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

The Natural Resources Board proposes an order to repeal NR 809.835(3)(intro.), (a) and (b), and 809 Appendix A to subch. VIII; to renumber NR 809.11(1)(b), (c) and (d), and 809.25(13)(d) and (e); to amend NR 809.04(54), 809.04(55), 809.09(2), 809.11(1)(c), (2)(a) and (4)(a), 809.12(9)(b), (c) and (14)(d), 809.21(10)(a), and 809.25(13)(a); to repeal and recreate NR 809.12(3)(intro.), (4)(intro.), (5)(intro.) and (13), 809.725(1) Table A and Table F, 809.835(2)(intro.), (a) and (b), and 809 Appendix A and Appendix B to subch. X; to create NR 809.11(5), 809.12(3)(g), 809.12(14)(e), 809.21(10)(e) and (18), 809.25(13)(d) and (22), 809.835(3), and 809 Appendix A to subch. VII relating to arsenic in public water systems.

DG-30-03

Analysis Prepared by Department of Natural Resources

Statutory authority: ss. 280.11 and 281.17(8), Stats.
Statutes interpreted: ss. 280.11 and 281.17(8), Stats.

USEPA published amendments to 40 CFR 141 and 142 relating to arsenic in public water systems. The Department of Natural Resources' ("the department") primacy agreement with EPA requires the department to adopt rules no less stringent than federal regulations. The proposed changes to Chapter NR 809 update it to reflect changes in 40 CFR, and are necessary to assure that the department's administrative rules are consistent with federal regulations.

Revisions to the arsenic rule establish an enforceable maximum contaminant level (MCL) for arsenic of 0.010 mg/L (10 μg/L), replacing the old standard of 0.050 mg/L (50 μg/L). The rule also establishes a health-based, non-enforceable maximum contaminant level goal (MCLG) for arsenic of zero. This regulation will apply to non-transient non-community water systems, which are not presently subject to standards for arsenic, and to community water systems. The date by which these systems must comply with the new MCL and MCLG for arsenic is January 23, 2006.

In addition, this rule revision includes clarifications for monitoring and demonstration of compliance for new systems or sources of drinking water. The rule revision also clarifies compliance for state-determined monitoring after exceedances for inorganic, volatile organic, and synthetic organic contaminants. Finally, the rule revision recognizes the state-specified time period and sampling frequency for new public water systems and systems using a new source of water to demonstrate compliance with drinking water regulations. The requirements for new systems and new source monitoring will be effective for inorganic, volatile organic and synthetic organic contaminants.

SECTION 1. NR 809.04(54) is amended to read:

NR 809.04(54) "Point-of-entry treatment device" or "POE" 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.

SECTION 2. NR 809.04(55) is amended to read:

NR 809.04(55) "Point-of-use treatment device" or "POU" is a water treatment device applied to a single tap used for the purpose of reducing contaminants in drinking water at that one tap.

SECTION 3. NR 809.09(2) is amended to read:

NR 809.09(2) Maximum contaminant level goals (MCLGs) which are less than the MCLs are as follows:

Contaminant	MCLG in mg/L
Acrylamide	0.00001
Alachlor	0.0004
Arsenic	zero[1]
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

[1] This value for arsenic is effective January 23, 2006. Until then, there is no MCLG for arsenic.

SECTION 4. NR 809.11(1)(b), (c) and (d) are renumbered (c), (d) and (e).

SECTION 5. NR 809.11(1)(b) is created to read:

NR 809.11(1)(b) The maximum contaminant level for arsenic is 0.05 mg/L for community water systems before January 23, 2006. On or after January 23, 2006 the maximum contaminant level for arsenic is 0.010 mg/L for community water systems and non-transient, non-community water systems.

SECTION 6. NR 809.11(1)(c), as renumbered, is amended to read:

NR 809.11(1)(c) The maximum contaminant ~~levels for arsenic and~~ level for fluoride only ~~apply~~ applies to community water systems.

SECTION 7. NR 809.11(2)(a) is amended to read:

NR 809.11(2) The following are the maximum contaminant levels for inorganic contaminants:

(a) Contaminant	MCL in mg/L
Arsenic	~~0.05~~ 0.010[1]
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 Nitrate + Nitrite	10 (as Nitrogen)
Selenium	0.05

[1] The MCL of 0.010 mg/L for arsenic is effective January 23, 2006. Until then, the MCL for arsenic is 0.05 mg/L.

SECTION 8. NR 809.11(4)(a) is amended to read:

NR 809.11(4)(a) The following are the best available technologies or BATs ~~available~~ for achieving compliance with the maximum contaminant levels for inorganic contaminants listed in sub. (2), except for ~~arsenic and~~ fluoride:

Contaminant	**BAT(s)**
Antimony	2,7
Arsenic[4]	1,2,5,6,7,9,12[5]
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 concentrations ≤ 10 µg/L.
[2] BAT for Chromium III only.
[3] BAT for Selenium IV only.
[4] BATs for Arsenic V. Pre-oxidation may be required to convert Arsenic III to Arsenic V.
[5] To obtain high removals, iron to arsenic ratio must be at least 20:1.

Key to BATs in Table:

1 = Activated Alumina
2 = Coagulation/Filtration (not BAT for systems < 500 service connections)
3 = Direct and Diatomite Filtration
4 = Granular Activated Carbon
5 = Ion Exchange
6 = Lime Softening (not BAT for systems < 500 service connections)
7 = Reverse Osmosis
8 = Corrosion Control
9 = Electrodialysis
10 = Oxidation (Chlorine)
11 = Ultraviolet
12 = Oxidation/Filtration

SECTION 9. NR 809.11(5) is created to read:

NR 809.11(5) The EPA identifies the following table as the affordable technology, treatment technique, or other means available to water systems serving 10,000 persons or fewer for achieving compliance with the maximum contaminant level for arsenic:

Small System Compliance Technologies[1] for Arsenic[2]

Small system compliance technology	Affordable for listed small system categories[3]
Activated Alumina (centralized)	All size categories
Activated Alumina (Point-of-Use)[4]	All size categories
Coagulation/Filtration[5]	501–3,300, 3,301–10,000
Coagulation-assisted Microfiltration	501–3,300, 3,301–10,000
Electrodialysis reversal[6]	501–3,300, 3,301–10,000
Enhanced coagulation/filtration	All size categories
Enhanced lime softening (pH> 10.5)	All size categories
Ion Exchange	All size categories
Lime Softening[5]	501–3,300, 3,301–10,000
Oxidation/Filtration[7]	All size categories
Reverse Osmosis (centralized)[6]	501–3,300, 3,301–10,000
Reverse Osmosis (Point-of-Use)[4]	All size categories

[1] Section 1412(b)(4)(E)(ii) of the Safe Drinking Water Act or SDWA specifies that small system compliance technologies must be affordable and technically feasible for small systems.

[2] Small system compliance technology for Arsenic V. Pre-oxidation may be required to convert Arsenic III to Arsenic V.

[3] Section 1412(b)(4)(E)(ii) of the Safe Drinking Water Act or SDWA specifies 3 categories of small systems: (i) those serving 25 or more, but fewer than 501, (ii) those serving more than 500, but fewer than 3,301, and (iii) those serving more than 3,300, but fewer than 10,001.

[4] When POU or POE devices are used for compliance, programs to ensure proper long-term operation, maintenance, and monitoring must be provided by the water system to ensure adequate performance.

[5] Unlikely to be installed solely for arsenic removal. May require pH adjustment to optimal range if high removals are needed.

[6] Technologies reject a large volume of water—may not be appropriate for areas where water quantity may be an issue.

[7] To obtain high removals, iron to arsenic ratio must be at least 20:1.

SECTION 10. NR 809.12(3)(intro.) is repealed and recreated to read:

NR 809.12(3)(intro.) The frequency of monitoring for each community and non-transient, non-community water system to determine compliance with the MCLs specified in s. NR 809.11(2) for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium and thallium shall be conducted as follows:

SECTION 11. NR 809.12(3)(g) is created to read:

NR 809.12(3)(g) All new systems or systems that use a new source of water that begin operation after January 22, 2004 shall demonstrate compliance with the MCLs specified in s. NR 809.11(2) in accordance with the requirements in this section. The system shall also comply with the initial sampling frequencies specified by the department to ensure a system can demonstrate compliance with the MCLs. Routine and increased monitoring frequencies shall be conducted in accordance with the requirements in this section.

SECTION 12. NR 809.12(4)(intro.) is repealed and recreated to read:

NR 809.12(4)(intro.) The frequency of monitoring for all public water systems to determine compliance with the MCL for nitrate specified in s. NR 809.11(2) shall be conducted as follows:

SECTION 13. NR 809.12(5)(intro.) is repealed and recreated to read:

NR 809.12(5)(intro.) The frequency of monitoring for all public water systems to determine compliance with the MCL for nitrite specified in s. NR 809.11(2) shall be conducted as follows:

SECTION 14. NR 809.12(9)(b) is amended to read:

NR 809.12(9)(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. If a system fails to collect the required number of samples, compliance shall be based on the total number of samples collected.

SECTION 15. NR 809.12(9)(c) is amended to read:

NR 809.12(9)(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. If a system fails to collect the required number of samples, compliance shall be based on the total number of samples collected.

SECTION 16. NR 809.12(9)(e) is created to read:

NR 809.12(9)(e) Arsenic sampling results shall be reported to the nearest 0.001 mg/L.

SECTION 17. NR 809.12(13) is repealed and recreated to read:

NR 809.12(13)(intro.) Analyses under this section shall only be conducted by laboratories that have received certification under ch. NR 149 or approval by EPA.

(a) To receive certification to conduct analyses for antimony, arsenic, asbestos, barium, beryllium, cadmium, cyanide, fluoride, mercury, nickel, nitrate, nitrite, selenium and thallium, a laboratory shall carry out annual analyses of performance evaluation samples approved by the department or EPA.

(b) For each contaminant that has been included in the performance evaluation sample and for each method for which a laboratory desires certification, the laboratory shall achieve quantitative results that are within the following acceptance limits:

Contaminant	**Acceptance limit**
Antimony	±30% at ≥0.006 mg/L
Arsenic	±30% at ≥0.003 mg/L
Asbestos	2 standard deviations based on study statistics
Barium	±15% at ≥0.15 mg/L
Beryllium	±15% at ≥0.001 mg/L
Cadmium	±20% at ≥0.002 mg/L
Chromium	±15% at ≥0.01 mg/L
Cyanide	±25% at ≥0.1 mg/L
Fluoride	±10% at ≥1 to 10 mg/L
Mercury	±30% at ≥0.0005 mg/L
Nickel	±15% at ≥0.01 mg/L
Nitrate	±10% at ≥0.4 mg/L
Nitrite	±15% at ≥0.4 mg/L
Selenium	±20% at ≥0.01 mg/L
Thallium	±30% at ≥0.002 mg/L

SECTION 18. NR 809.12(14)(d) is amended to read:

NR 809.12(14)(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.~~

SECTION 19. NR 809.12(14)(e) is created to read:

NR 809.12(14)(e) The following are detection limits for each analytical method and MCLs for inorganic contaminants specified in this section and s. NR 809.11:

Detection Limits For Inorganic Contaminants

Contaminant	MCL (mg/L)	Methodology	Detection limit (mg/L)
Antimony	0.006	Atomic Absorption; Furnace Atomic Absorption; Platform ICP-Mass Spectrometry Hydride-Atomic Absorption	0.003 0.0008[5] 0.0004 0.001
Arsenic	0.010[6]	Atomic Absorption; Furnace Atomic Absorption; Platform—Stabilized Temperature Atomic Absorption; Gaseous Hydride ICP-Mass Spectrometry	0.001 0.0005[7] 0.001 0.0014[8]
Asbestos	7 MFL[1]	Transmission Electron Microscopy	0.01 MFL
Barium	2	Atomic Absorption; furnace technique Atomic Absorption; direct aspiration Inductively Coupled Plasma	0.002 0.1 0.002 (0.001)
Beryllium	0.004	Atomic Absorption; Furnace Atomic Absorption; Platform Inductively Coupled Plasma[2] ICP-Mass Spectrometry	0.0002 0.00002[5] 0.0003 0.0003
Cadmium	0.005	Atomic Absorption; furnace technique Inductively Coupled Plasma	0.0001 0.001
Chromium	0.1	Atomic Absorption; furnace technique Inductively Coupled Plasma	0.001 0.007 (0.001)
Cyanide	0.2	Distillation, Spectrophotometric[3] Distillation, Automated, Spectrophotometric[3] Distillation, Selective Electrode[3] Distillation, Amenable, Spectrophotometric[4]	0.02 0.005 0.05 0.02
Mercury	0.002	Manual Cold Vapor Technique Automated Cold Vapor Technique	0.0002 0.0002
Nickel	xl	Atomic Absorption; Furnace Atomic Absorption; Platform Inductively Coupled Plasma[2] ICP-Mass Spectrometry	0.001 0.0006[5] 0.005 0.0005
Nitrate	10 (as N)	Manual Cadmium Reduction Automated Hydrazine Reduction Automated Cadmium Reduction Ion Selective Electrode Ion Chromatography	0.01 0.01 0.05 1 0.01
Nitrite	1 (as N)	Spectrophotometric Automated Cadmium Reduction Manual Cadmium Reduction Ion Chromatography	0.01 0.05 0.01 0.004

Selenium	0.05	Atomic Absorption; furnace Atomic Absorption; gaseous hydride	0.002 0.002
Thallium	0.002	Atomic Absorption; Furnace Atomic Absorption; Platform ICP-Mass Spectrometry	0.001 0.0007[5] 0.0003

[1] MFL = million fibers per liter >10 µm.

[2] Using a 2X pre-concentration step as noted in Method 200.7. Lower method detection limits may be achieved when using a 4X pre-concentration.

[3] Screening method for total cyanides.

[4] Measures ''free'' cyanides.

[5] Lower method detection limits are reported using stabilized temperature graphite furnace atomic absorption.

[6] The value for arsenic is effective January 23, 2006. Until then, the MCL is 0.05 mg/L.

[7] The method detection limit reported for EPA method 200.9 (Atomic Absorption; Platform—Stabilized Temperature) was determined using a 2X concentration step during sample digestion. The method detection limit determined for samples analyzed using direct analyses (i.e., no sample digestion) will be higher. Using multiple depositions, EPA Method 200.9 is capable of obtaining a method detection limit of 0.0001 mg/L.

[8] Using selective ion monitoring, EPA Method 200.8 (ICP–MS) is capable of obtaining a method detection limit of 0.0001 mg/L.

SECTION 20. NR 809.21(10)(a) is amended to read:

NR 809.21(10)(a) Compliance with the synthetic organic contaminant MCLs specified in s. NR 809.20 shall be determined based on the analytical results obtained at each entry point. If one entry point is in violation of an MCL, the system is in violation of the MCL.

SECTION 21. NR 809.21(10)(e) is created to read:

NR 809.21(10)(e) If a system fails to collect the required number of samples, compliance shall be based on the total number of samples collected.

SECTION 22. NR 809.21(18) is created to read:

NR 809.21(18) All new systems or systems that use a new source of water that begin operation after January 22, 2004 shall demonstrate compliance with the MCLs specified in s. NR 809.20(1) in accordance with the requirements in this section. The system shall also comply with the initial sampling frequencies specified by the department to ensure a system can demonstrate compliance with the MCLs. Routine and increased monitoring frequencies shall be conducted in accordance with the requirements in this section.

SECTION 23. NR 809.25(13)(a) is amended to read:

NR 809.25(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. If one entry point is in violation of an MCL, the system is in violation of the MCL.

SECTION 24. NR 809.25(13)(d) and (e) is renumbered (e) and (f):

SECTION 25. NR 809.25(13)(d) is created to read:

NR 809.25(13)(d) If a system fails to collect the required number of samples, compliance shall be based on the total number of samples collected.

SECTION 26. NR 809.25(22) is created to read:

NR 809.25(22) All new systems or systems that use a new source of water that begin operation after January 22, 2004 shall demonstrate compliance with the MCLs specified in s. NR 809.24(1) in accordance with the requirements in this section. The system shall also comply with the initial sampling frequencies specified by the department to ensure a system can demonstrate compliance with the MCLs. Routine and increased monitoring frequencies shall be conducted in accordance with the requirements in this section.

SECTION 27. NR 809.725(1) Table A is repealed and recreated to read:

TABLE A
Approved Methodology for Primary Inorganic Contaminants

Contaminant and Methodology[12]	Reference (Method Number)			
	EPA	**ASTM[3]**	**SM[4]**	**Other**
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[13]				
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)[14]	200.7[2]	-	3120 B[14]	-
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	-
Manual distillation; Colorimetric. SPADNS	-	-	4500-F- B, D	-
Manual electrode	-	D1179-93B	4500-F- C	-
Automated Alizarin flouride 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[6]	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[6]	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 and 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, NW, 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.

[12]Because method detection limits reported in EPA Methods 200.7 and 200.9 were determined using a 2X preconcentration step during sample digestion, method detection limits determined when samples are analyzed by direct analysis *(i.e.,* no sample digestion) will be higher. For direct analysis of cadmium and arsenic by Method 200.7, and arsenic by Method 3120 B sample preconcentration using pneumatic nebulization may be required to achieve lower detection limits. Preconcentration may also be required for direct analysis of antimony, lead, and thallium by Method 200.9; antimony and lead by Method 3113 B; and lead by Method D3559–90D unless multiple in-furnace depositions are made.

[13]If ultrasonic nebulization is used in the determination of arsenic by Methods 200.7, 200.8, or SM 3120 B, the arsenic must be in the pentavalent state to provide uniform signal response. For methods 200.7 and 3120 B, both samples and standards must be diluted in the same mixed acid matrix concentration of nitric and hydrochloric acid with the addition of 100 µL of 30% hydrogen peroxide per 100ml of solution. For direct analysis of arsenic with method 200.8 using ultrasonic nebulization, samples and standards must contain one mg/L of sodium hypochlorite.

[14]After January 23, 2006 analytical methods using the ICP–AES technology, may not be used because the detection limits for these methods are 0.008 mg/L or higher. This restriction means that the two ICP–AES methods (EPA Method 200.7 and SM 3120 B) approved for use for the MCL of 0.05 mg/L may not be used for compliance determinations for the revised MCL of 0.010 mg/L. However, prior to 2005 systems may have compliance samples analyzed with these less sensitive methods.

SECTION 28. NR 809.725(1) Table F is repealed and recreated to read:

TABLE F
Sample Preservation, Containers and
Maximum Holding Times for Inorganic Parameters

Parameter	Preservation[1]	Container[2]	Holding Time[3]
METALS			
Aluminum	HNO_3	P or G	6 months
Antimony	HNO_3	P or G	6 months
Arsenic	HNO_3 to pH<2	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
OTHER PARAMETERS			
Asbestos	Cool, 4°C	P or G	48 hours[4]
Bromate	Ethylenediamine	P or G	28 days
Chloride	None	P or G	28 days
Chlorite	50 mg/L EDA, Cool to 4°C	P or G	14 days
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	P or G	14 days
Fluoride	None	P or G	28 days
Foaming Agents	Cool,4°C	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[5]
Nitrate + Nitrite[6]	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] Instructions for containers, preservation procedures and holding times as specified in Method 100.2 must be adhered to for all compliance analyses including those conducted with Method 101.1.

[5] If the sample is chlorinated, the holding time for an unacidified sample kept at 4°C is extended to 14 days.

[6] Nitrate-nitrite refers to a measurement of total nitrate.

SECTION 29. NR 809.835(2) is repealed and recreated to read:

NR 809.835(2) Beginning July 1, 2002 a system that detects arsenic above 0.005 mg/L and up to and including 0.01 mg/L:

(a) Shall include in its report a short information statement about arsenic, using language such as: While your drinking water meets EPA's standard for arsenic, it does contain low levels of arsenic. EPA's standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. EPA continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.

(b) May write its own educational statement, but only in consultation with the department.

SECTION 30. NR 809.835(3) is repealed and recreated to read:

NR 809.835(3) Beginning July 1, 2002 and ending January 22, 2006 a community water that detects arsenic above 0.01 mg/L and up to and including 0.05 mg/L shall include health effects language for arsenic prescribed by Appendix A to this subchapter.

SECTION 31. The title of NR 809 Appendix A to subchapter VIII is amended to read Appendix A to subchapter VII.

Appendix A to Subchapter VII

Contaminant (units)	Traditional MCL in mg/L	To convert for CCR; multiply by	MCL in CCR units	MCLG	Major sources in drinking water	Health effects language
Microbial contaminants:						
Total Coliform Bacteria	MCL: (systems that collect ≥40 samples/ month) 5% of monthly samples are positive; (systems that collect ≤40 samples/ month) 1 positive monthly sample.	N/A	MCL: (systems that collect ≥40 samples/ month) 5% of monthly samples are positive; (systems that collect ≤40 samples/ month) 1 positive monthly sample.	0	Naturally present in the environment.	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.
Fecal coliform and E. coli	0	N/A	0	0	Human and animal fecal waste.	Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.
Total organic carbon (ppm)	TT	N/A	TT	N/A	Naturally present in the environment.	Total organic carbon has no health effects. However, total organic carbon provides a medium for the formation of disinfection byproducts. Their byproducts include trihalomethanes and haloacetic acids. Drinking water containing these byproducts in excess of the MCL may lead to adverse health effects, liver or kidney problems, or nervous system effects, and may lead to an increased risk of getting cancer.
Turbidity (NTU)	TT	N/A	TT	N/A	Soil runoff.	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:						
Beta/photon emitters (mrem/yr)	4 mrem/yr	N/A	4	N/A	Decay of natural and man-made deposits.	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.
Alpha emitters (pCi/l)	15 pCi/l	N/A	15	N/A	Erosion of natural deposits.	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.
Combined radium (pCi/l)	5 pCi/l	N/A	5	N/A	Erosion of natural deposits.	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: Antimony (ppb)	.006	1000	6	6	Discharge from petroleum refineries, fire retardants, ceramics, electronics, solder.	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.
Arsenic (ppb)	0.010[1]	1000	10[1]	0[1]	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes.	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.
Asbestos (MFL)	7 MFL	N/A	7	7	Decay of asbestos cement water; Erosion of natural deposits.	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.
Barium (ppm)	2	N/A	2	2	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits.	Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.
Beryllium (ppb)	.004	1000	4	4	Discharge from metal refineries and coal-burning factories; Discharge from electrical, aerospace, and defense industries.	Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions.
Cadmium (ppb)	.005	1000	5	5	Corrosion of galvanized pipes; Erosion of natural deposits; Discharge from metal refineries; Runoff from waste batteries and paints.	Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage.
Chromium (ppb)	.1	1000	100	100	Discharge from steel and pulp mills; Erosion of natural deposits.	Some people who drink water containing chromium well in excess of the MCL over many years could experience allergic dermatitis.
Copper (ppm)	AL = 1.3	N/A	AL = 1.3	1.3	Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservatives.	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.
Cyanide (ppb)	.2	1000	200	200	Discharge from steel/metal factories; Discharge from plastic and fertilizer factories.	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.
Fluoride (ppm)	4	N/A	4	4	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from	Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of bones. Fluoride in drinking water at

					fertilizer and aluminum factories.	half the MCL or more may cause mottling of children's teeth, usually in children less than 9 years old. Mottling, also known as dental fluorosis, may include brown staining and/or pitting of the teeth, and occurs only in developing teeth before they erupt from the gums.
Lead (ppb)	AL = .015	1000	AL = 15	0	Corrosion of household plumbing system; Erosion of natural deposits.	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 attentions span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.
Mercury [inorganic] (ppb)	.002	1000	2	2	Erosion of natural deposits; Discharge from refineries and factories; Runoff from landfills; Runoff from cropland.	Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage.
Nitrate (ppm)	10	N/A	10	10	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.	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.
Nitrite (ppm)	1	N/A	1	1	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.	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.
Selenium (ppb)	.05	1000	50	50	Discharge from petroleum and metal refineries; Erosion of natural deposits; Discharge from mines.	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 loss, numbness in fingers or toes, or problems with their circulation.
Thallium (ppb)	.002	1000	2	0.5	Leaching from ore-processing sites; Discharge from electronic, glass, and drug factories.	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:						
2,4-D (ppb)	.07	1000	70	70	Runoff from herbicide used on row crops.	Some people who drink water containing the weed killer 2,4-D well in excess of the MCL over many years could experience problems with their kidneys, liver, or adrenal glands.
2,4,5-TP [Silvex] (ppb)	.05	1000	50	50	Residue of banned herbicide.	Some people who drink water containing silvex in excess of the MCL over many years could experience liver problems.
Acrylamide	TT	N/A	TT	0	Added to water during sewage/wastewater treatment.	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.
Alachlor (ppb)	.002	1000	2	0	Runoff from herbicide used on	Some people who drink water containing alachlor in excess of

					row crops.	the MCL over many years could have problems with their eyes, liver, kidney, or spleen, or experience anemia, and may have an increased risk of getting cancer.
Atrazine (ppb)	.003	1000	3	3	Runoff from herbicide used on row crops.	Some people who drink water containing atrazine well in excess of the MCL over many years could experience problems with their cardiovascular systemor reproductive difficulties.
Benzo(a)pyrene [PAH] (nanograms/l)	.0002	1,000,000	200	0	Leaching from lining of water storage tanks and distribution lines.	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.
Carbofuran (ppb)	.04	1000	40	40	Leaching of soil fumigant used on rice and alfalfa.	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.
Chlordane (ppb)	.002	1000	2	0	Residue of banned termiticide.	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.
Dalapon (ppb)	.2	1000	200	200	Runoff from herbicide used on rights of way.	Some people who drink water containing dalapon well in excess of the MCL over many years could experience minor kidney changes.
Di(2-ethylhexyl) adipate (ppb)	.4	1000	400	400	Discharge from chemical factories.	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.
Di(2-ethylhexyl) phthalate (ppb)	.006	1000	6	0	Discharge from rubber and chemical factories.	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.
Dibromochloropropane (ppt)	.0002	1,000,000	200	0	Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards.	Some people who drink water containing DBCP in excess of the MCL over many years could experience reproductive problems and may have an increased risk of getting cancer.
Dinoseb (ppb)	.007	1000	7	7	Runoff from herbicide used on soybeans and vegetables.	Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties.
Diquat (ppb)	.02	1000	20	20	Runoff from herbicide use.	Some people who drink water containing diquat in excess of the MCL over many years could get cataracts.
Dioxin [2,3,7,8-TCDD] (ppq)	.00000003	1,000,000,000	30	0	Emissions from waste incineration and other combustion; Discharge from chemical factories.	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.
Endothall (ppb)	.1	1000	100	100	Runoff from herbicide use.	Some people who drink water containing endothall in excess of the MCL over many years could experience problems with their stomach or intestines.
Endrin (ppb)	.002	1000	2	2	Residue of banned insecticide.	Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems.

Epichlorohydrin	TT	N/A	TT	0	Discharge from industrial chemical factories; An impurity of some water treatment chemicals.	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.
Ethylene dibromide (ppt)	.00005	1,000,000	50	0	Discharge from petroleum refineries.	Some people who drink water containing ethylene dibromide in excess of the MCL over many years could experience problems with their liver, stomach, reproductive systems, or kidneys, and may have an increased risk of getting cancer.
Glyphosate (ppb)	.7	1000	700	700	Runoff from herbicide use.	Some people who drink water containing glyphosate in excess of the MCL over many years could experience problems with their kidneys or reproductive difficulties.
Heptachlor (ppt)	.0004	1,000,000	400	0	Residue of banned pesticide.	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.
Heptachlor epoxide (ppt)	.0002	1,000,000	200	0	Breakdown of heptachlor.	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.
Hexachlorobenzene (ppb)	.001	1000	1	0	Discharge from metal refineries and agricultural chemical factories.	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.
Hexachlorocyclopentadiene (ppb)	.05	1000	50	50	Discharge from chemical factories.	Some people who drink water containing hexachlorocyclopentadiene well in excess of the MCL over many years could experience problems with their kidneys or stomach.
Lindane (ppt)	.0002	1,000,000	200	200	Runoff/leaching from insecticide used on cattle, lumber and gardens.	Some people who drink water containing lindane in excess of the MCL over many years could experience problems with their kidneys or liver.
Methoxychlor (ppb)	.04	1000	40	40	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa and livestock.	Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties.
Oxamyl [Vydate] (ppb)	.2	1000	200	200	Runoff/leaching from insecticide used on apples, potatoes and tomatoes.	Some people who drink water containing oxamyl in excess of the MCL over many years could experience slight nervous system effects.
PCBs [Polychlorinated biphenyls] (ppt)	.0005	1,000,000	500	0	Runoff from landfills; Discharge of waste chemicals.	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.
Pentachlorophenol (ppb)	.001	1000	1	0	Discharge from wood preserving factories.	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.
Picloram (ppb)	.5	1000	500	500	Herbicide runoff.	Some people who drink water containing picloram in excess of the MCL over many years could experience problems with

						their liver.
Simazine (ppb)	.004	1000	4	4	Herbicide runoff.	Some people who drink water containing simazine in excess of the MCL over many years could experience problems with their blood.
Toxaphene (ppb)	.003	1000	3	0	Runoff/leaching from insecticide used on cotton and cattle.	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:						
Benzene (ppb)	.005	1000	5	0	Discharge from factories; Leaching from gas storage tanks and landfills.	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.
Bromate (ppb)	.010	1000	10	0	By-product of drinking water chlorination.	Some people who drink water containing bromate in excess of the MCL over many years may have an increased risk of getting cancer.
Carbon tetrachloride (ppb)	.005	1000	5	0	Discharge from chemical plants and other industrial activities.	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.
Chloramines (ppm)	MRDL = 4	N/A	MRDL = 4	MRDLG = 4	Water additive used to control microbes.	Some people who drink water containing chloramines well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chloramines well in excess of the MRDL could experience stomach discomfort or anemia.
Chlorine (ppm)	MRDL = 4	N/A	MRDL = 4	MRDLG = 4	Water additive used to control microbes.	Some people who use water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach discomfort.
Chlorite (ppm)	1	N/A	1	0.8	By-product of drinking water chlorination.	Some infants and young children who drink water containing chlorite in excess of the MCL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorite in excess of the MCL. Some people may experience anemia.
Chloride dioxide (ppb)	MRDL = .8	1000	MRDL = 800	MRDLG = 800	Water additive used to control microbes.	Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia.
Chlorobenzene (ppb)	.1	1000	100	100	Discharge from chemical and agricultural chemical factories.	Some people who drink water containing chlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys.
o-Dichlorobenzene (ppb)	.6	1000	600	600	Discharge from industrial	Some people who drink water containing o-dichlorobenzene

					chemical factories.	well in excess of the MCL over many years could experience problems with their liver, kidneys, or circulatory systems.
p-Dichlorobenzene (ppb)	.075	1000	75	75	Discharge from industrial chemical factories.	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.
1,2-Dichloroethane (ppb)	.005	1000	5	0	Discharge from industrial chemical factories.	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.
1,1-Dichloroethylene (ppb)	.007	1000	7	7	Discharge from industrial chemical factories.	Some people who drink water containing 1,1-dichloroethylene in excess of the MCL over many years could experience problems with their liver.
cis-1,2-dichloroethylene (ppb)	.07	1000	70	70	Discharge from industrial chemical factories.	Some people who drink water containing cis-1,2-dichloroethylene in excess of the MCL over many years could experience problems with their liver.
Trans-1,2-Dichloroethylene (ppb)	.1	1000	100	100	Discharge from industrial chemical factories.	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.
Dichloromethane (ppb)	.005	1000	5	0	Discharge from pharmaceutical and chemical factories.	Some people who drink water containing dichlorormethane in excess of the MCL over many years could have liver problems and may have an increased risk of getting cancer.
1,2-dichloropropane (ppb)	.005	1000	5	0	Discharge from industrial chemical factories.	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.
Ethylbenzene (ppb)	.7	1000	700	700	Discharge from petroleum refineries.	Some people who drink water containing ethylbenzene well in excess of the MCL over many years could experience problems with their liver or kidneys.
Haloacetic Acids (pbb)	.060	1000	60	N/A	By-product of drinking water disinfection.	Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.
Styrene (ppb)	.1	1000	100	100	Discharge from rubber and plastic factories; Leaching from landfills.	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.
Tetrachloroethylene (ppb)	.005	1000	5	0	Discharge from factories and dry cleaners.	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.
1,2,4-Trichlorobenzene (ppb)	.07	1000	70	70	Discharge from textile-finishing factories.	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.
1,1,1-Trichloroethane (ppb)	.2	1000	200	200	Discharge from metal degreasing sites and other factories.	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.
1,1,2-Trichloroethane (ppb)	.005	1000	5	3	Discharge from industrial chemical factories.	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.
Trichloroethylene (ppb)	.005	1000	5	0	Discharge from metal degreasing sites and other factories.	Some people who drink water containing trichoroethylene in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.
TTHMs [Total trihalomethanes] (ppb)	0.10/0.80	1000	100/80	N/A	By-product of drinking water chlorination.	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.
Toluene (ppm)	1	N/A	1	1	Discharge from petroleum factories.	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.
Vinyl Chloride (ppb)	.002	1000	2	0	Leaching from PVC piping; Discharge from plastics factories.	Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer.
Xylenes (ppm)	10	N/A	10	10	Discharge from petroleum factories; Discharge from chemical factories.	Some people who drink water containing xylenes in excess of the MCL over many years could experience damages to their nervous system.

[1] These arsenic values are effective January 23, 2006. Until then, the MCL is 0.05 mg/L and there is no MCLG.

Key:

AL =	Action Level
MCL =	Maximum Contaminant Level
MCLG =	Maximum Contaminant Level Goal
MFL =	million fibers per liter
MRDL =	Maximum Residual Disinfectant Level
MRDLG =	Maximum Residual Disinfectant Level Goal
mrem/year =	millirems per year (a measure of radiation absorbed by the body)
N/A =	Not Applicable
NTU =	Nephelometric Turbidity Units (a measure of water clarity)
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 (µg/l)
ppt =	parts per trillion, or nanograms per liter
ppq =	parts per quadrillion, or picograms per liter
TT =	Treatment Technique

SECTION 32. NR 809 Appendix A to subchapter X is repealed and recreated to read:

Appendix A to Subchapter X
NPDWR Violations And Other Situations Requiring Public Notice[1]

Contaminant	MCL/MRDL/TT violations[2]		Monitoring & testing procedure violations	
	Tier of public notice required	Citation	Tier of public notice required	Citation
I. Violations of National Primary Drinking Water Regulations:[3]				
A. Microbiological Contaminants				
1. Total coliform	2	809.30(1)	3	809.31(1)-(4)
2. Fecal coliform/E. coli	1	809.30(2)	[4]1, 3	809.31(4)
3. Turbidity (for TT violations resulting from a single exceedance of maximum allowable turbidity level)	[6]2, 1	809.755(1)(b), 809.755(3)(b)1., 809.76(1)(b), 809.76(3)(b), 809.76(4)(b), 809.76(5), 809.76(1)(b), 809.76(5)	3	809.78(2)(a), 809.78(1)(b), 809.76
6. Surface Water Treatement Rule violations, other than violations resulting from single exceedance of max. allowable turbidity level (TT)	2	809.75 – 809.77	3	809.78
7. Interim Enhanced Surface Water Treatment Rule violations, other than violations resulting from single exceedance of max. turbidity level (TT)	2	NR 809 subch. V	3	809.77, 809.76
B. Inorganic Chemicals (IOCs)				
1. Antimony	2	809.11(2)	3	809.12(intro.), 809.12(3)
2. Arsenic	2	809.11(2)	3	809.12(intro.), 809.12(3)
3. Asbestos (fibers >10 µm)	2	809.11(2)	3	809.12(intro.), 809.12(3)
4. Barium	2	809.11(2)	3	809.12(intro.), 809.12(3)
5. Beryllium	2	809.11(2)	3	809.12(intro.), 809.12(3)
6. Cadmium	2	809.11(2)	3	809.12(intro.), 809.12(3)
7. Chromium (total)	2	809.11(2)	3	809.12(intro.), 809.12(3)
8. Cyanide	2	809.11(2)	3	809.12(intro.), 809.12(3)
9. Fluoride	2	809.11(2)	3	809.12(intro.), 809.12(3)
10. Mercury (inorganic)	2	809.11(2)	3	809.12(intro.), 809.12(3)
11. Nitrate	1	809.11(2)	[8]1, 3	809.12(intro.), 809.12(4), 809.12(6)(b)
12. Nitrite	1	809.11(2)	[8]1, 3	809.12(intro.), 809.12(5), 809.12(6)(b)
13. Total Nitrate and Nitrite	1	809.11(2)	3	809.12(intro.)
14. Selenium	2	809.11(2)	3	809.12(intro.), 809.12(3)
15. Thallium	2	809.11(2)	3	809.12(intro.), 809.12(3)
C. Lead and Copper Rule (Action Level for lead is 0.015 mg/L, copper is 1.3 mg/L)				
1. Lead and Copper Rule (TT)	2	809.541 – 809.55	3	809.541-809.55
D. Synthetic Organic Chemicals (SOCs)				
1. 2,4-D	2	809.20(1)	3	809.21(1)
2. 2,4,5-TP (Silvex)	2	809.20(1)	3	809.21(1)

3. Alachlor	2	809.20(1)	3	809.21(1)
4. Atrazine	2	809.20(1)	3	809.21(1)
5. Benzo(a)pyrene (PAHs)	2	809.20(1)	3	809.21(1)
6. Carbofuran	2	809.20(1)	3	809.21(1)
7. Chlordane	2	809.20(1)	3	809.21(1)
8. Dalapon	2	809.20(1)	3	809.21(1)
9. Di (2-ethylhexyl) adipate	2	809.20(1)	3	809.21(1)
10. Di (2-ethylhexyl) phthalate	2	809.20(1)	3	809.21(1)
11. Dibromochloropropane	2	809.20(1)	3	809.21(1)
12. Dinoseb	2	809.20(1)	3	809.21(1)
13. Dioxin (2, 3, 7, 8-TCDD)	2	809.20(1)	3	809.21(1)
14. Diquat	2	809.20(1)	3	809.21(1)
15. Endothall	2	809.20(1)	3	809.21(1)
16. Endrin	2	809.20(1)	3	809.21(1)
17. Ethylene dibromide	2	809.20(1)	3	809.21(1)
18. Glyphosate	2	809.20(1)	3	809.21(1)
19. Heptachlor	2	809.20(1)	3	809.21(1)
20. Heptachlor epoxide	2	809.20(1)	3	809.21(1)
21. Hexachlorobenzene	2	809.20(1)	3	809.21(1)
22. Hexachlorocyclo-pentadiene	2	809.20(1)	3	809.21(1)
23. Lindane	2	809.20(1)	3	809.21(1)
24. Methoxychlor	2	809.20(1)	3	809.21(1)
25. Oxamyl (Vydate)	2	809.20(1)	3	809.21(1)
26. Pentachlorophenol	2	809.20(1)	3	809.21(1)
27. Picloram	2	809.20(1)	3	809.21(1)
28. Polychlorinated biphenyls	2	809.20(1)	3	809.21(1)
29. Simazine	2	809.20(1)	3	809.21(1)
30. Toxaphene	2	809.20(1)	3	809.21(1)
E. Volatile Organic Chemicals (VOCs)				
1. Benzene	2	809.24(1)	3	809.25(1)
2. Carbon tetrachloride	2	809.24(1)	3	809.25(1)
3. Chlorobenzene (monochlorobenzene)	2	809.24(1)	3	809.25(1)
4. o-Dichlorobenzene	2	809.24(1)	3	809.25(1)
5. p-Dichlorobenzene	2	809.24(1)	3	809.25(1)
6. 1,2-Dichloroethane	2	809.24(1)	3	809.25(1)
7. 1,1-Dichloroethylene	2	809.24(1)	3	809.25(1)
8. cis-1,2-Dichloroethylene	2	809.24(1)	3	809.25(1)
9. trans-1,2-Dichloroethylene	2	809.24(1)	3	809.25(1)
10. Dichloromethan	2	809.24(1)	3	809.25(1)
11. 1,2-Dichloropropane	2	809.24(1)	3	809.25(1)
12. Ethylbenzene	2	809.24(1)	3	809.25(1)
13. Styrene	2	809.24(1)	3	809.25(1)
14. Tetrachloroethylene	2	809.24(1)	3	809.25(1)
15. Toluene	2	809.24(1)	3	809.25(1)
16. 1,2,4-Trichlorobenzene	2	809.24(1)	3	809.25(1)
17. 1,1,1-Trichloroethane	2	809.24(1)	3	809.25(1)
18. 1,1,2-Trichloroethane	2	809.24(1)	3	809.25(1)
19. Trichloroethylene	2	809.24(1)	3	809.25(1)
20. Vinyl chloride	2	809.24(1)	3	809.25(1)
21. Xylenes (total)	2	809.24(1)	3	809.25(1)
F. Radioactive Contaminants				
1. Beta/photon emitters	2	809.51	3	809.52(1), 809.53(2)
2. Alpha emitters	2	809.50(2)	3	809.52(1), 809.53(1)
3. Combined radium (226 & 228)	2	809.50(1)	3	809.52(1), 809.53(1)
G. Disinfection Byproducts (DBPs), Byproduct Precursors, Disinfectant Residuals. Where disinfection is used in the treatment of drinking water, disinfectants combine with organic and inorganic matter present in water to form chemicals called disinfection byproducts. EPA sets standards for controlling the levels of disinfectants and disinfection byproducts in drinking water, including trihalomethanes and haloacetic acids. [9]				
1. Total trihalomethanes	2	809.22, 809.561(1)	3	809.25, 809.565(1)-(4)

2. Haloacetic Acids	2	809.561(1)	3	809.565(1)-(4)
3. Bromate	2	809.561(1)	3	809.565(1)-(4)
4. Chlorite	2	809.561(1)	3	809.565(1)-(4)
5. Chlorine (MRDL)	2	809.561(2)	3	809.565(1), (5)
6. Chloramine (MRDL)	2	809.561(2)	3	809.565(1), (5)
7. Chlorine dioxide (MRDL), where any 2 consecutive daily samples at entrance to distribution system only are above MRDL	2	809.561(2), 809.566(d)	[11]2, 3	809.565(1), (5), 809.566(3)(b)
8. Chlorine dioxide (MRDL), where samples in distribution system the next day are also above MRDL	[12]1	809.561(2), 809.566(d)	1	809.565(1), (5), 809.566(3)(b)
9. Control of disinfection byproducts precursors – TOC (TT)	2	809.569(1)-(2)	3	809.565(1), (6)
10. Bench marking and disinfection profiling	N/A	N/A	3	809.77
11. Development of monitoring plan	N/A	N/A	3	809.565(8)
H. Other Treatement Techniques				
1. Acrylamide (TT)	2	809.26(5)	N/A	N/A
2. Epichlorohydrin (TT)	2	809.26(5)	N/A	N/A
II. Unregulated Contaminant Monitoring:[13]				
A. Unregulated contaminants	N/A	N/A	3	809.74
B. Nickel	N/A	N/A	3	809.12(4)(c), 809.735(1) Table A
III. Public Notification for Conditional Waivers and Variances				
A. Operation under a conditional waiver or variance	3	809.90, 809.91	N/A	N/A
B. Violation of a conditional waiver or variance	2	Subchapter X	N/A	N/A
IV. Other Situations Requiring Public Notification:				
A. Fluoride secondary maximum contaminant level exceedance	3	809.60	N/A	N/A
B. Exceedance of nitrate MCL for non-community systems, as allowed by the department	1	809.11(3)	N/A	N/A
C. Availability of unregulted contaminant monitoring data	3	809.26	N/A	N/A
D. Waterborne disease outbreak	1	809.04, 809.755(3)(b)2.	N/A	N/A
E. Other waterborne emergency[14]	1	N/A	N/A	N/A
F. Other situations as determined by the department	[15]1, 2, 3	N/A	N/A	N/A

[1] Violations and other situations not listed in this table, e.g., reporting violations and failure to prepare Consumer Confidence Reports, do not require notice, unless otherwise determined by the department. Departments may, at their option, also require a more stringent public notice tier, e.g., Tier 1 instead of Tier 2 or Tier 2 instead of Tier 3, for specific violations and situations listed in this Appendix, as authorized under s. NR 809.951(1) and (2).

[2] MCL--Maximum contaminant level, MRDL—Maximum residual disinfectant level, TT—Treatment technique.

[3] The term Violations of National Primary Drinking Water Regulations is used here to include violations of MCL, MRDL, TT, monitoring and testing procedure requirements.

[4] Failure to test for fecal coiform or E. coli is a Tier 1 violation if testing is not done after any repeat sample tests positive for coliform. All other total coliform monitoring and testing procedure violations are Tier 3.

[5] Systems that violate the turbidity MCL of 5 NTU based on an average of measurements over 2 consecutive days shall consult with the department within 24 hours after learning of the violation. Based on this consultation, the department may subsequently decide to elevate the violation to Tier 1. If a system is unable to make contact with the department in the 24-hour period, the violation is automatically elevated to Tier 1.

[6] Systems with treatment technique violation involving a single exceedance of a maximum turbidity limit under the Surface Water Treatment Rule or the Interim Enhanced Surface Water Treatment Rule are required to consult with the department within 24 hours after learning of the violation. Based on this consultation, the department may subsequently decide to elevate the violation to Tier 1. If a system is unable to make contact with the department in the 24-hour period, the violation is automatically elevated to Tier 1.

[7] Most of the requirements of the Interim Enhanced Surface Water Treatment Rule (63 FR 69477) become effective January 1, 2002 for systems using surface water or ground water under the direct influence of surface water serving at least 10,000 persons. However, NR 809.77 has some requirements that become effective as early as April 16, 1999. The Surface Water Treatment Rule remains in effect for systems serving at least 10,000 persons even after 2002; the Interim Enhanced Surface Water Treatment Rule adds additional requirements and does not in many cases supersede the Surface Water Treatment Rule.

[8] Failure to take a confirmation sample within 24 hours for nitrate or nitrite after an initial sample exceeds the MCL is a Tier 1 violation. Other monitoring violations for nitrate are Tier 3.

[9] Water systems using surface water or ground water under the direct influence of surface water community and non-transient non-community systems serving greater that or equal to 10,000 must comply with the new disinfection byproducts MCLs, disinfectant MRDLs, and related monitoring requirements beginning January 1, 2002. All other community and non-transient non-community systems must meet the MCLs and MRDLs beginning January 1, 2004. Water systems using surface water or ground water under the direct influence of surface water transient non-community systems serving 10,000 or more persons and using chlorine dioxide as a disinfectant or oxidant must comply with the chlorine dioxide MRDL beginning January 1, 2002. Water systems using surface water or ground water under the direct influence of surface

water transient non-community systems serving fewer than 10,000 persons and using only ground water not under the direct influence of surface water and using chlorine dioxide as a disinfectant or oxidant must comply with the chlorine dioxide MRDL beginning January 1, 2004.

[10] NR 809.22 will no longer apply after January 1, 2004.

[11] Failure to monitor for chlorine dioxide at the entrance to the distribution system the day after exceeding the MRDL at the entrance to the distribution system is a Tier 2 violation.

[12] If any daily sample taken at the entrance to the distribution system exceeds the MRDL for chlorine dioxide and one or more samples taken in the distribution system the next day exceed the MRDL, Tier 1 notification is required. Failure to take the required samples in the distribution system after the MRDL is exceeded at the entry point also triggers Tier 1 notification.

[13] Some water systems must monitor for certain unregulated contaminants listed in NR 809.26.

[14] Other waterborne emergencies require a Tier 1 public notice under §141.202(a) for situations that do not meet the definition of a waterborne disease outbreak given in 40 CFR 141.2 but that still have the potential to have serious adverse effects on health as a result of short-term exposure. These could include outbreaks not related to treatment deficiencies, as well as situations that have the potential to cause outbreaks, such as failure or significant interruption in water treatment processes, natural disasters that disrupt the water supply, chemical spills, or unexpected loading of possible pathogens into the source water.

[15] The department may place other situations in any tier they believe appropriate, based on threat to public safety.

SECTION 33. NR 809 Appendix B to subchapter X is repealed and recreated to read:

Appendix B to Subchapter X
Standard Health Effects Language for Public Notification

Contaminant	MCGL[1] mg/L	MCL[2] mg/L	Standard health effects language for public notification
National Primary Drinking Water Regulations:			
A. Microbiologocial Contaminants:			
1a. Total coliform	Zero	See footnote[3]	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.
1b. Fecal coliform/E. coli	Zero	Zero	Fecal coliforms and E. coli are bacteria whose presence indicate that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.
2a. Turbidity (MCL)[4]	None	1 NTU[5]/5 NTU	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.
2b. Turbidity (SWTR TT)[6]	None	TT[7]	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.
2c. Turbidity (IESWTR TT)[8]	None	TT	Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches.
B. Surface Water Treatment Rule and Interim Enhanced Surface Water Treatment Rule violations:			

3. Giardia lamblia	Zero	TT[9]	Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.
4. Viruses			
5. Heterotrophic plate count bacteria[10]			
6. Legionella			
7. Cryptosporidium			
C. Inorganic Chemicals:			
8. Antimony	0.006	0.006	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.
9. Arsenic	0[11]	0.010[11]	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.
10. Asbestos (10 μm)	7 MFL[11]	7 MFL	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.
11. Barium	2	2	Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.
12. Beryllium	0.004	0.004	Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions.
13. Cadmium	0.005	0.005	Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage.
14. Chromium (total)	0.1	0.1	Some people who use water containing chromium well in excess of the MCL over many years could experience allergic dermatitis.
15. Cyanide	0.2	0.2	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	4.0	4.0	Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Fluoride in drinking water at half the MCL or more may cause mottling of children's teeth, usually in children less than 9 years old. Mottling, also known as dental fluorosis, may include brown staining and/or pitting of the teeth, and occurs only in developing teeth before they erupt from the gums.
17. Mercury (inorganic)	0.002	0.002	Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage.
18. Nitrate	10	10	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.

19. Nitrite	1	1	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.
20. Total Nitrate and Nitrite	10	10	Infants below the age of 6 months who drink water containing nitrate and nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
21. Selenium	0.05	0.05	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	0.0005	0.002	Some people who drink water containing thallium in excess of the MCL over many years could experience hair loss, changes in their blood, or problems with their kidneys, intestines, or liver.
D. Lead and Copper Rule:			
23. Lead	Zero	TT[12]	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.
24. Copper	1.3	TT13	Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor.
E. Synthetic Organic Chemicals:			
25. 2,4-D	0.07	0.07	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.
26. 2,4,5-TP (Silvex)	0.05	0.05	Some people who drink water containing silvex in excess of the MCL over many years could experience liver problems.
27. Alachlor	Zero	0.002	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.
28. Atrazine	0.003	0.003	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.
29. Benzo(a)pyrene (PAHs)	Zero	0.0002	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.

30. Carbofuran	0.04	0.04	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.
31. Chlordane	Zero	0.002	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.
32. Dalapon	0.2	0.2	Some people who drink water containing dalapon well in excess of the MCL over many years could experience minor kidney changes.
33. Di (2-ethylhexyl) adipate	0.4	0.4	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.
34. Di (2-ethylhexyl) phthalate	Zero	0.006	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.
35. Dibromochloropropane	Zero	0.0002	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.
36. Dinoseb	0.007	0.007	Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties.
37. Dioxin (2,3,7,8-TCDD)	Zero	$3x10^{-8}$	Some people who drink water containing dioxin in excess of the MCL over many years could experience reproductive difficulties and many have an increased risk of getting cancer.
38. Diquat	0.02	0.02	Some people who drink water containing diquat in excess of the MCL over many years could get cataracts.
39. Endothall	0.1	0.1	Some people who drink water containing endothall in excess of the MCL over many years could experience problems with their stomach or intestine.
40. Endrin	0.002	0.002	Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems.
41. Ethylene dibromide	Zero	0.00005	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	0.7	0.7	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	Zero	0.0004	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	Zero	0.0002	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	Zero	0.001	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. Hexachlorocyclo-pentadiene	0.05	0.05	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	0.0002	0.0002	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	0.04	0.04	Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties.
49. Oxamyl (Vydate)	0.2	0.2	Some people who drink water containing oxamyl in excess of the MCL over many years could experience slight nervous system effects.
50. Pentachlorophenol	Zero	0.001	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.
51. Picloram	0.5	0.5	Some people who drink water containing picloram in excess of the MCL over many years could experience problems with their liver.
52. Polychlorinated biphenyls	Zero	0.0005	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.
53. Simazine	0.004	0.004	Some people who drink water containing simazine in excess of the MCL over many years could experience problems with their blood.
54. Toxaphene	Zero	0.003	Some people who drink water containing toxaphene in excess of the MCL over many years could have problems with their kidneys, liver, or thyroid, and may have an increased risk of getting cancer.
F. Volatile Organic Chemicals:			
55. Benzene	Zero	0.005	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	Zero	0.005	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 (monochlorobenzene)	0.1	0.1	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	0.6	0.6	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	0.075	0.075	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	Zero	0.005	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	0.007	0.007	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	0.07	0.07	Some people who drink water containing cis-1,2-dichloroethylene in excess of the MCL over many years could experience problems with their liver.
63. *trans*-1,2-Dichloroethylene	0.1	0.1	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	Zero	0.005	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	Zero	0.005	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	0.7	0.7	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	0.1	0.1	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	Zero	0.005	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. Toluene	1	1	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.
70. 1,2,4-Trichlorobenzene	0.07	0.07	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.
71. 1,1,1-Trichloroethane	0.2	0.2	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.
72. 1,1,2-Trichloroethane	0.003	0.005	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.
73. Trichloroethylene	Zero	0.005	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.

74. Vinyl chloride	Zero	0.002	Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer.
75. Xylenes (total)	10	10	Some people who drink water containing xylenes in excess of the MCL over many years could experience damage to their nervous system.
G. Radioactive Contaminants:			
76. Beta/photon emitters	Zero	4 mrem/yr[14]	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.
77. Alpha emitters	Zero	15 pCi/L[15]	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 getting cancer.
78. Combined radium (226 & 228)	Zero	5 pCi/L	Some people who drink water containing radium 226 and 228 in excess of the MCL over many years may have an increased risk of getting cancer.
H. Disinfection Byproducts, Byproduct Precursors, and Disinfectant Residuals: Where disinfection is used in the treatment of drinking water, disinfectants combine with organic and inorganic matter present in water to form chemicals called disinfection byproducts. EPA sets standards for controlling the levels of disinfectants and DBPs in drinking water, including trihalomethanes and haloacetic acids:[16]			
79. Total trihalomethanes	N/A	0.10/ 0.80[17] [18]	Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer.
80. Haloacetic Acids	N/A	0.060[19]	Some people who drink water containing haloacetic acids in excess of the MCL over many years may have increased risk of getting cancer.
81. Bromate	Zero	0.010	Some people who drink water containing bromate in excess of the MCL over many years may have an increased risk of getting cancer.
82. Chlorite	0.08	1.0	Some infants and young children who drink water containing chlorite in excess of the MCL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorite in excess of the MCL. Some people may experience anemia.
83. Chlorine	4 (MRDLG)[20]	4.0 (MRDL)[21]	Some people who use water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach discomfort.
84. Chloramines	4 (MRDLG)	4.0 (MRDL)	Some people who use water containing chloramines well in excess of the MRDL could experience irritating

			effects to their eyes and nose. Some people who drink water containing chloramines well in excess of the MRDL could experience stomach discomfort or anemia.
85a. Chlorine dioxide, where any 2 consecutive daily samples taken at the entrance to the distribution system are above the MRDL.	0.8 (MRDLG)	0.8 (MRDL)	Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia.
85b. Chlorine dioxide, where one or more distribution system samples are above the MRDL.	0.8 (MRDLG)	0.8 (MRDL)	Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia. *Add for public notification only:* The chlorine dioxide violations reported today include exceedances of the EPA standard within the distribution system which delivers water to consumers. Violations of the chlorine dioxide standard within the distribution system may harm human health based on short-term exposures. Certain groups, including fetuses, infants, and young children, may be especially susceptible to nervous system effects from excessive chlorine dioxide exposure.
86. Control of DBP precursors (TOC)	None	TT	Total organic carbon (TOC) has no health effects. However, total organic carbon provides a medium for the formation of disinfection byproducts. These byproducts include trihalomethanes and haloacetic acids. Drinking water containing these byproducts in excess of the MCL may lead to adverse health effects, liver or kidney problems, or nervous system effects, and may lead to an increased risk of getting cancer.
I. Other Treatment Techniques:			
87. Acrylamide	Zero	TT	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.
88. Epichlorohydrin	Zero	TT	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.

[1] MCLG--Maximum contaminant level goal.

[2] MCL--Maximum contaminant level.

[3] For water systems analyzing at least 40 samples per month, no more than 5.0 percent of the monthly samples may be positive for total coliforms. For systems analyzing fewer than 40 samples per month, no more than one sample per month may be positive for total coliforms.

[4] There are various regulations that set turbidity standards for different types of systems, including 40 CFR 141.13, the 1989 Surface Water Treatment Rule, and the 1998 Interim Enhanced Surface Water Treatment Rule. The MCL for the monthly turbidity average is 1 NTU; the MCL for the 2-day average is 5 NTU for systems that are required to filter but have not yet installed filtration (40 CFR 141.13).

[5] NTU--Nephelometric turbidity unit.

[6] There are various regulations that set turbidity standards for different types of systems, including 40 CFR 141.13, the 1989 Surface Water Treatment Rule, and the 1998 Interim Enhanced Surface Water Treatment Rule. Systems subject to the Surface Water Treatment Rule (both filtered and unfiltered) may not exceed 5 NTU. In addition, in filtered systems, 95 percent of samples each month shall not exceed 0.5 NTU in systems using conventional or direct filtration and shall not exceed 1 NTU in systems using slow sand or diatomaceous earth filtration or other filtration technologies approved by the department.

[7] TT--Treatment technique.

[8] There are various regulations that set turbidity standards for different types of systems, including 40 CFR 141.13, the 1989 Surface Water Treatment Rule, and the 1998 Interim Enhanced Surface Water Treatment Rule. For systems subject to the interim enhanced surface water treatment rule (systems serving at least 10,000 people, using surface water or ground water under the direct influence of surface water), that use conventional filtration or direct filtration, after January 1, 2002, the turbidity level of a system's combined filter effluent may not exceed 0.3 NTU in at least 95 percent of monthly measurements, and the turbidity level of a system's combined filter effluent shall not exceed 1 NTU at any time. Systems subject to the interim enhanced surface water treatment rule using technologies other than conventional, direct, slow sand, or diatomaceous earth filtration shall meet turbidity limits set by the department.

[9] Surface water treatment rule and interim enhanced surface water treatment rule treatment technique violations that involve turbidity exceedances may use the health effects language for turbidity instead.

[10] The bacteria detected by heterotrophic plate count are not necessarily harmful. HPC is simply an alternative method of determining disinfectant residual levels. The number of bacteria is an indicator of whether there is enough disinfectant in the distribution system.

[11] These arsenic values are effective January 23, 2006. Until then, the MCL is 0.05 mg/L and there is no MCLG.

[12] Million fibers per liter.

[13] Action Level = 0.015 mg/L.

[14] Action Level = 1.3 mg/L.

[15] Millirems per year.

[16] Picocuries per liter.

[17] Surface water systems and ground water systems under the direct influence of surface water are regulated under Subpart H of 40 CFR 141. Community and non-transient non-community systems using ground water under the direct influence of surface water serving 10,000 or more shall comply with DBP MCLs and disinfectant maximum residual disinfectant levels beginning January 1, 2002. All other community and non-transient non-community systems shall meet the MCLs and MRDLs beginning January 1, 2004. Transient non-community systems using ground water under the direct influence of surface water serving 10,000 or more persons and using chlorine dioxide as a disinfectant or oxidant shall comply with the chlorine dioxide MRDL beginning January 1, 2002. Transient non-community systems using ground water under the direct influence of surface water serving fewer than 10,000 persons and systems using only ground water not under the direct influence of surface water and using chlorine dioxide as a disinfectant or oxidant shall comply with the chlorine dioxide MRDL beginning January 1, 2004.

[18] The MCL of 0.10 mg/l for total trihalomethanes is in effect until January 1, 2002 for community water systems using ground water under the direct influence of surface water serving 10,000 or more. This MCL is in effect until January 1, 2004 for community water systems with a population of 10,000 or more using only ground water not under the direct influence of surface water. After these deadlines, the MCL will be 0.080 mg/l. On January 1, 2004, all systems serving less than 10,000 will have to comply with the new MCL as well.

[19] The MCL for total trihalomethanes is the sum of the concentrations of the individual trihalomethanes.

[20] The MCL for haloacetic acids is the sum of the concentrations of the individual haloacetic acids.

[21] MRDLG--Maximum residual disinfectant level goal.

[22] MRDL--Maximum residual disinfectant level.

SECTION 34. Terminology changes. ss. NR 809.833(3)(c)9. and (e), (5)(c) and (d), and NR 809.835(5) by revising "Appendix A to subch. VIII" to read "Appendix A to this subchapter".

SECTION 35. EFFECTIVE DATE. This rule shall take effect the first day of the month following publication in the Wisconsin administrative register as provided in s. 227.22(2)(intro.), Stats.

SECTION 36. BOARD ADOPTION. This rule was approved and adopted by the State of Wisconsin Natural Resources Board on October 22, 2003.

Dated at Madison, Wisconsin _____.

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

By _____
Scott Hassett, Secretary

(SEAL)