

5. If the system elects to request that the department approve a more representative annual data set than the data set determined under par. (b) 1., the system shall submit this request in writing not later than December 31, 1999.

(f) Any system having either a TTHM annual average $\geq$ 30.064 mg/L or an HAA5 annual average $\geq$ 30.048 mg/L during the period identified in pars. (a) and (b) shall comply with sub. (2).

Note: The information collection rule refers to 40 CFR 1, part 141, Subpart M, ss. 141.140 through 141.144.

(2) DISINFECTION PROFILING. (a) Any system that meets the criteria in sub. (1) (f) shall develop a disinfection profile of its disinfection practice for a period of up to 3 years.

(b) The system shall monitor daily for a period of 12 consecutive calendar months to determine the total logs of inactivation for each day of operation, based on the CT99.9 values in s. NR 809.78 (1) (c) 6., Tables 1–8 as appropriate, through the entire treatment plant. This system shall begin this monitoring not later than April 1, 2000. As a minimum, the system with a single point of disinfectant application prior to entrance to the distribution system shall conduct the monitoring in subds. 1. to 4. A system with more than one point of disinfectant application shall conduct the monitoring in subds. 1. to 4. for each disinfection segment. The system shall monitor the parameters necessary to determine the total inactivation ratio, using analytical methods in s. NR 809.725, as follows:

1. The temperature of the disinfected water shall be measured once per day at each residual disinfectant concentration sampling point during peak hourly flow.

2. If the system uses chlorine, the pH of the disinfected water shall be measured once per day at each chlorine residual disinfectant concentration sampling point during peak hourly flow.

3. The disinfectant contact times ("T") shall be determined for each day during peak hourly flow.

4. The residual disinfectant concentrations ("C") of the water before or at the first customer and prior to each additional point of disinfection shall be measured each day during peak hourly flow.

(c) In lieu of the monitoring conducted under the provisions of par. (b) to develop the disinfection profile, the system may elect

to meet the requirements of subd. 1. In addition to the monitoring conducted under the provisions of par. (b) to develop the disinfection profile, the system may elect to meet the requirements of subd. 2.

1. A public water system that has 3 years of existing operational data may submit those data, a profile generated using those data, and a request that the department approve use of those data in lieu of monitoring under the provisions of par. (b) not later than March 31, 2000. The department shall determine whether these operational data are substantially equivalent to data collected under the provisions of par. (b). These data shall also be representative of *Giardia lamblia* inactivation through the entire treatment plant and not just of certain treatment segments. Until the department approves this request, the system is required to conduct monitoring under the provisions of par. (b).

2. In addition to the disinfection profile generated under par. (b), a public water system that has existing operational data may use those data to develop a disinfection profile for additional years. Systems may use these additional yearly disinfection profiles to develop a benchmark under sub. (3). The department shall determine whether these operational data are substantially equivalent to data collected under par. (b). These data shall also be representative of inactivation through the entire treatment plant and not just of certain treatment segments.

(d) The system shall calculate the total inactivation ratio as follows:

1. If the system uses only one point of disinfectant application, the system may determine the total inactivation ratio for the disinfection segment based on either of the methods in subd. 1.a. or b.

a. Determine one inactivation ratio ($CTcalc/CT_{99.9}$) before or at the first customer during peak hourly flow.

b. Determine successive $CTcalc/CT_{99.9}$ values, representing sequential inactivation ratios, between the point of disinfectant application and a point before or at the first customer during peak hourly flow. Under this alternative, the system shall calculate the total inactivation ratio by determining ($CTcalc/CT_{99.9}$) for each sequence and then adding the ($CTcalc/CT_{99.9}$) values together to determine (Σ ($CTcalc/CT_{99.9}$)).

2. If the system uses more than one point of disinfectant application before the first customer, the system shall determine the CT value of each disinfection segment immediately prior to the next point of disinfectant application, or for the final segment, before or at the first customer, during peak hourly flow. The ($CTcalc/CT_{99.9}$) value of each segment and (Σ ($CTcalc/CT_{99.9}$)) shall be calculated using the method in subd. 1.

3. The system shall determine the total logs of inactivation by multiplying the value calculated in subd. 1. or 2. by 3.0.

(e) A system that uses either chloramines or ozone for primary disinfection shall also calculate the logs of inactivation for viruses using a method approved by the department.

(f) The system shall retain disinfection profile data in graphic form, as a spreadsheet, or in some other format acceptable to the department for review as part of sanitary surveys conducted by the department.

(3) DISINFECTION BENCHMARKING. (a) Any system required to develop a disinfection profile under subs. (1) and (2) and that decides to make a significant change to its disinfection practice shall consult with the department prior to making the change. Significant changes to disinfection practice include any of the following:

1. Changes to the point of disinfection.
2. Changes to the disinfectants used in the treatment plant.
3. Changes to the disinfection process.
4. Any other modification identified by the department.

(b) Any system that modifies its disinfection practice shall calculate its disinfection benchmark using the following procedure:

1. For each year of profiling data collected and calculated under sub. (2), the system shall determine the lowest average monthly *Giardia lamblia* inactivation in each year of profiling data. The system shall determine the average *Giardia lamblia* inactivation for each calendar month for each year of profiling data by dividing the sum of daily *Giardia lamblia* inactivation by the number of values calculated for that month.

2. The disinfection benchmark is the lowest monthly average value, for systems with one year of profiling data, or average of lowest monthly average values, for systems with more than one year of profiling data, of the monthly logs of *Giardia lamblia* inactivation in each year of profiling data.

(c) A system that uses either chloramines or ozone for primary disinfection also shall calculate the disinfection benchmark for viruses using a method approved by the department.

(d) The system shall submit all of the following information to the department as part of its consultation process:

1. A description of the proposed change.

2. The disinfection profile for *Giardia lamblia* and, if necessary, viruses, under par. (b) and benchmark as required by par. (b) 2.

3. An analysis of how the proposed change will affect the current levels of disinfection.

History: Cr. Register, December, 2000, No. 540, eff. 1-1-01.

NR 809.78 Monitoring requirements. (1) MONITORING REQUIREMENTS FOR GROUND WATER SYSTEMS UNDER THE DIRECT INFLUENCE OF SURFACE WATER THAT DO NOT PROVIDE FILTRATION. A public water system that uses a ground water source under the direct influence of surface water and does not provide filtration treatment shall begin monitoring as specified in sub. (1) on December 31, 1990, or 6 months after the department determines that the ground water source is under the direct influence of surface water, whichever is later.

(a) Fecal coliform or total coliform density measurements as required by s. NR 809.755 (1) (a) shall be performed on representative source water samples immediately prior to the first or only point of disinfectant application. The system owner or operator shall sample for fecal or total coliforms at the following minimum frequency each week the system serves water to the public:

System Size (persons served)	Samples/week[1]
< or = 500	1
501 to 3,300	2
3,301 to 10,000	3
10,001 to 25,000	4
>25,000	5

[1] Shall be taken on separate days

In addition, one fecal or total coliform density measurement shall be performed every day the system serves water to the public and the turbidity of the source water exceeds 1 NTU (these samples count toward the weekly coliform sampling requirement).

(b) Turbidity measurements as required by s. NR 809.755 (1) (b) shall be performed on representative grab samples of source water immediately prior to the first or only point of disinfectant application every 4 hours (or more frequently) that the system serves water to the public. A public water system may substitute continuous turbidity monitoring for grab sample monitoring if it validates the continuous measurement for accuracy on a regular basis using a protocol approved by the department.

(c) The total inactivation ratio for each day that the system is in operation shall be determined based on the $CT_{99.9}$ values in Tables 1 to 8 of subd. 6., as appropriate. The parameters necessary to determine the total inactivation ratio shall be monitored as follows:

1. Temperature of the disinfected water shall be measured at least once per day at each residual disinfectant concentration sampling point.

2. If the system uses chlorine, the pH of the disinfected water shall be measured at least once per day at each chlorine residual disinfectant concentration sampling point.

3. The disinfectant contact time ("T") shall be determined for each day during peak hourly flow.

4. The residual disinfectant concentration ("C") of the water before or at the first customer shall be measured each day during peak hourly flow.

5. If a system uses a disinfectant other than chlorine, the system may demonstrate to the department, through the use of a department approved protocol for on-site disinfection challenge studies or other information satisfactory to the department, that CT values other than those specified in tables 7 and 8, and other operational parameters, are adequate to demonstrate that the system is achieving the minimum inactivation rates specified in s. NR 809.77 (1) (a).

6. CT Tables.

Table 1 —
CT Values ($CT_{99.9}$) for 99.9 Percent Inactivation of *Giardia Lamblia* Cysts by Free Chlorine at 0.5 °C or Lower[1]

RESIDUAL (mg/l)	pH						
	<=6.0	6.5	7.0	7.5	8.0	8.5	<=9.0
< or =0.4	137	163	195	237	277	329	390
0.6	141	168	200	239	286	342	407
0.8	145	172	205	246	295	354	422
1.0	148	176	210	253	304	365	437
1.2	152	180	215	259	313	376	451
1.4	155	184	221	266	321	387	464
1.6	157	189	226	273	329	397	477
1.8	162	193	231	279	338	407	489
2.0	165	197	236	286	346	417	500
2.2	169	201	242	297	353	426	511
2.4	172	205	247	298	361	435	522
2.6	175	209	252	304	368	444	533
2.8	178	213	257	310	375	452	543
3.0	181	217	261	316	382	460	552

[1] These CT values achieve greater than a 99.9 percent inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature and at the higher pH.

Table 2 —
CT Values ($CT_{99.9}$) for 99.9 Percent Inactivation of *Giardia Lamblia Cysts* by Free Chlorine at 5.0 °C[1]

RESIDUAL (mg/l)	pH						
	<=6.0	6.5	7.0	7.5	8.0	8.5	<=9.0
< or = 0.4	97	117	139	166	198	239	279
0.6	100	120	143	171	204	244	291
0.8	103	122	146	175	210	252	301
1.0	105	125	149	179	216	260	312
1.2	107	127	152	183	221	267	320
1.4	809	130	155	187	227	274	329
1.6	111	132	158	192	232	281	337
1.8	114	135	162	196	238	287	345
2.0	116	138	165	200	243	294	353
2.2	118	140	169	204	248	300	361
2.4	120	143	172	209	253	306	368
2.6	122	146	175	213	258	312	375
2.8	124	148	178	217	263	318	382
3.0	126	151	182	221	268	324	389

[1] These CT values achieve greater than a 99.9 percent inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature and at the higher pH.

Table 3
CT Values ($CT_{99.9}$) for 99.9 Percent Inactivation of *Giardia Lamblia* Cysts by Free Chlorine at 10.0°C[1]

RESIDUAL (mg/l)	pH						
	<= 6.0	6.5	7.0	7.5	8.0	8.5	<= 9.0
< or = 0.4	73	88	104	125	149	177	209
0.6	75	90	107	128	153	183	218
0.8	78	92	110	131	158	189	226
1.0	79	94	112	134	162	195	234
1.2	80	95	114	137	166	200	240
1.4	82	98	116	140	170	206	247
1.6	83	99	119	144	174	211	253
1.8	86	101	122	147	179	215	259
2.0	87	104	124	150	182	221	265
2.2	89	105	127	153	186	225	271
2.4	90	107	129	157	190	230	276
2.6	92	110	131	160	194	234	281
2.8	93	111	134	163	197	239	287
3.0	95	113	137	166	201	243	292

[1] These CT values achieve greater than a 99.9 percent inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. $CT_{99.9}$ values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the CT value at the lower temperature and at the higher pH.

Table 4 –
CT VAlues ($CT_{99.9}$) for 99.9 Percent Inactivation of *Giardia Lamblia* Cysts by Free Chlorine at 15.0°C[1]

RESIDUAL (mg/l)	pH						
	< =6.0	6.5	7.0	7.5	8.0	8.5	<=9.0
< or =0.40	49	59	70	83	99	118	140
0.6	50	60	72	86	102	122	146
0.8	52	61	73	88	105	126	151
1.0	53	63	75	90	108	130	156
1.2	54	64	76	92	111	134	160
1.4	55	65	78	94	114	137	165
1.6	56	66	79	96	116	141	169
1.8	57	68	81	98	119	144	173
2.0	58	69	83	100	122	147	177
2.2	59	70	85	102	124	150	181
2.4	60	72	86	105	127	153	184
2.6	61	73	88	107	129	156	188
2.8	62	74	89	809	132	159	191
3.0	63	76	91	111	134	162	195

[1] These CT values achieve greater than a 99.9 percent inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature and at the higher pH.

Table 5 —
CT Values ($CT_{99.9}$) for 99.9 Percent Inactivation of *Giardia Lamblia* Cysts by Free Chlorine at 20.0 °C[1]

RESIDUAL (mg/l)	pH						
	<=6.0	6.5	7.0	7.5	8.0	8.5	<=9.0
<or=0.4	36	44	52	62	74	89	105
0.6	38	45	54	64	77	92	809
0.8	39	46	55	66	79	95	113
1.0	39	47	56	67	81	98	117
1.2	40	48	57	69	83	100	120
1.4	41	49	58	70	85	103	123
1.6	42	50	59	72	87	105	126
1.8	43	51	61	74	89	108	129
2.0	44	52	62	75	91	110	132
2.2	44	53	63	77	93	113	135
2.4	45	54	65	78	95	115	138
2.6	46	55	66	80	97	117	141
2.8	47	56	67	81	99	119	143
3.0	47	57	68	83	101	122	146

[1] These CT values achieve greater than a 99.9 percent inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature and at the higher pH.

Table 6 —
CT Values ($CT_{99.9}$) for 99.9 Percent Inactivation of *Giardia Lamblia* Cysts by Free Chlorine at 25.0 °C or Higher[1]

RESIDUAL (mg/l)	pH						
	<=6.0	6.5	7.0	7.5	8.0	8.5	<=9.0
<or=0.4	24	29	35	42	50	59	70
0.6	25	30	36	43	51	61	73
0.8	26	31	37	44	53	63	75
1.0	26	31	37	45	54	65	78
1.2	27	32	38	46	55	67	80
1.4	27	33	39	47	57	69	82
1.6	28	33	40	48	58	70	84
1.8	29	34	41	49	60	72	86
2.0	29	35	41	50	61	74	88
2.2	30	35	42	51	62	75	90
2.4	30	36	43	52	63	77	92
2.6	31	37	44	53	65	78	94
2.8	31	37	45	54	66	80	96
3.0	32	38	46	55	67	81	97

[1] These CT values achieve greater than a 99.9 percent inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature and at the higher pH.

Table 7 —
Values ($CT_{99.9}$) for 99.9 Percent Inactivation of *Giardia Lamblia* Cysts by Chlorine Dioxide and Ozone[1]

DISINFECTANT	TEMPERATURE					
	<=1°C	5°C	10°C	15°C	20°C	>=25°C
Chlorine Dioxide	63	26	23	19	15	11
Ozone	2.9	1.9	1.4	0.95	0.72	0.48

[1] These CT values achieve greater than 99.9 percent inactivation or viruses. CT values between the indicated temperatures may be determined by linear interpolation. If no interpolation is used, use the CT value at the lower temperature for determining the $CT^{99.9}$ values between indicated temperatures.

Table 8 —
CT Values ($CT_{99.9}$) for 99.9 Percent Inactivation of *Giardia Lamblia* Cysts by Chloramines[1]

<1°C	5°C	10°C	15°C	20°C	25°C
3,800	2,200	1,850	1,500	1,100	750

[1] These values are for pH values of 6 to 9. These CT values may be assumed to achieve greater than 99.99 percent inactivation of viruses only if chlorine is added and mixed in the water prior to the addition of ammonia. If this condition is not met, the system shall demonstrate, based on site studies or other information, as approved by the department, that the system is achieving at least 99.99 percent inactivation of viruses. CT values between the indicated temperatures may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature for determining $CT_{99.9}$ values between indicated temperatures.

(d) The total inactivation ratio shall be calculated as follows:

1. If the system uses only one point of disinfectant application, the system owner or operator may determine the total inactivation ratio based on either of the following 2 methods:

a. One inactivation ratio ($CTcalc/CT_{99.9}$) is determined before or at the first customer during peak hourly flow and if the $CTcalc/CT_{99.9}$ is greater than or equal to 1.0, the 99.9% *Giardia lamblia* inactivation requirement has been achieved; or

b. Successive $CTcalc/CT_{99.9}$ values, representing sequential inactivation ratios, are determined between the point of disinfectant application and a point before or at the first customer during peak hourly flow. Under this alternative, the following method shall be used to calculate the total inactivation ratio:

Determine $CTcalc/CT_{99.9}$ for each sequence,

Add the CTcalc/CT values together (Σ(CTcalc)/CT))

If Σ ($CTcalc/CT_{99.9}$) > or = 1.0, the 99.9% *Giardia lamblia* inactivation requirement has been achieved.

2. If the system uses more than one point of disinfectant application before or at the first customer, the system owner or operator shall determine the CT value of each disinfection sequence immediately prior to the next point of disinfectant application during peak flow. The $CTcalc/CT_{99.9}$ value of each sequence and

$$\Sigma \text{ (CTcalc/CT)}$$

shall be calculated using the method in subd. 1.b. to determine if the system is in compliance with s. NR 809.77.

3. Although not required, the total percent inactivation for a system with one or more points of residual disinfectant concentration monitoring may be calculated by solving the following equation:

Percent inactivation = 100 – (100/10), where

$z = 3 \times$ summation of $(CTcalc/CT_{99.9})$

(e) The residual disinfectant concentration of the water entering the distribution system shall be monitored continuously, and the lowest value shall be recorded each day, except that if there is a failure in the continuous monitoring equipment, grab sampling every 4 hours may be conducted in lieu of continuous monitoring, but for no more than 5 working days following the failure of the equipment, and systems serving 3,300 or fewer persons may take grab samples in lieu of providing continuous monitoring on an ongoing basis at the following prescribed frequencies:

System Size by Population	Samples/day[1]
< or = 500	1
501 to 1,000	2
1,001 to 2,500	3
2,501 to 3,300	4

[1]The day's samples cannot be taken at the same time. The sampling intervals are subject to department review and approval.

If at any time the residual disinfectant concentration falls below 0.2 mg/l in a system using grab sampling in lieu of continuous monitoring, the system shall take a grab sample every 4 hours until the residual concentration is equal to or greater than 0.2 mg/l.

(f) 1. The residual disinfectant concentration shall be measured at least at the same points in the distribution system and at the same time as total coliforms are sampled, except that the department may allow a public water system which uses a ground water source, to take disinfectant residual samples at points other than the total coliform sampling points if the department determines that such points are more representative of treated (disinfected) water quality within the distribution system. Heterotrophic bacteria, measured as heterotrophic plate count (HPC) as specified in s. NR 809.725 (1), Table C, may be measured in lieu of residual disinfectant concentration, when approved by the department.

2. If the department determines, based on site specific considerations, that a system has no means for having a sample transported and analyzed for HPC by a certified laboratory under the requisite time and temperature conditions specified by s. NR 809.725, Table C, and that the system is providing adequate disinfection in the distribution system, the requirements of subd. 1. do not apply to that system.

(2) MONITORING REQUIREMENTS FOR SYSTEMS USING FILTRATION TREATMENT. A public water system that uses a surface water source or a ground water source under the direct influence of surface water and provides filtration treatment shall monitor in accordance with this section on or after June 29, 1993 or when filtration is installed whichever is later.

(a) Turbidity measurements as specified in s. NR 809.76 shall be performed on representative samples of the system's filtered water every 4 hours (or more frequently) that the system serves water to the public. A public water system may substitute continuous turbidity monitoring for grab sample monitoring if it validates the continuous measurement for accuracy on a regular basis using a protocol approved by the department. For any systems using slow sand filtration or filtration treatment other than conventional treatment, direct filtration or diatomaceous earth filtration, the department may reduce the sampling frequency to once per day if it determines that less frequent monitoring is sufficient to indicate effective filtration performance. For systems serving 500 or fewer persons, the department may reduce the turbidity sampling frequency to once per day, regardless of the type of filtration treatment used, if the department determines that less frequent monitoring is sufficient to indicate effective filtration performance.

(b) The residual disinfectant concentration of the water entering the distribution system shall be monitored continuously, and the lowest value shall be recorded each day, except that if there is a failure in the continuous monitoring equipment, grab sampling every 4 hours may be conducted in lieu of continuous monitoring, but for no more than 5 working days following the failure of the equipment. Systems serving 3,300 or fewer persons may take grab samples in lieu of providing continuous monitoring on an ongoing basis at the frequencies each day prescribed as follows:

System Size by Population	Samples/day[1]
< or = 500	1
501 to 1,000	2
1,001 to 2,500	3
2,501 to 3,300	4

[1]The day's samples cannot be taken at the same time. The sampling intervals are subject to department review and approval.

If at any time the residual disinfectant concentration falls below 0.2 mg/l in a system using grab sampling in lieu of continuous monitoring, the system shall take a grab sample every 4 hours until the residual disinfectant concentration is equal to or greater than 0.2 mg/l.

(c) 1. The residual disinfectant concentration shall be measured at least at the same points in the distribution system and at the same time as total coliforms are sampled. The department may allow a public water system which uses both a surface water source or a ground water source under direct influence of surface water, and a ground water source to take disinfectant residual samples at points other than the total coliform sampling points if the department determines that such points are more representative of treated (disinfected) water quality within the distribution system. Heterotrophic bacteria, measured as heterotrophic plate count (HPC) as specified in s. NR 809.725 (1), Table C, may be measured in lieu of residual disinfectant concentration, when approved by the department.

2. If the department determines, based on site specific considerations, that a system has no means for having a sample transported and analyzed for HPC by a certified laboratory under the requisite time and temperature conditions specified in s. NR 809.725 (1), Table C, and that the system is providing adequate disinfection in the distribution system, the requirements of subd 1. do not apply to that system.

History: Cr. Register, March, 1991, No. 423, eff. 4–1–91; renum. from NR 109.78 and am. (1) (intro.), (c) 2. and 6. Tables 2 and 4, (f) and (2) (c), Register, July, 1993, No. 451, eff. 8–1–93.

Subchapter VII — Reporting, Public Notification, Consumer Confidence Reports and Record Keeping

NR 809.80 Reporting requirements. (1) Except where a shorter reporting period is specified in this chapter, the supplier of water shall report to the department 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.

(2) Except where some other period is specified in this chapter, the supplier of water shall report to the department within 24 hours the failure to comply with any maximum contaminant level, or monitoring requirement, or treatment technique set forth in this chapter.

(3) The supplier of water is not required to report analytical results to the department in cases where the state laboratory of hygiene performs the analysis and reports the results to the department.

(4) When determining compliance with microbiological MCLs, and other microbiological monitoring required under subch. I, the department shall accept analytical results only from laboratories that report results directly to the department and are certified under ch. ATCP 77 for safe drinking water analyses. Results from microbiological samples collected to satisfy subch. I, shall be reported to the department and the water supplier within

24 hours of the time the results are obtained by the laboratory. When results are obtained on a weekend or holiday, the results shall be provided to the water supplier and the department as soon as practicable.

(5) The supplier of water, within 10 days of completion of each public notification required under s. NR 809.81, 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.

(6) A public water system that uses a ground water source under the direct influence of surface water and does not provide filtration treatment shall report monthly to the department the information specified in this subsection.

(a) Source water quality information shall be reported to the department within 10 days after the end of each month the system serves water to the public. Information that shall be reported includes:

1. The cumulative number of months for which results are reported.

2. The number of fecal or total coliform samples, whichever are analyzed during the month (if a system monitors for both, only fecal coliforms shall be reported), the dates of sample collection, and the dates when the turbidity level exceeded 1 NTU.

3. The number of samples during the month that had equal to or less than 20/100 ml fecal coliforms or equal to or less than 100/100 ml total coliforms, whichever are analyzed.

4. The cumulative number of fecal or total coliform samples, whichever are analyzed, during the previous 6 months the system served water to the public.

5. The cumulative number of samples that had equal to or less than 20/100 ml fecal coliforms or equal to or less than 100/100 ml total coliforms, whichever are analyzed, during the previous 6 months the system served water to the public.

6. The percentage of samples that had equal to or less than 20/100 ml fecal coliforms or equal to or less than 100/100 ml total coliforms, whichever are analyzed, during the previous 6 months the system served water to the public.

7. The maximum turbidity level measured during the month, the dates of occurrence for any measurements which exceeded 5 NTU, and the dates the occurrences were reported to the department.

8. For the first 12 months of record keeping, the dates and cumulative number of events during which the turbidity exceeded 5 NTU, and after one year of record keeping for turbidity measurements, the dates and cumulative number of events during which the turbidity exceeded 5 NTU in the previous 12 months the system served water to the public.

9. For the first 120 months of record keeping, the dates and cumulative number of events during which the turbidity exceeded 5 NTU, and after 10 years of record keeping for turbidity measurements, the dates and cumulative number of events during which the turbidity exceeded 5 NTU in the previous 120 months the system served water to the public.

(b) Disinfection information specified in s. NR 809.78 (1) shall be reported to the department within 10 days after the end of each month the system serves water to the public. Information that shall be reported includes:

1. For each day, the lowest measurement of residual disinfectant concentration in mg/l in water entering the distribution system.

2. The date and duration of each period when the residual disinfectant concentration in water entering the distribution system fell below 0.2 mg/l and when the department was notified of the occurrence.

3. The daily residual disinfectant concentrations (in mg/l) and disinfectant contact times (in minutes) used for calculating the CT values.

4. If chlorine is used, the daily measurements of pH of disinfected water following each point of chlorine disinfection.

5. The daily measurements of water temperature in °C following each point of disinfection.

6. The daily CTcalc and CTcalc/$CT_{99.9}$ values for each disinfectant measurement or sequence and the sum of all CTcalc/$CT_{99.9}$ values (Σ(CTcalc/ $CT_{99.9}$)) before or at the first customer.

7. The daily determination of whether disinfection achieves adequate *Giardia lamblia* cyst and virus inactivation, i.e., whether (CTcalc/ $CT_{99.9}$) is at least 1.0, or where disinfectants other than chlorine are used, other indicator conditions that the department determines are appropriate, are met.

8. The following information on the samples taken in the distribution system in conjunction with total coliform monitoring pursuant to s. NR 809.77:

a. Number of instances where the residual disinfectant concentration is measured;

b. Number of instances where the residual disinfectant concentration is not measured but heterotrophic bacteria plate count (HPC) is measured;

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

d. Number of instances where no residual disinfectant concentration is detected and where HPC is > 500/ml;

e. Number of instances where the residual disinfectant concentration is not measured and HPC is > 500/ml;

f. For the current and previous month the system serves water to the public, the value of "V" in the following formula:

$$V = c + d + e/a + b \times 100$$

where:

a = the value in subd. 8. a.

b = the value in subd. 8. b.

c = the value in subd. 8. c.

d = the value in subd. 8. d.

e = the value in subd. 8. e.

g. If the department determines, based on site specific considerations, that a system has no means for having a sample transported and analyzed for HPC by a certified laboratory within the requisite time and temperature conditions specified by s. NR 809.78 and that the system is providing adequate disinfection in the distribution system, the requirements of subd. 8. a. to f. do not apply.

9. A public water system owner or operator need not report the data listed in subds. 1. and 3. through 6. if all data listed in par. (b) remain on file at the system and department determines that:

a. The system owner or operator has submitted to the department all the information required by subds. 1. to 8. for at least 12 months; and

b. The department has determined that the system is not required to provide filtration treatment.

(c) No later than 10 days after the end of each federal fiscal year (September 30), each water supplier shall provide a report which summarizes their water system compliance with all well head protection program requirements specified in s. NR 809.755 (2) (b).

(d) No later than 10 days after the end of each federal fiscal year (September 30), each water supplier shall provide to the department a report of the on-site inspection conducted during that year pursuant to s. NR 809.755 (2) (c), unless the on-site

inspection was conducted by the department. If the inspection was conducted by the department, the department shall provide a copy of its report to the public water system.

(e) 1. Each water supplier, upon discovering that a waterborne disease outbreak potentially attributable to their water system has occurred, shall report that occurrence to the department as soon as possible, but no later than by the end of the next business day.

2. If at any time the turbidity exceeds 5 NTU, the water supplier shall inform the department as soon as possible, but no later than the end of the next business day.

3. If at any time the disinfectant residual falls below 0.2 mg/l in the water entering the distribution system, the water supplier shall notify the department as soon as possible, but no later than by the end of the next business day. The water supplier also shall notify the department by the end of the next business day whether or not the residual was restored to at least 0.2 mg/l within 4 hours.

(7) A public water system that uses a surface water source or a ground water source under the direct influence of surface water and provides filtration treatment shall report monthly to the department the information specified in this subsection.

(a) Turbidity measurements as required by s. NR 809.78 (2) (a) shall be reported within 10 days after the end of each month the system serves water to the public. Information that shall be reported includes:

1. The total number of filtered water turbidity measurements taken during the month and the highest daily turbidity measurement for each day.

2. The number and percentage of filtered water turbidity measurements taken during the month which are less than or equal to the turbidity limits specified in s. NR 809.76 for the filtration technology being used.

3. The date and value of any turbidity measurements taken during the month which exceed 1.0 NTU for systems using conventional or direct filtration, or which exceed the maximum level set in s. NR 809.76.

(b) Disinfection information specified in s. NR 809.78 shall be reported to the department within 10 days after the end of each month the public serves water to the public. Information that shall be reported includes:

1. For each day, the lowest measurement of residual disinfectant concentration in mg/l in water entering the distribution system.

2. The date and duration of each period when the residual disinfectant concentration in water entering the distribution system fell below 0.2 mg/l and when the department was notified of the occurrence.

3. The following information on the samples taken in the distribution system in conjunction with total coliform monitoring pursuant to s. NR 809.77:

a. Number of instances where the residual disinfectant concentration is measured;

b. Number of instances where the residual disinfectant concentration is not measured but heterotrophic bacteria plate count (HPC) is measured;

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

d. Number of instances where no residual disinfectant concentration is detected and where HPC is > 500/ml;

e. Number of instances where the residual disinfectant concentration is not measured and HPC is > 500/ml;

f. For the current and previous month the system serves water to the public, the value of "V" in the following formula:

$$V = c + d + e/a + b \times 100$$

where:

a = the value in subd. 3. a.

b = the value in subd. 3. b.

c = the value in subd. 3. c.

d = the value in subd. 3. d.

e = the value in subd. 3. e.

g. If the department determines, based on site specific considerations, that a system has no means for having a sample transported and analyzed for HPC by a certified laboratory within the requisite time and temperature conditions specified by s. NR 809.78 and that the system is providing adequate disinfection in the distribution system, the requirements of subpars. a. to f. do not apply.

4. A water supplier need not report the data listed in subd. 1. if all data listed in par. (b) remain on file at the system and the department determines that the water supplier has submitted all the information required by par. (b) for at least 12 months.

(c) 1. If during any 4 hour monitoring period the turbidity exceeds 1.0 NTU or at any time during the month, turbidity measurements indicate the 95th percentile turbidity level of 0.5 NTU will be exceeded for that month, the water supplier shall inform the department as soon as possible, but no later than the end of the next business day.

2. If at any time the disinfectant residual falls below 0.2 mg/l in the water entering the distribution system, the water supplier shall notify the department as soon as possible, but no later than the end of the next business day. The water supplier also shall notify the department by the end of the next business day whether or not the residual was restored to at least 0.2 mg/l within 4 hours.

(8) Systems shall maintain the results of individual filter monitoring taken under s. NR 809.765 for at least 3 years. Systems shall report that they have conducted individual filter turbidity monitoring under s. NR 809.765 within 10 days after the end of each month the system serves water to the public. Systems shall report individual filter turbidity measurement results taken under s. NR 809.765 within 10 days after the end of each month the system serves water to the public only if measurements demonstrate one or more of the conditions in pars. (a) to (d). Systems that use lime softening may apply to the department for alternative exceedance levels for the levels specified in pars. (a) to (d) if they can demonstrate that higher turbidity levels in individual filters are due to lime carryover only and not due to degraded filter performance.

(a) For any individual filter that has a measured turbidity level of greater than 1.0 NTU in 2 consecutive measurements taken 15 minutes apart, the system shall report the filter number, the turbidity measurement, and the dates on which the exceedance occurred. In addition, the system shall either produce a filter profile for the filter within 7 days of the exceedance, if the system is not able to identify an obvious reason for the abnormal filter performance, and report that the profile has been produced or report the obvious reason for the exceedance.

(b) For any individual filter that has a measured turbidity level of greater than 0.5 NTU in 2 consecutive measurements taken 15 minutes apart at the end of the first 4 hours of continuous filter operation after the filter has been backwashed or otherwise taken offline, the system shall report the filter number, the turbidity, and the dates on which the exceedance occurred. In addition, the system shall either produce a filter profile for the filter within 7 days of the exceedance, if the system is not able to identify an obvious reason for the abnormal filter performance, and report that the profile has been produced or report the obvious reason for the exceedance.

(c) For any individual filter that has a measured turbidity level of greater than 1.0 NTU in 2 consecutive measurements taken 15 minutes apart at any time in each of 3 consecutive months, the system shall report the filter number, the turbidity measurement, and the dates on which the exceedance occurred. In addition, the system shall conduct a self–assessment of the filter within 14 days of the exceedance and report that the self–assessment was conducted. The self–assessment shall consist of at least the following

components: assessment of filter performance; development of a filter profile; identification and prioritization of factors limiting filter performance; assessment of the applicability of corrections; and preparation of a filter self–assessment report.

(d) For any individual filter that has a measured turbidity level of greater than 2.0 NTU in 2 consecutive measurements taken 15 minutes apart at any time in each of 2 consecutive months, the system shall report the filter number, the turbidity measurement, and the dates on which the exceedance occurred. In addition, the system shall arrange for the conduct of a comprehensive performance evaluation by the department or a third party approved by the department no later than 30 days following the exceedance and have the evaluation completed and submitted to the department no later than 90 days following the exceedance.

(9) Each water supplier, upon discovering that a waterborne disease outbreak potentially attributable to their water system has occurred, shall report that occurrence to the department as soon as possible, but no later than by the end of the next business day.

(10) 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 809.82 or copies of any documents then in existence which the department is entitled to inspect under the authority of s. 281.97, Stats.

(11) The department may specify the format for reporting analytical results required under this chapter.

History: Cr. Register, February, 1978, No. 266, eff. 3–1–78; am. (1), cr. (4) and (5), Register, April, 1982, No. 316, eff. 5–1–82; am. (3), Register, August, 1989, No. 404, eff. 9–1–89; am. (2), renum. (5) to be (8), cr. (5) to (7), Register, March, 1991, No. 423, eff. 4–1–91; renum. from NR 109.80 and am. (2), (5) (b) 9. (intro.), (6) (a) and (b) (intro.), cr. (9), Register, July, 1993, No. 451, eff. 8–1–93; am. (6) (a) 1. and 3., (c) 1., Register, August, 1994, No. 464, eff. 9–1–94; correction in (5) (b) and (8) made under s. 13.93 (2m) (b) 7., Stats., Register, May, 1999, No. 521; **renum. (4) to (9) to be (5) to (7) and (9) to (11) and am.(6) (intro.), (7) (intro.) and 3., cr. (4) and (8), Register, December, 2000, No. 540, eff. 1–1–01.**

NR 809.81 Public notification. (1) MAXIMUM CONTAMINANT LEVEL (MCL), TREATMENT TECHNIQUE, VARIANCE, AND CONDITIONAL WAIVER VIOLATIONS. The owner or operator of a public water system which fails to comply with an applicable MCL or treatment technique established by this chapter or which fails to comply with the requirements of any variance under s. NR 809.91 or conditional waiver under s. NR 809.90 shall notify persons served by the system as follows:

(a) Except as provided in par. (c), the owner or operator of a community water system shall give notice:

1. By publication in a daily newspaper of general circulation in the area served by the system as soon as possible, but in no case later than 14 days after the violation or failure. If the area served by a community water system is not served by a daily newspaper of general circulation, notice shall instead be given by publication in a weekly newspaper of general circulation serving the area; and

2. By mail delivery, by direct mail or with the water bill, or by hand delivery, not later than 45 days after the violation or failure. The department may waive mail or hand delivery if it determines that the owner or operator of the community water system in violation has corrected the violation or failure within the 45–day period. The department shall make the determination in writing and within the 45–day period; and

3. For violations of the MCLs and MRDLs of contaminants that may pose an acute risk to human health, by furnishing a copy of the notice to the radio and television stations serving the area served by the community water system or by hand delivery to each customer as soon as possible but in no case later than 72 hours after the violation. The following violations are acute violations:

a. Occurrence of a waterborne disease outbreak, as defined in s. NR 809.04 (65), or a violation of the microbiological MCL or treatment technique which poses an acute risk to public health as defined in s. NR 809.30 (2).

b. Any violation of the microbiological MCL or treatment technique which the department determines warrants a notification to boil water.

c. Violation of the MCL for nitrate, nitrite or combined nitrate and nitrite as defined in s. NR 809.11 (2) and determined according to s. NR 809.12 (9) (d).

d. Violation of the MRDL for chlorine dioxide as defined in s. NR 809.561(2).

(b) Except as provided in par. (c), following the initial notice given under par. (a), the owner or operator of the community water system shall give notice at least once every 3 months by mail delivery (by direct mail or with the water bill) or by hand delivery, for as long as the violation or failure exists.

(c) In lieu of the requirements of par. (a) 1. or 2., the owner or operator of a community water system in an area that is not served by a daily or weekly newspaper of general circulation shall give notice within 14 days after the violation or failure by hand delivery or by continuous posting in conspicuous places within the area served by the system. Posting shall continue for as long as the violation or failure exists. Notice by hand delivery shall be repeated at least every 3 months for as long as the violation or failure exists.

(d) The owner or operator of a non–community water system shall give notice within 72 hours after the violation or failure by continuous posting in conspicuous places within the area served by the system. The owner or operator of a restaurant or tavern which is permitted to serve water exceeding a maximum contaminant level to customers away from water outlets shall provide a written public notice at each table. Posting shall continue for as long as the violation or failure exists.

(2) OTHER VIOLATIONS, VARIANCES, CONDITIONAL WAIVERS. The owner or operator of a public water system which fails to perform monitoring required by this chapter, fails to comply with a testing procedure established by this chapter, is subject to a variance granted under subch. VII or is subject to a conditional waiver under subch. VII shall notify persons served by the system as follows:

(a) Except as provided in par. (c) or (d), the owner or operator of a community water system shall give notice within 30 days of being notified of the violation or granting of a conditional waiver under s. NR 809.90 by publication in a daily newspaper of general circulation in the area served by the system. If the area served by a community water system is not served by a daily newspaper of general circulation, notice shall instead be given by publication in a weekly newspaper of general circulation serving the area.

(b) Except as provided in par. (c) or (d), following the initial notice given under par. (a), the owner or operator of the community water system shall give notice at least once every 3 months by mail delivery (by direct mail or with the water bill) or by hand delivery, for as long as the violation exists. Repeat notice of the existence of a conditional waiver under s. NR 809.90 shall be given every 3 months for as long as the conditional waiver remains in effect.

(c) In lieu of the requirements of par. (a) or (b), the owner or operator of a community water system in an area that is not served by a daily or weekly newspaper of general circulation shall give notice, within 30 days of being notified of the violation, or granting of a conditional waiver under s. NR 809.90, by hand delivery or by continuous posting in conspicuous places within the area served by the system. Posting shall continue for as long as the violation exists or the conditional waiver remains in effect. Notice by hand delivery shall be repeated at least every 3 months for as long as the violation exists or the conditional waiver remains in effect.

(d) The owner or operator of a non–community water system shall give notice, within 30 days of being notified of the violation

or the granting of the variance under s. NR 809.91 or conditional waiver under s. NR 809.90, by continuous posting at all drinking water outlets within the area served by the system. Posting shall continue for a period of 30 days or as long as the violation exists, whichever is longer or the variance or conditional waiver remains in effect.

(e) The owner or operator of a community water system serving an institution and granted a variance from the maximum contaminant level for nitrate as nitrogen under s. NR 809.91 (2) shall give notice, within 72 hours of the granting of the variance, by continuous posting at all drinking water outlets within the area served by the system. Posting shall continue for as long as the variance remains in effect.

(3) NOTICE TO NEW BILLING UNITS. The owner or operator of a community water system shall give a copy of the most recent public notice for any outstanding violation of any maximum contaminant level, treatment technique requirement or conditional waiver under s. NR 809.90 to all new billing units or new hookups prior to or at the time service begins.

(4) GENERAL CONTENT OF PUBLIC NOTICE. Each notice required by this section shall provide a clear and readily understandable explanation of the violation, any potential adverse health effects, the population at risk, the steps that the supplier of water is taking to correct such violation, the necessity for seeking alternative water supplies, if any, and any preventive measures the consumer should take until the violation is corrected. Each notice shall be conspicuous and may not contain unduly technical language, unduly small print, or similar problems that frustrate the purpose of the notice. Each notice shall include the telephone number of the owner, operator, or designee of the public water system as a source of additional information concerning the notice. Where appropriate, the notice shall be multi-lingual.

(5) MANDATORY HEALTH EFFECTS LANGUAGE. When providing the information on potential adverse health effects required by sub. (4) in notices of violations of maximum contaminant levels or treatment technique requirements, notices of the granting or the continued existence of a conditional waiver under s. NR 809.90 or a variance under s. NR 809.91 or notices of failure to comply with a conditional waiver under s. NR 809.90 or a variance under s. NR 809.91, the owner or operator of a public water system shall include the following language specified for each contaminant.

Note: If language for a particular contaminant is not specified below at the time notice is required, this section does not apply.

(a) *Acrylamide.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that acrylamide is a health concern at certain levels of exposure. Polymers made from acrylamide are sometimes used to treat water supplies to remove particulate contaminants. Acrylamide has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. Sufficiently large doses of acrylamide are known to cause neurological injury. EPA has set the drinking water standard for acrylamide using a treatment technique to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. This treatment technique limits the amount of acrylamide in the polymer and the amount of the polymer which may be added to drinking water to remove particulates. Drinking water systems which comply with this treatment technique have little to no risk and are considered safe with respect to acrylamide.

(am) *Alachlor.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that alachlor is a health concern at certain levels of exposure. This organic chemical is a pesticide. When soil and climatic conditions are favorable, alachlor may get into drinking water by runoff into surface water or by leaching into ground water. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for alachlor at 0.002 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets this standard is associated with little to none of this risk and is considered safe with respect to alachlor.

(an) *Antimony.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that antimony is a health concern at certain levels of exposure. This inorganic chemical occurs naturally in soils, groundwater and surface waters and is often used in the flame retardant industry. It is also used in ceramics, glass, batteries, fireworks and explosives. It may get into drinking water through natural weathering of rock, industrial production, municipal waste disposal or manufacturing processes. This chemical has been shown to decrease longevity, and altered blood levels of cholesterol and glucose in laboratory animals such as rats exposed to high levels during their lifetimes. EPA has set the drinking water standard for antimony at 0.006 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to antimony.

(c) *Atrazine.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that atrazine is a health concern at certain levels of exposure. This organic chemical is a pesticide. When soil and climatic conditions are favorable, atrazine may get into drinking water by runoff into surface water or by leaching into ground water. This chemical has been shown to affect offspring of rats and the hearts of dogs. EPA has set the drinking water standard for atrazine at 0.003 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to atrazine.

(ce) *Asbestos.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that asbestos fibers greater than 10 micrometers in length are a health concern at certain levels of exposure. Asbestos is a naturally occurring mineral. Most asbestos fibers in drinking water are less than 10 micrometers in length and occur in drinking water from natural sources and from corroded asbestos–cement pipes in the distribution system. The major uses of asbestos were in the production of cements, floor tiles, paper products paint, and caulking; in transportation–related applications; and in the production of textiles and plastics. Asbestos was once a popular insulating and fire retardant material. Inhalation studies have shown that various forms of asbestos have produced lung tumors in laboratory animals. The available information on the risk of developing gastrointestinal tract cancer associated with the ingestion of asbestos from drinking water is limited. Ingestion of intermediate–range chrysotile asbestos fibers greater than 10 micrometers in length is associated with causing benign tumors in male rats. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for asbestos at 7 million long fibers per liter to reduce the potential risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to asbestos.

(ct) *Barium.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that barium is a health concern at certain levels of exposure. This inorganic chemical occurs naturally in some aquifers that serve as sources of ground water. It is also used in oil and gas drilling muds,

automotive paints, bricks, tiles and jet fuels. It generally gets into drinking water after dissolving from naturally occurring minerals in the ground. This chemical may damage the heart and cardiovascular system, and is associated with high blood pressure in laboratory animals such as rats exposed to high levels during their lifetimes. In humans, EPA believes that effects from barium on blood pressure should not occur below 2 parts per million (ppm) in drinking water. EPA has set the drinking water standard for barium at 2 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to barium.

(d) *Benzene.* The United States environmental protection agency (EPA) sets national drinking water standards and has determined that benzene is a health concern at certain levels of exposure. The chemical is used as a solvent and degreaser of metals. It is also a major component of gasoline. Drinking water contamination generally results from leaking underground gasoline and petroleum tanks or improper waste disposal. This chemical has been associated with significantly increased risks of leukemia among certain industrial workers who were exposed to relatively large amounts of this chemical during their working careers. This chemical has also been shown to cause cancer in laboratory animals when the animals are exposed at high levels over their lifetimes. Chemicals that cause increased risk of cancer among exposed industrial workers and laboratory animals also may increase the risk of cancer in humans who are exposed at lower levels over long periods of time. EPA has set the enforceable drinking water standard for benzene at 0.005 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in humans and laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.

(db) *Benzo[a]pyrene.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that benzo[a]pyrene is a health concern at certain levels of exposure. Cigarette smoke and charbroiled meats are common sources of general exposure. The major source of benzo[a]pyrene in drinking water is the leaching from coal tar lining and sealants in water storage tanks. This chemical has been shown to cause cancer in animals such as rats and mice when the animals are exposed at high levels. EPA has set the drinking water standard for benzo[a]pyrene at 0.0002 parts per million (ppm) to protect against the risk of cancer. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to benzo[a]pyrene.

(dc) *Beryllium.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that beryllium is a health concern at certain levels of exposure. This inorganic metal occurs naturally in soils, groundwater and surface waters and is often used in electrical equipment and electrical components. It generally gets into water from runoff from mining operations, discharge from processing plants and improper waste disposal. Beryllium compounds have been associated with damage to the bones and lungs and induction of cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. There is limited evidence to suggest that beryllium may pose a cancer risk via drinking water exposure. Therefore, EPA based the health assessment on noncancer effects with an extra uncertainty factor to account for possible carcinogenicity. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for beryllium at 0.004 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to beryllium.

(de) *Cadmium.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that cadmium is a health concern at certain levels of exposure. Food and the smoking of tobacco are common sources of general exposure. This inorganic metal is a contaminant in the metals used to galvanize pipe. It generally gets into water by corrosion of galvanized pipes or by improper waste disposal. This chemical has been shown to damage the kidney in animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Some industrial workers who were exposed to relatively large amounts of this chemical during working careers also suffered damage to the kidney. EPA has set the drinking water standard for cadmium at 0.005 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to cadmium.

(dt) *Carbofuran.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that carbofuran is a health concern at certain levels of exposure. This organic chemical is a pesticide. When soil and climatic conditions are favorable, carbofuran may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to damage the nervous and reproductive systems of laboratory animals such as rats and mice exposed at high levels over their lifetimes. Some humans who were exposed to relatively large amounts of this chemical during their working careers also suffered damage to the nervous system. Effects on the nervous system are generally rapidly reversible. EPA has set the drinking water standard for carbofuran at 0.04 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to carbofuran.

(e) *Carbon tetrachloride.* The United States environmental protection agency (EPA) sets national drinking water standards and has determined that carbon tetrachloride is a health concern at certain levels of exposure. This chemical was once a popular household cleaning fluid. It generally gets into drinking water by improper waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed to high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed at lower levels over long periods of time. EPA has set forth the enforceable drinking water standard for carbon tetrachloride at 0.005 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.

(ee) *Chlordane.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that chlordane is a health concern at certain levels of exposure. This organic chemical is a pesticide used to control termites. Chlordane is not very mobile in soils. It usually gets into drinking water after application near water supply intakes or wells. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for chlordane at 0.002 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to chlordane.

(et) *Chromium.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that chromium is a health concern at certain levels of exposure.

This inorganic metal occurs naturally in the ground and is often used in the electroplating of metals. It generally gets into water from runoff from old mining operations and improper waste disposal from plating operations. This chemical has been shown to damage the kidney, nervous system, and the circulatory system of laboratory animals such as rats and mice when the animals are exposed at high levels. Some humans who were exposed to high levels of this chemical suffered liver and kidney damage, dermatitis and respiratory problems. EPA has set the drinking water standard for chromium at 0.1 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of the risk and is considered safe with respect to chromium.

(eu) *Copper.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that copper is a health concern at certain exposure levels. Copper, a reddish– brown metal, is often used to plumb residential and commercial structures that are connected to water distribution systems. Copper contaminating drinking water as a corrosion by–product occurs as the result of the corrosion of copper pipes that remain in contact with water for a prolonged period of time. Copper is an essential nutrient, but at high doses it has been shown to cause stomach and intestinal distress, liver and kidney damage, and anemia. Persons with Wilson's disease may be at a higher risk of health effects due to copper than the general public. EPA's national primary drinking water regulation requires all public water systems to install optimal corrosion control to minimize copper contamination resulting from the corrosion of plumbing materials. Public water systems serving 50,000 people or fewer that have copper concentrations below 1.3 parts per million (ppm) in more than 90% of tap water samples (the EPA "action level") are not required to install or improve their treatment. Any water system that exceeds the action level shall also monitor their source water to determine whether treatment to remove copper in source water is needed.

(ew) *Cyanide.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that cyanide is a health concern at certain levels of exposure. This inorganic chemical is used in electroplating, steel processing, plastics, synthetic fabrics and fertilizer products. It usually gets into water as a result of improper waste disposal. This chemical has been shown to damage the spleen, brain and liver of humans fatally poisoned with cyanide. EPA has set the drinking water standard for cyanide at 0.2 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to cyanide.

(ex) *Dalapon.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that dalapon is a health concern at certain levels of exposure. This organic chemical is a widely used herbicide. It may get into drinking water after application to control grasses crops, drainage ditches and along railroads. This chemical has been shown to cause damage to the kidneys and liver in laboratory animals when the animals are exposed to high levels over their lifetimes. EPA has set the drinking water standard for dalapon at 0.2 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to dalapon.

(f) *Dibromochloropropane (DBCP).* The United States environmental protection agency (EPA) sets drinking water standards and has determined that DBCP is a health concern at certain levels of exposure. This organic chemical was once a popular pesticide. When soil and climatic conditions are favorable, dibromochloropropane may get into drinking water by runoff into surface water or by leaching into groundwater. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals may also increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for DBCP at 0.0002 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to DBCP.

(fe) *o–Dichlorobenzene.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that o–dichlorobenzene is a health concern at certain levels of exposure. This organic chemical is used as solvent in the production of pesticides and dyes. It generally gets into water by improper waste disposal. This chemical has been shown to damage the liver, kidney and the blood cells of laboratory animals such as rats and mice exposed to high levels during their lifetimes. Some industrial workers who were exposed to relatively large amounts of this chemical during their working careers also suffered damage to the liver, nervous system, and circulatory system. EPA has set the drinking standard for o–dichlorobenzene at 0.6 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to o–dichlorobenzene.

(ft) *Para–dichlorobenzene.* The United States environmental protection agency (EPA) sets national drinking water standards and has determined that para–dichlorobenzene is a health concern at certain levels of exposure. This chemical is a component of deodorizers, moth balls and pesticides. It generally gets into drinking water by improper waste disposal. This chemical has been shown to cause liver and kidney damage in laboratory animals such as rats and mice when the animals are exposed to high levels over their lifetimes. Chemicals that cause adverse effects in laboratory animals also may cause adverse health effects in humans who are exposed at lower levels over long periods of time. EPA has set the enforceable drinking water standard for para–dichlorobenzene at 0.075 parts per million (ppm) to reduce the risk of these adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.

(g) *1,2–Dichloroethane.* The United States environmental protection agency (EPA) sets national drinking water standards and has determined that 1,2–dichloroethane is a health concern at certain levels of exposure. This chemical is used as a cleaning fluid for fats, oils, waxes and resins. It generally gets into drinking water by improper waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed at lower levels over long periods of time. EPA has set forth the enforceable drinking water standard for 1,2–dichloroethane at 0.005 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.

(gt) *1,1–Dichloroethylene.* The United States environmental protection agency (EPA) sets national drinking water standards and has determined that 1,1–dichloroethylene is a health concern at certain levels of exposure. This chemical is used in industry and is found in drinking water as a result of the breakdown of related solvents. The solvents are used as cleaners and degreasers of metals and generally get into drinking water by improper waste disposal. This chemical has been shown to cause liver and kidney damage in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals which cause adverse effects in laboratory animals also may cause adverse health effects in humans who are exposed at lower levels

over long periods of time. EPA has set the enforceable drinking water standard for 1,1–dichloroethylene at 0.007 parts per million (ppm) to reduce the risk of these adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.

(h) *cis–1,2–Dichloroethylene.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that cis–1,2–dichloroethylene is a health concern at certain levels of exposure. This organic chemical is used as a solvent and intermediate in chemical production. It generally gets into water by improper waste disposal. This chemical has been shown to damage the liver, nervous system, and circulatory system of laboratory animals such as rats and mice when exposed at high levels over their lifetimes. Some humans who were exposed to relatively large amounts of this chemical also suffered damage to the nervous system. EPA has set the drinking water standard for cis–1,2–dichloroethylene at 0.07 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to cis–1,2–dichloroethylene.

(he) *trans–1,2,–Dichloroethylene.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that trans–1,2,–dichloroethylene is a health concern at certain levels of exposure. This organic chemical is used as a solvent and intermediate in chemical production. It generally gets into water by improper waste disposal. This chemical has been shown to damage the liver, nervous system, and the circulatory system of laboratory animals such as rats and mice when exposed at high levels over their lifetimes. Some humans who were exposed to relatively large amounts of this chemical also suffered damage to the nervous system. EPA has set drinking water standard for trans–1,2,–dichloroethylene at 0.1 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to trans–1,2,–dichloroethylene.

(hm) *Dichloromethane.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that dichloromethane (methylene chloride) is a health concern at certain levels of exposure. This organic chemical is a widely used solvent. It is used in the manufacture of paint remover, as a metal degreaser and as an aerosol propellant. It generally gets into drinking water after improper discharge or waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for dichloromethane at 0.005 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe with respect to dichloromethane.

(hp) *Di(2–ethylhexyl)adipate.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that Di(2–ethylhexyl)adipate is a health concern at certain levels of exposure. Di(2–ethylhexyl)adipate is a widely used plasticizer in a variety of products, including synthetic rubber, food packaging materials and cosmetics. It may get into drinking water after improper waste disposal. This chemical has been shown to damage the liver and testes in laboratory animals such as rats and mice exposed to high levels. EPA has set the drinking water standard for di(2–ethylhexyl)adipate at 0.4 parts per million (ppm) to protect against the risk of adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to di(2–ethylhexyl)adipate.

(hq) *Di(2–ethylhexyl)phthalate.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that di(2–ethylhexyl)phthalate is a health concern at certain levels of exposure. Di(2–ethylhexyl)phthalate is a widely used plasticizer, which is primarily used in the production of polyvinyl chloride (PVC) resins. It may get into drinking water after improper waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice exposed to high levels over their lifetimes. EPA has set the drinking water standard for di(2–ethylhexyl)phthalate at 0.006 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to di(2–ethylhexyl)phthalate.

(ht) *1,2–Dichloropropane.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that 1,2–dichloropropane is a health concern at certain levels of exposure. This organic chemical is used as a solvent and pesticide. When soil and climatic conditions are favorable, 1,2–dichloropropane may get into drinking water by runoff into surface water or by leaching into groundwater. It may also get into drinking water through improper waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for 1,2–dichloropropane at 0.005 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which may have been observed in laboratory animals. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to 1,2–dichloropropane.

(hv) *Dinoseb.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that dinoseb is a health concern at certain levels of exposure. Dinoseb is a widely used pesticide and generally gets into drinking water after application on orchards, vineyards and other crops. This chemical has been shown to damage the thyroid and reproductive organs in laboratory animals such as rats exposed to high levels. EPA has set the drinking water standard for dinoseb at 0.007 parts per million (ppm) to protect against the risk of adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to dinoseb.

(hx) *Diquat.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that diquat is a health concern at certain levels of exposure. This organic chemical is a herbicide used to control terrestrial and aquatic weeds. It may get into drinking water by runoff into surface water. This chemical has been shown to damage the liver, kidneys and gastrointestinal tract and causes cataract formation in laboratory animals such as dogs and rats exposed at high levels over their lifetimes. EPA has set the drinking water standard for diquat at 0.02 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to diquat.

(i) *2,4–D.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that 2,4–D is a health concern at certain levels of exposure. This organic chemical is used as a herbicide and to control algae in reservoirs. When soil and climatic conditions are favorable, 2,4–D may get into drinking water by runoff into surface water or by leaching into ground water. This chemical has been shown to damage the liver and kidney of laboratory animals such as rats

exposed at high levels during their lifetimes. Some humans who were exposed to relatively large amounts of this chemical also suffered damage to the nervous system. EPA has set the drinking water standard for 2,4–D at 0.07 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to 2,4–D.

(ib) *Endothall.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that endothall is a health concern at certain levels of exposure. This organic chemical is a herbicide used to control terrestrial and aquatic weeds. It may get into drinking water by runoff into surface water. This chemical has been shown to damage the liver, kidneys, gastrointestinal tract and reproductive system of laboratory animals such as rats and mice exposed at high levels over their lifetimes. EPA has set the drinking water standard for endothall at 0.1 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to endothall.

(ic) *Endrin.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that endrin is a health concern at certain levels of exposure. This organic chemical is a pesticide no longer registered for use in the United States. However, this chemical is persistent in treated soils and accumulates in sediments and aquatic and terrestrial biota. This chemical has been shown to cause damage to the liver, kidneys and heart in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. EPA has set the drinking water standard for endrin at 0.002 parts per million (ppm) to protect against the risk of these adverse health effects which have been observed in laboratory animals. Drinking water that meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to endrin.

(ie) *Epichlorohydrin.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that epichlorohydrin is a health concern at certain levels of exposure. Polymers made from epichlorohydrin are sometimes used in the treatment of water supplies as a flocculent to remove particulates. Epichlorohydrin generally gets into drinking water by improper use of these polymers. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for epichlorohydrin using a treatment technique to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. This treatment technique limits the amount of epichlorohydrin in the polymer and the amount of the polymer which may be added to drinking water as a flocculent to remove particulates. Drinking water systems which comply with this treatment technique have little to no risk and are considered safe with respect to epichlorohydrin.

(it) *Ethylbenzene.* The United States environmental protection agency (EPA) sets drinking water standards and has determined ethylbenzene is a health concern at certain levels of exposure. This organic chemical is a major component of gasoline. It generally gets into water by improper waste disposal or leaking gasoline tanks. This chemical has been shown to damage the kidney, liver, and nervous system of laboratory animals such as rats exposed to high levels during their lifetimes. EPA has set the drinking water standard for ethylbenzene at 0.7 part per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to ethylbenzene.

(j) *Ethylene dibromide (EDB).* The United States environmental protection agency (EPA) sets drinking water standards and has determined that EDB is a health concern at certain levels of exposure. This organic chemical was once a popular pesticide. When soil and climatic conditions are favorable, EDB may get into drinking water by runoff into surface water or by leaching into ground water. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for EDB at 0.00005 part per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets this standards is associated with little to none of this risk and is considered safe with respect to EDB.

(je) *Fecal coliforms/e. coli.* (To be used when there is a violation of s. NR 809.30 (2) or 809.30 (1) and (2)). The United States environmental protection agency (EPA) sets drinking water standards and has determined that the presence of fecal coliforms and *E. Coli* is a serious health concern. Fecal coliforms and E. Coli are generally not harmful themselves, but their presence in drinking water is serious because they usually are associated with sewage or animal wastes. The presence of these bacteria is generally a result of a problem with water treatment or the pipes which distribute the water, and indicates that the water may be contaminated with organisms that can cause disease. Disease symptoms may include diarrhea, cramps, nausea, and possibly jaundice, and any associated headaches and fatigue. These symptoms, however, are not just associated with disease–causing organisms in drinking water, but also may be caused by a number of factors other than your drinking water. EPA has set an enforceable drinking water standard for fecal coliforms and E. Coli to reduce the risk of these adverse health effects. Under this standard, all drinking water shall be free of these bacteria. Drinking water which meets this standard is usually not associated with a health risk from disease–causing bacteria and should be considered safe. State and local health authorities recommend that consumers take the following precautions: (To be inserted by the public water system owner or operator, according to instructions from the department)

(jt) *Fluoride.* The notice shall contain the following language:

Public Notice

Dear User,

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

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

Fluoride in children's drinking water at levels of approximately 1 mg/l reduces the number of dental cavities. However, some children exposed to levels of fluoride greater than about 2.0 mg/l may develop dental fluorosis. Dental fluorosis, in its moderate and severe forms, is a brown staining and/or pitting of the permanent teeth.

Because dental fluorosis occurs only when developing teeth (before they erupt from the gums) are exposed to elevated fluoride levels, households without children are not expected to be

affected by this level of fluoride. Families with children under the age of 9 are encouraged to seek other sources of drinking water for their children to avoid the possibility of staining and pitting.

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

For further information, contact _____(water supplier insert the name, address, and telephone number of a contact person at the public water system) at your water system.

(jv) *Glyphosate.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that glyphosate is a health concern at certain levels of exposure. This organic chemical is a herbicide used to control grasses and weeds. It may get into drinking water by runoff into surface water. This chemical has been shown to cause damage to the liver and kidneys in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. EPA has set the drinking water standard for glyphosate at 0.7 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to glyphosate.

(k) *Heptachlor.* The United States Environmental Agency (EPA) sets drinking water standards and has determined that heptachlor is a health concern at certain levels of exposure. This organic chemical was once a popular pesticide. When soil and climatic conditions are favorable, heptachlor may get into drinking water by runoff into surface water or by leaching into ground water. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standards for heptachlor at 0.0004 part per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets this standard is associated with little to none of this risk and is considered safe with respect to heptachlor.

(ke) *Heptachlor epoxide.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that heptachlor epoxide is a health concern at certain levels of exposure. This organic chemical was once a popular pesticide. When soil and climatic conditions are favorable, heptachlor epoxide may get into drinking water by runoff into surface water or by leaching into ground water. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standards for heptachlor epoxide at 0.0002 part per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets this standard is associated with little to none of this risk and is considered safe with respect to heptachlor epoxide.

(kj) *Hexachlorobenzene.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that hexachlorobenzene is a health concern at certain levels of exposure. This organic chemical is produced as an impurity in the manufacture of certain solvents and pesticides. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed to high levels during their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for hexachlorobenzene at 0.001 parts per million (ppm) to protect against the risk of cancer and other adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to hexachlorobenzene.

(km) *Hexachlorocyclopentadiene.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that hexachlorocyclopentadiene is a health concern at certain levels of exposure. This organic chemical is used as an intermediate in the manufacture of pesticides and flame retardants. It may get into water by discharge from production facilities. This chemical has been shown to damage the kidneys and the stomach of laboratory animals when exposed at high levels over their lifetimes. EPA has set the drinking water at 0.05 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to hexachlorocyclopentadiene.

(kr) *Lead.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that lead is a health concern at certain exposure levels. Materials that contain lead have frequently been used in the construction of water supply distribution systems, and plumbing systems in private homes and other buildings. The most commonly found materials include service lines, pipes, brass and bronze fixtures, and solders and fluxes. Lead in these materials can contaminate drinking water as a result of the corrosion that takes place when water comes into contact with those materials. Lead can cause a variety of adverse health effects in humans. At relatively low levels of exposure, these effects may include interference with red blood cell chemistry, delays in normal physical and mental development in babies and young children, slight deficits in the attention span, hearing, and learning abilities of children, and slight increases in the blood pressure of some adults. EPA's national primary drinking water regulation requires all public water systems to optimize corrosion control to minimize lead contamination resulting from the corrosion of plumbing materials. Public water systems serving 50,000 people or fewer that have lead concentrations below 15 parts per billion (ppb) in more than 90% of tap water samples (the EPA "action level") have optimized their corrosion control treatment. Any water system that exceeds the action level shall also monitor their source water to determine whether treatment to remove lead in source water is needed. Any water system that continues to exceed the action level after installation of corrosion control and/or source water treatment shall eventually replace all lead service lines contributing in excess of 15 ppb of lead to drinking water. Any water system that exceeds the action level shall also undertake a public education program to inform consumers of ways they can reduce their exposure to potentially high levels of lead in drinking water.

(kt) *Lindane.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that lindane is a health concern at certain levels of exposure. This organic chemical is used as a pesticide. When soil and climatic conditions are favorable, lindane may get into drinking water by runoff into surface water or by leaching into ground water. This chemical has been shown to damage the liver, kidney, nervous system, and immune system of laboratory animals such as rats, mice and dogs exposed at high levels during their lifetimes. Some humans who were exposed to relatively large amounts of this chemical also suffered damage to the nervous system and circulatory system. EPA has established the drinking water standard for lindane at 0.0002 part per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to lindane.

(L) *Mercury.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that mercury is a health concern at certain levels of exposure. This inorganic metal is used in electrical equipment and some water pumps. It usually gets into water as a result of improper waste disposal. This chemical has been shown to damage the kidney of laboratory animals such as rats when the animals are exposed at high levels over their lifetimes. EPA has set the drinking water standard for mercury at 0.002 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to mercury.

(Le) *Methoxychlor.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that methoxychlor is a health concern at certain levels of exposure. This organic chemical is used as a pesticide. When soil and climatic conditions are favorable, methoxychlor may get into drinking water by runoff into surface water or by leaching into ground water. This chemical has been shown to damage the liver, kidney, nervous system, and reproductive system of laboratory animals such as rats exposed at high levels during their lifetimes. It has also been shown to produce growth retardation in rats. EPA has set the drinking water standard for methoxychlor at 0.04 part per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to methoxychlor.

(Lt) *Microbiological contaminants.* (for use when there is a violation of the treatment technique requirements for filtration and disinfection in subch. V). The United States environmental protection agency (EPA) sets drinking water standards and has determined that the presence of microbiological contaminants are a health concern at certain levels of exposure. If water is inadequately treated, microbiological contaminants in that water may cause disease. Disease symptoms may include diarrhea, cramps, nausea, and possibly jaundice, and any associated headaches and fatigue. These symptoms, however, are not just associated with disease causing organisms in drinking water, but also may be caused by a number of factors other than your drinking water. EPA has set enforceable requirements for treating drinking water to reduce the risk of these adverse health effects. Treatment such as filtering and disinfecting the water removes or destroys microbiological contaminants. Drinking water which is treated to meet EPA requirements is associated with little to none of this risk and should be considered safe.

(m) *Monochlorobenzene.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that monochlorobenzene is a health concern at certain levels of exposure. This organic chemical is used as a solvent. It generally gets into water by improper waste disposal. This chemical has been shown to damage the liver, kidney and nervous system of laboratory animals such as rats and mice exposed to high levels during their lifetimes. EPA has set the drinking water standard for monochlorobenzene at 0.1 part per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to monochlorobenzene.

(mb) *Nickel.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that nickel poses a health concern at certain levels of exposure. This inorganic metal occurs naturally in soils, ground water and surface waters and is often used in electroplating, stainless steel and alloy products. It generally gets into water from mining and refining operations. This chemical has been shown to damage the heart and liver in laboratory animals when the animals are exposed to high levels over their lifetimes. EPA has set the drinking water standard at 0.1 parts per million (ppm) for nickel to protect against the risk of these adverse effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to nickel.

(me) *Nitrate.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that nitrate poses an acute health concern at certain levels of exposure. Nitrate is used in fertilizer and is found in sewage and wastes from human and/or farm animals and generally gets into drinking water from those activities. Excessive levels of nitrate in drinking water have caused serious illness and sometimes death in infants under six months of age. The serious illness in infants is caused because nitrate is converted to nitrite in the body. Nitrite interferes with the oxygen carrying capacity of the child's blood. This is an acute disease in that symptoms can develop rapidly in infants. In most cases, health deteriorates over a period of days. Symptoms include shortness of breath and blueness of the skin. Clearly, expert medical advise should be sought immediately if these symptoms occur. The purpose of this notice is to encourage parents and other responsible parties to provide infants with an alternate source of drinking water. Local and State health authorities are the best source for information concerning alternate sources of drinking water for infants. EPA has set the drinking water standard at 10 parts per million (ppm) for nitrate to protect against the risk of these adverse effects. EPA has also set a drinking water standard for nitrite at 1 ppm. To allow for the fact that the toxicity of nitrate and nitrite are additive, EPA has also established a standard for the sum of nitrate and nitrite at 10 ppm. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to nitrate.

(mt) *Nitrite.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that nitrite poses an acute health concern at certain levels of exposure. This inorganic chemical is used in fertilizers and is found in sewage and wastes from humans and/or farm animals and generally gets into drinking water as a result of those activities. While excessive levels of nitrite in drinking water have not been observed, other sources of nitrite have caused serious illness and sometimes death in infants under 6 months of age. The serious illness in infants is caused because nitrite interferes with the oxygen carrying capacity of the child's blood. This is an acute disease in that symptoms can develop rapidly. However, in most cases, health deteriorates over a period of days. Symptoms include shortness of breath and blueness of the skin. Clearly, expert medical advice should be sought immediately if these symptoms occur. The purpose of this notice is to encourage parents and other responsible parties to provide infants with an alternate source of drinking water. Local and State health authorities are the best source for information concerning alternate sources of drinking water for infants. EPA has set the drinking water standard at 1 part per million (ppm) for nitrite to protect against the risk of these adverse effects. EPA has also set a drinking water standard for nitrate (converted to nitrite in humans) at 10 ppm and for the sum of nitrate and nitrite at 10 ppm. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to nitrite.

(mw) *Oxamyl.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that oxamyl is a health concern at certain levels of exposure. This organic chemical is used as a pesticide for the control of insects and other pests. It may get into drinking water by runoff into surface water or leaching into ground water. This chemical has been shown to damage the kidneys of laboratory animals such as rats when exposed at high levels over their lifetimes. EPA has set the drinking water standard for oxamyl at 0.2 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to oxamyl.

(n) *Pentachlorophenol.* The United States environmental protection agency (EPA) sets drinking water standards and has

determined that pentachlorophenol is a health concern at certain levels of exposure. This organic chemical is used as a wood preservative, herbicide, disinfectant, and defoliant. It generally gets into drinking water by runoff into surface water or leaching into ground water. This chemical has been shown to produce adverse reproductive effects and to damage the liver and kidneys of laboratory animals such as rats exposed to high levels during their lifetimes. Some humans who were exposed to relatively large amounts of this chemical also suffered damage to the liver and kidneys. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed to high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for pentachlorophenol at 0.001 parts per million (ppm) to protect against the risk of cancer or other adverse health effects. Drinking water that meets the EPA standard is associated with little or no risk and is considered safe with respect to pentachlorophenol.

(nc) *Picloram.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that picloram is a health concern at certain levels of exposure. This organic chemical is used as a pesticide for broadleaf weed control. It may get into drinking water by runoff into surface water or leaching into ground water as a result of pesticide application and improper waste disposal. This chemical has been shown to cause damage to the kidneys and liver in laboratory animals such as rats when the animals are exposed at high levels over their lifetimes. EPA has set the drinking water standard for picloram at 0.5 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to picloram.

(ne) *Polychlorinated biphenyls (PCBs).* The United States environmental protection agency (EPA) sets drinking water standards and has determined that polychlorinated biphenyls (PCBs) are a health concern at certain levels of exposure. These organic chemicals were once widely used in electrical transformers and other industrial equipment. They generally get into drinking water by improper waste disposal or leaking electrical industrial equipment. This chemical has been shown to cause cancer in laboratory animals such as rates and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for PCBs at 0.0005 part per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets this standard is associated with little to none of this risk and is considered safe with respect to PCBs.

(nt) *Selenium.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that selenium is a health concern at certain high levels of exposure. Selenium is also an essential nutrient at low levels of exposure. This inorganic chemical is found naturally in food and soils and is used in electronics, photocopy operations, the manufacture of glass, chemicals and drugs, and as a fungicide and a feed additive. In humans, exposure to high levels of selenium over a long period of time has resulted in a number of adverse health effects, including a loss of feeling and control in the arms and legs. EPA has set the drinking water standard for selenium at 0.05 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to selenium.

(nw) *Simazine.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that simazine is a health concern at certain levels of exposure. This organic chemical is a herbicide used to control annual grasses and broadleaf weeds. It may leach into ground water or runoff into surface water after application. This chemical may cause cancer in laboratory animals such as rats and mice exposed at high levels during their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for simazine at 0.004 parts per million (ppm) to reduce the risk of cancer or other adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to simazine.

(o) *Styrene.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that styrene is a health concern at certain levels of exposure. This organic chemical is commonly used to make plastics and is sometimes a component of resins used for drinking water treatment. Styrene may get into drinking water from improper waste disposal. This chemical has been shown to damage the liver and nervous system in laboratory animals when exposed at high levels during their lifetimes. EPA has set the drinking water standard to styrene at 0.1 part per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to styrene.

(oe) *Tetrachloroethylene.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that tetrachloroethylene is a health concern at certain levels of exposure. This organic chemical has been a popular solvent, particularly for dry cleaning. It generally gets into drinking water by improper waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for tetrachloroethylene at 0.005 part per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets this standard is associated with little to none of this risk and is considered safe with respect to tetrachloroethylene.

(om) *Thallium.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that thallium is a health concern at certain levels of exposure. This inorganic metal is found naturally in soils and is used in electronics, pharmaceuticals, and the manufacture of glass and alloys. This chemical has been shown to damage the kidneys, liver, brain and intestines of laboratory animals when the animals are exposed at high levels over their lifetimes. EPA has set the drinking water standard for thallium at 0.002 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water which meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to thallium.

(ot) *Toluene.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that toluene is a health concern at certain levels of exposure. This organic chemical is used as a solvent and in the manufacture of gasoline for airplanes. It generally gets into water by improper waste disposal or leaking underground storage tanks. This chemical has been shown to damage the kidney, nervous system, and circulatory system of laboratory animals such as rats and mice exposed to high levels during their lifetimes. Some industrial workers who were exposed to relatively large amounts of this chemical during working careers also suffered damage to the liver, kidney and nervous system. EPA has set the drinking water standard for toluene at 1 part per million (ppm) to protect against the risk of adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to toluene.

(p) *Total coliforms.* (To be used when there is a violation of s. NR 809.30 (1) and not a violation of s. NR 809.30 (2)). The

United States environmental protection agency (EPA) sets drinking water standards and has determined that the presence of total coliforms is a possible health concern. Total coliforms are common in the environment and are generally not harmful themselves. The presence of these bacteria in drinking water, however, generally is a result of a problem with water treatment or the pipes which distribute the water, and indicates that the water may be contaminated with organisms that can cause disease. Disease symptoms may include diarrhea, cramps, nausea, and possibly jaundice, and any associated headaches and fatigue. These symptoms, however, are not just associated with disease–causing organisms in drinking water, but also may be caused by a number of factors other than your drinking water. EPA has set an enforceable drinking water standard for total coliforms to reduce the risk of these adverse health effects. Under this standard, no more than 5.0% of the samples collected during any month can contain these bacteria, except that systems collecting fewer than 40 samples/month that have one total coliform–positive sample per month are not violating the standard. Drinking water which meets this standard is usually not associated with a health risk from disease–causing bacteria and should be considered safe.

(pe) *Toxaphene.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that toxaphene is a health concern at certain levels of exposure. This organic chemical was once a pesticide widely used on cotton, corn, soybeans, pineapples and other crops. When soil and climatic conditions are favorable, toxaphene may get into drinking water by runoff into surface water or by leaching into ground water. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for toxaphene at 0.003 part per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets this standard is associated with little to none of this risk and is considered safe with respect to toxaphene.

(pm) *2,3,7,8–TCDD (Dioxin).* The United States environmental protection agency (EPA) sets drinking water standards and has determined that dioxin is a health concern at certain levels of exposure. This organic chemical is an impurity in the production of some pesticides. It may get into drinking water by industrial discharge of wastes. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed over long periods of time. EPA has set the drinking water standard for dioxin at 0.00000003 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water that meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to dioxin.

(pt) *2,4,5–TP.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that 2,4,5–TP is a health concern at certain levels of exposure. This organic chemical is used as a herbicide. When soil and climatic conditions are favorable, 2,4,5–TP may get into drinking water by runoff into surface water or by leaching into ground water. This chemical has been shown to damage the liver and kidney of laboratory animals such as rats and dogs exposed to high levels during their lifetimes. Some industrial workers who were exposed to relatively large amounts of this chemical during working careers also suffered damage to the nervous system. EPA has set the drinking water standard for 2,4,5–TP at 0.05 part per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and is considered safe with respect to 2,4,5–TP.

(pw) *1,2,4–Trichlorobenzene.* The United States environmental protection agency (EPA) sets drinking water standards and has determined that 1,2,4–trichlorobenzene is a health concern at certain levels of exposure. This organic chemical is used as a dye carrier and as a precursor in herbicide manufacture. It generally gets into drinking water by discharges from industrial activities. This chemical has been shown to cause damage to several organs, including the adrenal glands. EPA has set the drinking water standard for 1,2,4–trichlorobenzene at 0.07 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to 1,2,4–trichlorobenzene.

(q) *1,1,1–Trichloroethane.* The United States environmental protection agency (EPA) sets national drinking water standards and has determined that 1,1,1–trichloroethane is a health concern at certain levels of exposure. This chemical is used as a cleaner and degreaser of metals. It generally gets into drinking water by improper waste disposal. This chemical has been shown to damage the liver, nervous system and circulatory system of laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Some industrial workers who were exposed to relatively large amounts of this chemical during their working careers also suffered damage to the liver, nervous system and circulatory. Chemicals which cause adverse effects among exposed industrial workers and in laboratory animals also may cause adverse health effects in humans who are exposed at lower levels over long periods of time. EPA has set the enforceable drinking water standard for 1,1,1–trichloroethane at 0.2 parts per million (ppm) to protect against the risk of these adverse health effects which have been observed in humans and laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.

(qc) *1,1,2–Trichloroethane.* The United States environmental protection agency (EPA) sets national drinking water standards and has determined that 1,1,2–trichloroethane is a health concern at certain levels of exposure. This organic chemical is an intermediate in the production of 1,1–dichloroethylene. It generally gets into water by industrial discharge of wastes. This chemical has been shown to damage the kidney and liver of laboratory animals such as rats exposed to high levels during their lifetimes. EPA has set the drinking water standard for 1,1,2–trichloroethane at 0.005 parts per million (ppm) to protect against the risk of these adverse health effects. Drinking water that meets the EPA standard is associated with little to none of this risk and should be considered safe with respect to 1,1,2–trichloroethane.

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

(qt) *Vinyl chloride.* The United States environmental protection agency (EPA) and the Wisconsin department of natural resources set drinking water standards and have determined that vinyl chloride is a health concern at certain levels of exposure. This chemical is used in industry and is found in drinking water as a result of the breakdown of related solvents. The solvent are used as cleaners and degreasers of metals and generally get into

drinking water by improper disposal. This chemical has been associated with significantly increased risks of cancer among certain industrial workers who were exposed to relatively large amounts of this chemical during their working careers. This chemical has been shown to cause cancer in laboratory animals when the animals are exposed at high levels over their lifetimes. Chemicals which cause increased risk of cancer among exposed industrial workers and in laboratory animals also may increase the risk of cancer in humans who are exposed at lower levels over long periods of time. The Wisconsin department of natural resources has set the enforceable drinking water standard for vinyl chloride at 0.0002 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in humans and laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.

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

(6) PUBLIC NOTICES FOR FLUORIDE. Notice of violation of the maximum contaminant level for fluoride, notice of a conditional waiver under s. NR 809.90 from the maximum contaminant level for fluoride, and notice of failure to comply with a conditional waiver under s. NR 809.90 for the maximum contaminant level for fluoride shall consist of the public notice prescribed in sub. (5) (i), plus a description of any steps which the system is taking to come into compliance.

(7) FAILURE TO COMPLY. If a public water system fails to comply with the requirements of this section, the department may issue public notification directly.

History: Cr. Register, February, 1978, No. 266, eff. 3–1–78; am. (4) (a), Register, April, 1982, No. 316, eff. 5–1–82; r. and recr., Register, August, 1989, No. 404, eff. 9–1–89; am. (1) (a) 3. intro. and (2) (intro.), cr. (5) (j) to (l), Register, March, 1991, No. 423, eff. 4–1–91; renum. from NR 109.81 and am. (1) (intro.), (a) 3., (d), (2) (a), (c) and (d), r. (2) (f), renum. (5) (a) to (l) to be (5) (qe), (e), (g), (qt), (d), (gt), (ft), (q), (jt), (p), (je) and (lt), cr. (5) (a) to (ct), (de), (df), (ee) to (fe), (h) to (j), (k) to (le), (m) to (ot), (pe), (pt) and (r), Register, July, 1993, No. 451, eff. 8–1–93; am. (1) (a) 3. a. and b., (2) (d), cr. (5) (an), (db), (dc), (ew), (ex), (hm) to (hx), (ib), (ic), (jr), (kj), (km), (mb), (mw), (nc), (nw), (om), (pm), (pw) and (qc), Register, August, 1994, No. 464, eff. 9–1–94; am. (5) (ee) and (5) (hq), Register, October, 1997, No. 502, eff. 11–1–97; **am. (1) (a) 3. (intro.) and (5) (Lt), cr. (1) (a) 3. d., Register, December, 2000, No. 540, eff. 1–1–01.**

NR 809.82 Record maintenance. Any owner or operator of a public water system subject to the provisions of this chapter shall retain on the premises or at a convenient location near the premises the following records:

(1) Records of bacteriological analyses made pursuant to this part shall be kept for not less than 5 years. Records of chemical analyses made pursuant to this part shall be kept for not less than 10 years. Actual laboratory reports may be kept, or data may be transferred to tabular summaries, provided that the following information is included:

(a) The date, place, and time of sampling, and the name of the person who collected the sample;

(b) Identification of the sample as to whether it was a routine distribution system sample, check sample, raw or process water sample or other special purpose sample;

(c) Date of analysis;

(d) Laboratory and person responsible for performing analysis;

(e) The analytical technique/method used; and

(f) The results of the analysis.

(2) Records of action taken by the supplier of water to correct violations of this chapter shall be kept for a period not less than 3 years after the last action taken with respect to the particular violation involved.

(3) Copies of any written reports, summaries or communications relating to sanitary surveys of the system conducted by the supplier of water, by a private consultant, or by any local, state or federal agency, shall be kept for a period not less than 10 years after completion of the sanitary survey involved.

(4) Records concerning a variance or exemption granted to the system shall be kept for a period ending not less than 5 years following the expiration of such variance or exemption.

(5) The owner or operator of any system subject to the requirements of subch. II shall retain on the premises original records of all sampling data and analyses, reports, surveys, letters, evaluations, schedules, department determinations, and any other information required by ss. NR 809.542 to 809.549. Each water system owner or operator shall retain the records for no fewer than 12 years.

History: Cr. Register, February, 1978, No. 266, eff. 3–1–78; am. (intro.), Register, April, 1982, No. 316, eff. 5–1–82; renum. from NR 109.82, cr. (5), Register, July, 1993, No. 451, eff. 8–1–93.

NR 809.83 Consumer confidence reports. (1) PURPOSE AND APPLICABILITY. Suppliers of water to community water systems shall deliver to their customers an annual report containing information on the quality of the water and the characterization of risks, if any, from exposure to contaminants detected in the drinking water delivered by their water system. The report shall be written in an accurate and understandable manner.

(a) Customers under this paragraph are defined as billing units or service connections to which water is delivered by a community water system.

(b) Detected under this paragraph refers to all contaminants identified in subch. I and means any quantity reported by a safe drinking water certified laboratory.

(2) DEADLINES. (a) Each existing community water system shall deliver its report by July 1 annually. Reports shall contain data collected during, or prior to, the previous calendar year.

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

(c) A community water system that sells water to another community water system shall deliver the applicable information required in s. NR 809.833 to the buyer system:

1. No later than April 1 annually; or

2. On a date mutually agreed upon by the seller and the purchaser, and specifically included in a contract between the parties.

History: Cr. Register, December, 2000, No. 540, eff. 1–1–01.

NR 809.833 Content of the reports. Each community water system shall provide to its customers an annual report that contains all of the information specified in this section and s. NR 809.835.

(1) INFORMATION ON THE SOURCE OF THE WATER DELIVERED. Each report shall identify the sources of the water delivered by the community water system by providing information on all of the following:

(a) The type of the water, e.g., surface water, ground water.

(b) The commonly used name, if any, and location of the bodies of water.

(c) If a source water assessment has been completed, the report shall notify consumers of the availability of this information and the means to obtain it. In addition, systems are encouraged to

highlight in the report significant sources of contamination in the source water area if they have readily available information. Where a system has received a source water assessment from the department, the report shall include a brief summary of the system's susceptibility to potential sources of contamination, using language provided by the department or written by the water system owner or operator.

(2) DEFINITIONS. (a) Each report shall include all of the following definitions:

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

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

(b) A report for a community water system operating under a variance or an exemption issued under subch. VIII shall include the following definition, "Variances and Exemptions: state or EPA permission not to meet an MCL or a treatment technique under certain conditions."

(c) A report which contains data on a contaminant for which EPA has set a treatment technique or an action level shall include one or both of the following definitions as applicable:

1. "Treatment technique: A required process intended to reduce the level of a contaminant in drinking water."

2. "Action level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system shall follow."

(3) INFORMATION ON DETECTED CONTAMINANTS. With the exception of *Cryptosporidium*, reports shall contain the following information in the specified format, for regulated contaminants with MCLs, treatment techniques, or action levels, unregulated contaminants for which monitoring is required under subch. I, and disinfection by–products and microbial contaminants for which monitoring is required under subchs. IV and V:

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

(b) The data shall be derived from data collected to comply with EPA and state monitoring and analytical requirements during calendar year 1998 for the first report and subsequent calendar years thereafter except that:

1. Where a system is allowed to monitor for regulated contaminants less often than once a year, the tables shall include the date and results of the most recent sampling and the report shall include a brief statement indicating that the data presented in the report are from the most recent testing done in accordance with the regulations. No data older than 5 years need be included.

2. Results of monitoring in compliance with requirements issued under 40 CFR Sub. D, part 141, ss. 141.142 and 141.143 (information collection rule) need only be included for 5 years from the date of last sample or until any of the detected contaminants becomes regulated and subject to routine monitoring requirements, whichever comes first.

(c) For detected regulated contaminants, listed in Appendix A to this subchapter, the tables shall contain all of the following:

1. The MCL for that contaminant expressed as a number equal to or greater than 1.0, as provided in Appendix A to this subchapter.

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

3. If there is no MCL for a detected contaminant, the table shall indicate that there is a treatment technique, or specify the action level, applicable to that contaminant, and the report shall include the definitions for treatment technique or action level, or both, as appropriate, specified in this paragraph.

4. For contaminants subject to an MCL, except turbidity and total coliforms, the highest contaminant level used to determine compliance with requirements of this chapter and the range of detected levels as follows:

a. When compliance with the MCL is determined annually or less frequently: the highest detected level at any sampling point and the range of detected levels expressed in the same units as the MCL.

b. When compliance with the MCL is determined by calculating a running annual average of all samples taken at a sampling point: the highest average of any of the sampling points and the range of all sampling points expressed in the same units as the MCL

c. When compliance with the MCL is determined on a system–wide basis by calculating a running annual average of all samples at all sampling points: the average and range of detection expressed in the same units as the MCL.

Note: When rounding of results to determine compliance with the MCL is allowed by the regulations, rounding should be done prior to multiplying the results by the factor listed in Appendix A of this subchapter.

5. For turbidity:

a. When it is reported pursuant to s. NR 809.76, the highest average monthly value.

b. When it is reported pursuant to s. NR 809.755, the highest monthly value. The report should include an explanation of the reasons for measuring turbidity.

c. When it is reported pursuant to s. NR 809.755, the highest single measurement and the lowest monthly percentage of samples meeting the turbidity limits specified in s. NR 809.76 for the filtration technology being used. The report should include an explanation of the reasons for measuring turbidity.

6. For lead and copper: the 90th percentile value of the most recent round of sampling and the number of sampling sites exceeding the action level.

7. For total coliform:

a. The highest monthly number of positive samples for systems collecting fewer than 40 samples per month; or

b. The highest monthly percentage of positive samples for systems collecting at least 40 samples per month.

8. For fecal coliform, the total number of positive samples.

9. The likely sources of detected contaminants to the best of the water system owner or operator's knowledge. Specific information regarding contaminants may be available in sanitary surveys and source water assessments, and should be used when available to the water system owner or operator. If the water system owner or operator lacks specific information on the likely source, the report shall include one or more of the typical sources for that contaminant listed in Appendix B to this subchapter that are most applicable to the system.

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

(e) The tables shall clearly identify any data indicating violations of MCLs or treatment techniques and the report shall contain a clear and readily understandable explanation of the violation including: the length of the violation, the potential adverse health effects, and actions taken by the system to address the violation. To describe the potential health effects, the system shall use the relevant language of Appendix C to this subchapter.

(f) For detected unregulated contaminants for which monitoring is required, except *Cryptosporidium*, the tables shall contain

the average and range at which the contaminant was detected. The report may include a brief explanation of the reasons for monitoring for unregulated contaminants.

(4) INFORMATION ON CRYPTOSPORIDIUM, RADON AND OTHER CONTAMINANTS. (a) If the system has performed any monitoring for *Cryptosporidium*, including monitoring performed to satisfy the requirements of 40 CFR sub. D, part 141, s. 141.143 (information collection rule), which indicates that *Cryptosporidium* may be present in the source water or the finished water, the report shall include all of the following:

1. A summary of the results of the monitoring.

2. An explanation of the significance of the results.

(b) If the system has performed any monitoring for radon which indicates that radon may be present in the finished water, the report shall include all of the following:

1. The results of the monitoring.

2. An explanation of the significance of the results.

(c) If the system has performed additional monitoring which indicates the presence of other contaminants in the finished water, the report shall include all of the following:

1. The results of the monitoring.

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

(5) COMPLIANCE WITH ALL DRINKING WATER REGULATIONS. In addition to the requirements of sub. (3) (f), the report shall note any violation that occurred during the year covered by the report of a requirement listed in this subsection. The report also shall include a clear and readily understandable explanation of the violation, any potential adverse health effects, and the steps the system has taken to correct the violation. All of the following violations shall be included:

(a) Failure to comply with requirements for monitoring and reporting of compliance data.

(b) For systems which have failed to install adequate filtration or disinfection equipment or processes, or have had a failure of the equipment or processes which constitutes a violation, the report shall include the following language as part of the explanation of potential adverse health effects. Inadequately treated water may contain disease–causing organisms. These organisms include bacteria, viruses and parasites, which can cause symptoms such as nausea, cramps, diarrhea and associated headaches.

(c) For systems that fail to take one or more actions prescribed by s. NR 809.541 (4), 809.542, 809.543, 809.544 or 809.545, the report shall include the applicable language of Appendix C to this subchapter for lead, copper or both.

(d) For systems that violate the requirements of s. NR 809.26 (4), the report shall include the relevant language from Appendix C to this subchapter.

(e) Failure to comply with required recordkeeping of compliance data.

(f) Failure to comply with special monitoring requirements prescribed by ss. NR 809.13 and 809.26.

(g) Violation of the terms of a variance, an exemption or an administrative or judicial order.

(6) VARIANCES AND EXEMPTIONS. If a system is operating under the terms of a conditional waiver or variance issued under subch. VIII, the report shall contain all of the following:

(a) An explanation of the reasons for the variance or exemption.

(b) The date on which the variance or exemption was issued.

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

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

(7) ADDITIONAL INFORMATION. (a) The report shall contain a brief explanation regarding contaminants, which may reasonably be expected to be found in drinking water including bottled water. This explanation may include the language of subds. 1. through 3. or systems may use their own comparable language. The report also shall include the language of subd. 4.

1. "The sources of drinking water, both tap water and bottled water, include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity."

2. "Contaminants that may be present in source water include:"

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

b. "Inorganic contaminants, such as salts and metals, which can be naturally–occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming."

c. "Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff and residential uses."

d. "Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by–products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff and septic systems."

e. "Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities."

3. "In order to ensure that tap water is safe to drink, EPA prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. FDA regulations establish limits for contaminants in bottled water, which shall provide the same protection for public health."

4. "Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the environmental protection agency's safe drinking water hotline (800–426–4791)."

(b) The report shall include the telephone number of the owner, operator or designee of the community water system as a source of additional information concerning the report.

(c) In communities where non–English speaking residents comprise a significant portion of the population served, the report should contain information in the appropriate language or languages regarding the importance of the report, or contain a telephone number or address where the residents may contact the system to obtain a translated copy of the report or assistance in the appropriate language. In communities where a specific non–English speaking group comprises at least 5% of the population of the community served, the report shall be translated into that language.

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

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

History: Cr. Register, December, 2000, No. 540, eff. 1–1–01.

NR 809.835 Required additional health information. **(1)** All reports shall prominently display the following language: "Some people may be more vulnerable to contaminants in drink-

ing water than the general population. Immuno–compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium and other microbial contaminants are available from the environmental protection agency's safe drinking water hotline (800–426–4791)."*

(2) A system which detects arsenic at levels above 25 mg/l but below the MCL:

(a) Shall include in its report a short informational statement about arsenic, using language such as: EPA is reviewing the drinking water standard for arsenic because of special concerns that it may not be stringent enough. Arsenic is a naturally occurring mineral known to cause cancer in humans at high concentrations.

(b) May write its own educational statement, but only in consultation with the department.

(3) A system which detects nitrate at levels above 5 mg/l but below the MCL:

(a) Shall include a short informational statement about the impacts of nitrate on children using language such as: Nitrate in drinking water at levels above 10 ppm is a health risk for infants of less than 6 months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. If you are caring for an infant you should ask advice from your health care provider.

(b) May write its own educational statement, but only in consultation with the department.

(4) Systems which detect lead above the action level in more than 5%, but fewer that 10%, of homes sampled:

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

(b) May write its own educational statement, but only in consultation with the department.

History: Cr. Register, December, 2000, No. 540, eff. 1–1–01.

NR 809.837 Report delivery and recordkeeping. (1) Except as provided in sub. (7), each community water system shall mail or otherwise directly deliver one copy of the report to each customer.

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

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

(4) No later than the date the system is required to distribute the report to its customers, each community water system shall deliver the report to any other agency or clearinghouse identified by the department.

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

(6) Each community water system serving 100,000 or more persons shall post its current year's report to a publicly accessible site on the Internet.

(7) The governor of Wisconsin or the governor's designee may waive the requirement of par. (a) for community water systems serving fewer than 10,000 persons.

(a) A system that has received a waiver under this subsection shall do all of the following:

1. Publish the reports in one or more local newspapers serving the area in which the system is located.

2. Inform the customers that the reports will not be mailed, either in the newspapers in which the reports are published or by other means approved by the department.

3. Make the reports available to the public upon request.

(b) A system serving 500 or fewer persons that has received a waiver under this subsection may forego the requirements of par. (a) 1. and 2. if they provide notice at least once per year to their customers by mail, door–to–door delivery or by posting in an appropriate location that the report is available upon request.

(8) Any systems subject to this subchapter shall retain copies of its consumer confidence report for no less than 5 years.

Note: Appendices A through C of subch. VI are found at the end of this chapter.

History: Cr. Register, December, 2000, No. 540, eff. 1–1–01.

Subchapter VII — Conditional Waivers and Variances

NR 809.90 Conditional waivers. (1) A public system may apply to the department for a conditional waiver respecting compliance with a maximum contaminant level or treatment technique requirement for a period up to 3 years if all of the following apply:

(a) One of the following situations exists:

1. Because of the characteristics of the raw water sources which are reasonably available, the public water system cannot comply with a maximum contaminant level despite application of best technology, treatment techniques or other means generally available, taking costs into consideration.

2. Compelling factors, which may include economic factors, indicate that the public water system cannot comply with a maximum contaminant level or treatment technique requirement for a limited period of time.

(b) The public water system was in operation on the effective date of the maximum contaminant level or treatment technique requirement.

(c) Granting of a conditional waiver will not result in an unreasonable risk to public health.

(2) Small systems serving less than 3300 persons, may apply for a conditional waiver only for nonmicrobial contaminants and only when all of the following conditions are met:

(a) The contaminant or treatment technique to be waived has a maximum contaminant level or treatment technique requirement established in national primary drinking water regulations promulgated on or after January 1, 1986.

(b) The technology used to comply with the maximum contaminant level or treatment technique is approved by the department.

(c) Compliance with maximum contaminant levels or treatment techniques is not reasonably affordable through restructuring or consolidation changes, including ownership change or physical consolidation or both with another public water system, or obtaining financial assistance through the Wisconsin drinking water state revolving loan fund (DWSRF).

(d) The small system is financially and technically capable of installing, operating and maintaining the applicable small system technology under par. (b).

(e) Granting of a conditional waiver will not result in an unreasonable risk to public health.

(3) The department may grant a conditional waiver if the supplier of water has established that the criteria of sub. (1) or (2) have been met. Any conditional waiver granted shall require all of the following:

(a) Compliance, including increments of progress, by the supplier of water with each maximum contaminant level or treatment technique requirement within the time frame specified by the department in the compliance schedule.

(b) Implementation by the water supplier of control measures the department deems necessary until compliance with the maximum contaminant level or treatment technique requirement is achieved.

(4) Public water systems that use bottled water as a requirement for receiving a conditional waiver shall meet all the of following requirements:

(a) The department shall require and approve a monitoring program for bottled water. The public water system owner or operator shall develop and put in place a monitoring program that provides reasonable assurances that the bottled water meets all MCLs. The public water system owner or operator shall monitor a representative sample of the bottled water for all contaminants regulated under ss. NR 809.24 (1), (2) and 809.11 during the first 3–month period that it supplies the bottled water to the public, and annually thereafter. Results of the monitoring program shall be provided to the department annually.

(b) The public water system owner or operator shall receive a certification from the bottled water company that the bottled water supplied meets all requirements of s. ATCP 40.07. The public water system owner or operator shall provide the certification to the department the first quarter after it supplies bottled water and annually thereafter.

(c) The public water system shall be fully responsible for the provision of sufficient quantities of bottled water to every person supplied by the public water system via door–to–door bottled water delivery.

(5) If the department approves the use of a point–of–entry device as a requisite for granting a conditional waiver, the water supplier shall provide documentation that the device will not cause increased corrosion of plumbing materials which could increase contaminant levels at the consumer's tap.

(6) Additional requirements for conditional waivers shall include all of the following:

(a) Proof of proper and effective installation, operation and maintenance of any applicable treatment technologies.

(b) Department specified monitoring requirements for the contaminant for which the conditional waiver is sought.

(c) Other terms or conditions specified by the department to ensure adequate public health protection, including but not limited to all of the following:

1. Public education requirements.

2. Source water protection requirements.

3. Quarterly conditional waiver compliance reports to the department.

(7) Before the department may grant a conditional waiver under this section, a class 1 public notice under ch. 985, Stats., and opportunity for a public hearing on the proposed conditional waiver shall be provided by the department. A hearing held pursuant to a request under this subsection is a class 1 hearing and shall be conducted in accordance with ch. 227, Stats.

(8) The department may extend a compliance deadline not to exceed 3 years or 2 years for a small system conditional waiver under sub. (2), beyond the expiration date of the original conditional waiver if the supplier of water establishes all of the following:

(a) The public water system cannot meet the maximum contaminant level or treatment technique requirement without capital improvements which cannot be completed within the period of the conditional waiver.

(b) The supplier of water has entered into an enforceable agreement to become part of a regional public water system or, if the supplier of water needs financial assistance for the necessary capital improvements, the supplier of water has entered into an agreement to obtain the financial assistance.

(c) The supplier of water is taking all practicable steps to meet the standard.

(9) The department may renew an extension granted under sub. (8) if the supplier of water establishes all of the following:

(a) The public water system does not serve more than 500 service connections.

(b) The public water system cannot meet a maximum contaminant level or treatment technique requirement without financial assistance for the necessary capital improvements.

(c) The public water system is taking all practicable steps to achieve compliance with a maximum contaminant level or treatment technique requirement.

History: Cr. Register, August, 1989, No. 404, eff. 9–1–89; renum. from NR 109.90, cr. (2) (c) and (d), Register, July, 1993, No. 451, eff. 8–1–93; **r. and recr., Register, December, 2000, No. 540, eff. 1–1–01.**

NR 809.91 Nitrate variances. (1) A non–community water system is eligible for a variance from the nitrate as nitrogen maximum contaminant level if:

(a) The department determines that because of the characteristics of the raw water sources which are reasonably available, the non–community water system cannot comply with the maximum contaminant level for nitrate as nitrogen; and

(b) The non–community water system has not had a nitrate as nitrogen sample which exceeds 20 mg/l, confirmed by a check sample; and

(c) The supplier of water continuously posts a department approved notice at all water taps supplied with water by the non–community water system. The notice shall state that the nitrate as nitrogen level exceeds 10 mg/l and describe the potential health effects of exposure; and

(d) The supplier of water ensures that water from its system will not be available to children under 6 months of age and provides bottled water which complies with all maximum contaminant levels for such children; and

(e) No adverse health effects will result.

(2) A community water system serving a nursing home, prison or mental health care facility, is eligible for a variance from the nitrate as nitrogen maximum contaminant level if:

(a) The institution does not permit infants under 6 months of age as residents; and

(b) The community water system has not had a nitrate as nitrogen sample which exceeds 20 mg/l, confirmed by a check sample; and

(c) The institution continuously posts a department approved notice at all water taps supplied with water by the community water system. The notice shall state that the nitrate as nitrogen level exceeds 10 mg/l and describe the potential health effects of exposure; and

(d) The institution ensures that water from its system will not be available to children under 6 months of age and provides

bottled water which complies with all maximum contaminant levels for such children; and

(e) No adverse health effects will result.

(3) The department may condition the issuance of a variance under this section on compliance with such control measures as it deems necessary. Failure to comply with any term or condition of a variance granted by the department under this section voids the variance.

History: Cr. Register, August, 1989, No. 404, eff. 9–1–89; renum. from NR 109.91, Register, July, 1993, No. 451, eff. 8–1–93.

Appendix A to Subchapter VII — Converting MCL Compliance Values for Consumer Confidence Reports

Key:

AL=Action Level

MCL=Maximum Contaminant Level

MCLG=Maximum Contaminant Level Goal

MFL=million fibers per liter

mrem/year=millirems per year (a measure of radiation absorbed by the body)

NTU=Nephelometric Turbidity Units

pCi/l=picocuries per liter (a measure of radioactivity)

ppm=parts per million, or milligrams per liter (mg/l)

ppb=parts per billion, or micrograms per liter (g/l)

ppt=parts per trillion, or nanograms per liter

ppq=parts per quadrillion, or picograms per liter

TT=Treatment Technique

Contaminant	MCL in compliance units (mg/L)	Multiply by...	MCL in CCR units	MCLG in CCR units
Microbiological Contaminants				
1. Total Coliform Bacteria	–	–	presence of coliform bacteria in 5% of monthly samples	0
2. Fecal coliform and *E. coli*	–	–	a routine sample and a repeat sample are total coliform positive, and one is also fecal coliform or *E. coli positive*	0
3. Turbidity	–	–	TT (NTU)	n/a
Radioactive Contaminants				
1. Beta/photon emitters	4 mrem/yr	–	4 mrem/yr	0
2. Alpha emitters	15 pCi/l	–	15 pCi/l	0
3. Combined radium	5 pCi/l	–	5 pCi/l	0
Inorganic Contaminants				
1. Antimony	.006	1000	6 ppb	6
2. Arsenic	.05	1000	50 ppb	n/a
3. Asbestos	7 MFL	–	7 MFL	7
4. Barium	2	–	2 ppm	2
5. Beryllium	.004	1000	4 ppb	4
6. Cadmium	.005	1000	5 ppb	5
7. Chromium	.1	1000	100 ppb	100
8. Copper	AL=1.3	–	AL=1.3 ppm	1.3
9. Cyanide	.2	1000	200 ppb	200
10. Fluoride	4	–	4 ppm	4
11. Lead	AL=.015	1000	AL=15 ppb	0
12. Mercury (inorganic)	.002	1000	2 ppb	2
13. Nitrate (as Nitrogen)	10	–	10 ppm	10
14. Nitrite (as Nitrogen)	1	–	1 ppm	1
15. Selenium	.05	1000	50 ppb	50
16. Thallium	.002	1000	2 ppb	0.5
Synthetic Organic Contaminants including Pesticides and Herbicides				
1. 2,4–D	.07	1000	70 ppb	70
2. 2,4,5–TP [Silvex]	.05	1000	50 ppb	50
3. Acrylamide	–	–	TT	0
4. Alachlor	.002	1000	2 ppb	0
5. Atrazine	.003	1000	3 ppb	3
6. Benzo(a)pyrene [PAH]	.0002	1,000,000	200 ppt	0
7. Carbofuran	.04	1000	40 ppb	40
8. Chlordane	.002	1000	2 ppb	0
9. Dalapon	.2	1000	200 ppb	200
10. Di(2–ethylhexyl)adipate	.4	1000	400 ppb	400
11. Di(2–ethylhexyl) phthalate	.006	1000	6 ppb	0
12. Dibromochloropropane	.0002	1,000,000	200 ppt	0

13. Dinoseb	.007	1000	7 ppb	7
14. Diquat	.02	1000	20 ppb	20
15. Dioxin [2,3,7,8–TCDD]	.00000003	1,000,000,000	30 ppq	0
16. Endothall	.1	1000	100 ppb	100
17. Endrin	.002	1000	2 ppb	2
18. Epichlorohydrin	–	–	TT	0
19. Ethylene dibromide	.00005	1,000,000	50 ppt	0
20. Glyphosate	.7	1000	700 ppb	700
21. Heptachlor	.0004	1,000,000	400 ppt	0
22. Heptachlor epoxide	.0002	1,000,000	200 ppt	0
23. Hexachlorobenzene	.001	1000	1 ppb	0
24. Hexachlorocyclopenta-diene	.05	1000	50 ppb	50
25. Lindane	.0002	1,000,000	200 ppt	200
26. Methoxychlor	.04	1000	40 ppb	40
27. Oxamyl [Vydate]	.2	1000	200 ppb	200
28. PCBs [Polychlorinated biphenyls]	.0005	1,000,000	500 ppt	0
29. Pentachlorophenol	.001	1000	1 ppb	0
30. Picloram	.5	1000	500 ppb	500
31. Simazine	.004	1000	4 ppb	4
32. Toxaphene	.003	1000	3 ppb	0
Volatile Organic Contaminants				
1. Benzene	.005	1000	5 ppb	0
2. Carbon tetrachloride	.005	1000	5 ppb	0
3. Chlorobenzene	.1	1000	100 ppb	100
4. o–Dichlorobenzene	.6	1000	600 ppb	600
5. p–Dichlorobenzene	.075	1000	75 ppb	75
6. 1,2–Dichloroethane	.005	1000	5 ppb	0
7. 1,1–Dichloroethylene	.007	1000	7 ppb	7
8. cis–1,2–Dichloroethylene	.07	1000	70 ppb	70
9. trans–1,2–Dichloroethylene	.1	1000	100 ppb	100
10. Dichloromethane	.005	1000	5 ppb	0
11. 1,2–Dichloropropane	.005	1000	5 ppb	0
12. Ethylbenzene	.7	1000	700 ppb	700
13. Styrene	.1	1000	100 ppb	100
14. Tetrachloroethylene	.005	1000	5 ppb	0
15. 1,2,4–Trichlorobenzene	.07	1000	70 ppb	70
16. 1,1,1–Trichloroethane	.2	1000	200 ppb	200
17. 1,1,2–Trichloroethane	.005	1000	5 ppb	3
18. Trichloroethylene	.005	1000	5 ppb	0
19. TTHMs [Total trihalome-thanes]	.10	1000	100 ppb	0
20. Toluene	1	–	1 ppm	1
21. Vinyl Chloride	.002	1000	2 ppb	0
22. Xylenes	10	–	10 ppm	10

Appendix B to Subchapter VII — Regulated Contaminants

Key:

AL=Action Level

MCL=Maximum Contaminant Level

MCLG=Maximum Contaminant Level Goal

MFL=million fibers per liter

mrem/year=millirems per year (a measure of radiation absorbed by the body)

na=not applicable

NTU=Nephelometric Turbidity Units

pCi/l=picocuries per liter (a measure of radioactivity)

ppm=parts per million, or milligrams per liter (mg/l)

ppb=parts per billion, or micrograms per liter (g/l)

ppt=parts per trillion, or nanograms per liter

ppq=parts per quadrillion, or picograms per liter

TT=Treatment Technique

Contaminant (units)	MCLG	MCL	Major Sources in Drinking Water
Microbiological Contaminants			
1. Total Coliform Bacteria (na)	0	presence of coliform bacteria in 5% of monthly samples,	Naturally present in the environment
2. Fecal coliform and *E. coli (na)*	0	a routine sample and a repeat sample are total coliform positive, and one is also fecal coliform or *E. coli positive*	Human and animal fecal waste
3. Turbidity (NTU)	na	TT	Soil runoff
Radioactive Contaminants			
1. Beta/photon emitters (mrem/yr)	0	4	Decay of natural and man–made deposits
2. Alpha emitters (pCi/l)	0	15	Erosion of natural deposits
3. Combined radium (pCi/l)	0	5	Erosion of natural deposits
Inorganic Contaminants			
1. Antimony (ppb)	6	6	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder
2. Arsenic (ppb)	na	50	Erosion of natural deposits, runoff from orchards; runoff from glass and electronics production wastes
3. Asbestos (MFL)	7	7	Decay of asbestos cement water mains; erosion of natural deposits
4. Barium (ppm)	2	2	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
5. Beryllium (ppb)	4	4	Discharge from metal refineries and coal–burning factories; discharge from electrical, aerospace, and defense industries
6. Cadmium (ppb)	5	5	Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries and paints
7. Chromium (ppb)	100	100	Discharge from steel and pulp mills; erosion of natural deposits
8. Copper (ppm)	1.3	AL=1.3	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives
9. Cyanide (ppb)	200	200	Discharge from steel/metal factories; discharge from plastic and fertilizer factories
10. Fluoride (ppm)	4	4	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories
11. Lead (ppb)	0	AL=15	Corrosion of household plumbing systems; erosion of natural deposits
12. Mercury [inorganic] (ppb)	2	2	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills; runoff from cropland
13. Nitrate [as Nitrogen] (ppm)	10	10	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
14. Nitrite [as Nitrogen] (ppm)	1	1	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
15. Selenium (ppb)	50	50	Discharge from petroleum and metal refineries; erosion of natural deposits; discharge from mines
16. Thallium (ppb)	0.5	2	Leaching from ore–processing sites; discharge from electronics, glass, and drug factories
Synthetic Organic Contaminants including Pesticides and Herbicides			
1. 2,4–D (ppb)	70	70	Runoff from herbicide used on row crops
2. 2,4,5–TP [Silvex](ppb)	50	50	Residue of banned herbicide
3. Acrylamide	0	TT	Added to water during sewage/wastewater treatment

4. Alachlor (ppb)	0	2	Runoff from herbicide used on row crops
5. Atrazine (ppb)	3	3	Runoff from herbicide used on row crops
6. Benzo(a)pyrene [PAH] (nanograms/l)	0	200	Leaching from linings of water storage tanks and distribution lines
7. Carbofuran (ppb)	40	40	Leaching of soil fumigant used on rice and alfalfa
8. Chlordane (ppb)	0	2	Residue of banned termiticide
9. Dalapon (ppb)	200	200	Runoff from herbicide used on rights of way
10. Di(2–ethylhexyl) adipate (ppb)	400	400	Discharge from chemical factories
11. Di(2–ethylhexyl) phthalate (ppb)	0	6	Discharge from rubber and chemical factories
12. Dibromochloropropane (ppt)	0	200	Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards
13. Dinoseb (ppb)	7	7	Runoff from herbicide used on soybeans and vegetables
14. Diquat (ppb)	20	20	Runoff from herbicide use
15. Dioxin [2,3,7,8–TCDD] (ppq)	0	30	Emissions from waste incineration and other combustion; discharge from chemical factories
16. Endothall (ppb)	100	100	Runoff from herbicide use
17. Endrin (ppb)	2	2	Residue of banned insecticide
18. Epichlorohydrin	0	TT	Discharge from industrial chemical factories; an impurity of some water treatment chemicals
19. Ethylene dibromide (ppt)	0	50	Discharge from petroleum refineries
20. Glyphosate (ppb)	700	700	Runoff from herbicide use
21. Heptachlor (ppt)	0	400	Residue of banned termiticide
22. Heptachlor epoxide (ppt)	0	200	Breakdown of heptachlor
23. Hexachlorobenzene (ppb)	0	1	Discharge from metal refineries and agricultural chemical factories
24. Hexachlorocyclopentadiene (ppb)	50	50	Discharge from chemical factories
25. Lindane (ppt)	200	200	Runoff/leaching from insecticide used on cattle, lumber, gardens
26. Methoxychlor (ppb)	40	40	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock
27. Oxamyl [Vydate](ppb)	200	200	Runoff/leaching from insecticide used on apples, potatoes and tomatoes
28. PCBs [Polychlorinated biphenyls] (ppt)	0	500	Runoff from landfills; discharge of waste chemicals
29. Pentachlorophenol (ppb)	0	1	Discharge from wood preserving factories
30. Picloram (ppb)	500	500	Herbicide runoff
31. Simazine (ppb)	4	4	Herbicide runoff
32. Toxaphene (ppb)	0	3	Runoff/leaching from insecticide used on cotton and cattle
Volatile Organic Contaminants			
1. Benzene (ppb)	0	5	Discharge from factories; leaching from gas storage tanks and landfills
2. Carbon tetrachloride (ppb)	0	5	Discharge from chemical plants and other industrial activities
3. Chlorobenzene (ppb)	100	100	Discharge from chemical and agricultural chemical factories
4. o–Dichlorobenzene (ppb)	600	600	Discharge from industrial chemical factories
5. p–Dichlorobenzene (ppb)	75	75	Discharge from industrial chemical factories
6. 1,2–Dichloroethane (ppb)	0	5	Discharge from industrial chemical factories
7. 1,1–Dichloroethylene (ppb)	7	7	Discharge from industrial chemical factories
8. cis–1,2–Dichloroethylene (ppb)	70	70	Discharge from industrial chemical factories
9. trans–1,2–Dichloroethylene (ppb)	100	100	Discharge from industrial chemical factories
10. Dichloromethane (ppb)	0	5	Discharge from pharmaceutical and chemical factories
11. 1,2–Dichloropropane (ppb)	0	5	Discharge from industrial chemical factories
12. Ethylbenzene (ppb)	700	700	Discharge from petroleum refineries

13. Styrene (ppb)	100	100	Discharge from rubber and plastic factories; leaching from landfills
14. Tetrachloroethylene (ppb)	0	5	Discharge from factories and dry cleaners
15. 1,2,4–Trichlorobenzene (ppb)	70	70	Discharge from textile–finishing factories
16. 1,1,1–Trichloroethane (ppb)	200	200	Discharge from metal degreasing sites and other factories
17. 1,1,2–Trichloroethane (ppb)	3	5	Discharge from industrial chemical factories
18. Trichloroethylene (ppb)	0	5	Discharge from metal degreasing sites and other factories
19. TTHMs [Total trihalomethanes](ppb)	0	100	By–product of drinking water chlorination
20. Toluene (ppm)	1	1	Discharge from petroleum factories
21. Vinyl Chloride (ppb)	0	2	Leaching from PVC piping; discharge from plastics factories
22. Xylenes (ppm)	10	10	Discharge from petroleum factories; discharge from chemical factories

Appendix C to Subchapter VII — Health Effects Language

Microbiological Contaminants:

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

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

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

Radioactive Contaminants:

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

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

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

Inorganic Contaminants:

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

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

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

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

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

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

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

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

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

(16) Fluoride. Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Children may get mottled teeth.

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

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

(19) Nitrate. Infants below the age of 6 months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue–baby syndrome.

(20) Nitrite. Infants below the age of 6 months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue–baby syndrome.

(21) Selenium. Selenium is an essential nutrient. However, some people who drink water containing selenium in excess of the MCL

over many years could experience hair or fingernail losses, numbness in fingers or toes, or problems with their circulation.

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

Synthetic organic contaminants including pesticides and herbicides:

(23) 2,4–D. Some people who drink water containing the weed killer 2,4–D well in excess of the MCL over many years could experience problems with their kidneys, liver or adrenal glands.

(24) 2,4,5–TP (Silvex). Some people who drink water containing silvex in excess of the MCL over many years could experience liver problems.

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

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

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

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

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

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

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

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

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

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

(35) Dinoseb. Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties.

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

(37) Diquat. Some people who drink water containing diquat in excess of the MCL over many years could get cataracts.

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

(39) Endrin. Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems.

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

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

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

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

(44) Heptachlor epoxide. Some people who drink water containing heptachlor epoxide in excess of the MCL over many years could experience liver damage, and may have an increased risk of getting cancer.

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

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

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

(48) Methoxychlor. Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties.

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

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

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

(52) Picloram. Some people who drink water containing picloram in excess of the MCL over many years could experience problems with their liver.

(53) Simazine. Some people who drink water containing simazine in excess of the MCL over many years could experience problems with their blood.

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

Volatile Organic Contaminants:

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

(56) Carbon tetrachloride. Some people who drink water containing carbon tetrachloride in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.

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

(58) o–Dichlorobenzene. Some people who drink water containing o–dichlorobenzene well in excess of the MCL over many years could experience problems with their liver, kidneys or circulatory systems.

(59) p–Dichlorobenzene. Some people who drink water containing p–dichlorobenzene in excess of the MCL over many years could experience anemia, damage to their liver, kidneys or spleen, or changes in their blood.

(60) 1,2–Dichloroethane. Some people who drink water containing 1,2–dichloroethane in excess of the MCL over many years may have an increased risk of getting cancer.

(61) 1,1–Dichloroethylene. Some people who drink water containing 1,1–dichloroethylene in excess of the MCL over many years could experience problems with their liver.

(62) cis–1,2–Dichloroethylene. Some people who drink water containing cis–1,2–dichloroethylene in excess of the MCL over many years could experience problems with their liver.

(63) trans–1,2–Dicholoroethylene. Some people who drink water containing trans–1,2–dichloroethylene well in excess of the MCL over many years could experience problems with their liver.

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

(65) 1,2–Dichloropropane. Some people who drink water containing 1,2–dichloropropane in excess of the MCL over many years may have an increased risk of getting cancer.

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

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

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

(69) 1,2,4–Trichlorobenzene. Some people who drink water containing 1,2,4–trichlorobenzene well in excess of the MCL over many years could experience changes in their adrenal glands.

(70) 1,1,1,–Trichloroethane. Some people who drink water containing 1,1,1–trichloroethane in excess of the MCL over many years could experience problems with their liver, nervous system or circulatory system.

(71) 1,1,2–Trichloroethane. Some people who drink water containing 1,1,2–trichloroethane well in excess of the MCL over many years could have problems with their liver, kidneys or immune systems.

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

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

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

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

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

Subchapter VIII — Water System Capacity

NR 809.931 System capacity. All new community and non–transient non–community water systems constructed after September 1, 1999, shall develop and maintain adequate financial, managerial and technical capacity to meet the requirements of this chapter and 42 USC 300f to 300j–26.

Note: 42 USC 300f to 300j–26 is entitled the federal safe drinking water act

History: Cr., Register, May, 1999, No. 521, eff. 6–1–99.

NR 809.932 New system capacity evaluation. (1) No new community or non–transient non–community water system may be constructed after September 1, 1999, unless the owner of the proposed water system first demonstrates to the satisfaction of the department that the water system shall have and shall maintain adequate financial, managerial and technical capacity to meet the requirements of this chapter and the requirements of 42 USC 300f to 300j–26. Additions to water systems constructed prior to September 1, 1999, are exempt from this requirement.

Note: 42 USC 300f to 300j–26 is entitled the federal safe drinking water act

(2) To demonstrate its financial, managerial and technical capacity to the department, before beginning construction of a water system, the owner of a proposed community or non–transient non–community water system shall submit to the department a system capacity evaluation that includes all of the following:

(a) A written description of the water system design that includes all of the following:

1. For groundwater systems, the proposed well construction and the name of the water bearing formation.

2. For surface water systems, the name of the source water body and the intake length and intake location.

3. The proposed pumping capacity.

4. The proposed water treatment.

5. The proposed water storage volume.

6. The proposed length and diameter of water mains.

7. The proposed pressure range within the water system.

8. The proposed location of any pressure reducing valves or pressure booster stations.

9. A map or plat showing the proposed water system.

(b) An evaluation of the potential for the water quality to exceed any of the primary or secondary standards of this chapter. For groundwater systems, this evaluation shall be based on a review of water quality information available from nearby existing wells or on the results of water quality monitoring from a test well. For surface water systems, this evaluation shall be based on water quality monitoring from the surface water.

(c) The anticipated average and maximum daily water use for the proposed water system.

(d) For groundwater systems, a site assessment that includes all of the following:

1. The separation distances between the well and potential sources of contamination within the proposed wellhead protection area.

2. Any violation of the applicable separation distances contained in chs. NR 811 and 812.

3. The proximity of the well to any wetlands.

4. The location of the well in relation to the 100 year flood elevation.

(e) For surface water systems, a source water assessment that includes the identification of potential sources of contamination in relation to the intake and the susceptibility of the water system to contamination.

(f) The anticipated number of industrial, commercial and residential water services.

(g) The initial and projected customer population and service area.

(h) Information for the identification, location and contact of the water system designer including the name, address, and telephone number of the system designer and designer's firm.

(i) The status of all department permits and approvals related to the construction of the water system.

(j) Information for the identification, location and contact of the water system owner including the name, address and telephone number of the water system owner and the extent of the owner's responsibility for the water system.

(k) Information for the identification, location and contact of the water system manager including the name, address and telephone number of the system manager.

(L) Information for the identification, location and contact of the water system operator including the name, address and telephone number of the designated or certified water system operator. If an operator has not been selected prior to submitting the capacity evaluation, a timetable for hiring an operator shall be included as part of the capacity evaluation in lieu of the information for the identification, location and contact of the water system operator. The water system may not be placed into operation until the department is provided with the information for the identification, location and contact of the water system operator required in this paragraph.

(m) A proposed water quality monitoring plan that includes monitoring for all of the following:

1. Total coliform bacteria.

2. Corrosion products, including lead and copper and associated water quality parameters.

3. Chemicals to be added to the water.

4. Other water quality monitoring required by the department as part of the construction plan approval.

(n) A description of the operational procedures required by chs. NR 809 and 811 and PSC 185 related to wellhead protection, well abandonment, cross–connection control, operational reporting, meter testing, hydrant and valve exercising and operator certification.

(o) A description of the rate or fee mechanism for other–than–municipal water systems. Other–than–municipal water system has the meaning contained in s. NR 811.02 (19).

Note: Sec. NR 811.02 (19) states that "Other–than–municipal water system" means a community water system that is not a municipal water system.

(p) A copy of the public service commission certificate authorizing the construction and operation, and estimating rates, for municipal water systems regulated by the public service commission. Municipal water system has the meaning contained in s. NR 811.02 (16).

Note: Sec. NR 811.02 (16) states that "Municipal water system" means a community water system owned by a city, village, county, town, town sanitary district, utility district, public inland lake and rehabilitation district, municipal water district, or a federal, state, county, or municipal owned institution for congregate care or correction, or a privately owned water utility serving the foregoing.

(q) A description of the method of payment for the construction and operation of the water system for non–transient non–community water systems.

(r) A statement from the water system owner on the financial capacity of the water system to meet the requirements of this chapter.

(3) The capacity evaluation shall be submitted on a form provided by the department or in a format approved by the department.

Note: Capacity evaluation forms may be obtained from the department bureau of drinking water and groundwater at no charge by writing to Bureau of Drinking Water and Groundwater, Box 7921, Madison, WI, 53707, or by calling (608) 266–6699.

(4) The information in sub. (2) (a) to (e) shall be prepared by a professional engineer for municipal water systems and by a professional engineer or licensed well driller for other–than–municipal or non–transient non–community water systems.

(5) The department may waive the requirement for the owner to supply information on well construction, well location, water quality monitoring, and operational procedures listed in sub. (2) (a) to (n) for non–community water systems provided that the owner acknowledges conformance to the requirements for well construction, well location, water quality monitoring, and water system operation contained in this chapter and ch. NR 812.

(6) A single engineering or design report may be submitted to satisfy the requirements of s. NR 811.13 (3) and (3m) and the capacity evaluation required by sub. (2).

History: Cr., Register, May, 1999, No. 521, eff. 6–1–99.

NR 809.933 Department approval of system capacity. (1) The construction of any new non–transient non–community or community water system may not commence without department approval of the system capacity evaluation demonstrating technical, financial and managerial capacity required in s. NR 809.932.

(2) The department may deny approval of the system capacity evaluation for any of the following reasons:

(a) The water system design does not conform to the applicable design and location standards, or approved variances to the standards, contained in chs. NR 811 and 812 and Comm 82.

(b) The water system operational procedures do not meet the applicable requirements of ch. PSC 185 or of this chapter and ch. NR 811 related to wellhead protection, well abandonment, cross–connection control, operational reporting, meter testing, hydrant and valve exercising and operator certification.

(c) The water system monitoring plan does not conform to the applicable monitoring requirements of this chapter, approved variances to the requirements of this chapter, or to monitoring requirements established as part of the department construction approval under chs. NR 811 and 812.

(d) The system capacity evaluation is incomplete.

(e) The information provided does not demonstrate adequate financial capacity to meet the requirements of this chapter.

History: Cr., Register, May, 1999, No. 521, eff. 6–1–99.