



Delaware Health and Social Services



**State of Delaware Regulations Governing Public Drinking
Water Systems**

Regulations adopted May 14, 1971, by the State Board of Health in conformance with Title 16 Section 122(3)(c), Delaware Code, Revised September 27, 1977, May 5, 1982, May 19, 1989, March 31, 1991, December 10, 1993, April 11, 1999, August 11, 1999, September 10, 2001, May 10, 2002, _____, 2003

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SECTION 22.1 DEFINITIONS

22.10 The following definitions shall apply to these regulations:

1. "**Action Level**" means the concentration of lead or copper in water specified in Section 22.607(A)(1) a & b which determines, in some cases, the treatment requirements contained in Section 22.607 that a water system is required to complete.
2. "**Alpha Particle**" means a particle identical with a helium nucleus, emitted from the nucleus of a radioactive element.
3. "**Approved**" means approved by the Division.
4. "**Best Available Technology (BAT)**" means the best technology, treatment techniques, or other means which the Division finds, after examination for efficacy under field conditions and not solely under laboratory conditions, are available (taking cost into consideration). For the purposes of setting maximum contaminant levels for synthetic organic chemicals, any BAT must be at least as effective as granular activated carbon.
5. "**Beta Particle**" means a particle identical with an electron, emitted from the nucleus of a radioactive element.
6. "**Capacity**" means the overall capability of a water system to reliably produce and deliver water meeting all national primary drinking water regulations. Capacity encompasses the technical, managerial, and financial capabilities that will enable a water system to plan for, achieve, and maintain compliance with applicable drinking water standards.

Technical Capacity refers to the physical infrastructure of the water system, including but not limited to, the adequacy of the source water, infrastructure (source, treatment, storage, and distribution), and the ability of system personnel to implement the requisite technical knowledge.

Managerial Capacity refers to the management structure of the water system, including but not limited to ownership accountability, staffing and organization, and effective linkages.

Financial Capacity refers to the financial resources of the water system, including but not limited to revenue sufficiency and fiscal controls.
7. "**Coagulation**" means a process using coagulant chemicals and mixing by which colloidal and suspended materials are de-stabilized and agglomerated into flocs.
8. "**Coliform Group**" means all organisms considered in the coliform group as set forth in the current edition of Standard Methods for the Examination of Water and Waste Water prepared and published jointly by the American Public Health Association, American Water Works Association and Water Pollution Control Federation.
9. "**Compliance Cycle**" means the nine-year calendar year cycle during which public water systems must monitor. Each compliance cycle consists of three three-year compliance periods. The first calendar year cycle begins January 1, 1993 and ends December 31,

2001; the second begins January 1, 2002 and ends December 31, 2010, the third begins January 1, 2011 and ends December 31, 2019.

10. **"Compliance Period"** means a three-year calendar year period within a compliance cycle. Each compliance cycle has three three-year compliance periods. Within the first compliance cycle, the first compliance period runs from January 1, 1993 to December 31, 1995; the second from January 1, 1996 to December 31, 1998, and the third from January 1, 1999 to December 31, 2001.
11. **"Comprehensive Performance Evaluation (CPE)"** means a thorough review and analysis of a treatment plant's performance-based capabilities and associated administrative, operation and maintenance practices. It is conducted to identify factors that may be adversely impacting a plant's capability to achieve compliance and emphasizes approaches that can be implemented without significant capital improvements. The comprehensive performance evaluation must consist of at least the following components: Assessment of plant performance; evaluation of major unit processes; identification and prioritization of performance limiting factors; assessment of the applicability of comprehensive technical assistance; and preparation of a CPE report.
12. **"Confluent Growth"** means a continuous bacterial growth covering the entire filtration area of a membrane filter, or a portion thereof, in which bacterial colonies are not discrete.
13. **"Consecutive Water Supply"** means a public water system that obtains all of its water from, but is not owned or operated by, a public water system to which such Regulations apply and alters the purchased water by some type of treatment, resells the purchased water to its customer, or furnishes water to an interstate carrier. The Division may opt to accept a consecutive supply as a single system for monitoring purposes.
14. **"Contaminant"** means any physical, chemical, biological or radiological substance or matter in water.
15. **"Conventional Filtration Treatment"** means a series of processes including coagulation, flocculation, sedimentation and filtration resulting in substantial particulate removal.
16. **"Corrosion Inhibitor"** means a substance capable of reducing the corrosivity of water toward metal plumbing materials, especially lead and copper, by forming a protective film on the interior surface of those materials.
17. **"CT or CTcalc"** means the product of the residual disinfectant concentration (C) (22.161) in milligrams per liter (mg/L) determined before or at the first customer, and the corresponding disinfectant contact time (T) (22.120) in minutes, i.e. "C" X "T". If a public water system applies disinfectants at more than one (1) point prior to the first customer, it must determine the CT of each disinfectant sequence before or at the first customer to determine the total percent inactivation or total inactivation ratio. In determining the total inactivation ratio, the public water system must determine the residual disinfectant concentration of each disinfection sequence and corresponding contact time before any subsequent disinfection application point(s). CT_{99.9} is the CT

value required for 99.9 percent (3-log) inactivation of Giardia lamblia cysts. The inactivation ratio is the CT_{calc} divided by the CT_{99.9} and the total inactivation ratio is the sum of the inactivation ratios for each disinfection sequence. A total inactivation ratio equal to or greater than 1.0 is assumed to provide a 3-log inactivation of Giardia lamblia cysts.

18. "**Diatomaceous Earth Filtration**" means a process resulting in substantial particulate removal in which a precoat cake of diatomaceous earth filter media is deposited on a support membrane (septum), and while the water is filtered by passing through the cake on the septum, additional filter media known as body feed is continuously added to the feed water to maintain the permeability of the filter cake.
19. "**Direct Filtration**" means a series of processes including coagulation and filtration but excluding sedimentation resulting in substantial particulate removal.
20. "**Direct Responsible Charge**" means accountability for and performance of active, daily, on-site operational duties.
21. "**Disinfectant**" means any oxidant, including but not limited to chlorine, chlorine dioxide, chloramines, and ozone added to water in any part of the treatment or distribution process, that is intended to kill or inactivate pathogens (disease causing organisms).
22. "**Disinfectant Contact Time (T)**" means the time in minutes that it takes for water to move from the point of disinfectant application or the previous point of disinfectant residual measurement to a point before or at the point where residual disinfectant concentration (C) is measured. Where only one (1) "C" is measured, "T" is the time in minutes that it takes for water to move from the point of disinfectant application to a point before or at where residual disinfectant concentration (C) is measured. Where more than one (1) "C" is measured, "T" is for the first measurement of "C", the time in minutes that it takes for water to move from the first or only point of disinfectant application to a point before or at the point where the first "C" is measured and for subsequent measurements of "C", the time in minutes that it takes for water to move from the previous "C" measurement point to the "C" measurement point for which the particular "T" is being calculated. Disinfectant contact time in pipelines must be calculated based on plug flow by dividing the internal volume of the pipe by the maximum hourly flow rate through that pipe. Disinfectant contact time within mixing basins and storage reservoirs must be determined by tracer studies or an equivalent demonstration.
23. "**Disinfection**" means a process which inactivates pathogenic organisms in water by chemical oxidants or equivalent agents.
24. "**Disinfection Profile**" means a summary of daily *Giardia lamblia* inactivation through the treatment plant. The procedure for developing a disinfection profile is contained in Sec. 22.1008.
25. "**Division**" means the Division of Public Health of the Department of Health and Social Services established by Title 29, Section 7904 (a), Delaware Code.

26. **"Domestic or Other Non-Distribution System Plumbing Problem"** means a coliform contamination problem in a public water system with more than one (1) service connection that is limited to the specific service connection from which the coliform positive sample was taken.
27. **"Dose Equivalent"** means the product of the absorbed dose from ionizing radiation and such factors as account for differences and biological effectiveness due to the type of radiation and its distribution in the body as specified by the International Commission on Radiological Units and Measurements.
28. **"Dwelling Unit"** means one or more rooms arranged for the use of one or more individuals as a single housekeeping unit with cooking, living, sanitary and sleeping facilities.
29. **"Effective Corrosion Inhibitor Residual"** means a concentration sufficient to form a passivating film on the interior walls of a pipe.
30. **"Emergency Situation"** means a condition in which the specific provisions of these Regulations cannot be met for a temporary period and which necessitates immediate action because of the potential danger to public health.
31. **"Enhanced Coagulation"** means the addition of sufficient coagulant for improved removal of disinfection byproduct precursors by conventional filtration treatment.
32. **"Enhanced Softening"** means the improved removal of disinfection byproduct precursors by precipitative softening.
33. **"Exemption"** means an allowance to deviate from or to exceed a maximum contaminant level requirement or treatment technique requirement for a specific period of time (see Section 22.203). In order for a system to qualify for an exemption, the system must be in operation on the date of adoption of any maximum contaminant level or treatment technique requirement.
34. **"Filter Profile"** means a graphical representation of individual filter performance, based on continuous turbidity measurements or total particle counts versus time for an entire filter run, from startup to backwash inclusively, that includes an assessment of filter performance while another filter is being backwashed.
35. **"Filtration"** means a process for removing particulate matter from water by passage through porous media.
36. **"First Draw Sample"** means a one (1) liter sample of tap water, collected in accordance with Section 22.607G2b, that has been standing in plumbing pipes at least six (6) hours and is collected without flushing the tap.
37. **"Flocculation"** means a process to enhance agglomeration or collection of smaller floc particles into larger, more easily settleable particles through gentle stirring by hydraulic or mechanical means.

38. "**GAC10**" means granular activated carbon filter beds with an empty-bed contact time of 10 minutes based on average daily flow and a carbon reactivation frequency of every 180 days.
39. "**Gross Alpha Particle Activity**" means the total radioactivity due to alpha particle emission as inferred from measurements on a dry sample.
40. "**Gross Beta Particle Activity**" means the total radioactivity due to beta particle emission as inferred from measurements on a dry sample.
41. "**Ground Water Under the Direct Influence of Surface Water**" means any water beneath the surface of the ground with significant occurrence of insects or other microorganisms, algae, or large diameter pathogens such as *Giardia lamblia* or (for subpart H systems serving at least 10,000 people only) *Cryptosporidium*, or significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH which closely correlate to climatological or surface water conditions. Direct influence must be determined for individual sources in accordance with criteria established by the Division. The Division determination of direct influence may be based on site-specific measurements of water quality and/or documentation of well construction characteristics and geology with field evaluation.
42. "**Haloacetic Acids (Five) (HAA5)**" mean the sum of the concentrations in milligrams per liter of the haloacetic acid compounds (monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid), rounded to two significant figures after addition.
43. "**Halogen**" means one of the chemical elements chlorine, bromine or iodine.
44. "**Health Hazard**" means any condition, device or practice in the water supply system or its operation which creates, or may create, a danger to the health and well-being of the water consumer.
45. "**Initial Compliance Period**" means the first full three-year compliance period which begins at least 18 months after promulgation, except for the following contaminants: Dichloromethane; 1,2,4-Trichlorobenzene; 1,1,2-Trichloroethane; Benzo[a]pyrene; Dalapon; Di(2-ethylhexyl adipate); Di(2-ethylhexyl) phthalate; Dinoseb; Diquat; Endothall; Endrin; Glyphosate; Hexachlorobenzene; Hexachlorocyclopentadiene; Oxamyl (Vydate); Picloram; Simazine; 2,3,7,8-TCDD (Dioxin); Antimony; Beryllium; Cyanide; Nickel; and Thallium, initial compliance period means the first full three-year compliance period after promulgation for systems with 150 or more service connections (January 1993 - December 1995) and first full three-year compliance period after the effective date of regulation (January 1996 - December 1998) for systems having fewer than 150 service connections.
46. "**Large Water System**" means a water system that serves more than 50,000 persons.

47. "**Lead Service Line**" means a service line made of lead which connects the water main to the building inlet and any lead pigtail, gooseneck or other fitting which is connected to such lead line.
48. "**Legionella**" means a genus of bacteria, some species of which have caused a type of pneumonia called Legionnaires Disease.
49. "**Man-Made Beta Particle and Photon Emitters**" means all radionuclides emitting beta particles and/or photons listed in Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air or Water for Occupational Exposure, NBS Handbook 69, except the daughter products of thorium 232, uranium 235 and uranium 238.
50. "**Maximum Contaminant Level (MCL)**" means the maximum permissible level of a contaminant in water which is delivered to any user of a public water system.
51. "**Maximum Residual Disinfectant Level (MRDL)**" means a level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap without an unacceptable possibility of adverse health effects. For chlorine and chloramines, a PWS is in compliance with the MRDL when the running annual average of monthly averages of samples taken in the distribution system, computed quarterly, is less than or equal to the MRDL. For chlorine dioxide, a PWS is in compliance with the MRDL when daily samples are taken at the entrance to the distribution system and no two consecutive daily samples exceed the MRDL. MRDLs are enforceable in the same manner as maximum contaminant levels under Section 1412 of the Safe Drinking Water Act. There is convincing evidence that addition of a disinfectant is necessary for control of waterborne microbial contaminants. Notwithstanding the MRDLs listed in 40 CFR Sec. 141.65, operators may increase residual disinfectant levels of chlorine or chloramines (but not chlorine dioxide) in the distribution system to a level and for a time necessary to protect public health to address specific microbiological contamination problems caused by circumstances such as distribution line breaks, storm runoff events, source water contamination, or cross-connections.
52. "**Maximum Residual Disinfection Level Goal (MRDLG)**" means the maximum level of a disinfectant added for water treatment at which no known or anticipated adverse effect on the health of persons would occur, and which allows an adequate margin of safety. MRDLGs are nonenforceable health goals and do not reflect the benefit of the addition of the chemical for control of waterborne microbial contaminants.
53. "**Maximum Total Trihalomethane Potential (MTP)**" means the maximum concentrations of total trihalomethanes produced in a given water containing a disinfectant residual after seven days at a temperature of 25°C or above.
54. "**Medium Size Water System**" means a water system that serves greater than 3,300 and less than or equal to 50,000 persons.

55. "**Minor Monitoring Violation**" means the failure of a public water system to collect all required water samples or the failure to follow the prescribed sampling procedure within the prescribed time frame.
56. "**Near the First Service Connection**" means at one (1) of the twenty (20) percent of all service connections in the entire system that are nearest the water supply treatment facility, as measured by water transport time within the distribution system.
57. "**Optimal Corrosion Control Treatment**" means the corrosion control treatment that minimizes the lead and copper concentrations at users' taps while insuring that the treatment does not cause the water system to violate any national primary drinking water regulations.
58. "**Person**" means any corporation, company, association, firm, municipally owned water utility, partnership, society and joint stock company, as well as any individual.
59. "**Picocurie (pCi)**" means the quantity of radioactive material producing 2.22 nuclear transformations per minute.
60. "**Point of Disinfectant Application**" means the point where the disinfectant is applied and water downstream of that point is not subject to recontamination by surface water runoff.
61. "**Point of Entry Treatment Device (POE)**" means a 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.
62. "**Point of Use Treatment Device (POU)**" means a treatment device applied to a single tap used for the purpose of reducing contaminants in the drinking water at that one (1) tap.
63. "**Pollution**" means the presence of anything in water which tends to degrade its quality so as to constitute a health hazard or impair the usefulness of the water.
64. "**Potable Water**" means water which is in compliance with all of the required drinking water standards specified in these Regulations, and is acceptable for human consumption.
65. "**Primary Maximum Contaminant Level (PMCL)**" means an MCL which involves a biological, chemical or physical characteristic of drinking water that may adversely affect the health of the consumer. This includes the MCLs for: coliform bacteria (includes total coliform and *E. coli*); antimony; arsenic; asbestos; barium; beryllium; cadmium; chromium; cyanide; fluoride; lead; mercury; nickel; nitrates; nitrites; total nitrate/nitrite selenium; thallium; turbidity; alachlor; aldicarb; aldicarb sulfone; aldicarb sulfoxide; atrazine; benzo (a) pyrene; carbofuran; chlordane; dalapon; di(2-ethylhexyl) adipate; di(2-ethylhexyl) phthalate; dibromochloropropane; dinoseb; diquat; 2,4-D; endothall; endrin; ethylenedibromide (EDB); glyphosate; heptachlor; heptachlor epoxide; hexachlorobenzene; hexachlorocyclopentadiene; lindane; methoxychlor; oxamyl (vydate); pentachlorophenol; picloram; polychlorinated biphenyls (PCBs); simazine; 2,3,7,8-TCDD

(Dioxin); toxaphene; 2,4,5-TP silvex; total trihalomethanes; benzene; carbon tetrachloride; o-dichlorobenzene; p-dichlorobenzene; 1,2-dichloroethane, 1,1-dichloroethylene; cis-1,2-dichloroethylene; trans-1,2-dichloroethylene; dichloromethane; 1,2-dichloropropane; ethylbenzene; monochlorobenzene; styrene; tetrachloroethylene; toluene; 1,2,4-trichlorobenzene; 1,1,1-trichloroethane; 1,1,2-trichloroethane; trichloroethylene; vinyl chloride; total xylenes and radioactivity (see Section 22.9).

65. **"Protection by Adequate Construction, Treatment and Supervision"** means:
- A. Works which are of adequate capacity to meet the maximum demands without creating health hazards and which are located, designed and constructed to eliminate or prevent pollution.
 - B. Any one or any combination of the controlled processes of coagulation, sedimentation, absorption, filtration, disinfection or other processes appropriate to the sources of supply, which produce a water consistently meeting the requirements of these Regulations.
 - C. Conscientious operation of a public water supply by an individual in direct responsible charge who is acceptable to the Division, and meets the certification requirements of the Division at such time as these requirements are established.
66. **"Public Water System (PWS)"** means a water supply system for the provision to the public of water for human consumption through pipes or other constructed conveyances either directly from the user's free flowing outlet or indirectly by the water being used to manufacture ice, foods and beverages or that supplies water for potable or domestic purposes for consumption in more than three dwelling units, or furnishes water for potable or domestic purposes to employees, tenants, members, guests or the public at large in commercial offices, industrial areas, multiple dwellings or semi-public buildings including, but without limitation, rooming and boarding houses, motels, tourist cabins, mobile home parks, restaurants, hospitals and other institutions, or offers any water for sale for potable domestic purposes. Public water systems are classified as follows:
- A. "Community Water System (CWS)" means a public water system which serves at least fifteen (15) service connections used by year-round residents or regularly serves at least twenty-five (25) year-round residents;
 - B. "Non-Transient Non-Community Water System (NTNCWS)" means a public water system that is not a community water system and that regularly serves at least twenty-five (25) of the same persons over six (6) months per year;
 - C. "Non-Community Water System (NCWS)" means a public water system which has at least fifteen (15) service connections or regularly serves an average of at least twenty-five (25) individuals daily at least sixty (60) days out of the year;
 - D. "Miscellaneous Public Water System (MPWS)" means a public water system that is neither community, non-community nor non-transient non-community.
67. **"Radioactivity"** means the spontaneous, uncontrollable disintegration of the nucleus of an atom with the emission of particles and rays.
68. **"Rem"** means the unit of dose equivalent from ionizing radiation to the total body or any internal organ or organ system. A millirem is one one-thousandth (1/1000) of a rem.

69. "**Repeat Compliance Period**" means any subsequent compliance period after the initial compliance period.
70. "**Residual Disinfectant Concentration (C)**" means the concentration of disinfectant measured in mg/L in a representative sample of water.
71. "**Sanitary Survey**" means a review of the water source, facilities, equipment, operation and maintenance of a public water system for the purpose of: evaluating the adequacy of such source, facilities, equipment, operation and maintenance for producing and distributing potable drinking water; or updating the inventory information. Sanitary surveys are classified as follows:
- A. Class 1 - on-site review.
 - B. Class 2 - telephone review.
72. "**Secondary Maximum Contaminant Level (SMCL)**" means an MCL which involves a biological, chemical or physical characteristic of water that may adversely affect the taste, odor, color or appearance (aesthetics), which may thereby affect public confidence or acceptance of the drinking water. This includes the MCLs for aluminum, chloride, color, copper, corrosivity, foaming agents, iron, manganese, odor, pH, silver, sulfate, total dissolved solids and zinc.
73. "**Secretary, Delaware Health and Social Services**" means the agency defined in Title 29, Section (b), Delaware Code.
74. "**Sedimentation**" means a process for removal of solids before filtration by gravity or separation.
75. "**Service Connection**" means a water line to a dwelling unit or building.
76. "**Service Line Sample**" means a one (1) liter sample of water collected in accordance with Section 22.607G2c that has been standing for at least six (6) hours in a service line.
77. "**Single Family Structure**" means a building constructed as a single family residence that is currently used as either a residence or a place of business.
78. "**Slow Sand Filtration**" means a process involving passage of raw water through a bed of sand at low velocity (generally less than 0.4 meters per hour) resulting in substantial particulate removal by physical and biological mechanisms.
79. "**Small Water System**" means a water system that served 3,300 persons or fewer.
80. "**Source**" means the place from which a system obtains its water. This may be either from underground or from the surface. Surface water may include rivers, lakes, reservoirs, springs, impoundments or a body of water with a surface exposed to the atmosphere.

81. **"Standard Sample"** means the sample size for bacteriological testing and shall consist of:
- A. For the fermentation tube test, five (5) standard portions of either twenty (20) milliliters (ml) or one hundred (100) ml.
 - B. For the membrane filter technique, not less than one hundred (100) ml.
82. **"Subpart H System"** means a public water systems using surface water or ground water under the direct influence of surface water as a source that ~~are~~ is subject to the filtration and disinfection requirements of ~~Subpart H~~ these regulations.
83. **"Supplier of Water"** means any person who owns or operates a public water system.
84. **"Surface Water"** means all water which is open to the atmosphere and subject to surface runoff.
85. **"SUVA"** means Specific Ultraviolet Absorption at 254 nanometers (nm), an indicator of the humic content of water. It is a calculated parameter obtained by dividing a sample's ultraviolet absorption at a wavelength of 254 nm (UV_{254}) (in cm^{-1}) by its concentration of dissolved organic carbon (DOC) (in mg/L).
86. **"System with a Single Service Connection"** means a system which supplies drinking water to consumers via a single service line.
87. **"Too Numerous to Count"** means that the total number of bacterial colonies exceeds two hundred (200) on a forty-seven (47) millimeter (mm) diameter membrane filter used for coliform detection.
88. **"Total Coliform-Positive Sample"** means any Presence-Absence (P-A) Coliform Test with a result of present (P), any Minimal Medium ONPG-MUG (MMO-MUG) Test with a result of P, any Membrane Filter Technique test with a result of one (1) or more colonies per one hundred (100) ml, or any Multiple Tube Fermentation test with a result of one (1) or more positive tubes.
89. **"Total Organic Carbon (TOC)"** means total organic carbon in mg/L measured using heat, oxygen, ultraviolet irradiation, chemical oxidants, or combinations of these oxidants that convert organic carbon to carbon dioxide, rounded to two significant figures.
90. **"Total Trihalomethanes (TTHMs)"** means the sum of the concentration in milligrams per liter of trihalomethane compounds [trichloromethane (chloroform), dibromochloromethane, bromodichloromethane and tribromomethane (bromoform)] rounded to two significant figures.
91. **"Treatment Technique Requirement"** means a requirement which specifies for a contaminant a specific treatment technique(s) demonstrated to the satisfaction of the Division to lead to a reduction in the level of such contamination sufficient to comply with these Regulations.

92. "**Trihalomethanes (THMs)**" means one of the family of organic compounds, named as derivatives of methane, wherein three (3) of the four (4) hydrogen atoms in methane are each substituted by a halogen atom in the molecular structure.
93. "**Turbidity**" means a measure of the clarity or cloudiness of water in Nephelometric Turbidity Units (NTUs).
94. "**Uncovered Finished Water Storage Facility**" means a tank, reservoir, or other facility used to store water that will undergo no further treatment except residual disinfection and is open to the atmosphere. Finished water storage facilities that are properly covered, screened and vented are excluded from this definition.
95. "**Variance**" means an allowance to deviate from or to exceed an MCL requirement or treatment technique requirement when necessary treatment techniques are not available (see Section 22.202).
96. "**Virus**" means a virus of fecal origin which is infectious to humans by waterborne transmission.
97. "**Vulnerable**" means subject to contamination, a determination which shall be made by the Division based on previous monitoring results, the number of persons served by the public water system, the proximity of a smaller system to a larger system, the proximity to commercial or industrial use, disposal or storage of volatile synthetic organic compounds (VOCs), and the protection of the water source(s).
98. "**Waterborne Disease Outbreak**" means the significant occurrence of an acute infectious illness epidemiologically associated with the ingestion of water from a public water system which is deficient in treatment, as determined by the Division.
99. "**Water Distribution System**" means the pumps, piping and storage facilities from the source(s)/treatment plant to the property line of the ultimate consumer.
100. "**Water Supply System**" means the structures, equipment and appurtenances for collection, treatment, storage and distribution of potable water from the source of supply to the free-flowing outlet of the ultimate consumer.

SECTION 22.2 GENERAL PROVISIONS

- 22.201 **Application:** These regulations shall apply to all public water systems in the State of Delaware.
- 22.202 **Variance:**
- A. The Secretary, Delaware Health and Social Services may grant one or more variances to any PWS from:

1. Any requirement respecting a MCL of an applicable primary or secondary drinking water requirement upon finding that:
 - a. Because of characteristics of the raw water sources which are reasonably available to the system, the system cannot meet the requirements respecting the MCLs of such drinking water regulations despite application of the best technology, treatment techniques or other means, which the Secretary, Delaware Health and Social Services finds are generally available (taking costs into consideration) and;
 - b. The granting of a variance will not result in an unreasonable risk to the health of persons served by the PWS.
 2. Any requirement of a specified treatment technique of an applicable primary or secondary drinking water requirement upon a finding that the PWS applying for the variance has demonstrated that such treatment technique is not necessary to protect the health of persons because of the nature of the raw water source of such system.
- B. A supplier of water may request the granting of variance for a PWS by submitting a written request to the Secretary, Delaware Health and Social Services. Suppliers of water may submit a joint request for variances when they seek similar variances under similar circumstances. Any written request for a variance or variances shall include the following information:
1. The nature and duration of the variance requested;
 2. Relevant analytical results of water quality sampling of the system, including results of relevant tests conducted pursuant to the requirements of the PMCLs;
 3. For any request made under this Section, the following is required:
 - a. Explanation in full and evidence of the best available treatment technology and techniques.
 - b. Economic and legal factors relevant to ability to comply.
 - c. Analytical results of raw water quality relevant to the variance requested.
 - d. A proposed compliance schedule, including the date each step toward compliance will be achieved. Such schedule shall include as a minimum the following dates:
 1. Date by which arrangement for alternative raw water source or improvement of existing raw water source will be completed.
 2. Date of initiation of the connection of the alternative raw water source or improvement of existing raw water source will be completed.
 3. Date by which final compliance is to be achieved.

- e. A plan for the provision of safe drinking water in the case of an excessive rise in the contaminant level for which the variance is requested.
 - f. A plan for interim control measures during the effective period of variance.
- 4. A statement that the water supplier will perform monitoring and other reasonable requirements prescribed by the Secretary, Delaware Health and Social Services as a condition to the variance.
 - 5. Other information, if any, believed to be pertinent by the applicant, or such information as the Secretary, Delaware Health and Social Services may require.
- C. The Secretary, Delaware Health and Social Services shall notify the applicant in writing of the disposition of the variance request within ninety (90) days of receipt of request.
- 1. If the Secretary, Delaware Health and Social Services decides to deny the application for a variance, it shall notify the applicant of its intention to issue a denial. Such notice shall include a statement of reasons for the proposed denial, and shall offer the applicant an opportunity to present, within thirty (30) days of receipt of the notice, additional information or argument to the Secretary, Delaware Health and Social Services. It shall make a final determination on the request within thirty (30) days after receiving any such additional information or argument. If no additional information or argument is submitted by the applicant, the application shall be denied.
 - 2. If the Secretary, Delaware Health and Social Services proposes to grant a variance request submitted pursuant to this Section, it shall notify the applicant of its decision in writing. Such notice shall identify the variance, the facility covered and conditions of the variance and shall specify the period of time for which the variance will be effective.
- D. No variances from the requirements of Section 22.51 (Microbiological requirements) shall be permitted.
- E. No variances from the requirements of Section 22.10 (Surface Water Treatment Rule) shall be permitted.

22.203

Exemption

- A. The Secretary, Delaware Health and Social Services may exempt any PWS from:
 - 1. Any requirement respecting an MCL or any treatment technique requirement or from both, of an applicable primary drinking water regulation upon finding that:

- a. Due to compelling factors (which may include economic factors) the PWS is unable to comply with such contaminant level or treatment technique requirement;
 - b. The PWS was in operation on the effective date of such contaminant level or treatment technique requirement and;
 - c. The granting of the exemption will not result in an unreasonable risk to health.
- B. A supplier of water may request the granting of any exemption by submitting a request in writing to the Secretary, Delaware Health and Social Services. Suppliers of water may submit a joint request for exemptions when they seek similar exemptions under similar circumstances. Any written request for an exemption or exemptions shall include the following information:
1. The nature and duration of the exemption requested.
 2. Relevant analytical results of water quality sampling of the system, including result of relevant tests conducted pursuant to the requirements of the Regulations.
 3. Explanation of the compelling factors such as time or economic factors which prevent such system from achieving compliance.
 4. A proposed compliance schedule, including the date when each step toward compliance will be achieved.
 5. Other information, if any, believed to be pertinent by the applicant or such information as the Secretary, Delaware Health and Social Services may require.
- C. The Secretary, Delaware Health and Social Services shall notify the applicant in writing of the disposition of the exemption request within ninety (90) days of receipt of request.
1. If the Secretary, Delaware Health and Social Services decides to deny the application for exemption, it shall notify the applicant of its intention to issue a denial. Such notice shall include a statement of reasons for the proposed denial, and shall offer the applicant an opportunity to present within thirty (30) days of receipt of the notice additional information or argument to the Secretary, Delaware Health and Social Services. It shall make a final determination on the request within thirty (30) days after receiving any such additional information or argument. If no additional information or argument is submitted by the applicant, the application shall be denied.
 2. If the Secretary, Delaware Health and Social Services grants an exemption request submitted pursuant to this Section, it shall notify the applicant of its decision in writing. Such notice shall provide that the exemption will be terminated when the system comes into compliance with the applicable regulations, and may be terminated upon a finding by the Secretary, Delaware Health and Social Services that the system has failed to comply with any requirements of a final schedule.

- a. The Secretary, Delaware Health and Social Services shall propose a schedule for:
 - 1. Compliance (including increments of progress) by the public water system with each contaminant level requirement and treatment technique requirement covered by the exemption and;
 - 2. Implementation by the public water system of such control measures as the Secretary, Delaware Health and Social Services may require for each contaminant covered by the exemption.
 - b. The schedule shall be prescribed by the Secretary, Delaware Health and Social Services within one (1) year after the granting of the exemption subsequent to provision of opportunity for hearing pursuant to Section 22.205. An exemption from a MCL or a treatment technique requirement if granted to a PWS is done so for a specific period of time. If any of the MCLs or treatment technique requirements are revised, then all exemptions from these revised standards shall terminate seven (7) years from the effective date of revision for single PWSs and nine (9) years for regional PWSs.
- D. No exemptions from the requirements of Section 22.51 (Microbiological requirements) shall be permitted.
 - E. No exemptions from the requirements of Section 22.10 (Surface Water Treatment Rule) shall be permitted.

22.204

Variations and Exemptions from MCLs for VOCs

- A. The Division hereby identifies the following as the best technology, treatment techniques, or other means available for achieving compliance with the MCLs for VOCs: removal using packed tower aeration; removal using granular activated carbon (except for Vinyl Chloride), removal using oxidation or other method(s) approved by the Division. See Section 22.63 for a listing of the best available technologies.
- B. The Division shall require CWSs and NTNCWSs to install and/or use any of the treatment methods identified in paragraph A of this Section as a condition for granting a variance or exemption except as provided in paragraph C of this Section. If, after the system's installation of the treatment method, the system cannot meet the MCL, the system shall be eligible for a variance or exemption under the provisions of Section 22.202 or 22.203 respectively.
- C. If a system can demonstrate through comprehensive engineering assessments, which may include pilot plant studies, that the treatment methods identified in paragraph A of this Section would only achieve a minimal reduction in the contaminants, the Division may issue a schedule of compliance that requires the

system being granted the variance or exemption to examine other treatment methods as a condition of obtaining the variance or exemption.

- D. If the Division determines that a treatment method identified in paragraph C of this Section is technically feasible, the Division may require the system to install and/or use that treatment method in connection with a compliance schedule issued under the provisions of Section 22.202 or 22.203. The Division's determination shall be based on studies by the system and other relevant information.

- 22.205 **Public Hearing:** Before a variance or exemption granted pursuant to Sections 22.202 and 22.203 may take effect, the Secretary, Delaware Health and Social Services shall provide notice and opportunity for public hearing on the variance or exemption. A notice given pursuant to the preceding sentence may cover the granting of more than one variance or exemption and hearing held pursuant to such notice shall include each of the variances and exemptions covered by the notice. Public notice of an opportunity for hearing on a variance or exemption shall be circulated in a manner designed to inform interested and potentially interested persons of the proposed variance or exemption. Notification shall include posting of a notice in the principal post office of each municipality or area served by the PWS and publishing of a notice in a newspaper or newspapers or general circulation in the area served by the PWS. Such notice shall include a summary of the proposed variance or exemption and shall inform interested persons that they may request a public hearing on the proposed variance or exemption. Requests must be submitted in writing to the Secretary, Delaware Health and Social Services within thirty (30) days after issuance of the public notices. Information needed in the formal hearing request will be listed on the public notice. Upon receipt of one or more formal hearings requests, the Secretary, Delaware Health and Social Services will give notice as set forth in this Section, of any hearings to be held. Notice shall also be sent to the person or persons requesting the hearing. Notice shall include pertinent information on the subject to be covered along with dates, times and telephone numbers of agencies and people involved. The disposition of the variance or exemption shall become effective thirty (30) days after notice of opportunity for hearing is given, if no request for hearing submitted and the Secretary, Delaware Health and Social Services does not determine to hold a public hearing on its own motion.
- 22.206 **Right of Entry:** The Director of the Division or his/her designee shall have the right of entry, during reasonable hours and in a reasonable manner and without fee or hindrance, for the purpose of conducting a sanitary survey and/or sampling of any public water supply and all water furnished by any public water supplier, whether or not the Division has evidence that the system is in violation of an applicable legal requirement.
- 22.207 **Prohibiting Water Usage:** The Division may prohibit the use of sources of water which after treatment do not provide water conforming to the standards established by these Regulations or which for any reason may pose a threat to the public's health.
- 22.208 **Separability:** If any provision of these Regulations is held invalid, such invalidity shall not affect other provisions which can be given effect without the invalid provision.
- 22.209 **Enforcement of Regulations:** All PWSs must be operated in compliance with the requirements as set forth in these Regulations.

- A. Notice: Whenever the Director of the Division, or his/her appointed representative, has reason to believe that a violation of any of these Regulations has occurred or is occurring, the Division shall notify the alleged violator. Such notice shall be in writing, may be sent by Certified Mail, or hand delivered, shall cite the Regulation or Regulations that are allegedly being violated, and shall state the facts which form the basis for believing that the violation has occurred or is occurring.
- B. Orders: Notice of a violation may be accompanied by an order that requires that certain corrective action be taken. The order shall be signed by the Director or his/her designee or any of his/her appointed representatives and may require:
 - 1. The immediate cessation or correction of the violation.
 - 2. The acquisition or use of additional equipment, supplies or personnel to insure that the violation does not recur.
 - 3. The submission of a plan to prevent future violations to the Division for review and approval.
 - 4. The submission of an application for a variance or exemption.
 - 5. Any other corrective action deemed necessary for proper compliance with the Regulations including interim remedies pending correction of violations.
- C. Hearing Request: Any supplier of water who receives an order from the Division may submit a request for a hearing to the Secretary, Delaware Health and Social Services to contest the order.
- D. Compliance with Effective Orders: Should any public water supplier fail to comply with any of these Regulations, the Secretary, Delaware Health and Social Services may apply to an appropriate court for an injunction or other legal process to prevent or stop any practice which is in violation of these regulations.
- E. Penalties: The Secretary, Delaware Health and Social Services shall have the authority to impose an administrative penalty upon any public water system that violates water quality standards pursuant to Title 16, Chapter 1, § 122(3)(C). The administrative penalty shall be as follows:
 - 1. For systems serving a population of more than 10,000 people, not less than \$1,000 nor more than \$10,000 per day per violation; and
 - 2. For any other system, the administrative penalty shall be not less than \$100 or more than \$10,000 per day per violation.

22.210

Emergency Orders: The Director of the Division or his/her appointed representative may issue emergency orders in any case where there is an imminent danger to the health of the public resulting from the operation of any waterworks or the source of a water supply. An emergency order may be communicated by the best practical notice under the circumstances, and is effective immediately upon receipt. The order may state any requirements necessary to remove the danger to the health of the public, including the immediate cessation of the operation of the PWS. Emergency orders shall be effective for

a period not exceeding sixty (60) days at the determination of the Director of the Division or his/her representative. Should any public water supplier fail to comply with an emergency order, the Secretary, Delaware Health and Social Services may apply to an appropriate court for an injunction or other legal process to prevent or stop any practice which is in violation of these Regulations.

22.211

Plans and Specifications:

- A. No person shall construct a new PWS or alter an existing PWS without a Certificate of Approval for Construction.
 - 1. Systems shall submit two (2) copies of plans and specifications prepared by a professional engineer. Plans shall be developed utilizing the latest edition of *Ten States Standards, NSF Standards*, or approved equivalent and other technical information as required by the Division.
 - 2. Construction shall be in accordance with the approved plans and all conditions listed in the Certificate of Approval to Construct.
 - 3. Whenever it is discovered that either of the above are occurring without such approval, the Director of the Division may order the owner, supplier of water or contractor to immediately stop the work and submit plans and specifications to the Division. After the submittal, any part of the system that has already been installed and is not in compliance shall be removed, altered or replaced in order to achieve compliance. Plans and specifications shall be on paper no larger than 30" x 42". Within thirty (30) days of receipt of plans and specifications, the Division shall notify the person who submitted the plans and specifications if they have been approved or disapproved. Such notice shall specify any conditions of approval or any reasons for disapproval. Approvals are valid for one (1) year and construction shall begin within that time. All construction shall be in accordance with the approved plans and all conditions listed in the Certificate of Approval.
- B. Effective October 1, 1999, all new community and non-transient non-community systems must comply with §22.11A, and, in addition, submit an Application for Capacity Development review. The plans and specifications must be prepared by a professional engineer utilizing the capacity development principles specified in §22.106.

22.212

Approval of Water Supplies:

- A. No person shall operate a newly constructed public water system or renovated portion of an existing water system without a Certificate of Approval to Operate. A Certificate of Approval to Operate shall be issued by the Division to water systems which meet the following requirements:
 - 1. Compliance with rules and regulations to prevent development of health hazards;
 - 2. Adequate protection of the water quality throughout all parts of the system, as demonstrated by sanitary surveys;

3. Proper operation of the water supply system under the responsible charge of personnel whose qualifications meet the certification requirements of the Division;
 4. Adequate capacity to meet anticipated peak demands while maintaining not less than twenty-five (25) pounds per square inch (psi) and not more than one hundred (100) psi at ground level at all points in the water distribution system and;
 5. Records of laboratory examinations showing compliance with the water quality requirements of these Regulations.
- B. Effective October 1, 1999, in addition to the requirements in 22.212A, approval of new community and non-transient non-community water systems shall be dependent upon the following:
1. A certification by a professional engineer that the system was built in accordance with approved plans and specifications and all conditions of the Certificate of Approval to Construct and.
 2. Managerial and financial information as required by the Division to demonstrate compliance with Capacity as defined in 22.106. This information may include, but not be limited to; annual reports, water system plans or business plans, self assessments/peer reviews, criteria used by lenders, financial viability assessment methods, financial and managerial training.
 3. Failure to comply with §22.212B.1 and 2 shall result in the Division denying the application for a Certificate of Approval to Operate. A new water system shall not commence operations without a Certificate of Approval to Operate.

22.213 **Siting Requirements:** Before any person may enter into a financial commitment for or initiate construction of a new PWS or increase the capacity of an existing PWS, he shall notify the Division and, to the extent practicable, avoid locating part or all of the new or expanded facility at a site which:

- A. Is subject to a significant risk from earthquakes, floods, fires or other disasters which could cause a breakdown of the PWS or a portion thereof or;
- B. Except for intake structures, is within the floodplain of a one hundred (100) year flood or is lower than any recorded high tide where appropriate records exist.

22.214 **Approved Certified Laboratory:** For the purpose of determining compliance with Sections 22.5, 22.6, 22.7 and 22.9, samples may be considered only if they have been analyzed by the Division, EPA, or an approved/certified laboratory, except that measurements for turbidity, free chlorine residual, temperature and pH may be performed by any person acceptable to the Division.

A. Laboratory Certification Process: Continuation of laboratory certification for conducting drinking water analyses is contingent upon successful, on-going compliance with the most recent edition of the “Manual for the Certification of Laboratories Analyzing Drinking Water.” Copies are available from the Office of Drinking Water.

B. Annual laboratory proficiency testing:

1. In order to demonstrate proficiency a laboratory shall successfully analyze a proficiency test (PT) from an approved provider annually using the same analytical method that is used to report compliance-monitoring results. In order to receive and maintain certification for an analyte, the laboratory shall successfully analyze PT samples using EPA-approved methods in accordance with 40 CFR 141, copies available from the Office of Drinking Water, for each analyte (microbiological and/or chemical) and by each method used to analyze compliance samples.
 2. In order to receive annual certification, laboratories located in Delaware, shall complete a PT in the first quarter of the calendar year. Failure to complete the PT within the first quarter will result in the laboratory status being downgraded to “provisional.” If a laboratory fails to get an acceptable result on a PT then they shall complete a make-up PT for those analytes that were unacceptable in the original PT within 60 days of notification by the Division. Failure to successfully complete a make-up PT will result in the laboratories status being downgraded to “not certified.”
 3. In order for the Division to accept compliance results from laboratories located outside of Delaware, the laboratory must comply with the requirements of their home state. In addition, they must submit copies of their home state certification, copies of the last two PTs and a copy of their Quality Assurance program prior to or at the time that compliance samples are submitted to the Division.
 4. Annual certified analyte lists for in-state laboratories will be issued on July 1st of each year and expire on June 30th of the following year.
- C. Reporting by laboratories: Laboratories that analyze compliance samples for public water systems in Delaware must report the results to the public water system in a timely manner and if a MCL exceedance occurs then the Office of Drinking Water must be notified in accordance with the following:
1. Microbiological samples: If the original sample or one or more repeat samples are positive for fecal coliforms or *E. coli*, the laboratory must report the results by the end of the business day, or if it is after business hours, then by the end of the next business day.
 2. Chemical samples: If a sample exceeds a maximum contaminant level as specified in these regulations the laboratory must report the results by the end of the business day, or if it is after business hours, then by the end of the next business day.
- D. Notification of major changes: Certified laboratories must notify the Division, in writing, within 30 days of major changes in personnel that impact who is conducting the analysis, new equipment, new methods being used, or laboratory re-location.

22.215

Quality: Drinking water shall not contain impurities in concentrations which may be hazardous to the health of the consumers. Substances used in its treatment shall not remain in the water in concentrations greater than required by good practice. Substances which may have deleterious physiological effects, or for which physiological effects are not known, shall not be introduced into the system in a manner which would permit them to reach the consumer. For the purpose of these regulations interim health-based

standards shall be set by the Division on a case-by-case basis at a level between 10^{-4} to 10^{-6} risk level for those contaminants that are potential carcinogens and a Hazard Quotient of 1 to 10 for non-cancer health effects based on the best available science at the time. These standards shall be enforceable. **[For the purpose of these regulations Hazard Quotient shall mean expressions applied to modeled human health risk values associated with exposures to systemic, non-cancer causing contaminants.]**

22.216 **Required Sampling, Monitoring or Analyses:** In any case where the Division does not perform sampling, monitoring or analyses required by these Regulations, the supplier of water shall be responsible for performing this sampling, monitoring or analyses.

A. Monitoring of consecutive public water systems: When a public water system supplies water to one or more other public water systems, the Division may modify the monitoring requirements imposed by these regulations to the extent that the interconnection of the systems justifies treating them as a single system for monitoring purposes. Any modified monitoring shall be conducted pursuant to a schedule specified by the Division and concurred in by the Administrator of the U.S. Environmental Protection Agency.

22.217 **Use of Bottled Water:** Public water systems shall not use bottled water to achieve compliance with an MCL. Bottled water may be used on a temporary basis to avoid unreasonable risk to health.

22.218 **Date of Effect:** These regulations shall become effective on [~~May 10, 2002~~] [__, 2003].

SECTION 22.3 SOURCE AND PROTECTION

22.301 **Water Source Desirability:** Drinking water shall be obtained from the most desirable source which is feasible, and efforts must be made to prevent or control pollution of the source. If the source fails to meet the bacteriological standards of Section 22.5 and is not already disinfecting pursuant to Section 22.802, it may be required to do so in order to meet the bacteriological standards.

22.302 **Sanitary Surveys:** Sanitary surveys shall be made by the Division in order to locate and identify health hazards which might exist in the water supply system. The manner and frequency of making these surveys, and the rate at which discovered health hazards are to be removed, shall be in accordance with a program approved by the Division.

A. Water systems must correct any major sanitary defects noted during a sanitary survey as soon as possible but no later than 45 days after being notified by the Division. If the corrections will take longer than 45 days to complete then a corrective action plan with a timetable must be submitted to the Office of Drinking Water.

22.303 **Protection of Water:** Water delivered to every consumer by any public water supplier shall be so protected by natural means, by proper constructions or by treatment so as to consistently equal or exceed the requirements herein established.

22.304 **Monitoring Water Quality:** Quality of water delivered by any public water supplier shall be continuously and/or periodically monitored in accordance with requirements herein

established or in accordance with such monitoring water system of equal or greater effect as may be proposed by a public water supplier for its own use, subject to Division approval.

- 22.305 **Responsibility:** For the purpose of application of these Regulations, the supplier of water shall be responsible for the water quality at the user's free flowing outlet except for turbidity and VOCs, which are measured at a representative entry point(s) to the water distribution system.

SECTION 22.4 REPORTING, PUBLIC NOTIFICATION, CONSUMER CONFIDENCE REPORTS AND RECORD MAINTENANCE

22.40 **Reporting**

- 22.401 **Results of Test, Measurement or Analysis:** Except where a shorter period is specified in this part, the supplier of water shall report to the Division the results of any test, measurement or analysis required by this part within:

- A. The first ten (10) days following the month in which the result is received, or
- B. The first ten (10) days following the end of the required monitoring period as stipulated by the Division, whichever of these is shortest.

- 22.402 **Failure to Comply with a PMCL:** Unless otherwise stipulated, the supplier of water shall report to the Division within twenty-four (24) hours the failure to comply with any Primary Drinking Water Regulations (including failure to comply with monitoring requirements).

- 22.403 **Analysis Performed by Division of Public Health Laboratory:** The supplier of water is not required to report analytical results to the Division in cases where an approved laboratory performs the analyses and reports the results directly to the Division.

- 22.404 **Reporting of Unregulated Contaminants:** The owner of a CWS or NTNCWS who is required to monitor under 40 CFR 141.40, shall send a copy of the results of such monitoring to the Division within thirty (30) days of receipt and any public notice issued under Section 22.416 to the Division.

- 22.405 **Reporting by Surface Water Systems:** A PWS that uses a surface water source or a ground water source under the direct influence of surface water and provides filtration treatment must report monthly to the Division the information specified in this paragraph, beginning June 29, 1993.

- A. Turbidity measurements must be reported within ten (10) days after the end of each month the system serves water to the public. Information that must be reported includes:
 - 1. The total number of filtered water turbidity measurements taken during the month.

2. The number and percentage of filtered water turbidity measurements taken during the month which are less than or equal to the turbidity limits for the filtration technology being used.
 3. The date and value of any turbidity measurements taken during the month which exceed five (5) NTU.
- B. Disinfection information must be reported to the Division within ten (10) days after the end of each month the system serves water to the public. Information that must be reported includes:
1. For each day, the lowest measurement of residual disinfectant concentration in mg/L in water entering the distribution system.
 2. The date and duration of each period when the residual disinfectant concentration in water entering the distribution system fell below 0.3 mg/L and when the Division was notified of the occurrence.
 3. The following information on the samples taken in the distribution system in conjunction with total coliform monitoring:
 - a. Number of instances where the residual disinfectant concentration is measured;
 - b. Number of instances where the residual disinfectant concentration is not measured but heterotrophic bacteria plate count (HPC) is measured;
 - c. Number of instances where the residual disinfectant concentration is measured but not detected and no HPC is measured;
 - d. Number of instances where no residual disinfectant concentration is detected and where HPC is greater than 500/ml;
 - e. Number of instances where the residual disinfectant concentration is not measured and HPC is greater than 500/ml;
 - f. For the current and previous month the system serves water to the public, the value of "V" in the following formula:

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

where: a = number of instances where the residual disinfectant concentration is measured;
 n = number of instances where the residual disinfectant concentration is not measured but HPC is measured;
 c = number of instances where the residual disinfectant concentration is measured but not detected and no HPC is measured;
 d = number of instances where no residual disinfectant concentration is detected and where the HPC is >500/ml; and e = number of instances where the residual disinfectant

concentration is not measured and HPC is >500/ml.

- g. If the Division determines, based on site-specific considerations, that a system has no means for having a sample transported and analyzed for HPC by an approved laboratory within the requisite time and temperature conditions, and that the system is providing adequate disinfection in the distribution system, the requirements of paragraph B.3.a-f of this Section do not apply.
- 4. A system need not report the data listed in paragraph B.1. of this Section if all the data listed in paragraphs B.1.-3. of this Section remain on file at the system and the Division determines that the system has submitted all the information required by paragraphs B.1.-3. of this Section for the last twelve (12) months.
- C. Each system, upon discovering that a waterborne disease outbreak potentially attributable to that water system has occurred, must report that occurrence to the Division as soon as possible, but no later than by the end of the next business day. If at any time the turbidity exceeds five (5) NTU, the system must inform the Division as soon as possible, but no later than the end of the next business day. If at any time the residual falls below 0.3 mg/L in the water entering the distribution system, the system must notify the Division as soon as possible, but no later than by the end of the next business day. The system must also notify the Division by the end of the next business day whether or not the residual was restored to at least 0.3 mg/L within four (4) hours.

22.406 **Reporting of Chemical Overfeed Incidents or Unusual Events:** It is the responsibility of the owner and/or the operator of a Public Water System to report to the Division, within 24 hours, any incidents of chemical overfeed and/or unusual events.

22.407 **Certification Requirements:** The public water system, within 10 days of completing the public notification requirements under Section 22.41 of these regulations for the initial public notice and any repeat notices, must submit to the Division a certification that it has fully complied with the public notification regulations. The public water system must include with this certification a representative copy of each type of notice distributed, published, posted, and made available to the persons served by the system and to the media.

22.408 **Submission to the Division:** The water supply system shall submit to the Division within the time stated in the request copies of any records required to be maintained under Section 22.43 hereof or copies of any documents then in existence that the Division or the Administrator of the US Environmental Protection Agency is entitled to inspect pursuant to the authority of section 1445 of the Safe Drinking Water Act or the equivalent provisions of the Delaware Code.

22.41 **Public Notification**

General Public Notice Requirements: It shall be the duty and responsibility of a water supply owner to give public notice in accordance with the following requirements:

- A. Tier 1 Public Notice: Form, manner, and frequency of notice.
1. Violation categories and other situations requiring a Tier 1 public notice. Section 22.413 identifies the tier assignment for each specific violation or situation.
 - a. Violation of the MCL for total coliforms when fecal coliform or E. coli are present in the water distribution system (as specified in Sec. 22.51), or when the water system fails to test for fecal coliforms or E. coli when any repeat sample tests positive for coliform (as specified in Sec. 22.51);
 - b. Violation of the MCL for nitrate, nitrite, or total nitrate and nitrite, as defined in Sec. 22.601, or when the water system fails to take a confirmation sample within 24 hours of the system's receipt of the first sample showing an exceedance of the nitrate or nitrite MCL, as specified in Sec. 22.602 or violation of the fluoride MCL as defined in Sec. 22.603(A);
 - c. Exceedance of the nitrate MCL by non-community water systems, where permitted to exceed the MCL by the Division under Sec. 22.602(K);
 - d. Violation of the MRDL for chlorine dioxide, as defined in Sec. 22.803(A), when one or more samples taken in the distribution system the day following an exceedance of the MRDL at the entrance of the distribution system exceed the MRDL, or when the water system does not take the required samples in the distribution system, as specified in Sec. 22.804(G);
 - e. Violation of the turbidity MCL under Sec. 22.701, where the Division determines after consultation that a Tier 1 notice is required or where consultation does not take place within 24 hours after the system learns of the violation;
 - f. Violation of the Surface Water Treatment Rule (SWTR) or Interim Enhanced Surface Water Treatment rule (IESWTR) treatment technique requirement resulting from a single exceedance of the maximum allowable turbidity limit (as identified in Sec. 22.413), where the Division determines after consultation that a Tier 1 notice is required or where consultation does not take place within 24 hours after the system learns of the violation;
 - g. Occurrence of a waterborne disease outbreak, as defined in Sec. 22.1, or other waterborne emergency (such as a failure or significant interruption in key water treatment processes, a natural disaster that disrupts the water supply or distribution system, or a chemical spill or unexpected loading of possible pathogens into the source water that significantly increases the potential for drinking water contamination);
 - h. Other violations or situations with significant potential to have serious adverse effects on human health as a result of short-term exposure, as determined by the Division either in these regulations or on a case-by-case basis.
 2. Public water systems must:
 - a. Provide a public notice as soon as practical but no later than 24 hours after the system learns of the violation;
 - b. Initiate consultation with the Division as soon as practical, but no later than 24 hours after the public water system learns of the violation or situation, to determine additional public notice requirements; and

- c. Comply with any additional public notification requirements (including any repeat notices or direction on the duration of the posted notices) that are established as a result of the consultation with the Division. Such requirements may include the timing, form, manner, frequency, and content of repeat notices (if any) and other actions designed to reach all persons served.
 - 3. Public water systems must provide the notice within 24 hours in a form and manner reasonably calculated to reach all persons served. The form and manner used by the public water system are to fit the specific situation, but must be designed to reach residential, transient, and non-transient users of the water system. In order to reach all persons served, water systems are to use, at a minimum, one or more of the following forms of delivery:
 - a. Appropriate broadcast media (such as radio and television);
 - b. Posting of the notice in conspicuous locations throughout the area served by the water system;
 - c. Hand delivery of the notice to persons served by the water system; or
 - d. Another delivery method approved in writing by the Division.
- B. Tier 2 Public Notice: Form, manner and frequency of notice.
 - 1. Violation categories and other situations requiring a Tier 2 public notice. Sec. 22.413 to this subpart identifies the tier assignment for each specific violation or situation.
 - a. All violations of the MCL, MRDL, and treatment technique requirements, except where a Tier 1 notice is required under Sec. 22.411(A) or where the Division determines that a Tier 1 notice is required;
 - b. Violations of the monitoring and testing procedure requirements, where the Division determines that a Tier 2 rather than a Tier 3 public notice is required, taking into account potential health impacts and persistence of the violation;
 - c. Failure to comply with the terms and conditions of any variance or exemption in place; and,
 - d. Other violations or situations with significant potential to have adverse effects on human health as a result of exposure, as determined by the Division either in these regulations or on a case-by-case basis.
 - 2. Public water systems must:
 - a. Public water systems must provide the public notice as soon as practical, but no later than 14 days after the system learns of the violation. If the public notice is posted, the notice must remain in place for as long as the violation or situation persists, but in no case for less than seven days, even if the violation or situation is resolved.
 - b. The public water system must repeat the notice every three months as long as the violation or situation persists, unless the Division determines that appropriate circumstances warrant a different repeat notice frequency. This determination must be in writing. In no circumstance may the repeat notice be given less frequently than once per year.
 - c. For the turbidity violations specified in this paragraph, public water systems must consult with the Division as soon as practical but no later than 24 hours after the public water system learns of the violation, to determine whether a Tier 1 public notice under Sec. 22.411(A) is required to protect

public health. When consultation does not take place within the 24-hour period, the water system must distribute a Tier 1 notice of the violation within the next 24 hours (i.e., no later than 48 hours after the system learns of the violation), following the requirements under Sec. 22.411(2) and (3). Consultation with the Division is required for:

1. Violation of the turbidity MCL under Sec. 22.701; or
 2. Violation of the SWTR or IESWTR treatment technique requirement resulting from a single exceedance of the maximum allowable turbidity limit.
3. Public water systems must provide the initial public notice and any repeat notices in a form and manner that is reasonably calculated to reach persons served in the required time period. The form and manner of the public notice may vary based on the specific situation and type of water system, but it must at a minimum meet the following requirements:
- a. Unless directed otherwise by the Division in writing, community water systems must provide notice by:
 1. Mail or other direct delivery to each customer receiving a bill and to other service connections to which water is delivered by the public water system; and
 2. Any other method reasonably calculated to reach other persons regularly served by the system, if they would not normally be reached by the notice required in paragraph (3)(a)(1) of this section. Such persons may include those who do not pay water bills or do not have service connection addresses (e.g., house renters, apartment dwellers, university students, nursing home patients, prison inmates, etc.). Other methods may include: Publication in a local newspaper; delivery of multiple copies for distribution by customers that provide their drinking water to others (e.g., apartment building owners or large private employers); posting in public places served by the system or on the Internet; or delivery to community organizations.
 - b. Unless directed otherwise by the Division in writing, non-community water systems must provide notice by:
 1. Posting the notice in conspicuous locations throughout the distribution system frequented by persons served by the system, or by mail or direct delivery to each customer and service connection (where known); and
 2. Any other method reasonably calculated to reach other persons served by the system if they would not normally be reached by the notice required in paragraph (3)(b)(1) of this section. Such persons may include those served who may not see a posted notice because the posted notice is not in a location they routinely pass by. Other methods may include: Publication in a local newspaper or newsletter distributed to customers; use of E-mail to notify employees or students; or, delivery of multiple copies in central locations (e.g., community centers).
- C. Tier 3 Public Notice: Form, manner, and frequency of notice
1. Violation categories and other situations requiring a Tier 3 public notice. Sec.

- 22.413 to this subpart identifies the tier assignment for each specific violation or situation
- a. Monitoring violations under 40 CFR part 141, except where a Tier 1 notice is required under Sec. 22.411(A) or where the Division determines that a Tier 2 notice is required;
 - b. Failure to comply with a testing procedure established in 40 CFR part 141, except where a Tier 1 notice is required under Sec. 22.411(A) or where the Division determines that a Tier 2 notice is required;
 - c. Operation under a variance or an exemption granted under Sec. 22.204 of these regulations;
 - d. Availability of unregulated contaminant monitoring results, as required under 22.416; and
 - e. Other violations or situations with significant potential to have adverse effects on human health as a result of exposure, as determined by the Division either in these regulations or on a case-by-case basis.
2. Public water systems must:
- a. Public water systems must provide the public notice not later than 90 days after the public water system learns of the violation or situation or begins operating under a variance or exemption. Following the initial notice, the public water system must repeat the notice annually for as long as the violation, variance, exemption, or other situation persists. If the public notice is posted, the notice must remain in place for as long as the violation, variance, exemption, or other situation persists, but in no case less than seven days (even if the violation or situation is resolved).
3. Public water systems must provide the initial notice and any repeat notices in a form and manner that is reasonably calculated to reach persons served in the required time period. The form and manner of the public notice may vary based on the specific situation and type of water system, but it must at a minimum meet the following requirements:
- a. Unless directed otherwise by the Division in writing, community water systems must provide notice by:
 1. Mail or other direct delivery to each customer receiving a bill and to other service connections to which water is delivered by the public water system; and
 2. Any other method reasonably calculated to reach other persons regularly served by the system, if they would not normally be reached by the notice required in paragraph (3)(a)(1) of this section. Such persons may include those who do not pay water bills or do not have service connection addresses (e.g., house renters, apartment dwellers, university students, nursing home patients, prison inmates, etc.). Other methods may include: Publication in a local newspaper; delivery of multiple copies for distribution by customers that provide their drinking water to others (e.g., apartment building owners or large private employers); posting in public places or on the Internet; or delivery to community organizations.
 - b. Unless directed otherwise by the Division in writing, non-community water systems must provide notice by:

1. Posting the notice in conspicuous locations throughout the distribution system frequented by persons served by the system, or by mail or direct delivery to each customer and service connection (where known); and
 2. Any other method reasonably calculated to reach other persons served by the system, if they would not normally be reached by the notice required in paragraph (3)(b)(1) of this section. Such persons may include those who may not see a posted notice because the notice is not in a location they routinely pass by. Other methods may include: Publication in a local newspaper or newsletter distributed to customers; use of E-mail to notify employees or students; or, delivery of multiple copies in central locations (e.g., community centers).
- D. Certification to the Division: The owner of a public water system, within ten (10) days of completing the public notice requirements of this section for the initial public notice and any repeat notices, shall submit to the Division a completed Delivery Certification Form, certifying when and how the public notice was delivered and that they have complied with the public notice regulations. The owner shall include with this certification a copy, as delivered, of each type of notice distributed, published, posted, and made available to the persons served by the system and to the media.

22.412

Content of a Public Notice

- A. When a public water system violates a NPDWR or has a situation requiring public notification, each public notice must include the following elements:
1. A description of the violation or situation, including the contaminant(s) of concern, and (as applicable) the contaminant level(s);
 2. When the violation or situation occurred;
 3. Any potential adverse health effects from the violation or situation, including the standard language under paragraph (D)(1) or (D)(2) of this section, whichever is applicable;
 4. The population at risk, including subpopulations particularly vulnerable if exposed to the contaminant in their drinking water;
 5. Whether alternative water supplies should be used;
 6. What actions consumers should take, including when they should seek medical help, if known;
 7. What the system is doing to correct the violation or situation;
 8. When the water system expects to return to compliance or resolve the situation;
 9. The name, business address, and phone number of the water system owner, operator, or designee of the public water system as a source of additional information concerning the notice; and
 10. A statement to encourage the notice recipient to distribute the public notice to other persons served, using the standard language under paragraph (D)(3) of this section, where applicable.
- B. Elements that must be included in the public notice for public water systems operating under a variance or exemption.
1. If a public water system has been granted a variance or an exemption, the

public notice must contain:

- a. An explanation of the reasons for the variance or exemption;
 - b. The date on which the variance or exemption was issued;
 - c. A brief status report on the steps the system is taking to install treatment, find alternative sources of water, or otherwise comply with the terms and schedules of the variance or exemption; and
 - d. A notice of any opportunity for public input in the review of the variance or exemption.
2. If a public water system violates the conditions of a variance or exemption, the public notice must contain the ten elements listed in paragraph (A) of this section.
- C. The public notice shall:
1. Each public notice required by this section:
 - a. Must be displayed in a conspicuous way when printed or posted;
 - b. Must not contain overly technical language or very small print;
 - c. Must not be formatted in a way that defeats the purpose of the notice;
 - d. Must not contain language which nullifies the purpose of the notice.
 2. Each public notice required by this section must comply with multilingual requirements, as follows:
 - a. For public water systems serving a large proportion of non-English speaking consumers, as determined by the Division, the public notice must contain information in the appropriate language(s) regarding the importance of the notice or contain a telephone number or address where persons served may contact the water system to obtain a translated copy of the notice or to request assistance in the appropriate language.
 - b. In cases where the Division has not determined what constitutes a large proportion of non-English speaking consumers, the public water system must include in the public notice the same information as in paragraph (C)(2)(a) of this section, where appropriate to reach a large proportion of non-English speaking persons served by the water system.
- D. Public water systems are required to include the following standard language in their public notice:
1. Standard health effects language for MCL or MRDL violations, treatment technique violations, and violations of the condition of a variance or exemption. Public water systems must include in each public notice the health effects language specified in Sec. 22.412(E) to this subpart corresponding to each MCL, MRDL, and treatment technique violation listed in Sec. 22.413 to this subpart, and for each violation of a condition of a variance or exemption.
 2. Standard language for monitoring and testing procedure violations. Public water systems must include the following language in their notice, including the language necessary to fill in the blanks, for all monitoring and testing procedure violations listed in Sec. 22.413 to this subpart:

“We are required to monitor your drinking water for specific contaminants

on a regular basis. Results of regular monitoring are an indicator of whether or not your drinking water meets health standards. During [compliance period], we “did not monitor or test” or “did not complete all monitoring or testing” for [contaminant(s)], and therefore cannot be sure of the quality of your drinking water during that time.”

3. Standard language to encourage the distribution of the public notice to all persons served. Public water systems must include in their notice the following language (where applicable):

“Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.”

- E. **Mandatory Health Effects Language:** When providing the information on potential adverse health effects required by (D)(1) of this Section in notices of violations of MCLs or treatment technique requirements, or notices of the granting or the continued existence of exemptions or variances, or notices of failure to comply with a variance or exemption schedule, the owner of a PWS must include the following mandatory language specific to each contaminant:

1. **Microbiological Contaminants:**

- A. **Turbidity:** Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.

- B. **Total Coliforms:** 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.

- C. **Fecal Coliforms/E. coli:** Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, and people with severely compromised immune systems.

- D. **Giardia lamblia, Viruses, Heterotrophic plate count (HPC) bacteria, Legionella, and Cryptosporidium:** 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.

2 **Inorganic Contaminants:**

- A. **Antimony:** Some people who drink water containing antimony well in excess of the MCL over many years could experience increases in blood cholesterol and decreases in blood sugar.
- B. **Arsenic:** Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.
- C. **Asbestos:** Some people who drink water containing asbestos in excess of the MCL over many years may have an increased risk of developing benign intestinal polyps.
- D. **Barium:** Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.
- E. **Beryllium:** Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions.
- F. **Cadmium:** Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage.
- G. **Chromium:** Some people who use water containing chromium well in excess of the MCL over many years could experience allergic dermatitis.
- H. **Copper:** Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor.
- I. **Cyanide:** Some people who drink water containing cyanide well in excess of the MCL over many years could experience nerve damage or problems with their thyroid.

- J. **Lead:** Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.
- K. **Mercury (inorganic):** Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage.
- L. **Nickel:** Some people who drink water containing nickel well in excess of the MCL over many years could experience heart and liver damage.
- M. **Nitrate:** Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.
- N. **Nitrite:** Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.
- O. **Selenium:** Selenium is an essential nutrient. However, some people who drink water containing selenium in excess of the MCL over many years could experience hair or fingernail losses, numbness in fingers or toes, or problems with their circulation.
- P. **Thallium:** Some people who drink water containing thallium in excess of the MCL over many years could experience hair loss, changes in their blood, or problems with their kidneys, intestines, or liver.

3. **Synthetic Organic Compounds**

- A. **Acrylamide:** Some people who drink water containing high levels of acrylamide over a long period of time could have problems with their nervous system or blood, and may have an increased risk of getting cancer.
- B. **Alachlor:** Some people who drink water containing alachlor in excess of the MCL over many years could have problems with their eyes, liver, kidneys, or spleen, or experience anemia, and may have an increased risk of getting cancer.

- C. **Aldicarb**: Some people who drink water containing aldicarb in excess of the MCL over many years may suffer damage to their nervous system.
- D. **Aldicarb sulfone**: Some people who drink water containing aldicarb sulfone in excess of the MCL over many years may damage to their nervous system.
- E. **Aldicarb sulfoxide**: Some people who drink water containing aldicarb sulfoxide in excess of the MCL over many years may suffer damage to their nervous system.
- F. **Atrazine**: Some people who drink water containing atrazine well in excess of the MCL over many years could experience problems with their cardiovascular system or reproductive difficulties.
- G. **Benzo(a)pyrene (PAH)**: Some people who drink water containing benzo(a)pyrene in excess of the MCL over many years may experience reproductive difficulties and may have an increased risk of getting cancer.
- H. **Carbofuran**: Some people who drink water containing carbofuran in excess of the MCL over many years could experience problems with their blood, or nervous or reproductive systems.
- I. **Chlordane**: Some people who drink water containing chlordane in excess of the MCL over many years could experience problems with their liver or nervous system, and may have an increased risk of getting cancer.
- J. **Dalapon**: Some people who drink water containing dalapon well in excess of the MCL over many years could experience minor kidney changes.
- K. **Dibromochloropropane (DBCP)**: Some people who drink water containing DBCP in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.
- L. **Dichloromethane**: Some people who drink water containing dichloromethane in excess of the MCL over many years could have liver problems and may have an increased risk of getting cancer.
- M. **Di(2-ethylhexyl)adipate**: Some people who drink water containing di (2-ethylhexyl) adipate well in excess of the MCL over many years could experience general toxic effects weight loss, liver enlargement or possible reproductive difficulties.

- N. **Di(2-ethylhexyl)phthalate:** Some people who drink water containing di (2-ethylhexyl) phthalate well 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.
- O. **Dinoseb:** Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties.
- P. **Diquat:** Some people who drink water containing diquat in excess of the MCL over many years could get cataracts.
- Q. **2,4-D:** Some people who drink water containing the weed killer 2,4-D well in excess of the MCL over many years could experience problems with their kidneys, liver, or adrenal glands.
- R. **Endothall:** Some people who drink water containing endothall in excess of the MCL over many years could experience problems with their stomach or intestines.
- S. **Endrin:** Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems.
- T. **Epichlorohydrin:** Some people who drink water containing high levels of epichlorohydrin over a long period of time could experience stomach problems, and may have an increased risk of getting cancer.
- U. **Ethylene dibromide (EDB):** 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.
- V. **Glyphosate:** Some people who drink water containing glyphosate in excess of the MCL over many years could experience problems with their kidneys or reproductive difficulties.
- W. **Heptachlor:** Some people who drink water containing heptachlor in excess of the MCL over many years could experience liver damage and may have an increased risk of getting cancer.
- X. **Heptachlor Epoxide:** Some people who drink water containing heptachlor epoxide in excess of the MCL over many years could experience liver damage, and may have an increased risk of getting cancer.

- Y. **Hexachlorobenzene:** Some people who drink water containing hexachlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys, or adverse reproductive effects, and may have an increased risk of getting cancer.
- Z. **Hexachlorocyclopentadiene:** Some people who drink water containing hexachlorocyclopentadiene well in excess of the MCL over many years could experience problems with their kidneys or stomach.
- AA. **Lindane:** Some people who drink water containing lindane in excess of the MCL over many years could experience problems with their kidneys or liver.
- BB. **Methoxychlor:** Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties.
- CC. **Oxamyl [Vydate]:** Some people who drink water containing oxamyl in excess of the MCL over many years could experience slight nervous system effects.
- DD. **Pentachlorophenol:** Some people who drink water containing pentachlorophenol in excess of the MCL over many years could experience problems with their liver or kidneys, and may have an increased risk of getting cancer.
- EE. **Picloram:** Some people who drink water containing picloram in excess of the MCL over many years could experience problems with their liver.
- FF. **Polychlorinated Biphenyls [PCBs]:** 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.
- GG. **Simazine:** Some people who drink water containing simazine in excess of the MCL over many years could experience problems with their blood.
- HH. **Toxaphene:** Some people who drink water containing toxaphene in excess of the MCL over many years could have problems with their kidneys, liver, or thyroid, and may have an increased risk of getting cancer.

- II. **2,3,7,8-TCDD (Dioxin)**: 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.
 - JJ. **2,4,5-TP. [Silvex]**: Some people who drink water containing silvex in excess of the MCL over many years could experience liver problems.
 - KK. **1,2,4-Trichlorobenzene**: Some people who drink water containing 1,2,4-trichlorobenzene well in excess of the MCL over many years could experience changes in their adrenal glands.
 - LL. **1,1,2-Trichloroethane**: Some people who drink water containing 1,1,2-trichloroethane well in excess of the MCL over many years could have problems with their liver, kidneys, or immune systems.
4. **Volatile Organic Compounds:**
- A. **Benzene**: Some people who drink water containing benzene in excess of the MCL over many years could experience anemia or a decrease in blood platelets, and may have an increased risk of getting cancer.
 - B. **Carbon Tetrachloride**: Some people who drink water containing carbon tetrachloride in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.
 - C. **o-Dichlorobenzene**: Some people who drink water containing o-dichlorobenzene well in excess of the MCL over many years could experience problems with their liver, kidneys, or circulatory systems.
 - D. **p-Dichlorobenzene**: Some people who drink water containing p-dichlorobenzene in excess of the MCL over many years could experience anemia, damage to their liver, kidneys, or spleen, or changes in their blood.
 - E. **1,2-Dichloroethane**: Some people who drink water containing 1,2-dichloroethane in excess of the MCL over many years may have an increased risk of getting cancer.
 - F. **1,1-Dichloroethylene**: Some people who drink water containing 1,1-dichloroethylene in excess of the MCL over many years could experience problems with their liver.

- G. **Cis-1,2-Dichloroethylene**: Some people who drink water containing cis-1,2-dichloroethylene in excess of the MCL over many years could experience problems with their liver.
- H. **Trans-1,2-Dichloroethylene**: Some people who drink water containing trans-1,2-dichloroethylene well in excess of the MCL over many years could experience problems with their liver.
- I. **1,2-Dichloropropane**: Some people who drink water containing 1,2-dichloropropane in excess of the MCL over many years may have an increased risk of getting cancer.
- J. **Ethylbenzene**: Some people who drink water containing ethylbenzene well in excess of the MCL over many years could experience problems with their liver or kidneys.
- K. **Methyl tert Butyl Ether (MTBE)**: Some people who drink water containing MTBE in excess of the MCL over many years may have an increased risk of developing cancer.
- L. **Monochlorobenzene [Chlorobenzene]**: Some people who drink water containing chlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys.
- M. **Styrene**: Some people who drink water containing styrene well in excess of the MCL over many years could have problems with their liver, kidneys, or circulatory system.
- N. **Tetrachloroethylene**: Some people who drink water containing tetrachloroethylene in excess of the MCL over many years could have problems with their liver, and may have an increased risk of getting cancer.
- O. **Toluene**: Some people who drink water containing toluene well in excess of the MCL over many years could have problems with their nervous system, kidneys, or liver.
- P. **1,1,1-Trichloroethane**: Some people who drink water containing 1,1,1-trichloroethane in excess of the MCL over many years could experience problems with their liver, nervous system, or circulatory system.
- Q. **Trichloroethylene**: Some people who drink water containing trichloroethylene in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.

- R. **Vinyl Chloride:** Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer.
- S. **Xylenes:** Some people who drink water containing xylenes in excess of the MCL over many years could experience damage to their nervous system.

5. **Radiological Compounds**

- A. **Beta/photon emitters:** Certain minerals are radioactive and may emit forms of radiation known as photons and beta radiation. Some people who drink water containing beta and photon emitters in excess of the MCL over many years may have an increased risk of getting cancer.
- B. **Alpha emitters:** Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer.
- C. **Combined Radium 226/228:** Some people who drink water containing radium 226 or 228 in excess of the MCL over many years may have an increased risk of getting cancer.
- D. **Uranium:** Some people who drink water containing uranium in excess of the MCL over many years may have an increased risk of getting cancer and kidney toxicity.

6. **Disinfection/Disinfection Byproducts (DBPs), Byproduct Precursors, Disinfection Residuals**

- A. **Chlorine:** 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.
- B. **Chloramines:** 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.
- C. **Chlorine dioxide, where any two consecutive daily samples taken at the entrance to the distribution system are above the 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.

1. *Add for public notification only:* The chlorine dioxide violations reported today are the result of exceedances at the treatment facility only, not within the distribution system which delivers water to consumers. Continued compliance with chlorine dioxide levels within the distribution system minimizes the potential risk of these violations to consumers.

D. **Chlorine dioxide, where one or more distribution system samples are above the 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.

1. *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 exposure to chlorine dioxide-treated water.

E. **Control of DBP precursors (TOC):** 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 (THMs) and haloacetic acids (HAAs). 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.

F. **Disinfection byproducts and treatment technique for DBPs:** The United States Environmental Protection Agency (EPA) sets drinking water standards and requires the disinfection of drinking water. However, when used in the treatment of drinking water, disinfectants react with naturally-occurring organic and inorganic matter present in water to form chemicals called disinfection byproducts (DBPs). EPA has determined that a number of DBPs are a health concern at certain levels of exposure. Certain DBPs, including some trihalomethanes (THMs) and some haloacetic acids (HAAs), have been shown to cause cancer in laboratory animals. Other DBPs have been shown to affect the liver and the nervous

system, and cause reproductive or developmental effects in laboratory animals. Exposure to certain DBPs may produce similar effects in people. EPA has set standards to limit exposure to THMs, HAAs, and other DBPs.

- F. **Bromate**: Some people who drink water containing bromate in excess of the MCL over many years may have an increased risk of getting cancer.
 - G. **Chlorite**: 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.
 - H. **Haloacetic Acids (HAA)**: Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.
 - I. **TTHMs [Total Trihalomethanes]**: Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer.
- F. **Public Notification for Fluoride**: Notice of violations of the MCL for fluoride, notices of variances and exemptions from the MCL for fluoride, and notices of failure to comply with variance and exemption schedules for the MCL level for fluoride shall consist of the public notice prescribed in this Section, plus a description of any steps which the system is taking to come into compliance. The public notice must contain the following language, including the language necessary to fill in the blanks;

“This is an alert about your drinking water and a cosmetic dental problem that might affect children under nine years of age. At low levels, fluoride can help prevent cavities, but children drinking water containing more than 2 milligrams per liter (mg/l) of fluoride may develop cosmetic discoloration of their permanent teeth (dental fluorosis). The drinking water provided by your community water system [name] has a fluoride concentration of [insert value] mg/l.

Dental fluorosis, in its moderate or severe forms, may result in a brown staining and/or pitting of the permanent teeth. This problem occurs only in developing teeth, before they erupt from the gums. Children under nine should be provided with alternative sources of drinking water or water that has been treated to remove the fluoride to avoid the possibility of staining and pitting of their permanent teeth. You may also want to contact your dentist about proper use by young children of fluoride-containing products. Older children and adults may safely drink the water.

Drinking water containing more than 4 mg/L of fluoride (the U.S.

Environmental Protection Agency's drinking water standard) can increase your risk of developing bone disease. Your drinking water does not contain more than 4 mg/l of fluoride, but we're required to notify you when we discover that the fluoride levels in your drinking water exceed 2 mg/l because of this cosmetic dental problem.

For more information, please call [name of water system contact] of [name of community water system] at [phone number]. Some home water treatment units are also available to remove fluoride from drinking water. To learn more about available home water treatment units, you may call NSF International at 1-877-8-NSF-HELP.”

- G. **Public Notification by the State:** The Division may give notice to the public required by this Section on behalf of the owner of a public water system if the Division complies with the requirements of this Section. However, the owner of the public water system remains legally responsible for ensuring that the requirements of this Section are met.
- H. **Record Maintenance:** Copies of public notices issued pursuant to Section 22.413 of this part and certifications made to the Division pursuant to Section 22.43 must be kept for five (5) years after issuance.

22.413 **Frequency, Tier Designation and Distribution of Public Notification:**

- A. **NPDWR Violations and Other Situations Requiring Public Notice**¹: Public notices shall be provided in accordance with the requirements of Sec. 22.411, 22.412 and the following table:

Contaminant	MCL/MRDL/TT violations ²		Monitoring & testing procedure violations	
	Tier of Public Notice Required	Citation	Tier of Public Notice Required	Citation
1. Violations of National Primary Drinking Water Regulations (NPDWR) ³				
A. Microbiological Contaminants				
1. Total coliform	2	22.51	3	22.50
2. Fecal coliform/E. coli	1	22.51	⁴ 1, 3	22.50
3. Turbidity MCL	2	22.70	3	22.70
4. Turbidity MCL (average of 2 days samples >5 NTU)	⁵ 2, 1	22.701	3	22.702
5. Turbidity (for TT violations resulting from a single exceedance of maximum allowable turbidity level)	⁶ 2, 1	22.701	3	22.702
6. Surface Water Treatment rule violations, other than violations resulting from single exceedance of max. allowable turbidity level (TT)	2	22.1004	3	22.1006(D)
7. Interim Enhanced Surface Water Treatment Rule violations, other than violations resulting from single exceedance of max. allowable turbidity level (TT)	2	⁷ 22.1007	3	22.1010
8. Filter Backwash Recycling Rule violations.	<u>2</u>	<u>22.1012</u>	<u>3</u>	<u>22.1012</u>
B. Inorganic Chemicals (IOCs)				

1. Antimony	2	22.601	3	[22.206][22.602]
2. Arsenic	2	22.601	3	[22.206][22.602]
3. Asbestos (fibers >10 microns)	2	22.601	3	[22.206][22.602]
4. Barium	2	22.601	3	[22.206][22.602]
5. Beryllium	2	22.601	3	[22.206][22.602]
6. Cadmium	2	22.601	3	[22.206][22.602]
7. Chromium (Total)	2	22.601	3	[22.206][22.602]
8. Cyanide	2	22.601	3	[22.206][22.602]
9. Fluoride	2	22.601	3	[22.206][22.602]
10. Mercury	2	22.601	3	[22.206][22.602]
11. Nickel	2	22.601	3	[22.206][22.602]
12. Nitrate	1	22.601	⁸ 1, 3	[22.206][22.602]
13. Nitrite	1	22.601	⁸ 1, 3	[22.206][22.602]
14. Total Nitrate and Nitrite	1	22.601	3	[22.206][22.602]
15. Selenium	2	22.601	3	[22.206][22.602]
16. Thallium	2	22.601	3	[22.206][22.602]
C. Lead and Copper Rule (Action level for lead is 0.015 mg/L, for copper is 1.3 mg/L)				
1. Lead and Copper rule (TT)	2	22.607	3	22.607
D. Synthetic Organic Chemicals (SOCs)				
1. 2,4 - D	2	22.611(A)	3	22.612
2. 2,4,5 -TP	2	22.611(A)	3	22.612
3. Alachlor	2	22.611(A)	3	22.612
4. Atrazine	2	22.611(A)	3	22.612
5. Benzo(a)pyrene (PAHs)	2	22.611(A)	3	22.612
6. Carbofuran	2	22.611(A)	3	22.612
7. Chlordane	2	22.611(A)	3	22.612
8. Dalapon	2	22.611(A)	3	22.612
9. Di (2-ethylhexyl) adipate	2	22.611(A)	3	22.612
10. Di (2-ethylhexyl) phthalate	2	22.611(A)	3	22.612
11. Dibromochloropropane	2	22.611(A)	3	22.612
12. Dinoseb	2	22.611(A)	3	22.612
13. Dioxin (2,3,7,8 – TCDD)	2	22.611(A)	3	22.612
14. Diquat	2	22.611(A)	3	22.612
15. Endothall	2	22.611(A)	3	22.612
16. Endrin	2	22.611(A)	3	22.612
17. Ethylene Dibromide	2	22.611(A)	3	22.612
18. Glyphosate	2	22.611(A)	3	22.612
19. Heptachlor	2	22.611(A)	3	22.612
20. Heptachlor epoxide	2	22.611(A)	3	22.612
21. Hexachlorobenzene	2	22.611(A)	3	22.612
22. Hexachlorocyclopentadiene	2	22.611(A)	3	22.612
23. Lindane	2	22.611(A)	3	22.612
24. Methoxychlor	2	22.611(A)	3	22.612
25. Oxamyl (Vydate)	2	22.611(A)	3	22.612
26. Pentachlorophenol	2	22.611(A)	3	22.612
27. Picloram	2	22.611(A)	3	22.612
28. Polychlorinated biphenyls (PCBs)	2	22.611(A)	3	22.612
29. Simazine	2	22.611(A)	3	22.612
30. Toxaphene	2	22.611(A)	3	22.612
31. Aldicarb	2	22.611(A)	3	22.612
32 Aldicarb sulfone	2	22.611(A)	3	22.612
33. Aldicarb sulfoxide	2	22.611(A)	3	22.612
E. Volatile Organic Chemicals (VOCs)				
1. Benzene	2	22.611(C)	3	22.614

2. Carbon tetrachloride	2	22.611(C)	3	22.614
3. Chlorobenzene (monochlorobenzene)	2	22.611(C)	3	22.614
4. o-Dichlorobenzene	2	22.611(C)	3	22.614
5. p-Dichlorobenzene	2	22.611(C)	3	22.614
6. 1,2-Dichloroethane	2	22.611(C)	3	22.614
7. 1,1-Dichloroethylene	2	22.611(C)	3	22.614
8. cis-1,2,-Dichloroethylene	2	22.611(C)	3	22.614
9. trans-1,2-Dichloroethylene	2	22.611(C)	3	22.614
10. Dichloromethane	2	22.611(C)	3	22.614
11. 1,2-Dichloropropane	2	22.611(C)	3	22.614
12. Ethylbenzene	2	22.611(C)	3	22.614
13. Styrene	2	22.611(C)	3	22.614
14. Tetrachloroethylene	2	22.611(C)	3	22.614
15. Toluene	2	22.611(C)	3	22.614
16. 1,2,4-Trichlorobenzene	2	22.611(C)	3	22.614
17. 1,1,1-Trichloroethane	2	22.611(C)	3	22.614
18. 1,1,2-Trichloroethane	2	22.611(C)	3	22.614
19. Trichloroethylene	2	22.611(C)	3	22.614
20. Vinyl chloride	2	22.611	3	22.614
21. Xylenes (total)	2	22.611(C)	3	22.614
22. Methyl <i>tert</i> Butyl Ether	2	22.611(C)	3	22.614
F. Radioactive Contaminants				
1. Beta/photon emitters	2	22.91	3	22.92
2. Alpha emitters	2	22.91	3	22.92
3. Combined radium (226 & 228)	2	22.91	3	22.92
4. Uranium	2	¹⁸ 22.91	3	¹⁹ 22.92
G. Disinfection Byproducts (DBPs), Byproduct Precursors, Disinfection Residuals. ⁹				
1. Total trihalomethanes (TTHMs)	2	¹⁰ 22.611(B)	3	22.613
2. Haloacetic Acids (HAA5)	2	22.611(B)	3	22.613
3. Bromate	2	22.611(B)	3	22.613
4. Chlorite	2	22.611(B)	3	22.613
5. Chlorine (MRDL)	2	22.803	3	22.804
6. Chloramine (MRDL)	2	22.803	3	22.804
7. Chlorine dioxide (MRDL), where any 2 consecutive daily samples at entrance to the distribution system only are above MRDL	2	22.803	2 ¹¹ , 3	22.804
8. Chlorine dioxide (MRDL), where sample(s) in distribution system the next day are also above MRDL	¹² 1	22.803	1	22.804
9. Control of DBP precursors – TOC (TT)	2	22.807	3	22.807(C)
10. Bench marking and disinfection profiling	N/A	N/A	3	22.1008
11. Development of monitoring plan	N/A	N/A	3	22.1008
H. Other Treatment Techniques				
1. Acrylamide	2	22.62(C)	N/A	N/A
2. Epichlorohydrin	2	22.62(C)	N/A	N/A
II. Unregulated Contaminant Monitoring ¹³				
A. Unregulated contaminants	N/A	N/A	3	CFR 141.40
III. Public Notification for Variances and Exemptions				
A. Operation under a variance or exemption	N/A	¹⁴ 22.204	3	N/A
B. Violation of conditions of a variance or exemption	N/A	¹⁵ 22.204	3	N/A
IV. Other Situations Requiring Public Notice				
[A. Fluoride secondary maximum contaminant level (SMCL) exceedance]	[3]	[22.603]	[N/A]	[N/A]

[B][A]. Exceedance of nitrate MCL for non-community systems, as allowed by Division	1	22.602(K)	N/A	N/A
[C][B]. Availability of unregulated contaminant monitoring data	3	CFR 141.40	N/A	N/A
[D][C]. Waterborne disease outbreak	1	22.1	N/A	N/A
[E][D]. Other waterborne emergency ¹⁶	1	N/A	N/A	N/A
[F][E]. Other situations as determined by the Division	¹⁷ 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 Division. The Division 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 Table, as authorized under CFR 141.202(a) and CFR 141.203(a).

² MCL – Maximum Contaminant Level, MRDL – Maximum Residual Disinfectant Level, TT – Treatment Technique

³ The term Violations of National Primary Drinking Water Regulations (NPDWR) is used here to include violations of MCL, MRDL, treatment technique, monitoring, and testing procedure requirements.

⁴ Failure to test for fecal coliform 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 two consecutive days must consult with the Division within 24 hours after learning of the violation. Based on this consultation, the Division may subsequently decide to elevate the violation to Tier 1. If a system is unable to make contact with the Division in the 24-hour period, the violation is automatically elevated to Tier 1.

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

⁷ Most of the requirements of the IESWTR (63 FR 69477) (CFR 141.170-141.171, 141.173, 141.174) become effective January 1, 2002 for Subpart H systems (surface water systems and groundwater under the direct influence of surface water) serving at least 10,000 persons. However, CFR 141.172 has some requirements that become effective as early as April 16, 1999. The SWTR remains in effect for systems serving at least 10,000 persons even after 2002; the IESWTR adds additional requirements and does not in many cases supersede the SWTR.

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 Subpart H community and non-transient non-community systems serving > 10,000 must comply with new DBP 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. Subpart H 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. Subpart H transient non-community systems serving fewer than 10,000 persons and using only groundwater 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 CFR 141.12 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 CFR 141.40

¹⁴ This citation refers to §§ 1415 and 1416 of the Safe Drinking Water Act. §§1415 and 1416 require that “a schedule prescribed... for a public water system granted a variance [or exemption] shall require compliance by the system...”

¹⁵ In addition to §§1415 and 1416 of the Safe Drinking Water Act, 40 CFR 142.307 specifies the items and schedule milestones that must be included in a variance for small systems.

¹⁶ 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 failures or significant interruption in water treatment processes, natural disasters that disrupt the water supply or distribution system, chemical spills, or unexpected loading of possible pathogens into the source water.

¹⁷ Primacy agencies may place other situations in any tier they believe appropriate, based on threat to public health.

¹⁸ The uranium MCL Tier 2 violation citations are effective December 8, 2003 for all community water systems.

¹⁹ The uranium Tier 3 violation citations are effective December 8, 2000 for all community water systems.

B. Notification to New Billing Units:

1. The owner of a community public water system must give a copy of the most recent public notice for any outstanding violation of any MCL, MRDL, or any treatment technique requirement, or any variance or exemption schedule or monitoring violation to all new billing units or new hookups prior to or at the time service begins.
 2. Non-community water systems must continuously post the public notice in conspicuous locations in order to inform new consumers of any continuing violation, variance or exemption, or other situation requiring a public notice for as long as the violation, variance, exemption, or other situation persists.
- C. All posted public notices shall remain readable and be protected by glass, plastic or some other suitable covering and remain in place until such time that the violation or failure has terminated.
- D. Notice to the public required by this Section may be given by the Division should the water supplier fail to do so.
- E. Nothing in this Section shall limit the authority of the Secretary, Delaware Health and Social Services to require notification by newspaper and to radio and television stations when circumstances make more immediate or broader notice appropriate to protect the public's health.
- F. All community and non-community water suppliers shall submit to the Division, within ten (10) days of the completion of issuance of public notification, a representative copy of each type of notice distributed, published, posted and/or made available to the person served by the system and/or to the media.

[G. Public water systems that sell or otherwise provide drinking water to other public water systems (i.e., to consecutive systems) are required to give public notice to the owner or operator of the consecutive system. The consecutive system is responsible for providing public notice to the persons it serves.

H. If a public water system has a violation in a portion of the distribution system that is physically or hydraulically isolated from other parts of the distribution system, the Division may allow the system to limit distribution of the public notice to only persons served by that portion of the system that is out of compliance. Permission by the Division for limiting distribution must be granted in writing.]

Public Notification Requirements Pertaining to Lead**A. Applicability of Public Notification Requirements:**

1. Except as provided in paragraph A.2. of this Section, by June 19, 1988, the owner of each CWS and each NTNCWS shall issue notice to persons served by the system that may be affected by lead contamination of their drinking water. The Division may require subsequent notices. The owner shall provide notice under this Section even if there is no violation of the national primary drinking water regulation for lead.
2. Notice under paragraph A.1. of this Section is not required if the system demonstrates to the Division that the water system, including the residential and non-residential portions connected to the water system, are lead free. For the purposes of this paragraph, the term "lead free" when used with respect to solders and flux refers to solder and flux containing not more than 0.2 percent lead, and when used with respect to pipes and pipe fittings, refers to pipes and pipe fittings containing not more than 8.0 percent lead.
3. The owner shall review, correct and complete the public notice and return it to the Division within seventy-two (72) hours with approval noted.

B. Manner of Notification:

1. Notice shall be given to persons served by the PWS either by:
 - a. Three newspaper notices one (1) for each of three (3) consecutive months and the first no later than June 19, 1988) or;
 - b. Once by mail notice with the water bill or in a separate mailing by June 19, 1988 or;
 - c. Once by hand delivery by June 19, 1988.
2. For NTNCWS, notice may be given by continuous posting. If posting is used, the notice shall be posted in a conspicuous place in the area served by the system and start no later than June 19, 1988, and continue for three (3) months.

C. General Content of Notice:

1. Notices issued under this Section shall provide a clear and readily understandable explanation of the potential sources of lead in drinking water, potential adverse health effects, reasonable available methods of mitigating known or potential lead content in drinking water, any steps the water system is taking to mitigate lead content in drinking water and the necessity for seeking alternative water supplies, if any. Use of the mandatory language in paragraph D. of this Section in the notice will be sufficient to explain potential adverse health effects.
2. Each notice shall also include specific advice on how to determine if materials containing lead have been used in homes or the water distribution

system and how to minimize exposure to water likely to contain high levels of lead. Each notice shall be conspicuous and shall not contain unduly technical language, unduly small print, or similar problems that frustrate the purpose of the notice. Each notice shall contain the telephone number of the owner, operator or designee of the PWS as a source of additional information regarding the notice. Where appropriate, the notice shall be multi-lingual.

D. Mandatory Health Effects Information: When providing the information in public notices required under paragraph C of this Section on the potential adverse health effects of lead in drinking water, the owner of the water system shall include the following mandatory language specific to lead.

1. Lead: The United States Environmental Protection Agency (USEPA) sets drinking water standards and has determined that lead is a health concern at certain levels of exposure. There is currently a standard of 0.020 parts per million (ppm). Part of the purpose of this notice is to inform you of the potential adverse health effects of lead. This is being done even though your water may not be in violation of the current standard. The USEPA and others are concerned about lead in drinking water. Too much lead in the human body can cause serious damage to the brain, kidneys, nervous system and red blood cells. The greatest risk, even with short-term exposure, is to young children and pregnant women. Lead levels in your drinking water are likely to be highest:

- * if your home or water system has lead pipes, or
- * if your home has copper pipes with lead solder, and
- * if the home is less than five (5) years old
- * if you have soft or acidic water, or
- * if water sits in the pipes for several hours.

22.415 **Public Notification Requirements Pertaining to VOCs and MRDLs:** If a CWS or NTNCWS fails to comply with an applicable MCL or MRDL level established under Section 22.611 and 22.803, or fails to comply with requirements of any schedule prescribed pursuant to a variance or exemption, the water supplier shall notify persons served by the system as provided in Section 22.413.

22.416 **Public Notification Requirements Pertaining to Unregulated Contaminants:**

- A. The owner of a community water system or non-transient, non-community water system required to monitor under CFR 141.40 must notify persons served by the system of the availability of the results of such sampling no later than 90 days after the monitoring results are known.
- B. The form and manner of the public notice must follow the requirements for a Tier 3 public notice prescribed in Secs. 22.411(3), (C)(1), and (C)(3). The notice must also identify a person and provide the telephone number to contact for information on the monitoring results.

22.417 **Procedures for Issuance of a Public Notice:**

A. PMCL Violation:

1. Upon notification that a condition exists as indicated in Section 22.411A., the Division shall prepare a notice in accordance with Section 22.412 and a draft public notice for use in public notification by the water supply owner.
2. As soon as possible, but in no case more than twenty-four (24) hours, the Division shall forward the notice and draft notice to the water supply owner.
3. The owner shall review, correct and complete the public notice and return it to the Division within twenty-four (24) hours with approval noted.
4. The Division shall resolve any discrepancies and approve the public notice until as rapidly as possible and retain the public notice until the final confirmation sample results are received.
5. Upon receipt of the confirmation sampling results, the Division shall determine if a public notice is warranted and shall return the approved public notice to the owner for appropriate public notification.
6. For all Tier 1 violations as noted in Sec. 22.411(A), the owner shall notify the Division as soon as possible. However, the owner shall be responsible for issuing the public notice to consumers within twenty-four (24) hours.

B. Other Violations or Circumstances Requiring Public Notification:

1. Upon notification that a condition exists as indicated in Section 22.411B. and 22.411C., the Division shall initiate the preparation of a draft public notice and notice if appropriate.
2. As soon as possible, but in no case more than seventy-two (72) hours, the Division shall forward a copy of the draft public notice with attached notice, if applicable, to the water supply owner.
3. The owner shall review, correct and complete the public notice and return it to the Division within seventy-two (72) hours with approval noted.
4. The Division shall resolve any discrepancies and approve the public notice as rapidly as possible.
5. The Division shall then return the approved public notice to the owner for appropriate public notification.

22.42 **Consumer Confidence Reports:**

22.421 **Purpose and applicability:** This subpart establishes the minimum requirements for the content of annual reports that community water systems must deliver to their customers. These reports must contain information on the quality of the water delivered by the systems and characterize the risks (if any) from exposure to contaminants detected in the drinking water in an accurate and understandable manner.

- A. This subpart applies only to community water systems.
- B. For purposes of this subpart, customers are defined as billing units or service connections to which water is delivered by a community water system.

- C. For purposes of this subpart, detected means: at or above the levels prescribed by CFR 141.23(a)(4) for inorganic contaminants, at or above the levels prescribed by CFR 141.24(f)(7) for the contaminants listed in Sec. 22.611(C), at or above the level prescribed by CFR 141.24(h)(18) for the contaminants listed in Sec. 22.611(A), and at or above the levels prescribed by CFR 141.25(c) for radioactive contaminants.

22.422

Effective dates: The regulations in this subpart shall take effect on September 18, 1998.

- A. Each existing community water system must deliver its first report by October 19, 1999, its second report by July 1, 2000, and subsequent reports by July 1 annually thereafter. The first report must contain data collected during, or prior to, calendar year 1998 as prescribed in Sec. 22.423(D). Each report thereafter must contain data collected during, or prior to, the previous calendar year.
- B. A new community water system must deliver its first report by July 1 of the year after its first full calendar year in operation and annually thereafter.
- C. A community water system that sells water to another community water system must deliver the applicable information required in Sec. 22.423 to the buyer system:
 - 1. No later than April 19, 1999, by April 1, 2000, and by April 1 annually thereafter; or,
 - 2. On a date mutually agreed upon by the seller and the purchaser and specifically included in a contract between the parties.

22.423

Content of the reports: Each community water system must provide to its customers an annual report that contains the information specified in this section and Sec. 22.424

- A. Each community water system must provide to its customers an annual report that contains the information specified in this section and Sec. 22.424.
- B. Information on the source of the water delivered:
 - 1. Each report must identify the source(s) of the water delivered by the community water system by providing information on:
 - a. The type of the water: e.g., surface water, ground water; and
 - b. The commonly used name (if any) and location of the body (or bodies) of water.
 - 2. If a source water assessment has been completed, the report must notify consumers of the availability of this information and the means to obtain it. In addition, systems are encouraged to highlight in the report significant sources of contamination in the source water area if they have readily available information. Where a system has received a source water assessment from the Division, the report must include a brief summary of the system's susceptibility to potential sources of contamination, using language provided by the Division or written by the operator.
- C. Definitions.
 - 1. Each report must include the following definitions:
 - a. Maximum Contaminant Level Goal or MCLG: The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

- b. Maximum Contaminant Level or MCL: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.
 - c. Maximum Residual Disinfectant Level Goal or MRDLG: The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.
 - d. Maximum Residual Disinfectant Level: The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control microbial contaminants.
2. A report for a community water system operating under a variance or an exemption issued under Sec. 22.204 of SDWA must include the following definition: Variances and Exemptions: State or EPA permission not to meet an MCL or a treatment technique under certain conditions.
 3. A report which contains data on a contaminant for which EPA has set a treatment technique or an action level must include one or both of the following definitions as applicable:
 - a. Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.
 - b. Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.
- D. Information on Detected Contaminants.
1. This sub-section specifies the requirements for information to be included in each report for contaminants subject to mandatory monitoring (except *Cryptosporidium*). It applies to:
 - a. Contaminants subject to an MCL, MRDL, action level, or treatment technique (regulated contaminants);
 - b. Contaminants for which monitoring is required by CFR 141.40 (unregulated contaminants); and
 - c. Disinfection by-products or microbial contaminants for which monitoring is required by CFR 141.142 and 141.143, except as provided under paragraph (E)(1) of this section, and which are detected in the finished water.
 2. The data relating to these contaminants must be displayed in one table or in several adjacent tables. Any additional monitoring results which a community water system chooses to include in its report must be displayed separately.
 3. The data must be derived from data collected to comply with EPA and State monitoring and analytical requirements during calendar year 1998 for the first report and subsequent calendar years thereafter except that:
 - a. Where a system is allowed to monitor for regulated contaminants less often than once a year, the table(s) must include the date and results of the most recent sampling and the report must include a brief statement indicating that the data presented in the report are

from the most recent testing done in accordance with the regulations. No data older than 5 years need be included.

- b. Results of monitoring in compliance with CFR 141.142 and 141.143 need only be included for 5 years from the date of last sample or until any of the detected contaminants becomes regulated and subject to routine monitoring requirements, whichever comes first.
4. For detected regulated contaminants (listed in 22.426 to this subpart), the table(s) must contain:
- a. The MCL for that contaminant expressed as a number equal to or greater than 1.0 (as provided in 22.426 to this subpart);
 - b. The MCLG for that contaminant expressed in the same units as the MCL;
 - c. If there is no MCL for a detected contaminant, the table must indicate that there is a treatment technique, or specify the action level, applicable to that contaminant, and the report must include the definitions for treatment technique and/or action level, as appropriate, specified in paragraph(C)(3) of this section;
 - d. For contaminants subject to an MCL, except turbidity and total coliforms, the highest contaminant level used to determine compliance with an NPDWR and the range of detected levels, as follows:
 1. When compliance with the MCL is determined annually or less frequently: The highest detected level at any sampling point and the range of detected levels expressed in the same units as the MCL.
 2. When compliance with the MCL is determined by calculating a running annual average of all samples taken at a sampling point: the highest average of any of the sampling points and the range of all sampling points expressed in the same units as the MCL.
 3. When compliance with the MCL is determined on a system-wide basis by calculating a running annual average of all samples at all sampling points: the average and range of detection expressed in the same units as the MCL.

Note to paragraph (D)(4)(d): When rounding of results to determine compliance with the MCL is allowed by the regulations, rounding should be done prior to multiplying the results by the factor listed in 22.426 of this subpart;

- e. For turbidity.
 1. When it is reported pursuant to Sec. 22.701: The highest average monthly value.
 2. When it is reported pursuant to the requirements of 40 CFR 141.71: the highest monthly value. The report should include an explanation of the reasons for measuring turbidity.
 3. When it is reported pursuant to 40 CFR 141.73: The highest single measurement and the lowest monthly percentage of

samples meeting the turbidity limits specified in 40 CFR 141.73 or 141.173 for the filtration technology being used. The report should include an explanation of the reasons for measuring turbidity;

- f. For lead and copper: the 90th percentile value of the most recent round of sampling and the number of sampling sites exceeding the action level;
 - g. For total coliform:
 - 1. The highest monthly number of positive samples for systems collecting fewer than 40 samples per month; or
 - 2. The highest monthly percentage of positive samples for systems collecting at least 40 samples per month;
 - h. For fecal coliform: The total number of positive samples; and
 - i. The likely source(s) of detected contaminants to the best of the operator's knowledge. Specific information regarding contaminants may be available in sanitary surveys and source water assessments, and should be used when available to the operator. If the operator lacks specific information on the likely source, the report must include one or more of the typical sources for that contaminant listed in 22.427 to this subpart which are most applicable to the system.
 - j. Community water systems that detect TTHM above 0.080 mg/L in 22.611(B) as an annual average, monitored and calculated in accordance with 22.612 must include health effects language for TTHMs prescribed in 22.412(E)(6)(I).
5. If a community water system distributes water to its customers from multiple hydraulically independent distribution systems that are fed by different raw water sources, the table should contain a separate column for each service area and the report should identify each separate distribution system. Alternatively, systems could produce separate reports tailored to include data for each service area.
6. The table(s) must clearly identify any data indicating violations of MCLs, MRDLs or treatment techniques and the report must contain a clear and readily understandable explanation of the violation including: the length of the violation, the potential adverse health effects, and actions taken by the system to address the violation. To describe the potential health effects, the system must use the relevant language of 22.412(E).
7. For detected unregulated contaminants for which monitoring is required (except *Cryptosporidium*), the table(s) must contain the average and range at which the contaminant was detected. The report may include a brief explanation of the reasons for monitoring for unregulated contaminants.
- E. Information on *Cryptosporidium*, radon, and other contaminants:
- 1. If the system has performed any monitoring for *Cryptosporidium*, including monitoring performed to satisfy the requirements of CFR 141.143, which indicates that *Cryptosporidium* may be present in the source water or the finished water, the report must include:
 - a. A summary of the results of the monitoring; and
 - b. An explanation of the significance of the results.

2. If the system has performed any monitoring for radon which indicates that radon may be present in the finished water, the report must include:
 - a. The results of the monitoring; and
 - b. An explanation of the significance of the results.
 3. If the system has performed additional monitoring which indicates the presence of other contaminants in the finished water, EPA strongly encourages systems to report any results which may indicate a health concern. To determine if results may indicate a health concern, EPA recommends that systems find out if EPA has proposed an NPDWR or issued a health advisory for that contaminant by calling the Safe Drinking Water Hotline (800-426-4791). EPA considers detects above a proposed MCL or health advisory level to indicate possible health concerns. For such contaminants, EPA recommends that the report include:
 - a. The results of the monitoring; and
 - b. An explanation of the significance of the results noting the existence of a health advisory or a proposed regulation.
- F. Compliance with NPDWR. In addition to the requirements of Sec. 22.423(D)(7), the report must note any violation that occurred during the year covered by the report of a requirement listed below, and include a clear and readily understandable explanation of the violation, any potential adverse health effects, and the steps the system has taken to correct the violation.
1. Monitoring and reporting of compliance data;
 2. Filtration and disinfection prescribed by subpart H of this part. For systems which have failed to install adequate filtration or disinfection equipment or processes, or have had a failure of such equipment or processes which constitutes a violation, the report must include the following language as part of the explanation of potential adverse health effects: Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.
 3. Lead and copper control requirements prescribed by subpart I of this part. For systems which fail to take one or more actions prescribed by Secs. 22.607(A)(2), 22.607(B), 22.607(C), 22.607(D), 22.607(E), the report must include the applicable language of 22.412(E) for lead, copper, or both.
 4. Treatment techniques for Acrylamide and Epichlorohydrin prescribed by subpart K of this part. For systems which violate the requirements of subpart K of this part, the report must include the relevant language from 22.412(E).
 5. Recordkeeping of compliance data.
 6. Special monitoring requirements prescribed by Secs. 22.602 and 22.604; and
 7. Violation of the terms of a variance, an exemption, or an administrative or judicial order.
- G. Variances and Exemptions. If a system is operating under the terms of a variance or an exemption issued under Sec. 22.202 or 22.203 of these regulations, the report must contain:
1. An explanation of the reasons for the variance or exemption;

2. The date on which the variance or exemption was issued;
3. A brief status report on the steps the system is taking to install treatment, find alternative sources of water, or otherwise comply with the terms and schedules of the variance or exemption; and
4. A notice of any opportunity for public input in the review, or renewal, of the variance or exemption.

H. Additional information:

1. The report must contain a brief explanation regarding contaminants which may reasonably be expected to be found in drinking water including bottled water. This explanation may include the language of paragraphs (H)(1) (a) through (c) or systems may use their own comparable language. The report also must include the language of paragraph (H)(1)(d) of this section.
 - a. The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.
 - b. Contaminants that may be present in source water include:
 1. Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
 2. Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
 3. Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.
 4. Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.
 5. Radioactive contaminants, which can be naturally-occurring or be the result of oil and gas production and mining activities.
 - c. In order to ensure that tap water is safe to drink, EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. FDA regulations establish limits for contaminants in bottled water which must provide the same protection for public health.
 - d. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the

Environmental Protection Agency's Safe Drinking Water Hotline (800-426-4791).

2. The report must include the telephone number of the owner, operator, or designee of the community water system as a source of additional information concerning the report.
3. In communities with a large proportion of non-English speaking residents, as determined by the Division, the report must contain information in the appropriate language(s) regarding the importance of the report or contain a telephone number or address where such residents may contact the system to obtain a translated copy of the report or assistance in the appropriate language.
4. The report must include information (e.g., time and place of regularly scheduled board meetings) about opportunities for public participation in decisions that may affect the quality of the water.
5. The systems may include such additional information as they deem necessary for public education consistent with, and not detracting from, the purpose of the report.

22.424

Required additional health information: All reports must prominently display the following language:

- A. Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (800-426-4791).
- B. Ending in the reports due by July 1, 2001 a system which detects arsenic at levels above 0.025 mg/L, but below 0.05 mg/l and beginning in the report due by July 1, 2002 a system that detects arsenic above 0.005 mg/L and up to and including ~~0.05~~ **[0.01][0.010]** mg/L:
 1. Must include in its report a short informational 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.
 2. May write its own educational statement, but only in consultation with the Division.
- C. A system which detects nitrate at levels above 5 mg/l, but below the MCL:
 1. Must include a short informational statement about the impacts of nitrate on children using language such as: Nitrate in drinking water at levels above 10 ppm is a health risk for infants of less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate

levels may rise quickly for short periods of time because of rainfall or agricultural activity. If you are caring for an infant you should ask advice from your health care provider.

2. May write its own educational statement, but only in consultation with the Division.
- D. Systems which detects lead above the action level in more than 5%, and up to and including 10%, of homes sampled:
1. Must include a short informational statement about the special impact of lead on children using language such as: Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water, you may wish to have your water tested and flush your tap for 30 seconds to 2 minutes before using tap water. Additional information is available from the Safe Drinking Water Hotline (800-426-4791).
 2. May write its own educational statement, but only in consultation with the Division.
- F. Beginning in the report due by July 1, 2002 and ending January 22, 2006, a community water system that detects arsenic above ~~[0.01]~~**[0.010]** mg/L and up to and including 0.05 mg/L must include the arsenic health effects language prescribed in 22.423.

22.425

Report delivery and recordkeeping: Except as provided in paragraph (G) of this section,

- A. Each community water system must mail or otherwise directly deliver one copy of the report to each customer.
- B. The system must make a good faith effort to reach consumers who do not get water bills, using means recommended by the Division. EPA expects that an adequate good faith effort will be tailored to the consumers who are served by the system but are not bill-paying customers, such as renters or workers. A good faith effort to reach consumers would include a mix of methods appropriate to the particular system such as: Posting the reports on the Internet; mailing to postal patrons in metropolitan areas; advertising the availability of the report in the news media; publication in a local newspaper; posting in public places such as cafeterias or lunch rooms of public buildings; delivery of multiple copies for distribution by single-billed customers such as apartment buildings or large private employers; delivery to community organizations.
- C. No later than the date the system is required to distribute the report to its customers, each community water system must mail a copy of the report to the Division, followed within 3 months by a certification that the report has been distributed to customers, and that the information is correct and consistent with the compliance monitoring data previously submitted to the Division.
- D. No later than the date the system is required to distribute the report to its customers, each community water system must deliver the report to any other agency or clearinghouse identified by the Division.

- E. Each community water system must make its reports available to the public upon request.
- F. Each community water system serving 100,000 or more persons must post its current year's report to a publicly-accessible site on the Internet.
- G. The Governor or his designee can waive the requirement of paragraph (A) of this section for community water systems serving fewer than 10,000 persons.
 - 1. Such systems must:
 - a. Publish the reports in one or more local newspapers serving the area in which the system is located;
 - b. Inform the customers that the reports will not be mailed, either in the newspapers in which the reports are published or by other means approved by the State; and
 - c. Make the reports available to the public upon request.
 - 2. Systems serving 500 or fewer persons may forego the requirements of paragraphs (G)(1)(a) and (b) of this section if they provide notice at least once per year to their customers by mail, door-to-door delivery or by posting in an appropriate location that the report is available upon request.
- H. Any system subject to this subpart must retain copies of its consumer confidence report for no less than 5 years.

22.426

Converting MCL Compliance Values for Consumer Confidence Reports:

Key

AL=Action Level

MCL=Maximum Contaminant Level

MCLG=Maximum Contaminant Level Goal

MFL=million fibers per liter

mrem/year=millirems per year (a measure of radiation absorbed by the body)

MRDL=Maximum Residual Disinfection Level

MRDLG=Maximum Residual Disinfection Level Goal

NTU=Nephelometric Turbidity Units

pCi/l=picocuries per liter (a measure of radioactivity)

ppm=parts per million, or milligrams per liter (mg/l)

ppb=parts per billion, or micrograms per liter (<greek-m>g/l)

ppt=parts per trillion, or nanograms per liter

ppq=parts per quadrillion, or picograms per liter

TT=Treatment Technique

Contaminant (units)	Traditional MCL in mg/L	To convert for CCR, multiply by	MCL in CCR units	MCLG
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Microbiological Contaminants

1. Total Coliform Bacteria	MCL: (systems that collect > 40 or more samples/month) 5% of monthly samples are positive; (systems that collect < 40 samples/month) 1 positive monthly sample			0
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2. Fecal coliform and E. coli	A routine sample and a repeat sample are total coliform positive, and one is also fecal coliform or E. coli positive.			0
3. Turbidity	TT (NTU)		TT	n/a
Radioactive Contaminants				
4. Beta/photon emitters	4 mrem/yr		4 mrem/yr	0
5. Alpha emitters	15 pCi/l		15 pCi/l	0
6. Combined radium	5 pCi/l		5 pCi/l	0
6a. Uranium	30 ug/L		30 ug/L	0
Inorganic Contaminants				
7. Antimony	.006	1000	6 ppb	6
8. Arsenic	.05	1000	50 ppb	n/a
8a. Arsenic after July 1, 2002	0.05 [.010]	1000	10 ppb	0
9. Asbestos	7 MFL		7 MFL	7
10. Barium	2		2 ppm	2
11. Beryllium	.004	1000	4 ppb	4
12. Cadmium	.005	1000	5 ppb	5
13. Chromium	.1	1000	100 ppb	100
14. Copper	AL=1.3		AL=1.3 ppm	1.3
15. Cyanide	.2	1000	200 ppb	200
16. Fluoride	1.8		1.8 ppm	1.8
17. Lead	AL=.015	1000	AL=15 ppb	0
18. Mercury (inorganic)	.002	1000	2 ppb	2
19. Nitrate (as Nitrogen)	10		10 ppm	10
20. Nitrite (as Nitrogen)	1		1 ppm	1
20a. Nitrate/nitrite (as Nitrogen)	10		10 ppm	10
21. Selenium	.05	1000	50 ppb	50
22. Thallium	.002	1000	2 ppb	0.5
Synthetic Organic Contaminants including Pesticides and Herbicides				
23. 2,4-D	.07	1000	70 ppb	70
24. 2,4,5-TP [Silvex]	.05	1000	50 ppb	50
25. Acrylamide	TT			0
26. Alachlor	.002	1000	2 ppb	0
27. Atrazine	.003	1000	3 ppb	3
28. Benzo(a)pyrene [PAH]	.0002	1,000,000	200 ppt	0
29. Carbofuran	.04	1000	40 ppb	40
30. Chlordane	.002	1000	2 ppb	0
31. Dalapon	.2	1000	200 ppb	200
32. Di(2-ethylhexyl)adipate	.4	1000	400 ppb	400
33. Di(2-ethylhexyl) phthalate	.006	1000	6 ppb	0
34. Dibromochloropropane	.0002	1,000,000	200 ppt	0
35. Dinoseb	.007	1000	7 ppb	7
36. Diquat	.02	1000	20 ppb	20
37. Dioxin [2,3,7,8-TCDD]	.00000003	1,000,000,000	30 ppq	0
38. Endothall	.1	1000	100 ppb	100
39. Endrin	.002	1000	2 ppb	2
40. Epichlorohydrin	TT			0
41. Ethylene dibromide	.00005	1,000,000	50 ppt	0
42. Glyphosate	.7	1000	700 ppb	700
43. Heptachlor	.0004	1,000,000	400 ppt	0
44. Heptachlor epoxide	.0002	1,000,000	200 ppt	0
45. Hexachlorobenzene	.001	1000	1 ppb	0
46. hexachlorocyclopentadiene	.05	1000	50 ppb	50
47. Lindane	.0002	1,000,000	200 ppt	200
48. Methoxychlor	.04	1000	40 ppb	40

49. Oxamyl [Vydate]	.2	1000	200 ppb	200
50. PCBs [Polychlorinated biphenyls].	.0005	1,000,000	500 ppt	0
51. Pentachlorophenol	.001	1000	1 ppb	0
52. Picloram	.5	1000	500 ppb	500
53. Simazine	.004	1000	4 ppb	4
54. Toxaphene	.003	1000	3 ppb	0
55. Aldicarb	.003	1000	3 ppb	3
56. Aldicarb sulfone	.002	1000	2 ppb	2
57. Aldicarb sulfoxide	.004	1000	4 ppb	4
Volatile Organic Contaminants				
55. Benzene	.005	1000	5 ppb	0
56. Bromate	.010	1000	10	0
57. Carbon tetrachloride	.005	1000	5 ppb	0
58. Chloramines	MRDL = 4		MRDL = 4	MRDLG = 4
59. Chlorine	MRDL = 4		MRDL = 4	MRDLG = 4
60. Chlorite	1		1	0.8
61. Chlorine dioxide	MRDL = .8	1000	MRDL = 800	MRDLG = 800
62. Chlorobenzene	.1	1000	100 ppb	100
63. o-Dichlorobenzene	.6	1000	600 ppb	600
64. p-Dichlorobenzene	.075	1000	75 ppb	75
65. 1,2-Dichloroethane	.005	1000	5 ppb	0
66. 1,1-Dichloroethylene	.007	1000	7 ppb	7
67. cis-1,2-Dichloroethylene	.07	1000	70 ppb	70
68. trans-1,2-Dichloroethylene	.1	1000	100 ppb	100
69. Dichloromethane	.005	1000	5 ppb	0
70. 1,2-Dichloropropane	.005	1000	5 ppb	0
71. Ethylbenzene	.7	1000	700 ppb	700
72. Haloacetic acids (HAA)	.060	1000	60 ppb	N/A
73. Methyl <i>tert</i> Butyl Ether	.01	1000	10 ppb	0
74. Styrene	.1	1000	100 ppb	100
75. Tetrachloroethylene	.005	1000	5 ppb	0
76. 1,2,4-Trichlorobenzene	.07	1000	70 ppb	70
77. 1,1,1-Trichloroethane	.2	1000	200 ppb	200
78. 1,1,2-Trichloroethane	.005	1000	5 ppb	3
79. Trichloroethylene	.005	1000	5 ppb	0
80. TTHMs [Total trihalomethanes]	0.080	1000	80 ppb	n/a
81. Toluene	1		1 ppm	1
82. Vinyl Chloride	.002	1000	2 ppb	0
83. Xylenes	10		10 ppm	10
84. Control of DBP Precursors (TOC) TT			TT	n/a

22.427 **Regulated contaminants and sources in drinking water:** Sources of contamination for regulated compounds.

Contaminant	Major sources in drinking water
Microbiological Contaminants	
1. Total Coliform Bacteria	Naturally present in the environment
2. Fecal coliform and E. coli	Human and animal fecal waste.
3. Turbidity	Soil runoff
Radioactive Contaminants	
4. Beta/photon emitters	Decay of natural and man-made deposits.
5. Alpha emitters	Erosion of natural deposits.
6. Combined radium	Erosion of natural deposits.
6a. Uranium	Erosion of natural deposits.
Inorganic Contaminants	

7. Antimony	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder.
8. Arsenic	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes.
9. Asbestos	Decay of asbestos cement water mains; Erosion of natural deposits.
10. Barium	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits.
11. Beryllium	Discharge from metal refineries and coal-burning factories; Discharge from electrical, aerospace, and defense industries.
12. Cadmium	Corrosion of galvanized pipes; Erosion of natural deposits; Discharge from metal refineries; runoff from waste batteries and paints.
13. Chromium	Discharge from steel and pulp mills; Erosion of natural deposits
14. Copper	Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservatives.
15. Cyanide	Discharge from steel/metal factories; Discharge from plastic and fertilizer factories.
16. Fluoride	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories.
17. Lead	Corrosion of household plumbing systems; Erosion of natural deposits.
18. Mercury [inorganic]	Erosion of natural deposits; Discharge from refineries and factories; Runoff from landfills; Runoff from cropland.
19. Nitrate [as Nitrogen]	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.
20. Nitrite [as Nitrogen]	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.
20a. Nitrate/nitrite (as Nitrogen)	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.
21. Selenium	Discharge from petroleum and metal refineries; Erosion of natural deposits; Discharge from mines
22. Thallium	Leaching from ore-processing sites; Discharge from electronics, glass, and drug factories.
Synthetic Organic Contaminants including Pesticides and Herbicides	
23. 2,4-	Runoff from herbicide used on row crops.
24. 2,4,5-TP [Silvex]	Residue of banned herbicide.
25. Acrylamide	Added to water during sewage/ wastewater treatment.
26. Alachlor	Runoff from herbicide used on row crops.
27. Atrazine	Runoff from herbicide used on row crops.
28. Benzo(a)pyrene [PAH]	Leaching from linings of water storage tanks and distribution lines.
29. Carbofuran	Leaching of soil fumigant used on rice and alfalfa.
30. Chlordane	Residue of banned termiticide.
31. Dalapon	Runoff from herbicide used on rights of way.
32. Di(2-ethylhexyl) adipate	Discharge from chemical factories.
33. Di(2-ethylhexyl) phthalate	Discharge from rubber and chemical factories.
34. Dibromochloropropane	Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards.
35. Dinoseb	Runoff from herbicide used on soybeans and vegetables.
36. Diquat	Runoff from herbicide use.
37. Dioxin [2,3,7,8-TCDD]	Emissions from waste incineration and other combustion; Discharge from chemical factories.
38. Endothall	Runoff from herbicide use.
39. Endrin	Residue of banned insecticide.
40. Epichlorohydrin	Discharge from industrial chemical factories; An impurity of some water treatment chemicals.
41. Ethylene dibromide	Discharge from petroleum refineries.
42. Glyphosate	Runoff from herbicide use.
43. Heptachlor	Residue of banned termiticide.
44. Heptachlor epoxide	Breakdown of heptachlor.

- 45. Hexachlorobenzene Discharge from metal refineries and agricultural chemical factories.
- 46. Hexachlorocyclopentadiene Discharge from chemical factories.
- 47. Lindane Runoff/leaching from insecticide used on cattle, lumber, gardens.
- 48. Methoxychlor Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock.
- 49. Oxamyl [Vydate] Runoff/leaching from insecticide used on apples, potatoes and tomatoes.
- 50. PCBs [Polychlorinated biphenyls] Runoff from landfills; Discharge of waste chemicals.
- 51. Pentachlorophenol Discharge from wood preserving factories.
- 52. Picloram Herbicide runoff.
- 53. Simazine Herbicide runoff.
- 54. Toxaphene Runoff/leaching from insecticide used on cotton and cattle.
- 55. Aldicarb Runoff from pesticide use on potatoes or peanuts.
- 56. Aldicarb sulfone Breakdown of aldicarb. Runoff from pesticide use on potatoes or peanuts.
- 57. Aldicarb sulfoxide Breakdown of aldicarb.

Volatile Organic Contaminants

- 55. Benzene Discharge from factories; Leaching from gas storage tanks and landfills.
- 56. Bromate Byproduct of drinking water chlorination.
- 57. Carbon tetrachloride Discharge from chemical plants and other industrial activities.
- 58. Chloramines Water additive used to control microbes.
- 59. Chlorine Water additive used to control microbes.
- 60. Chlorite Byproduct of drinking water chlorination.
- 61. Chlorine dioxide Water additive used to control microbes.
- 62. Chlorobenzene Discharge from chemical and agricultural chemical factories.
- 63. o-Dichlorobenzene Discharge from industrial chemical factories.
- 64. p-Dichlorobenzene Discharge from industrial chemical factories.
- 65. 1,2-Dichloroethane Discharge from industrial chemical factories.
- 66. 1,1-Dichloroethylene Discharge from industrial chemical factories.
- 67. cis-1,2-Dichloroethylene Discharge from industrial chemical factories.
- 68. trans-1,2-Dichloroethylene Discharge from industrial chemical factories.
- 69. Dichloromethane Discharge from pharmaceutical and chemical factories.
- 70. 1,2-Dichloropropane Discharge from industrial chemical factories.
- 71. Ethylbenzene Discharge from petroleum refineries.
- 72. Haloacetic acids Byproduct of drinking water disinfection.
- 73. Methyl *tert* Butyl Ether (MTBE) Discharge from petroleum refineries; Leaching from gas storage tanks.
- 74. Styrene Discharge from rubber and plastic factories; Leaching from landfills.
- 75. Tetrachloroethylene Discharge from factories and dry cleaners.
- 76. 1,2,4-Trichlorobenzene Discharge from textile- finishing factories.
- 77. 1,1,1-Trichloroethane Discharge from metal degreasing sites and other factories.
- 78. 1,1,2-Trichloroethane Discharge from industrial chemical factories.
- 79. Trichloroethylene Discharge from metal degreasing sites and other factories.
- 80. TTHMs [Total trihalomethanes] By-product of drinking water chlorination.
- 81. Toluene Discharge from petroleum factories.
- 82. Vinyl Chloride Leaching from PVC piping; Discharge from plastics factories.
- 83. Xylenes Discharge from petroleum factories; Discharge from chemical factories.
- 84. Control of DBP Precursors (TOC) Naturally present in the environment.

22.43 **Record Maintenance:**

22.431 **Retaining Records:** Effective upon the adoption of these Regulations, any owner of a PWS shall accumulate and make available to the Division within the time stated the following records which shall be retained on the premises or at a convenient location:

- A. Bacteriological analyses of records for not less than the previous five (5) years.
- B. Chemical analyses records for not less than the previous ten (10) years.

- C. Actual laboratory reports may be kept, or data may be transferred to tabular summaries, provided that the following information is included:
 - 1. The date, place and time of sampling and the name of the person who collected the sample;
 - 2. Identification of the sample as to whether it was a routine distribution system sample, check sample, raw or process water sample or other special purpose sample;
 - 3. Date of analysis;
 - 4. Laboratory and person responsible for performing analysis;
 - 5. The analytical technique/method used and;
 - 6. The results of the analysis.
- D. Records of action taken by the system to correct violations of PMCL regulations shall be kept for a period not less than three (3) years after the last action taken with respect to the particular violation involved.
- E. Reports, summaries and communications relating to sanitary surveys shall be kept for a period not less than ten (10) years after completion of the sanitary survey of the system conducted by the system itself, by a private consultant or by any local, State or Federal agency.
- F. Records concerning a variance or exemption shall be kept for a period ending not less than five (5) years following the expiration of such variance or exemption.
- G. Copies of Public Notices, Consumer Confidence Reports, the certifications for each, and any decisions by the Division relating to the Public Notice shall be kept for five (5) years.

22.432

Records Kept by Division: Records of microbiological analyses of repeat or special samples shall be retained for not less than one (1) year in the form of actual laboratory reports or in an appropriate summary form. Records of each of the following decisions made pursuant to the total coliform provisions shall be made in writing and retained by the Division.

- A. Records of the following decisions must be retained for five (5) years:
 - 1. Any decision to waive the twenty-four (24) hour time limit for collecting repeat samples after a total coliform positive routine sample if the public water system has a logistical problem in collecting the repeat sample that is beyond the system's control, and what alternative time limit the system must meet.
 - 2. Any decision to allow a system to waive the requirement for five (5) routine samples the month following a total coliform-positive sample. If the waiver decision is made, the record of the decision must contain all items listed in that paragraph.

3. Any decision to invalidate a total coliform-positive sample. If the decision to invalidate a total coliform positive sample is made, the record of the decision must contain all the items in that paragraph.
- B. Records of each of the following decisions must be retained in such a manner so that each system's current status may be determined:
1. Any decision to reduce the total coliform monitoring frequency for a CWS serving one thousand (1000) persons or fewer, that has no history of total coliform contamination in its current configuration and had a sanitary survey conducted within the last five (5) years showing that the system is supplied solely by a protected ground water source and is free of sanitary defects, to less than once per month and what the reduced monitoring frequency is. A copy of the reduced monitoring frequency must be provided to the system.
 2. Any decision to reduce the total coliform monitoring frequency for a NCWS using only ground water and serving one thousand (1000) persons or fewer to less than once per quarter, and what the reduced monitoring frequency is. A copy of the reduced monitoring frequency must be provided to the system.
 3. Any decision to reduce the total coliform monitoring frequency for a NCWS using only ground water and serving more than one thousand (1000) persons during any month the system serves one thousand (1000) persons or fewer. A copy of the reduced monitoring frequency must be provided to the system.
 4. Any decision to waive the twenty-four hour limit for taking a total coliform sample for a PWS which uses surface water, or ground water under the influence of surface water, and which does not practice filtration, and which measures a source water turbidity level exceeding one (1) NTU near the first service connection.
 5. Any decision that a NCWS is using only protected and disinfected ground water and therefore may reduce the frequency of its sanitary survey to less than once every five (5) years and what that frequency is. A copy of the reduced frequency must be provided to the system.
 6. A list of agents other than the Division, if any, approved by the Division to conduct sanitary surveys.
 7. Any decision to allow a PWS to forgo fecal coliform or E. coli testing on a total coliform positive sample if that system assumes that the total coliform positive sample is fecal coliform positive or E. coli positive.

SECTION 22.5 MICRO-BIOLOGICAL REQUIREMENTS:

22.50 **Sampling:**

22.501 **Sampling Sites:** Compliance with bacteriological requirements of these Regulations shall be based on examinations of samples collected at sites which are representative of water throughout the distribution system according to a written sample siting plan. These plans are subject to Division review and revision.

22.502

CWS Sampling Frequency: The supplier of water for a CWS shall sample for total coliform bacteria at least monthly in numbers proportional to the population served by the system in accordance with the following:

Population Served	Number of Samples Per Month
25-1,000	1
1,001-2,500	2
2,501-3,300	3
3,301-4,100	4
4,101-4,900	5
4,901-5,800	6
5,801-6,700	7
6,701-7,600	8
7,601-8,500	9
8,501-12,900	10
12,901-17,200	15
17,201-21,500	20
21,501-25,000	25
25,001-33,000	30
33,001-41,000	40
41,001-50,000	50
50,001-59,000	60
59,001-70,000	70
70,001-83,000	80
83,001-96,000	90
96,001-130,000	100
130,001-220,000	120

22.503

Reduced Monitoring Frequency for CWSs: If a CWS serving twenty-five (25) to one thousand (1000) persons has no history of total coliform contamination in its current configuration and a sanitary survey conducted in the past five (5) years shows that the system is supplied solely by a protected ground water source and is free of sanitary defects, the Division may reduce the monitoring frequency specified above, except that in no case may the Division reduce the monitoring frequency to less than one (1) sample per quarter. The Division must approve the reduced monitoring frequency in writing.

22.504

NCWS Sampling Frequency: The supplier of water for a NCWS and NTNCWS shall sample for total coliform bacteria in accordance with the following:

- A. A NCWS and NTNCWS using only ground water (except ground water under the direct influence of surface water) and serving one thousand (1000) persons or fewer must monitor each calendar quarter that the system provides water to the public, except that the Division may reduce this monitoring frequency, in writing, if

a sanitary survey shows that the system is free of sanitary defects. Beginning June 29, 1994 the Division cannot reduce the monitoring frequency for a NCWS using only ground water (except ground water under the direct influence of surface water) and serving one thousand (1000) persons or fewer to less than once per year.

- B. A NCWS and NTNCWS using only ground water (except ground water under the direct influence of surface water) and serving more than one thousand (1000) persons during any month must monitor at the same frequency as a like-sized CWS, as specified in Section 22.502, except the Division may reduce this monitoring frequency, in writing, for any month the system serves one thousand (1000) persons or fewer. The Division cannot reduce the monitoring frequency to less than once per year. For systems using ground water under the direct influence of surface water, Section 22.504D applies.
- C. A NCWS and NTNCWS using surface water, in total or in part, must monitor at the same frequency as a like-sized CWS, as specified in Section 22.502, regardless of the number of persons it serves.
- D. A NCWS and NTNCWS using ground water under the direct influence of surface water must monitor at the same frequency as a like-sized CWS, as specified in Section 22.502. The system must begin monitoring at this frequency beginning six (6) months after the Division determines that the ground water is under the direct influence of surface water.

22.505 **Special Sampling for Surface Water Systems:** A PWS that uses surface water or ground water under the direct influence of surface water, and does not practice filtration in compliance with Section 22.1004, must collect at least one (1) sample near the first service connection each day the turbidity level of the source water, measured as specified in Section 22.702, exceeds one (1) NTU. This sample must be analyzed for the presence of total coliforms. When one (1) or more turbidity measurements in any day exceed one (1) NTU, the system must collect this coliform sample within twenty-four (24) hours of the first exceedance, unless the Division determines that the system, for logistical reasons outside the system's control, cannot have the sample analyzed within thirty (30) hours of collection. Sample results from this coliform monitoring must be included in determining the MCL for total coliforms.

22.506 **Monthly/Quarterly Sampling:** The PWS must collect samples at regular time intervals throughout the month/quarter, except that a system that uses ground water (except ground water under the direct influence of surface water) and serves 4,900 persons or fewer, may collect all required samples on a single day if they are taken from different sites.

22.507 **Special Purpose Samples:** Special purpose samples, such as those taken to determine whether disinfection practices are sufficient following pipe placement, replacement, or repair, shall not be used to determine compliance with the MCL for total coliforms. Repeat samples taken pursuant to Section 22.513 are not considered special purpose samples, and must be used to determine compliance with the MCL for total coliforms.

22.51 **Microbiological MCLs:**

22.511

Total Coliforms, Fecal Coliforms and E. coli: The MCLs for microbiological contaminants are in accordance with the following:

- A. When any approved analytical methodology from Section 22.52 is used, compliance with the MCL is based on the presence or absence of total coliforms in a sample, rather than coliform density in accordance with the following:
 - 1. For a system which collects at least forty (40) samples per month/quarter, if no more than 5.0 percent of the samples collected during a month/quarter are total coliform-positive, the system is in compliance with the MCL for total coliforms.
 - 2. For a system which collects fewer than forty (40) samples per month/quarter, if no more than one (1) sample collected during a month/quarter is total coliform-positive, the system is in compliance with the MCL for total coliforms.
- B. Any fecal coliform-positive repeat sample, or E. coli-positive repeat sample, or any total coliform-positive repeat sample following a fecal coliform-positive or E. coli-positive routine sample constitutes a violation of the MCL for total coliforms. For purposes of the public notification requirements in Section 22.41, this is a violation that may pose an acute risk to health.
- C. A PWS must determine compliance with the MCL for total coliforms in accordance with the above for each month/quarter in which it is required to monitor for total coliforms.
- D. The Division hereby identifies the following as the BAT, treatment techniques, or other means available for achieving compliance with the MCL for total coliforms above:
 - 1. Protection of wells from contamination by coliforms by appropriate placement and construction;
 - 2. Maintenance of a disinfectant residual throughout the distribution system;
 - 3. Proper maintenance of the distribution system including appropriate pipe replacement and repair procedures, main flushing programs, proper operation and maintenance of storage tanks and reservoirs, and continual maintenance of positive water pressure in all parts of the distribution system;
 - 4. Filtration and/or disinfection of surface water, or disinfection of ground water using strong oxidants such as chlorine, chlorine dioxide, or ozone.
 - 5. The development of an EPA-approved State Wellhead Protection Program under Section 1428 of the Safe Drinking Water Act (SDWA).

22.512

Invalidation of Total Coliform-Positive Samples: Each total coliform positive sample counts in compliance calculations, unless it has been invalidated by the Division. Invalidated samples do not count toward the minimum monitoring frequency. The Division may invalidate a sample if:

- A. The analytical laboratory acknowledges that improper sample analysis caused the positive result;
- B. A laboratory must invalidate a total coliform sample (unless total coliforms are detected) if the sample produces a turbid culture in the absence of gas production using an analytical method where gas formation is examined (e.g. the Multiple-Tube Fermentation Technique), produces a turbid culture in the absence of an acid reaction in the Presence-Absence (P-A) Coliform Test, or exhibits confluent growth or produces colonies too numerous to count with an analytical method using a membrane filter (e.g. Membrane Filter Technique). If a laboratory invalidates a sample because of such interference, the system must collect another sample from the same location as the original sample within twenty-four (24) hours of being notified of the interference problem, and have it analyzed for the presence of total coliforms. The system must continue to re-sample within twenty-four (24) hours and have the samples analyzed until it obtains a valid result. The Division may waive the twenty-four (24) hour time limit on a case-by-case basis.
- C. The system determines that the contamination is a domestic or other non-distribution system plumbing problem on the basis that one (1) or more repeat samples taken at the same tap as the original total coliform positive sample is total coliform positive, but all repeat samples at nearby sampling locations that are within five (5) service connections of the original tap are total coliform negative. A total coliform-positive sample cannot be invalidated under this provision if the PWS has only one (1) service connection; or
- D. The Division has substantial grounds to believe that a total coliform positive result is due to some circumstance or condition which does not reflect water quality in the distribution system, if:
 1. The basis for this determination is documented in writing.
 2. This document is signed and approved by the Division.
 3. The documentation is made available to EPA and the public. The written documentation must state the specific cause of the total coliform-positive sample, and what action the system has taken, or will take, to correct this problem.

The system must still collect all repeat samples required under Section 22.513 to determine compliance with the MCL for total coliforms in Section 22.511.

22.513

Repeat Monitoring: When a total coliform-positive sample result is obtained, repeat sampling must be done in accordance with the following:

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

- B. The system must collect at least one (1) repeat sample from the sampling tap where the original total coliform-positive sample was taken, and at least one (1) repeat sample at a tap within five (5) service connections upstream and at least one (1) repeat sample at a tap within five (5) service connections downstream of the original sampling site. If a total coliform-positive sample is at the end of the distribution system, or one (1) away from the end of the distribution system, the Division may waive the requirement to collect at least one (1) repeat sample upstream or downstream of the original sampling site.
- C. The system must collect all repeat samples on the same day, except that the Division may allow a system with a single service connection to collect the required set of repeat samples over a four (4) day period or to collect a larger volume repeat sample(s) in one (1) or more sample containers of any size, as long as the total volume collected is at least four hundred (400) ml [three hundred (300) ml for systems which collect more than one (1) routine sample/month].
- D. If one (1) or more repeat samples in the set is total coliform-positive, the PWS must collect an additional set of repeat samples in the manner specified in paragraphs A, B, and C of this Section. The additional samples must be collected within twenty-four (24) hours of being notified of the positive result, unless the Division extends the limit as provided in paragraph A of this Section. The system must repeat this process until either total coliforms are not detected in one (1) complete set of repeat samples or the system determines that the MCL for total coliforms in Section 22.511 has been exceeded and notifies the Division.
- E. If a system collecting fewer than five (5) routine samples per month has one (1) or more total coliform-positive samples and the Division does not invalidate the sample(s) under Section 22.512, it must collect at least five (5) routine samples during the next month the system provides water to the public, except that the Division may waive this requirement if the conditions of paragraphs E1 and E2 are met. The Division cannot waive the requirement for a system to collect repeat samples in paragraphs A, B, C, and D of this Section.
 - 1. The Division may waive the requirements to collect five (5) routine samples the next month the system provides water to the public if the Division, or an agent approved by the Division, performs a site visit before the end of the next month the system provides water to the public. Although a sanitary survey need not be performed, the site visit must be sufficiently detailed to allow the Division to determine whether additional monitoring and/or any corrective action is needed. The Division cannot approve an employee of the system to perform the site visit, even if the employee is an agent approved by the Division to perform sanitary surveys.
 - 2. The Division may waive the requirements to collect five (5) routine samples the next month the system provides water to the public if the Division has determined why the sample was total coliform-positive and establishes that the system has corrected the problem or will correct the problem before the end of the next month the system serves water to the public. In this case, the Division must document this decision to waive the following month's additional monitoring requirement in writing, have it approved and signed by the supervisor of the Division official who recommends such a decision, and make this document available to the EPA

and the public. The written documentation must describe the specific cause of the total coliform-positive sample and what action the system has taken and/or will take to correct this problem. The Division cannot waive the requirement to collect five (5) routine samples the next month the system provides water to the public solely on the grounds that all coliform samples are total coliform-negative. Under this paragraph, a system must still take at least one (1) routine sample before the end of the next month it serves water to the public and use it to determine compliance with the MCL for total coliforms in Section 22.511, unless the Division has determined that the system has corrected the contamination problem before the system took the set of repeat samples required in paragraphs A, B, C, and D of this Section, and all repeat samples were total coliform negative.

- F. After a systems collects a routine sample and before it learns the results of the analysis of that sample, if it collects another routine sample(s) from within five (5) adjacent service connections of the initial sample, and the initial sample, after analysis, is found to contain total coliforms, then the system may count the subsequent sample(s) as a repeat sample instead of a routine sample.
- G. Results of all routine and repeat samples not invalidated by the Division must be included in determining compliance with the MCL for total coliforms in Section 22.511.

22.514 **Initial/Subsequent Sanitary Surveys:** PWSs which do not collect five (5) or more routine samples/month must undergo an initial sanitary survey by June 29, 1994 for CWSs and June 29, 1999 for NCWSs. Thereafter, systems must undergo another sanitary survey every five (5) years, except that NCWSs using only protected and disinfected ground water, as defined by the Division, must undergo subsequent sanitary surveys at least every ten (10) years after the initial sanitary survey. The Division must review the results of each sanitary survey to determine whether the existing monitoring frequency is adequate and what additional measures, if any, the system needs to undertake to improve drinking water quality. In conducting a sanitary survey of a system using ground water in a State having an EPA-approved wellhead protection program under Section 1428 of the SDWA, information on sources of contamination within the delineated wellhead protection area that was collected in the course of developing and implementing the program should be considered instead of collecting new information, if the information was collected since the last time the system was subject to a sanitary survey. Sanitary surveys must be performed by the Division and the system is responsible for ensuring the survey takes place.

22.515 **Fecal Coliforms/Escherichia coli (E. coli) Testing:** When a total coliform-positive sample result is obtained, the sample must be analyzed for fecal coliforms or E. coli in accordance with the following:

- A. If any routine or repeat sample is total coliform- positive, the system must analyze that total coliform-positive culture medium to determine if fecal coliforms are present, except that the system may test for E. coli in lieu of fecal coliforms. If fecal coliforms or E. coli are present, the system shall notify the Division by the end of the day when the system is notified of the test result, unless the system is

notified of the result after the Division office is closed, in which case the system shall notify the Division before the end of the next business day.

- B. The Division has the discretion to allow the PWS, on a case by case basis, to forgo fecal coliform or E. coli testing on a total coliform-positive sample if that system assumes that the total coliform-positive sample is fecal coliform-positive or E. coli positive. Accordingly, the system shall notify the Division as specified in paragraph A of this Section and the provisions of Section 22.511B apply.

22.516 **Response to Violation:** A PWS which has exceeded the MCL for total coliforms in Section 22.511 must report the violation to the Division no later than the end of the next business day after it learns of the violation, and notify the public in accordance with Section 22.41. A PWS which has failed to comply with a coliform monitoring requirement, including the sanitary survey requirement, must report the monitoring violation to the Division within ten (10) days after the system discovers the violation, and notify the public in accordance with Section 22.41.

22.52 **ANALYTICAL REQUIREMENTS:**

22.521 **Analytical Methodology:** The standard sample volume required for total coliform analysis, regardless of analytical method used, is one hundred (100) ml. Public water systems need only determine the presence or absence of total coliforms. A determination of total coliform density is not required. Public water systems must conduct total coliform analyses in accordance with 40 CFR 141.21(f)(3). Copies may be obtained from the Office of Drinking Water.

SECTION 22.6 INORGANIC AND ORGANIC CHEMICAL REQUIREMENTS

22.60 **INORGANIC CHEMICAL REQUIREMENTS:**

22.601 **PMCLs AND SMCLs:** The following are the inorganic PMCLs and SMCLs (mg/L - milligrams per liter). Compliance is determined pursuant to Section 22.602.

A. PMCLs Substance	MCL
Antimony (Sb)	0.006 mg/L
Arsenic (As)**	0.05 mg/L**
Asbestos	7 MF/L
Barium (Ba)	2 mg/L
Beryllium (Be)	0.004 mg/L
Cadmium (Cd)	0.005 mg/L
Chromium (Cr)	0.1 mg/L
Cyanide (Cn)	0.2 mg/L
Fluoride (F)	See Section 22.603
Mercury (Hg)	0.002 mg/L

Nickel (Ni)	0.1 mg/L
Nitrate-Nitrogen (NO ₃ -N)	10 mg/L (See Section 22.602 I3)
Nitrite-Nitrogen (NO-N)	1 mg/L
Total Nitrate Nitrogen and Nitrite Nitrogen	10 mg/L
Selenium (Se)	0.05 mg/L
Thallium (Tl)	0.002 mg/L
Turbidity	See Section 22.701

*MFL - million fibers per liter, with fiber length > 10 microns

Effective January 23, 2006, the arsenic standard for community and non-transient non-community public water systems shall be [~~0.04~~][0.010**] mg/L.

B. SMCLs

Substance	MCL
Aluminum	0.05-0.2 mg/L
Chloride (Cl)	250 mg/L
Color	15 color units
Corrosivity	Noncorrosive (See Section 22.71)
Foaming Agents	0.50 mg/L
Iron (Fe)	0.30 mg/L
Manganese (Mn)	0.05 mg/L
Odor	3 threshold odor number
pH	6.5 – 8.5
Silver	0.1 mg/L
Sulfate (SO ₄)	250 mg/L
Total Dissolved Solids (TDS)	500 mg/L
Zinc (Zn)	5 mg/L

C. The Maximum Contaminant Level Goals (MCLG) for lead and copper are as follows:

Lead	0 mg/L
Copper	1.3 mg/L

D. Arsenic:

1. The analyses and determination of compliance with the 0.05 mg/L maximum contaminant level for arsenic use the requirements of 22.602.

2. The maximum contaminant level for arsenic is 0.05 mg/L for community water systems until January 23, 2006

22.602

Sampling and Analytical Requirements: Community water systems shall conduct monitoring to determine compliance with the maximum contaminant levels specified in Section 22.601 in accordance with this section. Non-transient, non-community water systems shall conduct monitoring to determine compliance with the maximum contaminant levels specified in Section 22.601 in accordance with this section. Transient, non-community water systems shall conduct monitoring to determine compliance with the nitrate and nitrite maximum contaminant levels in Section 22.601 in accordance with this section. **[Detection limits for each analytical method shall be in accordance with 40 CFR 141.23(a)(4)(i) as amended. Copies may be obtained from the Office of Drinking Water].**

A. Monitoring shall be conducted as follows:

1. Groundwater systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after treatment [hereafter called a sampling point] beginning in the compliance period starting January 1, 1993. The system shall take each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.
 - a. Groundwater systems with 150 or more service connections shall begin monitoring for Phase II and Phase V contaminants on January 1, 1993.
 - b. Groundwater systems with less than 150 service connections shall begin monitoring for Phase II contaminants on January 1, 1993 and for Phase V contaminants on January 1, 1996.
2. Surface water systems shall take a minimum of one sample at every entry point to the distribution system after any application of treatment or in the distribution system at a point which is representative of each source after treatment [hereafter called a sampling point] beginning in the compliance period beginning January 1, 1993. The system shall take each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

NOTE: FOR PURPOSES OF THIS PARAGRAPH, SURFACE WATER SYSTEMS INCLUDE SYSTEMS WITH A COMBINATION OF SURFACE AND GROUND SOURCES.

- a. Surface water systems with 150 or more service connections shall begin monitoring for Phase II and Phase V contaminants on January 1, 1993.
 - b. Surface water systems with less than 150 service connections shall begin monitoring for Phase II contaminants on January 1, 1993 and for Phase V contaminants on January 1, 1996.
3. If a system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water is representative of all sources being used).

4. The Division may reduce the total number of samples which must be analyzed by allowing the use of compositing. Composite samples from a maximum of five sampling points are allowed provided that the detection limit of the method used for analysis is less than one-fifth of the MCL. Compositing of samples must be done in the laboratory.
 - a. If the concentration in the composite sample is greater than or equal to one-fifth of the MCL of any inorganic chemical, then a follow-up sample must be taken within 14 days at each sampling point included in the composite. These samples must be analyzed for the contaminants which exceeded one-fifth of the MCL in the composite sample. **~~[Detection limits for each analytical method shall be in accordance with 40 CFR 141.23(a)(4)(i). Copies may be obtained from the Office of Drinking Water.]~~**
 - b. If the population served by the system is >3,300 persons, then compositing may only be permitted by the Division at sampling points within a single system. In systems serving <3,300 persons, the State may permit compositing among different systems provided the 5-sample limit is maintained.
 - c. If duplicates of the original sample taken from each sampling point used in the composite are available, the system may use these instead of resampling. The duplicates must be analyzed and the results reported to the Division within 14 days of collection
 5. The frequency of monitoring for asbestos shall be in accordance with paragraph (B) of this section; the frequency of monitoring for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium, and thallium shall be in accordance with paragraph (C) of this section; the frequency of monitoring for nitrate shall be in accordance with paragraph (D) of this section; and the frequency of monitoring for nitrite shall be in accordance with paragraph (E) of this section.
- B. The frequency of monitoring conducted to determine compliance with the maximum contaminant level for asbestos specified in Section 22.601 shall be conducted as follows:
1. Each community and non-transient, non-community water system is required to monitor for asbestos during the first three-year compliance period of each nine-year compliance cycle beginning in the compliance period starting January 1, 1993.
 2. If the system believes it is not vulnerable to either asbestos contamination in its source water or due to corrosion of asbestos-cement pipe, or both, it may apply to the Division for a waiver of the monitoring requirement in paragraph (B1) of this section. If the Division grants the waiver, the system is not required to monitor.
 3. The Division may grant a waiver based on a consideration of the following factors:
 - a. Potential asbestos contamination of the water source, and
 - b. The use of asbestos-cement pipe for finished water distribution and the corrosive nature of the water.
 4. A waiver remains in effect until the completion of the three-year compliance period. Systems not receiving a waiver must monitor in accordance with the provisions of paragraph (B1) of this section.

5. A system vulnerable to asbestos contamination due solely to corrosion of asbestos-cement pipe shall take one sample at a tap served by asbestos-cement pipe and under conditions where asbestos contamination is most likely to occur.
 6. A system vulnerable to asbestos contamination due solely to source water shall monitor in accordance with the provision of paragraph (A) of this section.
 7. A system vulnerable to asbestos contamination due both to its source water supply and corrosion of asbestos-cement pipe shall take one sample at each entry point after treatment and a minimum of one tap sample served by asbestos-cement pipe and under conditions where asbestos contamination is most likely to occur.
 8. A system which exceeds PMCL listed in Section 22.601 shall monitor quarterly beginning in the next quarter after the violation occurred.
 9. The Division may decrease the quarterly monitoring requirement to the frequency specified in paragraph B1 of this section provided the Division has determined that the system is reliably and consistently below the maximum contaminant level. In no case can a Division make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface (or combined surface/ground) water system takes a minimum of four quarterly samples.
 10. If monitoring data collected after January 1, 1990 are generally consistent with the requirements of this section then the Division may allow systems to use that data to satisfy the monitoring requirement for the initial compliance period beginning January 1, 1993.
- C. The frequency of monitoring conducted to determine compliance with the maximum contaminant levels in Section 22.601 for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium and thallium shall be as follows:
1. Groundwater systems shall take one sample at each sampling point once every three (3) years. Surface Water systems (or combined surface/ground) shall take one sample annually at each sampling point beginning January 1, 1993.
 2. The system may apply to the Division for a waiver from the monitoring frequencies specified in paragraph C(1) of this section.
 3. A condition of the waiver shall require that a system shall take a minimum of one sample while the waiver is effective. The term during which the waiver is effective shall not exceed one compliance cycle (i.e., nine years).
 4. The Division may grant a waiver provided surface water systems have monitored annually for at least three years and groundwater systems have conducted a minimum of three rounds of monitoring. (At least one sample shall have been taken since January 1, 1990). Both surface and groundwater systems shall demonstrate that all previous analytical results were less than the maximum contaminant level. Systems that use a new water source are not eligible for a waiver until three rounds of monitoring from the new source have been completed.
 5. In determining the appropriate reduced monitoring frequency, the Division shall consider:
 - a. Reported concentrations from all previous monitoring.
 - b. The degree of variation in reported concentrations; and
 - c. Other factors which may affect contaminant concentrations such as changes in groundwater pumping rates, changes in the systems configuration, changes in the system's operating procedures, or changes in stream flows or characteristics.

6. A decision by the Division to grant a waiver shall be made in writing and shall set forth the basis for the determination. The determination may be initiated by the Division or upon an application by the public water system. The public water system shall specify the basis for its request. The Division shall review and, where appropriate, revise its determination of the appropriate monitoring frequency when the system submits new monitoring data or when other data relevant to the system's appropriate monitoring frequency become available.
 7. Systems which exceed the MCLs as calculated in paragraph I of this Section shall monitor quarterly beginning in the next quarter after the violation occurred.
 8. The Division may decrease the quarterly monitoring requirement to the frequencies specified in paragraphs C1 and C2 of this section provided it has determined that the system is reliably and consistently below the maximum contaminant level. In no case can the Division make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface water system takes a minimum of four quarterly samples.
 9. All new systems that use a new source of water [or existing systems that add a new source of water] that begin operation after January 22, 2004 must demonstrate compliance with the MCL within a period of time specified by the Division. The system must also comply with the initial sampling frequencies specified by the Division to ensure a system can demonstrate compliance with the MCL. Routine and increased monitoring frequencies shall be conducted in accordance with the requirements in this section.
- D. All public water systems (community; non-transient, non-community; and transient, non-community systems) shall monitor to determine compliance with the maximum contaminant level for nitrate in Section 22.601.
1. Community and non-transient, non-community water systems served by groundwater systems shall monitor annually beginning January 1, 1993; systems served by surface water shall monitor quarterly beginning January 1, 1993.
 2. For community and non-transient, non-community water systems, the repeat monitoring frequency for groundwater systems shall be quarterly for at least one year following any one sample in which the concentration is >50 percent of the MCL. The Division may allow a groundwater system to reduce the sampling frequency to annually after four consecutive quarterly samples are reliably and consistently less than the MCL.
 3. For community and non-transient, non-community water systems, the Division may allow a surface water system to reduce the sampling frequency to annually if all analytical results from four consecutive quarters are <50 percent of the MCL. A surface water system shall return to quarterly monitoring if any one sample is >50 percent of the MCL.
 4. Each transient non-community water system shall monitor annually beginning January 1, 1993.
 5. After the initial round of quarterly sampling is completed, each community and non-transient non-community system which is monitoring annually shall take subsequent samples during the quarter(s) which previously resulted in the highest analytical result.

- E. All public water systems (community; non-transient, non-community; and transient, non-community systems) shall monitor to determine compliance with the maximum contaminant level for nitrite in Section 22.601
1. All public water systems shall take one sample at each sampling point in the distribution system during the compliance period beginning January 1, 1993 and ending December 31, 1995.
 2. After the initial sample, systems where an analytical result for nitrite is <50 percent of the MCL shall monitor at the frequency specified by the Division.
 3. For community, non-transient, non-community, and transient non-community water systems, the repeat monitoring frequency for any water system shall be quarterly for at least one year following any one sample in which the concentration is >50 percent of the MCL. The Division may allow a system to reduce the sampling frequency to annually after determining the system is reliably and consistently less than the MCL.
 4. Systems which are monitoring annually shall take each subsequent sample during the quarter(s) which previously resulted in the highest analytical result.
- F. Confirmation Samples:
1. Where the results of sampling for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium, or thallium indicate an exceedance of the maximum contaminant level, the Division may require that one additional sample be collected as soon as possible after the initial sample was taken (but not to exceed two weeks) at the same sampling point.
 2. Where nitrate or nitrite sampling results indicate an exceedance of the maximum contaminant level, the system shall take a confirmation sample within 24 hours of the system's receipt of notification of the analytical results of the first sample. Systems unable to comply with the 24-hour sampling requirement must immediately notify the consumers in the area served by the public water system in accordance with Section 22.41. Systems exercising this option must take and analyze a confirmation sample within two weeks of notification of the analytical results of the first sample.
 3. If a Division-required confirmation sample is taken for any contaminant, then the results of the initial and confirmation sample shall be averaged. The resulting average shall be used to determine the system's compliance in accordance with paragraph I of this section. The Division has the discretion to delete results of obvious sampling errors. Sampling errors include, but are not limited to samples collected from the wrong system or samples collected from private wells located within a public water system.
- G. The Division may require more frequent monitoring than specified in paragraphs B, C, D and E of this section or may require confirmation samples for positive and negative results at its discretion.
- H. Systems may apply to the Division to conduct more frequent monitoring than the minimum monitoring frequencies specified in this section.
- I. Compliance with Section 22.601 shall be determined based on the analytical result(s) obtained at each sampling point:

1. For systems which are conducting monitoring at a frequency greater than annual, compliance with the maximum contaminant levels for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium, and thallium is determined by a running annual average at ~~each~~ any sampling point. If the average at any sampling point is greater than the MCL, then the system is out of compliance. If any one sample would cause the annual average to be exceeded, then the system is out of compliance immediately. Any sample below the method detection limit shall be calculated at zero for the purpose of determining the annual average. If a system fails to collect the required number of samples, compliance (average concentration) will be based on the total number of samples collected.
2. For systems which are monitoring annually, or less frequently, the system is out of compliance with the maximum contaminant levels for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium, and thallium if the level of a contaminant at any sampling point is greater than the MCL. If a confirmation sample is required by the Division, the determination of compliance will be based on the ~~average of two samples~~ annual average of the initial MCL exceedance and any Division-required confirmation samples. If a system fails to collect the required number of samples, compliance (average concentration) will be based on the total number of samples collected.
3. Compliance with the maximum contaminant levels for nitrate and nitrite is determined based on one sample if the levels of these contaminants are below the MCLs. If the levels of nitrate and/or nitrite exceed the MCLs in the initial sample, a confirmation sample is required and compliance shall be determined based on the average of the initial and confirmation samples.
4. If a public water system has a distribution system separable from other parts of the distribution system with no interconnections, the Division may allow the system to give public notice to only the area served by that portion of the system which is out of compliance.
5. Arsenic sampling results will be reported to the nearest 0.001 mg/L.

J. Each public water system shall monitor at the time designated by the Division during each compliance period.

K. At the discretion of the Division, nitrate levels not to exceed 20 mg/L may be allowed in NCWS and NTNCWS if the supplier of water demonstrates to the satisfaction of the Division that:

1. Such water will not be available to children under one (1) year of age;
2. There will be continuous posting of the fact that nitrate levels exceed ten (10) mg/L and the potential health effects of exposure and;
3. No adverse health effects shall result.

22.603

Fluoride (F):

A. Where fluoridation has been or will be instituted as provided by Delaware Law and the fluoride content of a water supply is less than 0.8 mg/L, fluoride should be adjusted to provide a concentration within a range of 0.8-1.2 mg/L and shall not exceed 1.8 mg/L. Defluoridation of water shall be provided when the natural fluoride concentration exceeds 1.8 mg/L. In addition to the sampling and analysis required by Section 22.605, fluoridated and defluoridated water supplies shall be sampled and analyzed daily by the supplier of

water at a representative point(s) in the water supply system. The fluoride levels shall be reported to the Division pursuant to Section 22.401.

- B. All municipal water supplies, whether municipally owned or privately owned, shall comply with paragraph A of this section. All affected water supplies shall submit cost estimates to the Department of Health and Social Services no later than November 15, 1998.

22.604

Sodium (Na):

- A. The supplier of water for a CWS shall collect and analyze one (1) sample per plant at the entry point of the distribution system for the determination of sodium concentration levels; samples must be collected and analyzed annually for systems utilizing surface water sources in whole or in part and at least every three (3) years for systems utilizing solely ground water sources. The minimum number of samples required to be taken by the system shall be based on the number of treatment plants used by the system, except that multiple wells drawing raw water from a single aquifer may, with Division approval be considered one (1) treatment plant for determining the minimum number of samples. The supplier of water may be required by the Division to collect and analyze water samples for sodium more frequently in locations where the sodium content is variable.
- B. The supplier of water shall report to the Division the results of analyses for sodium pursuant to Section 22.401.
- C. The supplier of water shall notify appropriate local and State public health officials of the sodium levels by written notice by direct mail within three (3) months. A copy of each notice required to be provided by this paragraph shall be sent to the Division within ten (10) days of issuance. The supplier of water is not required to notify appropriate local and State public health officials of the sodium levels where the Division provides such notices in lieu of the supplier.
- D. Analysis for sodium shall performed in accordance with 40 CFR 141.23(k)(1) [**as amended**]. Copies may be obtained from the Office of Drinking Water.

22.605

Inorganic Compliance Determination: Analysis for the purpose of determining compliance with Section 22.601 shall be in accordance with the following:

- A. PMCL analyses for all CWSs utilizing surface water sources shall be conducted annually. SMCL analyses shall be performed at the discretion of the Division.
- B. PMCL analyses for all CWSs utilizing only ground water sources shall be conducted at three (3) year intervals. SMCL analyses shall be performed at the discretion of the Division.
- C. For NCWSs and NTNCWSs, whether supplied by surface or ground water sources, analyses for nitrate shall be conducted at intervals determined by the Division.
- D. The Division has the authority to determine compliance or initiate enforcement action based upon analytical results and other information compiled by its sanctioned representatives and agencies.
- E. If the result of an analysis made pursuant to paragraphs A, B and C indicates that the level of any primary contaminant listed in Section 22.601, excluding nitrates, exceeds the PMCL, the supplier of water shall report to the Division within seven (7) days and initiate three (3) additional analyses at the same sampling point with one (1) month.
- F. When the average of four (4) analyses made pursuant to paragraph E of this section, rounded to the same number of significant figures as the PMCL for the substance in question, exceeds the PMCL, the supplier of water shall notify the Division pursuant to Section 22.40 and give notice to the public pursuant to Section 22.41. Monitoring after public notification shall be at a frequency designated by the Division and shall continue

until the PMCL has not been exceeded in two (2) successive samples or until a monitoring schedule as a condition to a variance, exemption or enforcement action shall become effective.

- G. The provision of paragraphs E and F of this Section notwithstanding compliance with the PMCL for nitrate shall be determined on the basis of the mean of two (2) analyses. When a level exceeding the PMCL for nitrate is found, a second analysis shall be initiated within twenty-four (24) hours, and if the mean of the two (2) analyses exceeds the PMCL, the supplier of water shall report his findings to the Division pursuant to Section 22.40 and shall notify the public pursuant to Section 22.41.
- H. For the initial analyses required by paragraphs A, B and C of this Section, data for surface waters acquired within one (1) year prior to the effective date and data for ground waters acquired within three (3) years prior to the effective date of this Section may be substituted at the discretion of the Division.

22.606 **Analytical Methodology:** Analyses conducted to determine compliance with Section 22.601 for inorganic chemicals shall be made in accordance with the following methods.

- A. **PMCLs** shall be in accordance with 40 CFR 141.23(k)(1) **[as amended]**. Copies may be obtained from the Office of Drinking Water.
- B. **SMCLs** shall be in accordance with 40 CFR Sec. 143.4 **[as amended]**. Copies may be obtained from the Office of Drinking Water.
- C. **Sample Collection and Preservation:** Sample collection for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, nitrate, nitrite, selenium and thallium under this section shall be conducted using the sample preservation method(s), container, and maximum holding time procedures in accordance with 40 CFR 141.23(k)(2) **[as amended]**. Copies may be obtained from the Office of Drinking Water.
- D. **Lab Approval:** Analysis under this section shall only be conducted by laboratories that have received approval by EPA, other approved certifying organization, or the State of Delaware. To receive approval to conduct analyses for antimony, **[arsenic]**, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, nitrate, nitrite, selenium, and thallium the laboratory must:
 - 1. Analyze Performance Evaluation samples annually in accordance with Section 22.214.
 - 2. Achieve quantitative results on the analyses that are in accordance with 40 CFR 141.23(k)(3)(ii) **[as amended]** and 40 CFR 141.23(k)(3)(iii) **[as amended]**. Copies may be obtained from the Office of Drinking Water.

22.607 **Lead (Pb) and Copper (Cu):** - Unless otherwise indicated, each of the provisions of this Section applies to CWSs and NTNCWSs. The requirements in Section (22.607) shall take effect November 9, 1992.

- A. **General Requirements:**
 - 1. Action Level:

- a. The lead action level is exceeded if the concentration of lead in more than 10 percent of tap water samples collected during any monitoring period conducted in accordance with Section 22.607(G) is greater than 0.015 mg/L (i.e., if the “90th percentile” lead level is greater than 0.015 mg/L).
 - b. The copper action level is exceeded if the concentration of copper in more than 10 percent of tap water samples collected during any monitoring period conducted in accordance with Section 22.607(G) is greater than 1.3 mg/L (i.e., if the “90th percentile” copper level is greater than 1.3 mg/L).
 - c. The 90th percentile lead and copper levels shall be computed as follows:
 1. The results of all lead or copper samples taken during a monitoring period shall be placed in ascending order from the sample with the lowest concentration to the sample with the highest concentration. Each sampling result shall be assigned a number ascending by single integers beginning with the number 1 for the sample with the lowest contaminant level. The number assigned to the sample with the highest contaminant level shall be equal to the total number of samples taken.
 2. The number of samples taken during the monitoring period shall be multiplied by 0.9.
 3. The contaminant concentration in the numbered sample yielded by the calculation in paragraph 1C(2) is the 90th percentile contaminant level.
 4. For water systems serving fewer than 100 people that collect five samples per monitoring period, the 90th percentile is computed by taking the average of the highest and second highest concentrations.
2. Corrosion Control Treatment Requirements:
 - a. All water systems shall install and operate optimal corrosion control treatment as defined in Section 22.147.
 - b. Any water system that complies with the applicable corrosion control treatment requirements specified by the Division under Sections 22.607 B and C shall be deemed in compliance with each treatment requirement contained in paragraph 2(a) of this section.
 3. Source Water Treatment Requirements: Any system exceeding the lead or copper action level shall implement all applicable source water treatment requirements specified by the Division under Section 22.607D.
 4. Lead Service Line Replacement: Any system exceeding the lead action level after implementation of applicable corrosion control and source water treatment requirements shall complete the lead service line replacement requirements contained in Section 22.607E.
 5. Public Education Requirements: Any system exceeding the lead action level shall implement the public education requirements contained in Section 22.607F.

6. Monitoring and Analytical Requirements: Tap water monitoring for lead and copper, monitoring for water quality parameters, source water monitoring for lead and copper, and analyses of the monitoring results under this Section shall be completed in compliance with Sections 22.607 G, H, I and L.
7. Reporting Requirements: Systems shall report to the Division any information required by the treatment provisions of this Section and Section 22.607J.
8. Recordkeeping Requirements: Systems shall maintain records in accordance with Section 22.607K.
9. Violation of National Primary Drinking Water Regulations: Failure to comply with the applicable requirements of Section 22.607 including requirements established by the Division pursuant to these provisions, shall constitute a violation of the national primary drinking water regulations for lead and/or copper.

B. Applicability of Corrosion Control Treatment Steps for Small, Medium Size and Large Water Systems:

1. Systems shall complete the applicable corrosion control treatment requirements described in Section 22.607C by the deadlines established in this section.
 - a. A large system (serving >50,000 persons) shall complete the corrosion control treatment steps specified in paragraph (4) of this section, unless it is deemed to have optimized corrosion control under paragraph 2(b) or 2(c) of this section.
 - b. A small system (serving <3300 persons) and a medium-size system (serving >3,300 and <50,000 persons) shall complete the corrosion control treatment steps specified in paragraph (5) of this section, unless it is deemed to have optimized corrosion control under paragraph 2(a), 2(b) or 2(c) of this section.
2. A system is deemed to have optimized corrosion control and is not required to complete the applicable corrosion control treatment steps identified in this section if the system satisfies one of the following criteria: specified in paragraphs (2)(a) through (2)(c) of this section. Any such system deemed to have optimized corrosion control under this paragraph, and which has treatment in place, shall continue to operate and maintain optimal corrosion control treatment and meet any requirements that the Division determines appropriate to ensure optimal corrosion control treatment is maintained.
 - a. A small or medium-size water system is deemed to have optimized corrosion control if the system meets the lead and copper action levels during each of two consecutive six-month monitoring periods conducted in accordance with Section 22.607(G).
 - b. Any water systems may be deemed by the Division to have optimized corrosion control treatment if the system demonstrates to the satisfaction of the Division that it has conducted activities equivalent to the corrosion control steps applicable to such system under this section. If the Division makes this determination, it shall provide the systems with written notice

explaining the basis for its decision and shall specify the water quality control parameters representing optimal corrosion control in accordance with Section 22.607(C)(6). Water systems deemed to have optimized corrosion control under this paragraph shall operate in compliance with the Division-designated optimal water quality control parameters in accordance with Section 22.607(C)(7) and continue to conduct lead and copper tap and water quality parameter sampling in accordance with Section 22.607(C)(3) and Section 22.607(C)(6) respectively. A system shall provide the Division with the following information in order to support a determination under this paragraph.

1. The results of all test samples collected for each of the water quality parameters in section 22.607(c)(3)(a).
 2. A report explaining the test methods used by the water system to evaluate the corrosion control treatments listed in Section 22.607(c)3(a), the results of all tests conducted, and the basis for the system's selection of optimal corrosion control treatment.
 3. A report explaining how corrosion control has been installed and how it is being maintained to insure minimal lead and copper concentrations at consumer's taps; and
 4. The results of tap water samples collected in accordance with Section 22.607G at least once every six months for one year after corrosion control has been installed.
- c. Any water system is deemed to have optimized corrosion control if it submits results of tap water monitoring conducted in accordance with Section 22.607(G) and source water monitoring conducted in accordance with Section 22.607(I) that demonstrates for two consecutive six-month monitoring periods that the difference between the 90th percentile tap water lead level computed under Section 22.607(A)(1)(c), and the highest source water lead concentration, is less than the Practical Quantitation Level (PQL) for lead specified in Section 22.607(L) (2)(c).
1. Those systems whose highest source water lead level is below the Method Detection Limit may also be deemed to have optimized corrosion control under this paragraph if the 90th percentile tap water lead level is less than or equal to the Practical Quantitation Level for lead for two consecutive six-month monitoring periods.
 2. Any water system deemed to have optimized corrosion control in accordance with this paragraph shall continue monitoring for lead and copper at the tap no less frequently than once every three calendar years using the reduced number of sites specified in Section 22.607(J) and collect the samples at times and locations specified in Section 22.607(J). Any such system that has not conducted a round of monitoring pursuant to Section 22.607(C)(3) since September 30, 1997, shall complete a round of monitoring pursuant to this paragraph no later than September 30, 2000.
 3. Any water system deemed to have optimized corrosion control pursuant to this paragraph shall notify the Division in writing pursuant to Section 22.607(C) of any change in treatment or the

addition of a new source. The Division may require any such system to conduct additional monitoring or to take other action the Division deems appropriate to ensure that such systems maintain minimal levels of corrosion in the distribution system.

4. As of July 12, 2001, a system is not deemed to have optimized corrosion control under this paragraph, and shall implement corrosion control treatment pursuant to paragraph (2)(c)(5) of this section unless it meets the copper action level.
5. Any system triggered into corrosion control because it is no longer deemed to have optimized corrosion control under this paragraph shall implement corrosion control treatment in accordance with the deadlines in paragraph 5 of this section. Any such large system shall adhere to the schedule specified in that paragraph for medium-size systems, with the time periods for completing each step being triggered by the date the system is no longer deemed to have optimized corrosion control under this paragraph.
3. Any small or medium-size water system that is required to complete the corrosion control steps due to its exceedance of the lead or copper action level may cease completing the treatment steps whenever the system meets both action levels during each of two consecutive monitoring periods conducted pursuant to Section 22.607(G) and submits the results to the Division. If any such water system thereafter exceeds the lead or copper action level during any monitoring period, the system (or the Division, as the case may be) shall recommence completion of the applicable treatment steps, beginning with the first treatment step which was not previously completed in its entirety. The Division may require a system to repeat treatment steps previously completed by the system where the Division determines that this is necessary to properly implement the treatment requirements of this section. The Division shall notify the system in writing of such a determination and explain the basis for its decision.
4. Treatment Steps and Deadlines for Large Systems:
 - a. Except as provided in paragraph 2(b) and 2(c) of this section, large systems shall complete the following corrosion control treatment steps (described in the referenced portions of Sections 22.607(C), (G) and (H) by the indicated dates.

Step 1: The system shall conduct two six-month initial monitoring periods by January 1, 1993.

Step 2: The system shall complete corrosion control studies, Section 22.607(C)(3), in 18 months, by July 1, 1994.

Step 3: The Division shall designate optimal corrosion control treatment, Section 22.607(C)(4), in 6 months, by January 1, 1995.

Step 4: The system shall install optimal corrosion control treatment, Section 22.607(C)(5), in 24 months, by January 1, 1997.

- Step 5: The system shall complete follow-up sampling, Section 22.607(G)(4)(b) and Section 22.607 (H)(3), in 12 months, by January 1, 1998
- Step 6: The Division shall review installation of treatment and designate optimal water quality control parameters, Section 22.607(C)(6), in 6 months, by July 1, 1998.
- Step 7: The system shall operate in compliance with the Division specified optimal water quality control parameters, Section 22.607(C)(7), and continue to conduct tap sampling, Section 22.607(G)(4) and Section 22.607(H)(4).

5. Treatment Steps and Deadlines for Small and Medium-Size Systems:

- a. Except as provided in paragraph (2) of this section, small and medium-size systems shall complete the following corrosion control treatment steps (described in the referenced portions of Section 22.607(C), (G) and (H) by the indicated time periods.

Step 1: The system shall conduct initial tap sampling, Section 22.607(G)(4)(a) and Section 22.607 (H)(2), until the system either exceeds the lead or copper action level or becomes eligible for reduced monitoring under Section 22.607(G)(4)(d). A system exceeding the lead or copper action level shall recommend optimal corrosion control treatment, Section 22.607(C)(1), within six months after it exceeds one of the action levels.

Step 2: Within 12 months after a system exceeds the lead or copper action level, the Division may require the system to perform corrosion control studies. The Division shall specify optimal corrosion control treatment, Section 22.607(C)(4), within the following time frames.

1. For medium-size systems, within 18 months after such system exceeds the lead or copper action level.
2. For small systems, within 24 months after such system exceeds the lead or copper action level.

Step 3: If the Division requires a system to perform corrosion control studies under step 2, the system shall complete the studies, Section 22.607(C)(3), within 18 months after the Division requires that such studies be conducted.

Step 4: If the system has performed corrosion control studies under step 2, the Division shall designate optimal corrosion control treatment, Section

22.607(C)(4), within 6 months after completion of step 3.

Step 5: The system shall install optimal corrosion control treatment, Section 22.607(C)(5), within 24 months after the Division designates optimal corrosion control treatment.

Step 6: The system shall complete follow-up sampling, Section 22.607(G)(4)(b) and Section 22.607(H)(3), within 36 months after the Division designates optimal corrosion control treatment.

Step 7: The Division shall review the system's installation of treatment and designate optimal water quality control parameters, Section 22.607(C)(6), within 6 months after completion of Step 6.

Step 8: The system shall operate in compliance with the Division-designated optimal water quality control parameters, Section 22.607(C)(7), and continue to conduct tap sampling, Section 22.607(G)(4)(c) and Section 22.607(H)(4).

C. **Description of Corrosion Control Treatment Requirements:** Each System shall complete the corrosion control treatment requirements described below which are applicable to such systems under Section 22.607(B).

1. **System Recommendation Regarding Corrosion Control Treatment:** Based upon the results of lead and copper tap monitoring and water quality parameter monitoring, small and medium-size water systems exceeding the lead or copper action level shall recommend installation of one or more of the corrosion control treatments listed in paragraph (3)(a) of this section which the system believes constitutes optimal corrosion control for that system. The Division may require the system to conduct additional water quality parameter monitoring in accordance with Section 22.607(H)(2) to assist the Division in reviewing the system's recommendation.
2. **Division Decision to Require Studies of Corrosion Control Treatment (Applicable to Small and Medium Size Systems):** The Division may require any small or medium-size system that exceeds the lead or copper action level to perform corrosion control studies under paragraph (3) of this section to identify optimal corrosion control treatment for the system.
3. **Performance of Corrosion Control Studies:**
 - a. Any public water system performing corrosion control studies shall evaluate the effectiveness of each of the following treatments, and, if appropriate, combinations of the following treatments to identify the optimal corrosion control treatment for that system:
 1. Alkalinity and pH adjustment;
 2. Calcium hardness adjustment; and
 3. The addition of a phosphate or silicate based corrosion inhibitor at a concentration sufficient to maintain an effective residual concentration in all test tap samples.

- b. The water system shall evaluate each of the corrosion control treatments using either pipe rig/loop tests, metal coupon tests, partial-system tests, or analyses based on documented analogous treatments with other systems of similar size, water chemistry and distribution system configuration.
 - c. The water system shall measure the following water quality parameters in any tests conducted under this paragraph before and after evaluating the corrosion control treatment listed above:
 - 1. Lead;
 - 2. Copper;
 - 3. pH;
 - 4. Alkalinity;
 - 5. Calcium;
 - 6. Conductivity;
 - 7. Orthophosphate (when an inhibitor containing a phosphate compound is used);
 - 8. Silicate (when a inhibitor containing a silicate compound is used);
 - 9. Water temperature.
 - d. The water system shall identify all chemical or physical constraints that limit or prohibit the use of a particular corrosion control treatment and document such constraints with at least one of the following:
 - 1. Data and documentation showing that a particular corrosion control treatment has adversely affected other water treatment processes when used by another water system with comparable water quality characteristics; and/or
 - 2. Data and documentation demonstrating that the water system has previously attempted to evaluate a particular corrosion control treatment and has found that the treatment is ineffective or adversely affects other water quality treatment processes.
 - e. The water system shall evaluate the effect of the chemicals used for corrosion control treatment on other water quality treatments processes.
 - f. On the basis of an analysis of the data generated during each evaluation, the water system shall recommend to the Division in writing the treatment option that the corrosion control studies indicate constitutes optimal corrosion control treatment for that system. The water system shall provide a rationale for its recommendation along with all supporting documentation specified in paragraphs (3)(a) through (e) of this section.
4. Division Designation of Optimal Corrosion Control Treatment:
- a. Based upon consideration of available information including, where applicable, studies performed under paragraph (3) of this section and a system's recommended treatment alternative, the Division shall either approve the corrosion control treatment option recommended by the system, or designate alternative corrosion control treatment(s) from among those listed in paragraph (3)(a) of this section. When designating optimal treatment the Division shall consider the effects that additional corrosion control treatment will have on water quality parameters and on other quality treatment processes.
 - b. The Division shall notify the system of its decision on optimal corrosion control treatment in writing and explain the basis for this determination

within 6 months of receiving follow up samples. If the Division requests additional information to aid its review, the water system shall provide the information.

5. Installation of Optimal Corrosion Control: Each system shall properly install and operate throughout its distribution system the optimal corrosion control treatment designated by the Division under paragraph (4) of this section.
6. Division Review of Treatment and Specification of Optimal Water Quality Control Parameters: The Division shall evaluate the results of all lead and copper tap samples and water quality parameter samples submitted by the water system and determine whether the system has properly installed and operated the optimal corrosion control treatment designated by the Division in paragraph (4) of this section. Upon reviewing the results of tap water and water quality parameter monitoring by the system, both before and after the system installs optimal corrosion control treatment, the Division shall designate:
 - a. A minimum value or a range of values for pH measured at each entry point to the distribution system;
 - b. A minimum pH value measured in all tap samples. Such value shall be equal to or greater than 7.0 unless the Division determines that meeting a pH level of 7.0 is not technologically feasible or is not necessary for the system to optimize corrosion control;
 - c. If a corrosion inhibitor is used, a minimum concentration or a range of concentrations for the inhibitor, measured at each entry point to the distribution system and in all tap samples, that the Division determines is necessary to form a passivating film on the interior walls of the pipes of the distribution system;
 - d. If alkalinity is adjusted as part of optimal corrosion control treatment, a minimum concentration or a range of concentrations for alkalinity, measured at each entry point to the distribution system and in all tap samples;
 - e. If calcium carbonate stabilization is used as part of corrosion control, a minimum concentration or a range of concentrations for calcium, measured in all tap samples. The values for the applicable water quality control parameters listed above shall be those that the Division determines to reflect optimal corrosion control treatment for the system. The Division may designate values for additional water quality control parameters determined by the Division to reflect optimal corrosion control for the system. The Division shall notify the system in writing of these determinations and explain the basis for its decisions.
7. Continued Operation and Monitoring: ~~All systems optimizing corrosion control shall continue to operate and maintain optimal corrosion control treatment, including All systems shall maintain maintaining~~ water quality parameter values at or above minimum values or within a ranges designated by the Division under paragraph 6 of this section, ~~in each sample collected under Section 22.607 (H)4. If the water quality parameter value of any sample is below the minimum value or outside the range designated by the Division, then the system is out of compliance with this paragraph. As specified in Section 22.607 (H)4, the system may take a confirmation sample for any water quality parameter value not later than 3 days after the first sample. If a confirmation sample is taken, the result must be~~

averaged with the first sampling result and the average must be used for any compliance determination under this paragraph. The Division has the discretion to delete results of obvious sampling errors from this calculation. In accordance with this paragraph for all samples collected under Section 22.607(G) through (J). Compliance with the requirements of this paragraph shall be determined every six months, as specified under Section 22.607(G). A water system is out of compliance with the requirements of this paragraph for a six-month period if it has excursions for any State-specified parameter on more than nine days during the period. An excursion occurs whenever the daily value for one or more of the water quality parameters measured at a sampling location is below the minimum value or outside the range designated by the Division. Daily values are calculated as follows. The Division has the discretion to delete results of obvious sampling errors from this calculation.

- a. On days when more than one measurement for the water quality parameter is collected at the sampling location, the daily value shall be the average of all results collected during the day regardless of whether they are collected through continuous monitoring, grab sampling, or a combination of both. If EPA has approved an alternative formula under [40 CFR] Section 142.16 of this chapter in the State's application for a program revision submitted pursuant to [40 CFR] Section 142.12 of this chapter, the State's formula shall be used to aggregate multiple measurements taken at a sampling point for the water quality parameter in lieu of the formula in this paragraph.
 - b. On days when only one measurement for the water quality parameter is collected at the sampling location, the daily value shall be that measurement.
 - c. On days when no measurement is collected for the water quality parameter at the sampling location, the daily value shall be the daily value calculated on the most recent day on which the water quality parameter was measured at the sample location.
8. Modification of Division's Corrosion Control Treatment Decision: Upon its own initiative, or in response to a request by the water system or other interested party, the Division may modify treatment determination. The requests in writing must explain why the change is appropriate and provide supporting documentation. The treatment may be changed when the Division determines that it is necessary for the water system to continue optimizing corrosion control. The Division's decision must specify new treatment, explain basis for decision, and provide for implementation.
9. EPA Treatment Decisions in Lieu of the Division's Decisions: The regional administrator may issue federal determinations in lieu of the Division's determinations when:
- a. The Division fails to issue a determination in a timely manner.
 - b. The Division abuses its discretion in a substantial number of cases or in cases affecting large populations.
 - c. The technical basis of the Division's decision is indefensible in federal enforcement action(s).

D. **Source Water Treatment Requirements:** Systems shall complete the applicable source water monitoring and treatment requirements (described in the referenced portions of paragraph (2) of this section, and in Section 22.607(G) and (I)) by the following deadlines:

1. **Deadlines for Completing Source Water Treatment Steps:**

- Step 1:** A system exceeding the lead or copper action level shall complete lead and copper source water monitoring, Section 22.607 (I)2, and make a treatment recommendation to the Division, Section 22.607(D)2(a), within 6 months after exceeding the lead or copper action level.
- Step 2:** The Division shall make a determination regarding source water treatment, Section 22.607(D)2(b) within 6 months after submission of monitoring results under step 1.
- Step 3:** If the Division requires installation of source water treatment, the system shall install the treatment, Section 22.607(D)2(c), within 24 months after completion of step 2.
- Step 4:** The system shall complete follow-up tap water monitoring, Section 22.607(G)4(b), and source water monitoring, Section 22.607(I)3, within 36 months after completion of step 2.
- Step 5:** The Division shall review the system's installation and operation of source water treatment and specify maximum permissible source water levels for lead and copper, Section 22.607(D)2(d), within 6 months after completion of step 4.
- Step 6:** The system shall operate in compliance with the Division-specified maximum permissible lead and copper source water levels, Section 22.607(D)2(d), and continue source water monitoring, Section 22.607(I)(4).

2. **Description of Source Water Treatment Requirements:**

- a. **System Treatment Recommendation:** Any system which exceeds the lead or copper action level shall recommend in writing to the Division the installation and operation of one of the source water treatments listed in paragraph (2)(b) of this section. A system may recommend that no treatment be installed based upon a demonstration that source water treatment is not necessary to minimize lead and copper levels at user's taps.
- b. **Division Determination Regarding Source Water Treatment:** The Division shall complete an evaluation of the results of all source water samples submitted by the water system to determine whether source water treatment is necessary to minimize lead or copper levels in water delivered to users' taps. If the Division determines that treatment is needed, the Division shall either require installation and operation of the source water treatment recommended by the system (if any) or require the installation and operation of another source water treatment from among the following: ion exchange, reverse osmosis, lime softening or coagulation/filtration. If the Division request additional information to aid in its review, the water system shall provide the information by the date

specified by the Division in its request. The Division shall notify the system in writing of its determination and set forth the basis for its decision.

- c. Installation of Source Water Treatment: Each system shall properly install and operate the source water treatment designated by the Division under paragraph (2)(b) of this section.
- d. Division Review of Source Water Treatment and Specification of Maximum Permissible Source Water Levels: The Division shall review the source water samples taken by the water system both before and after the system installs source water treatment, and determine whether the system has properly installed and operated the source water treatment designated by the Division. Based upon its review, the Division shall designate the maximum permissible lead and copper concentrations for finished water entering the distribution system. Such levels shall reflect the contaminant removal capability of the treatment properly operated and maintained. The Division shall notify the system in writing and explain the basis for its decision.
- e. Continued Operation and Maintenance: Each water system shall maintain lead and copper levels below the maximum permissible concentrations designated by the Division at each sampling point monitored in accordance with Section 22.607(I). The system is out of compliance with this paragraph if the level of lead or copper at any sampling point is greater than the maximum permissible concentration designated by the Division.
- f. Modification of Division Treatment Decisions: Upon its own initiative or in response to a request by a water system or other interested party, the Division may modify its determination of the source water treatment under paragraph (2)(b) of this section, or maximum permissible lead and copper concentrations for finished water entering the distribution system under paragraph (2)(d) of this section. A request for modification by a system or other interested party shall be in writing, explain why the modification is appropriate, and provide supporting documentation. The Division may modify its determination where it concludes that such change is necessary to ensure that the system continues to minimize lead and copper concentrations in source water. A revised determination shall be made in writing and set forth the new treatment requirements, explain the basis for the Division's decision and provide an implementation schedule for completing the treatment modifications.
- g. EPA Treatment Decisions in Lieu of the Division's Decisions: The regional administrator may issue federal determinations in lieu of the Division's determination when:
 - 1. The Division fails to issue a determination in a timely manner.
 - 2. The Division abuses its discretion in a substantial number of cases or in cases affecting large populations.
 - 3. The technical basis of the Division's decision is indefensible in federal enforcement action(s).

E. Lead Service Line Replacement Requirements:

- 1. Systems that fail to meet the lead action level in tap samples taken pursuant to Section 22.607(G)4(b) after installing corrosion control and/or source water treatment (whichever sampling occurs later) shall replace lead service lines in

accordance with the requirements of this section. If a system is in violation of Section 22.607(B) or (D) for failure to install source water or corrosion control treatment, the Division may require the system to commence lead service line replacement under this section after the date by which the system was required to conduct monitoring under Section 22.607 (G)4(b) has passed.

2. A system shall replace annually at least 7 percent of the initial number of lead service lines in its distribution system. The initial number of lead service lines is the number of lead lines in place at the time the replacement program begins. The systems shall identify the initial number of lead service lines in its distribution system, including an identification of the portion(s) owned by the system, based upon a materials evaluation, including the evaluation required under Section 22.607(G)(1) and relevant legal authorities (e.g., contracts, local ordinances) regarding the portion owned by the system. The first year of lead service line replacement shall begin on the date the action level was exceeded in tap sampling referenced in paragraph (1) of this section.
3. A system is not required to replace an individual lead service line if the lead concentration in all service line samples from that line taken pursuant to Section 22.607(G)2(c), is less than or equal to 0.015 mg/L.
4. ~~A water system shall replace the entire service line (up to the building inlet) unless it demonstrates to the satisfaction of the Division under paragraph (5) of this section that it control less than the entire service line. In such cases, the system shall replace the portion of the line which the Division determines is under the system's control. The system shall notify the user served by the line that the system will replace the portion of the service line under its control and shall offer to replace the building owner's portion of the line, but is not required to bear the cost of replacing the building owner's portion of the line. For buildings where only a portion of the lead service line is replaced, the water system shall inform the resident(s) that the system will collect a first flush tap water sample after partial replacement of the service line is completed if the resident(s) so desire. In cases where the resident(s) accept the offer, the system shall collect the sample and report the results to the resident(s) within 14 days following partial lead service line replacement.~~ A water system shall replace that portion of the lead service line that it owns. In cases where the system does not own the entire lead service line, the system shall notify the owner of the line, or the owners authorized agent, that the system will replace the portion of the service line that it owns and shall offer to replace the owner's portion of the line. A system is not required to bear the cost of replacing the privately-owned portion of the line, nor is it required to replace the privately-owned portion where the owner chooses not to pay the cost of replacing the privately-owned portion of the line, or where replacing the privately owned portion would be precluded by State, local or common law. A water system that does not replace the entire length of the service line also shall complete the following tasks.
 - a. At least 45 days prior to commencing with the partial replacement of a lead service line, the water system shall provide notice to the resident(s) of all buildings served by the line explaining that they may experience a temporary increase in lead levels in their drinking water, along with guidance on measures consumers can take to minimize their exposure to lead. The Division may allow the water system to provide notice under the

previous sentence less than 45 days prior to commencing partial lead service line replacement where such replacement is in conjunction with emergency repairs. In addition, the water system shall inform the resident(s) served by the line that the system will, at the system's expense, collect a sample from each partially-replaced lead service line that is representative of the water in the service line for analysis of lead content, as prescribed under Section 22.607(G)(2), within 72 hours after completion of the partial replacement of the service line. The system shall collect the sample and report the results of the analysis to the owner and the resident(s) served by the line within three business days of receiving the results. Mailed notices post-marked within three business days of receiving the results shall be considered "on time."

b. The water system shall provide the information required by paragraph (4)(a) of this section to the residents of individual dwellings by mail or by other methods approved by the Division. In instances where multi-family dwellings are served by the line, the water system shall have the option to post the information at a conspicuous location.

~~5. A water system is presumed to control the entire lead service line (up to the building inlet) unless the system demonstrates to the satisfaction of the Division, in a letter submitted under Section 22.607(J)5(d), that it does not have any of the following forms of control over the entire line (as defined by Division statutes, municipal ordinances, public service contracts or other applicable legal authority); authority to set standards for construction, repair, or maintenance of the line; authority to replace, repair, or maintain the service line, or ownership of the service line. The Division shall review the information supplied by the system and determine whether the system controls less than the entire service line and, in such cases, shall determine the extent of the system's control. The Division's determination shall be in writing and explain the basis for its decision.~~

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

6. Any system may cease replacing lead service lines whenever lead service line samples collected pursuant to paragraph (1) meet the lead action level during each of two consecutive monitoring periods and the system submits the results to the Division. If the lead service line samples in any such water system thereafter exceeds the lead action level, the system shall recommence replacing lead service lines, pursuant to paragraph (2) in this section.

7. To demonstrate compliance with paragraphs (1) through (4) of this section, a system shall report to the Division the information specified in Section 22.607(J)5.

F. **Public Education and Supplemental Monitoring Requirements:** A water system that exceeds the lead action level based on tap water samples collected in accordance with Section 22.607(G) shall deliver the public education materials contained in paragraphs (1) and (2) of this section in accordance with the requirements in paragraph (3) of this section. Content of written public education materials shall be as follows.

1. Content of Written Materials: A water system shall include the following text in all of the printed materials it distributes through its lead public education program. Any additional information presented by a system shall be consistent with the information below and be in plain English that can be understood by lay persons.
Community Water Systems: A community water system shall include the following text in all of the printed materials it distributes through its lead public education program. Systems may delete information pertaining to lead service lines, upon approval by the Division, if no lead service lines exist anywhere in the water system service area. Public education language at paragraphs (F)(1)(d)(2)(e) and (F)(1)(d)(4)(b) of this section may be modified regarding building permit record availability and consumer access to these records, if approved by the Division. Systems may also continue to utilize pre-printed materials that meet the public education language requirements in 40 CFR 141.85, effective November 6, 1991, and contained in the 40 CFR, parts 100 – 149, edition revised as of July 1, 1991. Any additional information presented by a system shall be consistent with the information below and be in plain English that can be understood by lay people.
 - a. Introduction: The United States Environmental Protection Agency (EPA) and (insert name of water supplier) are concerned about lead in your drinking water. Although most homes have very low levels of lead in their drinking water, some homes in the community have lead levels above the EPA action level of 15 parts per billion (ppb), or 0.015 milligrams of lead per liter of water (mg/L). Under Federal law we are required to have a program in place to minimize lead in your drinking water by (insert date when corrosion control will be completed for your system). This program includes corrosion control treatment, source water treatment, and public education. We are also required to replace ~~each lead service line that we control~~ the portion of each lead service line that we own if the line contributes lead concentrations of 15 ppb or more after we have completed the comprehensive treatment program. If you have any questions about how we are carrying out the requirements of the lead regulation please give us a call at (insert water system's phone number). This brochure explains the simple steps you can take to protect you and your family by reducing your exposure to lead in drinking water.
 - b. Health effects of Lead: Lead is a common metal found throughout the environment in lead-based paint, air, soil, household dust, food, certain types of pottery porcelain and pewter, and water. Lead can pose a significant risk to your health if too much of it enters your body. Lead builds up in the body over many years and can cause damage to the brain, red blood cells and kidneys. The greatest risk is to young children and pregnant women. Amounts of lead that won't hurt adults can slow down normal mental and physical development of growing bodies. In addition, a child at play often comes into contact with sources of lead contamination-like dirt and dust-that rarely affect an adult. It is important to wash children's hands and toys often, and to try to make sure they only put food in their mouths.
 - c. Lead in Drinking Water:
 1. Lead in drinking water, although rarely the sole cause of lead poisoning, can significantly increase a person's total lead exposure,

particularly the exposure of infants who drink baby formulas and concentrated juices that are mixed with water. The EPA estimates that drinking water can make up 20 percent or more of a person's total exposure to lead.

2. Lead is unusual among drinking water contaminants in that it seldom occurs naturally in water supplies like rivers and lakes. Lead enters drinking water primarily as a result of the corrosion, or wearing away, of materials containing lead in the water distribution system and household plumbing. These materials include lead-based solder used to join copper pipe, brass and chrome plated brass faucets, and in some cases, pipes made of lead that connect your house to the water main (service lines). In 1986, Congress banned the use of lead solder containing greater than 0.2% lead, and restricted the lead content of faucets, pipes, and other plumbing materials to 8.0%.
 3. When water stands in lead pipes or plumbing systems containing lead for several hours or more, the lead may dissolve into your drinking water. This means the first water drawn from the tap in the morning, or later in the afternoon after returning from work or school, can contain fairly high levels of lead.
- d. Steps You Can Take in the Home to Reduce Exposure to Lead in Drinking Water:
1. Despite our best efforts mentioned earlier to control water corrosivity and remove lead from the water supply, lead levels in some homes or buildings can be high. To find out whether you need to take action in your own home, have your drinking water tested to determine if it contains excessive concentrations of lead. Testing the water is essential because you cannot see, taste, or smell lead in drinking water. Some local laboratories that can provide this service are listed at the end of this booklet. For more information on having your water tested, please call (insert phone number of water system).
 2. If a water test indicates that the drinking water drawn from a tap in your home contains lead above 15 ppb, then you should take following precautions:
 - a. Let the water run from the tap before using it for drinking or cooking anytime the water in a faucet has gone unused for more than six hours. The longer water resides in your home's plumbing the more lead it may contain. Flushing the tap means running the cold water faucet until the water gets noticeably colder, usually about 15-30 seconds. If your house has a lead service line to the water main, you may have to flush the water for a longer time, perhaps one minute, before drinking. Although toilet flushing or showering flushes water through a portion of your home's plumbing system, you still need to flush the water in each faucet before using it for drinking or cooking. Flushing tap water is a simple and inexpensive measure you can take to

protect your family's health. It usually uses less than one or two gallons of water and costs less than (insert a cost estimate based on flushing two times a day for 30 days) per month. To conserve water, fill a couple of bottles for drinking water after flushing the tap, and whenever possible use the first flush water to wash the dishes or water the plants. If you live in a high-rise building, letting the water flow before using it may not work to lessen your risk from lead. The plumbing systems have more, and sometimes larger pipes than smaller buildings. Ask your landlord for help in locating the source of the lead and for advice on reducing the lead level.

- b. Try not to cook with or drink water from the hot water tap. Hot water can dissolve more lead more quickly than cold water. If you need hot water, draw water from the cold tap and heat it on the stove.
- c. Remove loose lead solder and debris from the plumbing materials installed in newly constructed homes, or homes in which the plumbing has recently been replaced, by removing the faucet strainers from all taps and running the water from 3 to 5 minutes. Thereafter, periodically remove the strainers and flush out any debris that has accumulated over time.
- d. If your copper pipes are joined with lead solder that has been installed illegally since it was banned in 1986, notify the plumber who did the work and request that he or she replace the lead solder with lead-free solder. Lead solder looks dull gray, and when scratched with a key looks shiny. In addition, notify the Division of Public Health about the violation.
- e. Determine whether or not the service line that connects your home or apartment to the water main is made of lead. The best way to determine if your service line is made of lead is by either hiring a licensed plumber to inspect the liner or by contacting the plumbing contractor who installed the line. You can identify the plumbing contractor by checking the city's record of building permits which should be maintained in the files of the (insert name of department that issues building permits). A licensed plumber can at the same time check to see if your home's plumbing contains lead solder, lead pipes, or pipe fittings that contain lead. The public water system that delivers water to your home should also maintain records of the materials located in the distribution system. If the service line that connects your dwelling to the water main contributes more than 15 ppb to drinking water, after our comprehensive treatment program is in place, we are required to replace the portion of the line we own. If the line is only partially ~~controlled~~ owned by the (insert name of the city, county, or water system that

~~controls owns~~ the line), we are required to provide ~~you~~ the owner of the privately-owned portion of the line with information on how to replace ~~you're~~ the privately-owned portion of the service line, and offer to replace that portion of the line at ~~you're the~~ owner's expense, ~~and take a follow-up tap water sample within 14 days of the replacement.~~ If we replace only the portion of the we own, we also are required to notify you in advance and provide you with information on steps you can take to minimize exposure to any temporary increase in lead levels that may result from the partial replacement, to take a follow-up sample at our expense from the line within 72 hours after the partial replacement, and to mail or otherwise provide you with the results of the sample within three business days of receiving the results. Acceptable replacement alternatives include copper, steel, iron and plastic pipes.

- f. Have an electrician check your wiring. If grounding wires from the electrical system are attached to your pipes, corrosion may be greater. Check with a licensed electrician or your local electrical code to determine if your wiring can be grounded elsewhere. DO NOT attempt to change the wiring yourself because improper grounding can cause electrical shock and fire hazards.
3. The steps described above will reduce the lead concentrations in your drinking water. However, if a water test indicates that the drinking water coming from your tap contains lead concentrations in excess of 15 ppb after flushing, or after we have completed our actions to minimize lead levels, then you may want to take the following additional measures:
 - a. Purchase or lease a home treatment device. Home treatment devices are limited in that each unit treats only the water that flows from the faucet to which it is connected, and all of the devices require periodic maintenance and replacement. Devices such reverse osmosis systems or distillers can effectively remove lead from your drinking water. Some activated carbon filters may reduce lead levels at the tap, however all lead reduction claims should be investigated. Be sure to check the actual performance of a specific home treatment device before and after installing the unit.
 - b. Purchase bottled water for drinking and cooking.
 4. You can consult a variety of sources for additional information. Your family doctor or pediatrician can perform a blood test for lead and provide you with information about the health effects of lead. The Division of Public Health and local government agencies that can be contacted include:

- a. (Insert the name of city, county or department of public utilities) at (insert phone number) can provide you with information about your community's water supply, and a list of local laboratories that have been certified by EPA for testing water quality;
 - b. (Insert the name of city or county department that issues building permits) at (insert phone number) can provide you with information about building permit records that should contain the names of plumbing contractors that plumbed your home; and
 - c. The Division of Public Health at (302) 739-5410 or the (insert the name of the city or county health department) at (insert phone number) can provide you with information about the health effects of lead and how you can have your child's blood tested.
5. The following is a list of some Division approved laboratories in your area that you can call to have your water tested for lead. (Insert names and phone numbers of at least two laboratories).
6. Content of Broadcast Materials: A water system shall include the following information in all public service announcements submitted under its lead public education program to television and radio stations for broadcasting:
- a. Why should everyone want to know the facts about lead and drinking water? Because an unhealthy amount of lead can enter drinking water through the plumbing in your home. That's why I urge you to do what I did. I had my water tested for (insert free or \$ per sample). You can contact the (insert the name of the city or water system) for information on testing and on simple ways to reduce your exposure to lead in drinking water.
 1. To have your water tested for lead, or to get more information about this public health concern, please call (insert the phone number of the city or water system).
7. Delivery of a Public Education Program:
- a. In communities where a significant proportion of the population speaks a language other than English, public education materials shall be communicated in the appropriate language(s).
 - b. A community water system that ~~fails to meet~~ exceeds the lead action level on the basis of tap water samples collected in accordance with Section 22.607(G), and that is not already repeating public education tasks pursuant to paragraph (7)(c), (7)(g), or (7)(h), of this section, shall, within 60 days:
 1. Insert notices in each customer's water utility bill containing the information in paragraph (a) of this

section, along with the following alert on the water bill itself in large print:

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

A community water system having a billing cycle that does not include a billing within 60 days of exceeding the action level, or that cannot insert information in the water utility bill without making major changes to its billing system, may use a separate mailing to deliver the information in paragraph (a) of this section as long as the information is delivered to each customer within 60 days of exceeding the action level. Such water systems shall also include the “alert” language specified in this paragraph.

2. Submit the information in paragraph (1) of this section to the editorial department(s) of the major daily and weekly newspapers circulated throughout the community.
 3. Deliver pamphlets and/or brochures that contain the public education materials in paragraphs (b) and (d) of this section to facilities and organizations, including the following:
 - a. public schools and/or local school boards;
 - b. city or county health department;
 - c. Women, Infants and Children and/or Head Start Program(s) whenever available;
 - d. public and private hospitals and/or clinics;
 - e. pediatricians;
 - f. family planning clinics and;
 - g. local welfare agencies.
 4. Submit the public service announcement in paragraph (2) of this section to at least five of the radio and television stations with the largest audiences that broadcast to the community served by the water system.
- c. A community water system shall repeat the tasks contained in paragraphs 3(b),(2)and(3) of this section every 12 months, and the tasks contained in paragraphs 3(b)(4) of this section every 6 months for as long as the system exceeds the lead action level.
- d. Within 60 days after it exceeds the lead action level, (unless it is already repeating public education tasks pursuant to paragraph (3)(e) of this section), a non-transient non-

community water system shall deliver the public education materials contained in paragraphs 1(a),(b) and (d) of this section as follows:

1. post informational posters on lead in drinking water in public places or common areas in each of the buildings served by the system; and
 2. distribute informational pamphlets and/or brochures on lead in drinking water to each person served by the non-transient non-community water system. The Division may allow the system to utilize electronic transmission in lieu of or combined with printed materials as long as it achieves at least the same coverage.
- e. A non-transient non-community water system shall repeat the tasks contained in paragraph 3(d) of this section at least once during each calendar year in which the system exceeds the lead action level.
- f. A water system may discontinue delivery of public education materials if the system has met the lead action level during the most recent six-month monitoring period conducted pursuant to Section 22.607(G). Such a system shall recommence public education in accordance with this section if it subsequently exceeds the lead action level during any monitoring period.
- g. A community water system may apply to the State, in writing, (unless the State has waived the requirement for prior State approval) to use the text specified in paragraph (a)(2) of this section in lieu of the text in paragraph (a)(1) of this section and to perform the tasks listed in paragraphs (c)(4) and (c)(5) of this section in lieu of the tasks in paragraphs (c)(2) and (c)(3) of this section if:
1. The system is a facility, such as a prison or a hospital, where the population served is not capable of or is prevented from making improvements to plumbing or installing point of use treatment devices; and
 2. The system provides water as part of the cost of services provided and does not separately charge for water consumption.
- h. Systems serving less than 3,300 people:
1. A community water system serving 3,300 or fewer people may omit the task contained in paragraph (7)(b)(4) of this section. As long as it distributes notices containing the information contained in paragraph (F)(1) of this section to every household served by the system, such systems may further limit their public education program as follows:

- a. Systems serving 500 or fewer people may forego the task contained in paragraph (7)(b)(2) of this section. Such a system may limit the distribution of the public education materials required under paragraph (7)(b)(3) of this section to facilities and organizations served by the system that are most likely to be visited regularly by pregnant women and children, unless it is notified by the State in writing that it must make a broader distribution.
 - b. If approved by the State in writing, a system serving 501 to 3,300 people may omit the task in paragraph (7)(b)(2) of this section and/or limit the distribution of the public education materials required under paragraph (7)(b)(3) of this section to facilities and organizations served by the system that are most likely to be visited regularly by pregnant women and children.
 2. A community water system serving 3,300 or fewer people that delivers public education in accordance with paragraph (1)(h)(1) of this section shall repeat the required public education tasks at least once during each calendar year in which the system exceeds the lead action level.
8. Supplemental Monitoring and Notification of Results: A water system that fails to meet the lead action level on the basis of tap samples collected in accordance with Section 22.607(G) shall offer to sample the tap water of any customer who requests it. The system is not required to pay for collecting or analyzing the sample, nor is the system required to collect and analyze the sample itself.
- 3 Non-transient Non-community Water Systems: A non-transient non-community water system shall either include the text specified in paragraph (F)(1) of this section or shall include the following text in all of the printed materials it distributes through its lead public education program. Water systems may delete information pertaining to lead service lines upon approval by the State if no lead service lines exist anywhere in the water system service area. Any additional information presented by a system shall be consistent with the information below and be in plain English that can be understood by lay people.
- a. Introduction. The United States Environmental Protection Agency (EPA) and [insert name of water supplier] are concerned about lead in your drinking water. Some drinking water samples taken from this facility have lead levels above the EPA action level of 15 parts per billion (ppb), or 0.015 milligrams of lead per liter of water (mg/L). Under Federal law we are required to have a program in place to minimize lead in your drinking water by [insert date when corrosion control will be completed for your

system]. This program includes corrosion control treatment, source water treatment, and public education. We are also required to replace the portion of each lead service line that we own if the line contributes lead concentrations of more than 15 ppb after we have completed the comprehensive treatment program. If you have any questions about how we are carrying out the requirements of the lead regulation please give us a call at [insert water system's phone number]. This brochure explains the simple steps you can take to protect yourself by reducing your exposure to lead in drinking water.

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

c. Lead in drinking water

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

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

3. When water stands in lead pipes or plumbing systems containing lead for several hours or more, the lead may dissolve into your drinking water. This means the first water drawn from the tap in the morning, or later in the afternoon if the water has not been used all day, can contain fairly high levels of lead.

d. Steps you can take to reduce exposure to lead in drinking water.

1. Let the water run from the tap before using it for drinking or cooking any time the water in a faucet has gone unused for more than six hours. The longer water resides in plumbing the more lead it may contain. Flushing the tap means running the cold-water

faucet for about 15-30 seconds. Although toilet flushing or showering flushes water through a portion of the plumbing system, you still need to flush the water in each faucet before using it for drinking or cooking. Flushing tap water is a simple and inexpensive measure you can take to protect your health. It usually uses less than one gallon of water.

2. Do not cook with, or drink water from the hot water tap. Hot water can dissolve more lead more quickly than cold water. If you need hot water, draw water from the cold tap and then heat it.
3. The steps described above will reduce the lead concentrations in your drinking water. However, if you are still concerned, you may wish to use bottled water for drinking and cooking.
4. You can consult a variety of sources for additional information. Your family doctor or pediatrician can perform a blood test for lead and provide you with information about the health effects of lead. State and local government agencies that can be contacted include:
 - a. [insert the name or title of facility official if appropriate] at [insert phone number] can provide you with information about your facilities water supply; and
 - b. [insert the name or title of the State Department of Public Health] at [insert phone number] or [insert the name of the city or county health department] at [insert phone number] can provide you with information about the health effects of lead.

G. Monitoring Requirements for Lead and Copper in Tap Water:

1. Sample Site Location:
 - a. By the applicable date for commencement of monitoring under paragraph 4(a) of this section, each water system shall complete a materials evaluation of its distribution system in order to identify a pool of targeted sampling sites that meets the requirements of this section, and which is sufficiently large enough to ensure that the water system can collect the number of lead and copper tap samples required in paragraph (3) of this section. All large systems shall have established targeted sampling sites by January 1, 1992; all medium size systems by July 1, 1992; and all small systems by July 1, 1993. All sites from which first draw samples are collected shall be selected from this pool of targeted sampling sites. Sampling sites may not include faucets that have point-of-use or point-of-entry treatment devices designed to remove inorganic contaminants.
 - b. A water system shall use the information on lead, copper, and galvanized steel that is required to collect under Section 22.714 of these regulations (special monitoring for corrosivity characteristics) when conducting a materials evaluation. When an evaluation of the information collected pursuant to Section 22.714 is insufficient to locate the requisite number of lead and copper sampling sites that meet the targeting criteria in paragraph (1) of this section, the water system shall review the sources of information listed below in order to identify a sufficient number of sampling sites. In addition, the

system shall seek to collect such information where possible in the course of its normal operations (e.g., checking service line materials when reading water meters or performing maintenance activities):

1. All plumbing codes, permits, and records in the files of the building department(s) which indicate the plumbing materials that are installed within publicly and privately owned structures connected to the distribution system;
 2. All inspections and records of the distribution system that indicate the material composition of the service connections that connect a structure to the distribution system; and
 3. All existing water quality information, which includes the results of all prior analyses of the system or individual structures connected to the system, indicating locations that may be particularly susceptible to high lead or copper concentrations.
- c. The sampling sites selected for a community water system's sampling pool ("tier 1 sampling sites") shall consist of single family structures that:
1. Contain copper pipes with lead solder installed after 1982 or contain lead pipes; and/or
 2. Are served by a lead service line. When multiple-family residences comprise at least 20 percent of the structures served by a water system, the system may include these types of structures in its sampling pool.
- d. Any community water system with insufficient tier 1 sampling sites shall complete its sampling pool with "tier 2 sampling sites", consisting of buildings, including multiple-family residences that:
1. Contain copper pipes with lead solder installed after 1982 or contain lead pipes; and/or
 2. are served by a lead service line.
- e. Any community water system with insufficient tier 1 and tier 2 sampling sites shall complete its sampling pool with "tier 3 sampling sites", consisting of single family structures that contain copper pipes with lead solder installed before 1983. A community water system with insufficient tier 1, tier 2, and tier 3 sampling sites shall complete its sampling pool with representative sites throughout the distribution system. For the purpose of this paragraph, a representative site is a site in which the plumbing materials used at that site would be commonly found at other sites served by the water system.
- f. The sampling sites selected for a non-transient non-community water system ("tier 1 sampling sites") shall consist of buildings that:
1. contain copper pipes with lead solder installed after 1982 or contain lead pipes; and/or
 2. are served by a lead service line.
- g. A non-transient non-community water system with insufficient tier 1 sites that meet the targeting criteria in paragraph 1(f) of this

section shall complete its sampling pool with tier 2 sampling sites that contain copper pipes with lead solder installed before 1983. If additional sites are needed to complete the sampling pool, the non-transient non-community water system shall use representative sites throughout the distribution system. For the purpose of this paragraph, a representative site is a site in which the plumbing materials used at that site would be commonly found at other sites served by the water system.

~~h. Any water system whose sampling pool does not consist exclusively of tier 1 sites shall demonstrate in a letter submitted to the Division under Section 22.607(J)1(b) why a review of the information listed in paragraph 1(b) of this section was inadequate to locate a sufficient number of tier 1 sites. Any community water system which includes tier 3 sampling sites in its sampling pool shall demonstrate in such a letter why it was unable to locate a sufficient number of tier 1 and tier 2 sampling sites. For large systems this shall be completed by January 1, 1992; for medium size systems by July 1, 1992; and for small systems by July 1, 1993.~~

h. Any water system whose distribution system contains lead service lines shall draw 50 percent of the samples it collects during each monitoring period from sites that contain lead pipes, or copper pipes with lead solder, and 50 percent of those samples from sites served by a lead service line. A water system that cannot identify a sufficient number of sampling sites served by a lead service line shall demonstrate in a letter submitted to the Division under Section 22.607(J)1(d) why the system was unable to locate a sufficient number of such sites. Such a water system shall collect lead service line samples from all of the sites identified as being served by such lines collect first-draw samples from all of the sites identified as being served by such lines.

2. Sample Collection Methods:

a. All tap samples for lead and copper collected in accordance with this subpart, with the exception of lead service line samples collected under Section 22.607(E)3 and samples collected under paragraph (2)(e) of this section, shall be first draw samples.

b. Each first-draw tap sample for lead and copper shall be one liter in volume and have stood motionless in the plumbing system of each sampling site for at least six hours. First-draw samples from residential housing shall be collected from the cold-water kitchen tap or bathroom sink tap. First-draw samples from a non-residential building shall be one liter in volume and shall be collected at an interior tap from which water is typically drawn for consumption. Non-first-draw samples collected in lieu of first-draw samples pursuant to paragraph (2)(e) of this section shall be one liter in volume and shall be collected at an interior tap from which water is typically drawn for consumption. First-draw samples may be collected by the system or the system may allow residents to collect first-draw samples after instructing the residents of the sampling

procedures specified in this paragraph. To avoid problems of residents handling nitric acid, acidification of first-draw samples may be done up to 14 days after the sample is collected. After acidification to resolubilize the metals, the sample must stand in the original container for the time specified in the approved EPA method before the sample can be analyzed. If a system allows residents to perform sampling, the system may not challenge, based on alleged errors in sample collection, the accuracy of sampling results. ~~Acidification of samples may be done up to 14 days after collection.~~

- c. Each service line sample shall be one liter in volume and have stood motionless in the lead service line for at least six hours. Lead service line samples shall be collected in one of the following three ways:
 1. At the tap after flushing the volume of water between the tap and the lead service line. The volume of water shall be calculated based on the interior diameter and length of the pipe between the tap and the lead service line;
 2. Tapping directly into the lead service line; or
 3. If the sampling site is a building constructed as a single-family residence, allowing the water to run until there is a significant change in temperature which would be indicative of water that has been standing in the lead service line.
- d. A water system shall collect each first-draw tap sample from the same sampling site from which it collected a previous sample. If, for any reason, the water system cannot gain entry to a sampling site in order to collect a follow-up tap sample, the system may collect the follow-up tap sample from pool as long as the new site meets the same targeting criteria, and is within reasonable proximity of the original site.
- e. A non-transient non-community water system, or a community water system that meets the criteria of 22.607(G)(1)(a), (b) and (c), that does not have enough taps that can supply first-draw samples as defined in 22.607(G)(2)(b), may apply to the Division in writing to substitute non-first-draw samples. Such systems must collect as many first-draw samples from appropriate taps as possible and identify sampling times and locations that would likely result in the longest standing time for the remaining sites. The Division has the discretion to waive the requirement for prior Division approval of non-first-draw sample sites selected by the system, either through State regulation or written notification to the system.
- f. Invalidation of lead and copper tap samples. A sample invalidated under this paragraph does not count toward determining lead or copper 90th percentile levels under Section 22.607(A)(1) or toward meeting the minimum monitoring requirements of paragraph (G)(3) of this section.
 1. The Division may invalidate a lead or copper tap sample at least if one of the following conditions is met.

- a. The laboratory establishes that improper sample analysis caused erroneous results.
 - b. The Division determines that the sample was taken from a site that did not meet the site selection criteria of this section.
 - c. The sample container was damaged in transit.
 - d. There is substantial reason to believe that the sample was subject to tampering.
2. The system must report the results of all samples to the Division and all supporting documentation for samples the system believes should be invalidated.
 3. To invalidate sample under paragraph (f)(1) of this section, the decision and the rationale for the decision must be documented in writing. States may not invalidate a sample solely on the grounds that a follow-up sample result is higher or lower than that of the original sample.
 4. The system must collect replacement samples for any samples invalidated under this section if, after the invalidation of one or more samples, the system has too few samples to meet the minimum requirements of paragraph (3) of this section. Any such replacement samples must be taken as soon as possible, but no later than 20 days after the date the Division invalidates the sample or by the end of the applicable monitoring period, whichever occurs later. Replacement samples taken after the end of the applicable monitoring period shall not also be used to meet the monitoring requirements of a subsequent monitoring period. The replacement samples shall be taken at the same locations as the invalidated samples or, if that is not possible, at locations other than those already used for sampling during the monitoring period.
3. Number of Samples: Water systems shall collect at least one sample during each monitoring period specified in paragraph (4)(a) of this section from the number of sites listed in the first column below (“standard monitoring”). A system conducting reduced monitoring under paragraph 4(d) of this section ~~may~~ shall collect one sample from the number of sites specified in the second column (“reduced monitoring”) below during each monitoring period specified in paragraph 4(d) of this section. Such reduced monitoring sites shall be representative of the sites required for standard monitoring. The Division may specify sampling locations when a system is conducting reduced monitoring. The table is as follows:

System size (no. people served)	No. of sites (standard monitoring)	No. of sites (reduced monitoring)
>100,000	100	50
10,001-100,000	60	30
3,301 – 10,000	40	20

501 – 3,300	20	10
101 – 500	10	5
≤100	5	5

4. Timing of Monitoring:

- a. Initial Tap Sampling: The first six-month monitoring period for small, medium-size and large systems shall begin on the following dates:

System Size (no. people served)	First six-month monitoring period begins on
>50,000	January 1, 1992
3,301 – 50,000	July 1, 1992
<3,300	July 1, 1993

1. All large systems shall monitor during two consecutive six-month periods.
2. All small and medium-size systems shall monitor during each six-month monitoring period until:
 - a. the system exceeds the lead or copper action level and is therefore required to implement the corrosion control treatment requirements under Section 22.607(B) in which case the system shall continue monitoring in accordance with paragraph 4(b) of this section, or
 - b. the system meets the lead or copper action levels during two consecutive six-month monitoring periods, in which case the system may reduce monitoring in accordance with paragraph 1(d) of this section.

b. Monitoring after Installation of Corrosion Control and Source Water Treatment:

1. Any large system which installs optimal corrosion control treatment pursuant to Section 22.607(B)(4) Step 4 shall monitor during two consecutive six-month periods by the date specified in Section 22.607(B)(4) Step 5.
2. Any small or medium-size system which installs optimal corrosion control treatment pursuant to Section 22.607(B)(5) Step 5 shall monitor during two consecutive six-month periods by the date specified in Section 22.607(B)(5) Step 6.
3. Any system which installs source water treatment pursuant to Section 22.607(D)1 Step 3 shall monitor during two consecutive six-month periods by the date specified in Section 22.607(D)1 Step 4.

- c. Monitoring after Division specifies Water Quality Parameter Values for Optimal Corrosion Control: After the Division specifies the values for water quality control parameters under Section 22.607(c)6, the system shall monitor during each subsequent six-month monitoring period, with the first monitoring period to begin on the date the Division specifies the optimal values under Section 22.607(c)6.
- d. Reduced Monitoring:
1. A small or medium-size water system that meets the lead and copper action levels during each of two consecutive six-month monitoring periods may reduce the number of samples in accordance with paragraph (3) of this section, and reduce the frequency of sampling to once per year. Division approval is not required.
 2. Any water system that maintains the range of values for the water quality control parameters reflecting optimal corrosion control treatment specified by the Division under Section 22.607(c)(6) during each of two consecutive six-month monitoring periods may ~~request that the Division allow the system to~~ reduce the frequency of monitoring to once per year and ~~to~~ reduce the number of lead and copper samples in accordance with paragraph (3) of this section if it receives written approval from the Division. The Division shall review monitoring, treatment, and other relevant ~~the~~ information submitted by the water system in accordance with Section 22.607(C), and shall make its decision in writing, setting forth the basis for its determination. The Division shall review, and where appropriate, revise its determination when the system submits new monitoring or treatment data, or when other data relevant to the number and frequency of tap sampling becomes available.
 3. A small or medium-size water system that meets the lead and copper action levels during three consecutive years of monitoring may reduce the frequency of monitoring for lead and copper from annually to once every three years. Any water system that maintains the range of values for the water quality control parameters reflecting optimal corrosion control treatment specified by the Division under Section 22.607(c)(6) during three consecutive years of monitoring may ~~request that the Division allow the system to~~ reduce the frequency of monitoring from annually to once every three years if it receives written approval from the Division. The Division shall review monitoring, treatment and other relevant ~~the~~ information submitted by the water system in accordance with Section 22.607(C) and shall make its decision in writing, setting forth the basis for its

determination. The Division shall review, and where appropriate, revise its determination when the system submits new monitoring or treatment data, or when other data relevant to the number and frequency of tap sampling becomes available.

4. A water system that reduces the number and frequency of sampling shall collect these samples from sites included in the pool of targeted sampling sites identified in paragraph (1) of this section. Systems sampling annually or less frequently shall conduct the lead and copper tap sampling during the months of June, July, August or September unless the Division has approved a different sampling period in accordance with paragraph (d)(4)(A) of this section.
 - a. The State, at its discretion, may approve a different period for conducting the lead and copper tap sampling for systems collecting a reduced number of samples. Such a period shall be no longer than four consecutive months and must represent a time of normal operation where the highest levels of lead are most likely to occur. For a non-transient non-community water system that does not operate during the months of June through September, and for which the period of normal operation where the highest levels of lead are most likely to occur is not known, the State shall designate a period that represents a time of normal operation for the system.
 - b. Systems monitoring annually, that have been collecting samples during the months of June through September and that receive State approval to alter their sample collection period under paragraph (G)(4)(a)(1) of this section, must collect their next round of samples during a time period that ends no later than 21 months after the previous round of sampling. Systems monitoring triennially that have been collecting samples during the months of June through September, and receive State approval to alter the sampling collection period as per paragraph (G)(4)(a)(1) of this section, must collect their next round of samples during a time period that ends no later than 45 months after the previous round of sampling. Subsequent rounds of sampling must be collected annually or triennially, as required by this section. Small systems with waivers, granted pursuant to paragraph (G)(6) of this section, that have been collecting samples during the months of June through September and receive State approval to alter their sample collection period under paragraph (G)(4)(a)(1) of this section must

collect their next round of samples before the end of the 9-year period.

5. Any water system that demonstrates for two consecutive 6-month monitoring periods that the tap water lead level computed under Sec. 141.80(c)(3) is less than or equal to 0.005 mg/L and the tap water copper level computed under Sec. 141.80(c)(3) is less than or equal to 0.65 mg/L may reduce the number of samples in accordance with paragraph (c) of this section and reduce the frequency of sampling to once every three calendar years.

~~5.~~ 6. Return to standard monitoring after failure to meet action levels or operate within specified water quality parameters.

a. A small or medium-size water system subject to reduced monitoring that exceeds the lead or copper action levels shall resume sampling in accordance with paragraph 4(c) of this section and collect the number of samples specified for standard monitoring under paragraph (3) of this section. Such a system shall also conduct water quality parameter monitoring in accordance with 22.607(H)(1)(2) or (3) (as appropriate) during the monitoring period in which it exceeded the action level. Any such system may resume annual monitoring for lead and copper at the tap at the reduced number of sites specified in paragraph (3) of this section after it has completed two subsequent consecutive six-month rounds of monitoring that meet the criteria of paragraph (4)(d)(1) of this section and/or may resume triennial monitoring for lead and copper at the reduced number of sites after it demonstrates through subsequent rounds of monitoring that it meets the criteria of either paragraph (4)(d)(3) or (4)(d)(5) of this section.

b. Any water system subject to reduced monitoring frequency that fails to operate within the range of values for the water quality control parameters specified by the Division under Section 22.607(c)6 for more than nine days in any six-month period specified in Section 22.607(H) shall conduct tap water sampling for lead and copper at the frequency specified in paragraph (4)(c) of this section, collect the number of samples specified under paragraph (3) of this section, and shall resume monitoring for water quality parameters within the distribution system in accordance with Section 22.607(H). Such a system may resume reduced monitoring for lead and copper at the tap and for water quality

parameters within the distribution system under the following conditions: shall resume tap water sampling in accordance with paragraph 4(c) of this section and collect the number of samples specified for standard monitoring under paragraph (3) of this section.

1. The system may resume annual monitoring for lead and copper at the tap at the reduced number of sites specified in paragraph (3) of this section after it has completed two subsequent six-month rounds of monitoring that meet the criteria of paragraph (4)(d)(2) of this section and the system has received written approval from the State that it is appropriate to resume reduced monitoring on an annual frequency.
2. The system may resume triennial monitoring for lead and copper at the tap at the reduced number of sites after it demonstrates through subsequent rounds of monitoring that it meets the criteria of either paragraph (4)(d)(3) or (4)(d)(5) of this section and the system has received written approval from the State that it is appropriate to resume triennial monitoring.
3. The system may reduce the number of water quality parameter tap water samples required in accordance with Section 22.607(H)(5) and the frequency with which it collects such samples in accordance with Section 22.607(H)(5)(b). Such a system may not resume triennial monitoring for water quality parameters at the tap until it demonstrates, in accordance with the requirements of Section 22.607(G)(4), that it has re-qualified for triennial monitoring.
7. Any water system subject to a reduced monitoring frequency under paragraph (4)(d) of this section that either adds a new source of water or changes any water treatment shall inform the Division in writing in accordance with Section 22.211 of these regulations. The Division may require the system to resume sampling in accordance with paragraph (4)(c) of this section and collect the number of samples specified for standard monitoring under paragraph (3) of this section or take other appropriate steps such as increased water quality parameter monitoring or re-evaluation of its corrosion control treatment given the potentially different water quality considerations.

5. Additional Monitoring by Systems: The results of any monitoring conducted in addition to the minimum requirements of this section shall be considered by the system and the Division in making any determinations (i.e., calculating the 90th percentile lead or copper level) under this section.
6. Monitoring Waivers for Small Systems: Any small system that meets the criteria of this paragraph may apply to the Division to reduce the frequency of monitoring for lead and copper under this section to once every nine years (i.e., a “full waiver”) if it meets all of the materials criteria specified in paragraph (6)(a) of this section and all of the monitoring criteria specified in paragraph (6)(b) of this section. If State regulations permit, any small system that meets the criteria in paragraphs (6)(a) and (b) of this section only for lead, or only for copper, may apply to the Division for a waiver to reduce the frequency of tap water monitoring to once every nine years for that contaminant only (i.e., a “partial waiver”).
 - a. Materials Criteria: The system must demonstrate that its distribution system and service lines and all drinking water supply plumbing, including plumbing conveying drinking water within all residences and buildings connected to the system, are free of lead-containing materials and/or copper-containing materials, as those terms are defined in this paragraph, as follows:
 1. Lead. To qualify for a full waiver, or a waiver of the tap water monitoring requirements for lead (i.e., a “lead waiver”), the water system must provide certification and supporting documentation to the Division that the system is free of all lead-containing materials as follows:
 - a.) It contains no plastic pipes which contain lead plasticizers, or plastic service lines which contain lead plasticizers; and
 - b.) It is free of lead service lines, lead pipes, lead soldered pipe joints, and leaded brass or bronze alloy fittings and fixtures, unless such fittings and fixtures meet the specifications of any standard established pursuant to 42 U.S.C. 300g-6(e) (Safe Drinking Water Act section 1417(e)).
 2. Copper. To qualify for a full waiver, or a waiver of the tap water monitoring requirements for copper (i.e., a “copper waiver”), the water system must provide certification and supporting documentation to the Division that the system contains no copper pipes or copper service lines.
 - b. Monitoring Criteria for Waiver Issuance: The system must have completed at least one six-month round of standard tap water monitoring for lead and copper at sites approved by the Division and from the number of sites required by paragraph (3) of this section and demonstrate that the 90th percentile levels for any and all rounds of monitoring conducted since the system became free of all lead-containing and/or copper-containing materials, as appropriate, meet the following criteria.

1. Lead levels. To qualify for a full waiver, or a lead waiver, the system must demonstrate that the 90th percentile lead level does not exceed 0.005 mg/L.
2. Copper levels. To qualify for a full waiver, or a copper waiver, the system must demonstrate that the 90th percentile copper level does not exceed 0.65 mg/L.
- c. Division Approval of Waiver Application: The Division shall notify the system of its waiver determination, in writing, setting forth the basis of its decision and any condition of the waiver. As a condition of the waiver, the Division may require the system to perform specific activities (e.g., limited monitoring, periodic outreach to customers to remind them to avoid installation of materials that void the waiver) to avoid the risk of lead or copper concentration of concern in tap water. The small system must continue monitoring for lead and copper at the tap as required by paragraphs (4)(a) through (4)(d) of this section, as appropriate, until it receives written notification from the Division that the waiver has been approved.
- d. Monitoring frequency for systems with waivers.
 1. A system with a full waiver must conduct tap water monitoring for lead and copper in accordance with paragraph (4)(d)(4) of this section at the reduced number of sampling sites identified in paragraph (3) of this section at least once every nine years and provide the materials certification specified in paragraph (6)(a) of this section for both lead and copper to the Division along with the monitoring results.
 2. A system with a partial waiver must conduct tap water monitoring for the waived contaminant in accordance with paragraph (4)(d)(4) of this section at the reduced number of sample sites specified in paragraph (3) of this section at least once every nine years and provide the materials certification specified in paragraph (6)(a) of this section pertaining to the waived contaminant along with the monitoring results. Such a system also must continue to monitor for the non-waived contaminant in accordance with requirements of paragraph (4)(a) through (4)(d) of this section, as appropriate.
 3. If a system with a full or partial waiver adds a new source of water or changes any water treatment, the system must notify the Division in writing in accordance with section 22.211. The Division has the authority to require the system to modify waiver conditions (e.g., require recertification that the system is free of lead-containing and/or copper-containing materials, require additional round(s) of monitoring), if it deems such modifications are necessary to address treatment or source water changes at the system.

4. If a system with a full or partial waiver becomes aware that it is no longer free of lead-containing or copper-containing materials, as appropriate, (e.g., as a result of new construction or repairs), the system shall notify the Division in writing no later than 60 days after becoming aware of such a change.
- e. Continued Eligibility: If the system continues to satisfy the requirements of paragraph (6)(d) of this section, the waiver will be renewed automatically, unless any of the conditions listed in paragraph (6)(e)(1) through (6)(e)(3) of this section occurs. A system whose waiver has been revoked may re-apply for a waiver at such time as it again meets the appropriate materials and monitoring criteria of paragraph (6)(a) and (6)(b) of this section.
 1. A system with a full waiver or a lead waiver no longer satisfies the materials criteria of paragraph (6)(a)(1) of this section or has a 90th percentile lead level greater than 0.005 mg/L.
 2. A system with a full waiver or a copper waiver no longer satisfies the materials criteria of paragraph (6)(a)(b) of this section or has a 90th percentile copper level greater than 0.65 mg/L.
 3. The State notifies the system, in writing, that the waiver has been revoked, setting forth the basis of its decision.
- f. Requirements Following Waiver Revocation: A system whose full or partial waiver has been revoked by the Division is subject to the corrosion control treatment and lead and copper tap water monitoring requirements, as follows:
 1. If the system exceeds the lead and/or copper action level, the system must implement corrosion control treatment in accordance with the deadlines specified in Section 22.607(B), and any other applicable requirements of this subpart.
 2. If the system meets both the lead and copper action level, the system must monitor for lead and copper at the tap no less frequently than once every three years using the reduced number of sample sites specified in paragraph (3) of this section.
- g. Pre-existing Waivers: Small system waivers approved by the Division in writing prior to April 11, 2000 shall remain in effect under the following conditions:
 1. If the system has demonstrated that it is both free of lead-containing and copper-containing materials, as required by paragraph (6)(a) of this section and that its 90th percentile lead levels and 90th percentile copper levels meet the criteria of paragraph (6)(b) of this section, the waiver remains in effect so long as the system continues to meet the waiver eligibility criteria of paragraph (6)(e) of this section. The first round of tap monitoring conducted pursuant to

paragraph (6)(d) of this section shall be completed no later than nine years after the last time the system has monitored for lead and copper at the tap.

2. If the system has met the materials criteria of paragraph (6)(a) of this section but has not met the monitoring criteria of paragraph (6)(b) of this section, the system shall conduct a round of monitoring for lead and copper at the tap demonstrating that it meets the criteria of paragraph (6)(b) of this section no later than September 30, 2003. Thereafter, the waiver shall remain in effect as long as the system meets the continued eligibility criteria of paragraph (6)(e) of this section. The first round of tap water monitoring conducted pursuant to paragraph (6)(d) of this section shall be completed no later than nine years after the round of monitoring conducted pursuant to paragraph (6)(b) of this section.

H. **Monitoring Requirements for Water Quality Parameters:** All large water systems and all small and medium-size systems that exceed the lead or copper action level shall monitor water quality parameters in addition to lead and copper in accordance with this section. The requirements of this section are summarized in the table at the end of this section.

1. **General Requirements:**

a. **Sample Collection Methods:**

1. Tap samples shall be representative of water quality throughout the distribution system taking into account the number of persons served, the different sources of water, the different treatment methods employed by the system, and seasonal variability. Tap sampling under this section is not required to be conducted at taps targeted for lead and copper sampling under Section 22.607(G)1. (NOTE: Systems may find it convenient to conduct tap sampling for water quality parameters at sites used for coliform sampling under Section 22.5.
2. Samples collected at the entry point(s) to the distribution system shall be from locations representative of each source after treatment. If a system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water is representative of all sources being used).

b. **Number of Samples:**

1. Systems shall collect two tap samples for applicable water quality parameters during each monitoring period specified under paragraphs (2) and (5) of this section from the following number of sites:

System Size (no. people served)	No. of sites for water quality parameters
>100,000	25
10,001-100,000	10
3,301 – 10,000	3
501 to 3,300	2
101 to 500	1
≤100	1

2. Except as provided in paragraph (3)(c) of this section, ~~S~~systems shall collect two samples for each applicable water quality parameter at each entry point to the distribution system during each monitoring period specified in paragraph (2) of this section. During each monitoring period specified in paragraphs (3) through (5) of this section, systems shall collect one sample for each applicable water quality parameter at each entry point to the distribution system.
 2. Initial Sampling: All large water systems shall measure the applicable water quality parameters as specified below at taps and at each entry point to the distribution system during each six-month monitoring period specified in Section 22.607(G)4(a). All small and medium-size systems shall measure the applicable water quality parameters at the locations specified below during each six-month monitoring period specified in Section 22.607(G)4(a) during which the system exceeds the lead or copper action levels.
 - a. At taps:
 1. pH;
 2. Alkalinity;
 3. Orthophosphate, when an inhibitor containing a phosphate compound is used;
 4. Silica, when an inhibitor containing a silicate compound is used;
 5. Calcium;
 6. Conductivity; and
 7. Water Temperature.
 - b. At each entry point to the distribution system, all of the applicable parameters listed in paragraph (H) 2 (a).
 3. Monitoring after Installation of Corrosion Control: Any large system which installs optimal corrosion control treatment pursuant to Section 22.607(B)(4) Step 4 shall measure the water quality parameters at the locations and frequencies specified below during each six-month monitoring period specified in Section 22.607(G)4(b)(1). Any small or medium-size system which installs optimal corrosion control treatment shall conduct such monitoring during each six-month monitoring period specified in Section 22.607(G)4(b)(2) in which the system exceeds the lead or copper action level.

- a. At taps two samples for:
 1. pH;
 2. Alkalinity;
 3. Orthophosphate, when an inhibitor containing a phosphate compound is used;
 4. Silica, when an inhibitor;
 5. Calcium, when calcium carbonate stabilization is used as part of corrosion control.
- b. Except as provided in paragraph (3)(c) of this section, At each entry point to the distribution system, one sample every two weeks (bi-weekly) for:
 1. pH;
 2. When alkalinity is adjusted as part of optimal corrosion control, a reading of the dosage rate of the chemical used to adjust alkalinity, and the alkalinity concentration; and
 3. When a corrosion inhibitor is used as part of optimal corrosion control, a reading of the dosage rate of the inhibitor used, and the concentration of orthophosphate or silica (whichever is applicable).
- c. Any groundwater system can limit entry point sampling described in paragraph (3)(b) of this section to those entry points that are representative of water quality and treatment conditions throughout the system. If water from untreated groundwater sources mixes with water from treated groundwater sources, the system must monitor for water quality parameters both at representative entry points receiving treatment and representative points receiving no treatment. Prior to the start of any monitoring under this paragraph, the system shall provide to the Division written information identifying the selected entry points and documentation, including information on seasonal variability, sufficient to demonstrate that the sites are representative of water quality and treatment conditions throughout the system.
4. Monitoring after Division Specifies Water Quality Parameter Values for Optimal Corrosion Control: After the Division specifies the values for applicable water quality control parameters reflecting optimal corrosion control treatment under Section 22.607(c)(6), all large systems shall measure the applicable water quality parameters in accordance with paragraph (3) of this section ~~during each monitoring period specified in Section 22.607(G)4(e) and determine compliance with the requirements of Section 22.607(G) every six months with the first six-month period to begin on the date the Division specifies the optimal values under Section 22.607(C).~~ Any small or medium-size system shall conduct such monitoring during each six-month monitoring period specified in this paragraph Section 22.607(G)4(e) in which the system exceeds the lead or copper action level. ~~The system may take a confirmation sample for any water quality parameter value no later than 3 days after the first sample. If a confirmation sample is taken, the result must be averaged with the first sampling result and the average must be used for any compliance~~

~~determination under Section 22.607(e)7. The Division has discretion to delete results of obvious sampling errors from this calculation. For any such small and medium-size system that is subject to a reduced monitoring frequency pursuant to Section 22.607(G)(4) at the time of the action level exceedance, the end of the applicable six-month period under this paragraph shall coincide with the end of the applicable monitoring period under Section 22.607(G)(4). Compliance with the Division-designated optimal water quality parameter values shall be determined as specified under Section 22.607(C)(6).~~

5. Reduced Monitoring:

- a. Any water system that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment during each of two consecutive six-month monitoring periods under paragraph (4) of this section shall continue monitoring at the entry point(s) to the distribution system as specified in paragraph 3(b) of this section. Such system may collect two tap samples for applicable water quality parameters from the following reduced number of sites during each six-month monitoring period.

System Size (no. people served)	Reduced No. of sites for water quality parameters
>100,000	10
10,001 to 100,000	7
3,301 to 10,000	3
501 to 3,300	2
101 to 500	1
<100	1

b. Frequency of Monitoring:

1. Any water system that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment specified by the Division under Section 22.607(c)6 during three consecutive years of monitoring may reduce the frequency with which it collects the number of tap samples for applicable water quality parameters specified in the paragraph 5(a) of this section from every six months to annually.
2. A water system may reduce the frequency with which it collects tap samples for applicable water quality parameters specified in paragraph (5)(a) of this section to every three years if it demonstrates during two consecutive monitoring periods that its tap water lead level at the 90th percentile is less than or equal to the PQL (Practical Quantitation Level) for lead specified in Section 22.607(L), that its tap water copper level at the 90th percentile is less than or equal to 0.65 mg/L for copper in Section 22.607(L), and that it also has maintained the range of values for the water quality

parameters reflecting optimal corrosion control treatment specified by the Division under Section 22.607(C).

- c. A water system that conducts sampling annually shall collect these samples evenly throughout the year so as to reflect seasonal variability.
 - d. Any water system subject to reduced monitoring frequency that fails to operate at or above the minimum value or within the range of values for the water quality parameters specified by the Division under Section 22.607(c)(6) for more than nine days in any six-month period specified in Section 22.607(C) shall resume distribution system tap water sampling in accordance with the number and frequency requirements in paragraph (3) of this section. Such a system may resume annual monitoring for water quality parameters at the tap at the reduced number of sites specified in paragraph (5)(a) of this section after it has completed two subsequent consecutive six-month rounds of monitoring that meet the criteria of that paragraph and/or may resume triennial monitoring for water quality parameters at the tap at the reduced number of sites after it demonstrates through subsequent rounds of monitoring that it meets the criteria of either paragraph (5)(b)(1) or (5)(b)(2) of this section.
6. Additional Monitoring by Systems: The results of any monitoring conducted in addition to the minimum requirements of this section shall be considered by the system and the Division in making any determinations(i.e., determining concentrations of water quality parameters) under this section or Section 22.607(c).

SUMMARY OF MONITORING REQUIREMENTS FOR WATER QUALITY PARAMETERS ¹

Monitoring	Parameters ²	Location	Frequency
Initial Monitoring	pH, alkalinity, orthophosphate or silica ³ , calcium conductivity temperature	Taps and at Entry <u>point(s)</u> to the distribution system	Every 6 months

<p>After installation of Corrosion Control</p>	<p>pH, alkalinity, orthophosphate or silica³, calcium⁴.</p> <p><u>pH, alkalinity, dosage rate and concentration (if alkalinity adjusted as part of corrosion control), inhibitor dosage rate and inhibitor residual⁵.</u></p>	<p>Taps</p> <p><u>Entry point(s) to the distribution system⁶.</u></p>	<p>Every 6 months</p> <p><u>No less frequently than every two weeks.</u></p>
<p>After Division Specifies Parameter Values for Optimal Corrosion Control</p>	<p><u>PH, alkalinity, orthophosphate or silica³, calcium⁴.</u></p> <p>pH, alkalinity, dosage rate and concentration (if alkalinity adjusted as part of corrosion control), inhibitor dosage rate and inhibitor residual⁵.</p>	<p><u>Taps</u></p> <p>Entry point(s) to the distribution system⁶.</p>	<p><u>Every 6 months</u></p> <p>Bi-weekly <u>No less frequently than every two weeks.</u></p>
<p>Reduced Monitoring</p>	<p>pH, alkalinity, orthophosphate or silica³, calcium⁴.</p> <p>pH, alkalinity dosage rate and concentration (if alkalinity adjusted as part of corrosion control), inhibitor dosage rate and inhibitor residual⁵.</p>	<p>Taps</p> <p>Entry point(s) to the distribution system⁶.</p>	<p>Every 6 months, <u>annually⁷ or every 3 years⁸</u>; at a reduced number of sites.</p> <p>Bi-weekly <u>No less frequently than every two weeks.</u></p>

1. Table is for illustrated purposes; consult the text of this section for precise regulatory requirements.
2. Small and medium-size systems have to monitor for water quality parameters only during monitoring periods in which the system exceeds the lead or copper level.
3. Orthophosphate must be measured only when an inhibitor containing a phosphate compound is used. Silica must be measured only when an inhibitor containing silicate compound is used.
4. Calcium must be measured only when calcium carbonate stabilization is used as part of corrosion control.
5. Inhibitor dosage rates and inhibitor residual concentrations (orthophosphate or silica) must be measured only when an inhibitor is used.
6. Groundwater systems may limit monitoring to representative locations throughout the system.
7. Water systems may reduce frequency of monitoring for water quality parameters at the tap from every six months to annually if they have maintained the range of values for water quality parameters reflecting optimal corrosion control during three consecutive years of monitoring.

8. Water systems may further reduce the frequency of monitoring for water quality parameters at the tap from annually to once every three years if they have maintained the range of values for water quality parameters reflecting optimal corrosion control during three consecutive years of annual monitoring. Water systems may accelerate to triennial monitoring for water quality parameters at the tap if they have maintained 90th percentile lead levels less than or equal to 0.005 mg/L, 90th percentile copper levels less than or equal to 0.65 mg/L, and the range of water quality parameters designated by the Division under Section 22.607() as representing optimal corrosion control during two consecutive six-month monitoring periods.

I. Monitoring Requirements for Lead and Copper in Source Water:

1. Sample Location Collection Methods, and Number of samples:

- a. A water system that fails to meet the lead or copper action level on the basis of tap samples collected in accordance with Section 22.607(G) shall collect lead and copper source water samples in accordance with the requirements regarding sample location, number of samples, and collection methods specified in Section 22.602(A)(1) — (4) (inorganic chemical sampling). (NOTE: The timing of sampling for lead and copper shall be in accordance with paragraphs(2) and (3) of this section, and not dates specified in Section 22.602(A)(1) and (2). following requirements regarding sample location, number of samples, and collection methods:

1. Groundwater systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after treatment (hereafter called a sampling point). The system shall take one sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.
2. Surface water systems shall take a minimum of one sample at every entry point to the distribution system after any application of treatment or in the distribution system at a point which is representative of each source after treatment (hereafter called a sampling point). The system shall take each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant. NOTE: For the purpose of this paragraph, surface water systems include systems with a combination of surface and groundwater sources.
3. If a system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water is representative of all sources being used).
4. The Division may reduce the total number of samples which must be analyzed by allowing the use of compositing. Compositing of samples must be done by certified laboratory personnel. Composite samples from a maximum of five samples are allowed, provided that if the lead concentration in the composite sample is greater than or equal to 0.001 mg/L or the copper concentration is greater than or equal to 0.160 mg/L, then either:
 - a. A follow-up sample shall be taken and analyzed within 14 days at each sampling point included in the composite; or

tap water samples during the entire source water sampling period applicable to the system under paragraph 4(a)(1) or (2) of this section.

5. Reduced Monitoring Frequency:

- a. ~~A water system using only groundwater which demonstrates that finished drinking water entering the distribution system has been maintained below the maximum permissible lead and/or copper concentrations specified by the Division in Section 22.607(D)(1) Step 2 during at least three consecutive compliance periods under paragraph 4(a) of this section may reduce the monitoring frequency for lead and/or copper to once during each nine-year compliance cycle (as that term is defined in Section 22.1). Division approval is not required.~~ may reduce the monitoring frequency for lead and copper in source water to once during each nine-year compliance cycle (as that term is defined in 40 CFR 141.2 Copies available from the Office of Drinking Water) if the system meets one of the following criteria:
1. The system demonstrates that finished drinking water entering the distribution system has been maintained below the maximum permissible lead and copper concentrations specified by the Division in Section 22.607(A)(1) during at least three consecutive compliance periods under paragraph (4)(a) of this section; or
 2. The Division has determined that source water treatment is not needed and the system demonstrates that, during at least three consecutive compliance periods in which sampling was conducted under paragraph (4)(a) of this section, the concentration of lead in source water was less than or equal to 0.005 mg/L and the concentration of copper in source water was less than or equal to 0.65 mg/L.
- b. ~~A water system using surface water (or a combination of surface and ground waters) which demonstrates that finished drinking water entering the distribution system has been maintained below the maximum permissible lead and copper concentrations specified by the Division in Section 22.607(D)(2)(d) for at least three consecutive years may reduce the monitoring frequency in paragraph 4(a) of this section to once during each nine-year compliance cycle (as that term is defined in Section 22.1). Division approval is not required.~~ May reduce the monitoring frequency in paragraph (4)(a) of this section to once during each nine-year compliance cycle (as that term is defined in 40 CFR 141.2 Copies available from the Office of Drinking Water) if the system meets one of the following criteria:
1. The system demonstrates that finished drinking water entering the distribution system has been maintained below the maximum permissible lead and copper concentrations specified by the Division in Section 22.607(A)(1) during at least three consecutive years; or
 2. The Division has determined that source water treatment is not needed and the system demonstrates that, during at least three consecutive years, the concentration of lead in source water was less than or equal to 0.005 mg/L and the concentration of copper in source water was less than or equal to 0.65 mg/L.

~~e. A water system that uses a new source of water is not eligible for reduced monitoring for lead and/or copper until concentrations in samples collected from the new source during three consecutive monitoring periods are below the maximum permissible lead and copper concentrations specified by the Division in Section 22.607(D)1 Step 5.~~

J. **Reporting Requirements:** All water systems shall report all of the following information to the Division in accordance with this section.

1. **Reporting Requirements for Tap Water Monitoring for Lead and Copper and for Water Quality Parameter Monitoring:**

a. ~~Except as provided in paragraph (1)(a)(8) of this section,~~ A a water system shall report the information specified below for all tap water samples within the first 10 days following the end of each applicable monitoring period specified in Section 22.607 (G),(H) and (I) (i.e., every six-months, annually, or every 3 years):

1. The results of all tap samples for lead and copper including the location of each site and the criteria under Section 22.206(G)(1)(c)(d),(e),(f), or (g) under which the site was selected for the system's sampling pool;
2. ~~a certification that each first draw sample collected by the water system is one liter in volume and, to the best of their knowledge, has stood motionless in the service line, or in the interior plumbing of a sampling site, for at least six hours~~ Documentation for each tap water lead or copper sample for which the water system requests invalidation pursuant to Section 22.607(G)(2);
3. ~~where residents collected samples, a certification that each tap sample collected by the residents was taken after the water system informed them of proper sampling procedures specified in 22.607(G)2(b).~~ [Reserved];
4. The 90th percentile lead and copper concentrations measured from among all lead and copper tap water samples collected during each monitoring period (calculated in accordance with 22.607(A)(1)(c)) unless the Division calculates the system's 90th percentile lead and copper levels under paragraph (8) of this section;
5. With the exception of initial tap sampling conducted pursuant to Section 22.607(G)(4)(a) the system shall designate any site which was not sampled during previous monitoring periods, and include an explanation of why 2 sampling sites have changed;
6. The results of all tap samples for pH, and where applicable, alkalinity, calcium, conductivity, temperature, and orthophosphate or silica collected under Section 22.607(H)(2-5);
7. The results of all samples collected at the entry point(s) to the distribution system for applicable water quality parameters under Section 22.607(H)(2-5);
8. A water system shall report the results of all water quality parameter samples collected under section 22.607(H)(1) through (3) during each six-month monitoring period specified in 22.607(G)(4) within the first ten days following the end of the

monitoring period unless the Division has specified a more frequent reporting requirement.

- b. ~~By the applicable date in Section 22.607(G)(4)(a) for commencement of monitoring, each community water system which does not complete its targeted sampling pool with tier 1 sampling sites meeting the criteria in Section 22.607(G)(1)(c) shall send a letter to the Division justifying its selection of tier 2 and/or tier 3 sampling sites under Section 22.607(G)(1)(d) and/or (1)(e). For a non-transient non-community water system, or a community water system meeting the criteria of Sections 22.607 (H)(1)(2) and (3), that does not have enough taps that can provide first-draw samples, the system must either:~~
 1. Provide written documentation to the Division identifying standing times and locations for enough non-first-draw samples to make up its sampling pool under Section 22.607(G)(2)(e) by the start of the first applicable monitoring period under Section 22.607(G)(4) that commences after April 11, 2000, unless the Division has waived prior Division approval of non-first-draw sample sites selected by the system pursuant to Section 22.607(G)(2)(b); or
 2. If the Division has waived prior approval of non-first-draw sample sites selected by the system, identify, in writing, each site that did not meet the six-hour minimum standing time and the length of standing time for that particular substitute sample collected pursuant to Section 22.607(G)(2)(e) and include this information with the lead and copper tap sample results required to be submitted pursuant too paragraph (1)(a)(1) of this section.
- c. ~~By the applicable date in Section 22.607(G)4(a) for commencement of monitoring, each non-transient, non-community water system which does not complete its sampling pool with tier 1 sampling sites meeting the criteria in Section 22.607(G)1(f) shall send a letter to the Division justifying its selection of sampling sites under Section 22.607(G)1(g). No later than 60 days after the addition of a new source or any change in water treatment, unless the Division requires earlier notification, a water system deemed to have optimized corrosion control under Section 22.607(A)(2), a water system subject to reduced monitoring pursuant to Section 22.607(G)(4)(d), or a water system subject to a monitoring waiver pursuant to Section 22.607(G)(6), shall send written documentation to the Division describing the change. In those instances where prior Division approval of the treatment change or new source is not required, water systems are encouraged to provide the notification to the Division beforehand to minimize the risk the treatment change or new source will adversely affect optimal corrosion control.~~
- d. ~~By the applicable date in Section 22.607(G)4(a) for commencement of monitoring, each water system with lead service lines that is not able to locate the number of sites served by such lines required under Section 22.607(G)1(I) shall send a letter to the Division demonstrating why it was unable to locate a sufficient number of such sites based upon the~~

~~information listed in Section 22.607(G)1(b). Any small system applying for a monitoring waiver under Section 22.607(G)(6), or subject to a waiver granted pursuant to Section 22.607(G)(6), shall provide the following information to the Division in writing by the specified deadline:~~

- ~~1. By the start of the first applicable monitoring period in Section 22.607(G), any small water system applying for a monitoring waiver shall provide the documentation required to demonstrate that it meets the waiver criteria of Sections 22.607(G)(6)(a)(1) and (2).~~
- ~~2. No later than nine years after the monitoring previously conducted pursuant to Section 22.607(G)(4) or Section 22.607(G)(6), each small system desiring to maintain its monitoring waiver shall provide the information required by Sections 22.607(G)(6)(a)(1) and (2).~~
- ~~3. No later than 60 days after it becomes aware that it is no longer free of lead-containing and/or copper-containing material, as appropriate, each small system with a monitoring waiver shall provide written notification to the Division, setting forth the circumstances resulting in the lead-containing and/or copper-containing materials being introduced into the system and what corrective action, if any, the system plans to remove these materials.~~
- ~~4. By October 10, 2003, any small system with a waiver granted prior to April 11, 2000 and that has not previously met the requirements of Section 22.607(G)(6)(a) shall provide the information required by that paragraph.~~
- e. ~~Each water system that requests that the Division reduce the number and frequency of sampling shall provide the information required under Section 22.607(G)(4)(d). Each groundwater system that limits water quality parameter monitoring to a subset of entry points under Section 22.607(H)(3)(c) shall provide, by the commencement of such monitoring, written correspondence to the Division that identifies the selected entry points and includes the information sufficient to demonstrate that the sites are representative of water quality and treatment conditions throughout the system.~~

2. Source Water Monitoring Reporting Requirements:

- a. A water system shall report the sampling results for all source water samples collected in accordance with Section 22.607(I) within the first 10 days following the end of each source water monitoring periods (i.e., annually, per compliance period, per compliance cycle) specified in Section 22.607(I).
- b. With the exception of the first round of source water sampling conducted pursuant to Section 22.607(I)(2), the system shall specify any site which was not sampled during previous monitoring periods, and include an explanation of why the sampling point has changed.

3. Corrosion Control Treatment Reporting Requirements: By the applicable dates under Section 22.607(B), systems shall report the following information:
 - a. for systems demonstrating that they have already optimized corrosion control, information required in Section 22.607(c)(3)(b) or (c).
 - b. for systems required to optimize corrosion control, their recommendation regarding optimal corrosion control treatment under Section 22.607(c)(1).
 - c. for systems required to evaluate the effectiveness of corrosion control treatments under Section 22.607(c)(3), the information required by that paragraph.
 - d. for systems required to install optimal corrosion control designated by the Division under Section 22.607(c)(4), a letter certifying that the system has completed installing that treatment.

4. Source Water Treatment Reporting Requirements: By the applicable dates in Section 22.607(D), systems shall provide the following information to the Division:
 - a. if required under Section 22.607(D)(2)(a) their recommendation regarding source water treatment;
 - b. for systems required to install source water treatment under Section 22.607(D)(2)(b), a letter certifying that the system has completed installing the treatment designated by the Division within 24 months after the Division designated the treatment.

5. Lead Service Line Replacement Reporting Requirements: Systems shall report the following information to the Division to demonstrate compliance with the requirements of Section 22.607(E):
 - a. Within 12 months after a system exceeds the lead action level in sampling referred to in Section 22.607(E)(1), the system shall demonstrate in writing to the Division that it has conducted a material evaluation, including the evaluation in Section 22.607(G)(1), to identify the initial number of lead service lines in its distribution system, and shall provide the Division with the system's schedule for replacing annually at least 7 percent of the initial number of lead service lines in its distribution system.
 - b. Within 12 months after a system exceeds the lead action level in sampling referred to in Section 22.607(E)(1), and every 12 months thereafter, the system shall demonstrate to the Division in writing that the system has either:
 1. replaced in the previous 12 months at least 7 percent of the initial lead service lines (or a greater number of lines specified by the Division under Section 22.607(E)(6)) in its distribution system; or
 2. conducted sampling which demonstrates that the lead concentration in all service lines samples from an individual line(s), taken pursuant to Section 22.607(G)(2)(c), is less than or equal to 0.015 mg/L. In such cases, the total number of lines replaced and/or which meet the criteria in Section 22.607 (E)(2) shall equal at least 7 percent of the initial number of lead lines identified under paragraph (a) of this section (or the percentage specified by the Division under Section 22.607(E)(6)).

- c. The annual letter submitted to the Division under paragraph 5(b) of this section shall contain the following information:
 - 1. the number of lead service lines scheduled to be replaced during the previous year of the system's replacement schedule;
 - 2. the number and location of each lead service line replaced during the previous year of the system's replacement schedule;
 - 3. if measured, the water lead concentration and location of each lead service line sampled, the sampling method, and the date of sampling.
 - d. ~~As soon as practicable, but in no case later than three months after a system exceeds the lead action level in sampling referred to in Section 22.607(E)1, any system seeking to rebut the presumption that it has control over the entire lead service line pursuant to Section 22.607(E)4 shall submit a letter to the Division describing the legal authority (e.g., Division statutes, municipal ordinances, public service contracts or other applicable legal authority) which limits the system's control over the service lines and the extent of the system's control. Any system which collects lead service line samples following partial lead service line replacement required by Section 22.607(E) shall report the results to the Division within the first ten days of the month following the month in which the system receives the laboratory results, or as specified by the Division. States, at their discretion may eliminate this requirement to report these monitoring results. Systems shall also report any additional information as specified by the Division, and in a time and manner prescribed by the Division, to verify that all partial lead service line replacement activities have taken place.~~
6. Public Education Program Reporting Requirements: By December 31st of each year, any water system that is subject to the public education requirements in Section 22.607(F) shall submit a letter to the Division demonstrating that the system has delivered the public education materials that meet the content requirements in Section 22.607(F)1 and 2 and the delivery requirements in Section 22.607(F)3. This information shall include a list of all the newspapers, radio stations, television stations, facilities and organizations to which the system delivered public education materials during the previous year. The water system shall submit the letter required by this paragraph annually for as long as it exceeds the lead action level.
- a. Any water system that is subject to the public education requirements in Section 22.607(F) shall, within ten days after the end of each period in which the system is required to perform public education tasks in accordance with Section 22.607(F)(1), send written documentation to the Division that contains:
 - 1. A demonstration that the system has delivered the public education materials that meet the content requirements in Section 22.607(F)(1) and (3) and the delivery requirements in Section 22.607(F); and
 - 2. A list of all the newspapers, radio stations, television stations, and facilities and organizations to which the system delivered public

education materials during the period in which the system was required to perform public education tasks.

b. Unless required by the Division, a system that previously has submitted the information required in paragraph (6)(a)(2) of this section need not resubmit the information required by paragraph (6)(a)(2) of this section, as long as there have been no changes in the distribution list and the system certifies that the public education materials were distributed to the same list submitted previously.

7. Reporting of Additional Monitoring Data: Any system which collects sampling data in addition to that required by this section shall report the results to the Division by the end of the applicable monitoring period under Sections 22.607(G), (H) and (I) during which the samples are collected.

8. Reporting of the 90th percentile lead and copper concentrations where the Division calculates a system's 90th percentile concentrations. A water system is not required to report the 90th percentile lead and copper concentrations measured from among all lead and copper tap water samples collected during each monitoring period, as required by paragraph (1)(a)(4) of this section if:

a. The Division has previously notified the water system that it will calculate the water system's 90th percentile lead and copper concentrations, based on the lead and copper tap results submitted pursuant to paragraph (8)(b)(1) of this section, and has specified a date before the end of the applicable monitoring period by which the system must provide the results of lead and copper tap water samples;

b. The system has provided the following information to the Division by the date specified in paragraph (8)(a) of this section:

1. The results of all tap samples for lead and copper including the location of each site and the criteria under Section 22.607(G)(1), (2), (3), (4) and/or (5) under which the site was selected for the system's sampling pool, pursuant to paragraph (1)(a)(1) of this section; and

2. An identification of sampling sites utilized during the current monitoring period that were not sampled during previous monitoring periods, and an explanation why sampling sites have change; and

c. The Division has provided the results of the 90th percentile lead and copper calculations, in writing, to the water system before the end of the monitoring period.

K. **Recordkeeping Requirements:** Any system subject to the requirements of this subpart shall retain on its premises original records of all sampling data and analyses, reports, surveys, letters, evaluations, schedules, Division determinations, and any other information required by Section 22.607(B) through Section 22.607(I). Each water system shall retain the records required by this section for no fewer than 12 years.

- L. **Analytical Methodology:** Analysis for compliance with this section shall be in accordance with 40 CFR 141.89. Copies may be obtained from the Office of Drinking Water.
1. ~~Analysis for lead, copper, pH conductivity, calcium, alkalinity, or the phosphate, silica and temperature shall be conducted in accordance with 40 CFR 141.23(k)(1). Copies may be obtained from the Office of Drinking Water.~~
 2. ~~Analyses under this section shall only be conducted by laboratories that have been approved by the EPA or the Division. To obtain certification to conduct analyses for lead and copper, laboratories must:~~
 - a. ~~Analyze performance evaluation samples annually; and~~
 - b. ~~Achieve quantitative acceptance limits as follows:~~
 1. ~~Lead: ± 30 percent of the actual amount in the Performance Evaluation sample when the actual amount is greater than or equal to 0.005 mg/L; and~~
 2. ~~Copper: ± 10 percent of the actual amount in the Performance Evaluation sample when the actual amount is greater than or equal to 0.050 mg/L;~~
 - c. ~~Achieve method detection limits according to the procedures listed in Section 22.607(L)(1) are as follows:~~
 1. ~~Lead: 0.001 mg/L (only if source water compositing is done under Section 22.602(A)4(a)); and~~
 2. ~~Copper: 0.001 mg/L or 0.020 mg/L when atomic absorption direct aspiration is used (only if source water compositing is done under Section 22.602(A)4(a)).~~
 - d. ~~Be currently certified by EPA or the Division to perform analyses to the specifications described in paragraph (L)2 of this section.~~
 3. ~~The Division has the authority to allow the use of previously collected monitoring data for purposes of monitoring, if the data were collected and analyzed in accordance with the requirements of this Section.~~
 4. ~~All water systems must report lead measurements between the PQL and the MDL as measured or as one half the PQL (0.0075 mg/l). All levels below the lead MDL must be reported as zero.~~
 5. ~~All water systems must report copper measurements between the PQL and the MDL as measured or as one half the PQL (0.025 mg/l). All levels below the copper MDL must be reported as zero.~~

22.61 **Organic Chemical Requirements:**

22.611 **PMCLs:** The following are the organic PMCLs (mg/L-milligrams per liter). Compliance is determined pursuant to Sections 22.612, 22.613, and 22.614.

- A. The following maximum contaminant levels for synthetic organic contaminants apply to community water systems and non-transient, non-community water systems:

Pesticides and PCBs

Contaminant	MCL
Alachlor	0.002 mg/L
Aldicarb	0.003 mg/L

Aldicarb Sulfone	0.002 mg/L
Aldicarb Sulfoxide	0.004 mg/L
Atrazine	0.003 mg/L
Benzo(a)pyrene	0.0002 mg/L
Carbofuran	0.04 mg/L
Chlordane	0.002 mg/L
Dalapon	0.2 mg/L
Di(2-ethylhexyl) adipate	0.4 mg/L
Di(2-ethylhexyl) phthalate	0.006 mg/L
Dibromochloropropane	0.0002 mg/L
Dinoseb	0.007 mg/L
Diquat	0.02 mg/L
2,4-D	0.07 mg/L
Endothall	0.1 mg/L
Endrin	0.002 mg/L
Ethylenedibromide (EDB)	0.00005 mg/L
Glyphosate	0.7 mg/L
Heptachlor	0.0004 mg/L
Heptachlor epoxide	0.0002 mg/L
Hexachlorobenzene	0.001 mg/L
Hexachlorocyclopentadiene	0.05 mg/L
Lindane	0.0002 mg/L
Methoxychlor	0.04 mg/L
Oxamyl (Vydate)	0.2 mg/L
Pentachlorophenol	0.001 mg/L
Picloram	0.5 mg/L
Polychlorinated biphenyls (PCBs)	0.0005 mg/L
Simazine	0.004 mg/L
2,3,7,8-TCDD (Dioxin)	3×10^{-8} mg/L
Toxaphene	0.003 mg/L
2,4,5-TP (Silvex)	0.05 mg/L

B. Disinfection Byproducts (DBPs)

Contaminant	MCL
Total Trihalomethanes (TTHMs)	0.080 mg/L
Haloacetic acids (five) (HAA5)	0.060 mg/L
Bromate	0.010 mg/L
Chlorite	1.0 mg/L

C. Volatile Synthetic Organic Chemicals (VOCs)

Contaminant	MCL
Benzene	0.005 mg/L
Carbon Tetrachloride	0.005 mg/L

1,2-Dichlorobenzene	0.6 mg/L
1,4-Dichlorobenzene	0.075 mg/L
1,2 Dichloroethane	0.005 mg/L
1,1 Dichloroethylene	0.007 mg/L
Cis-1,2-Dichloroethylene	0.07 mg/L
Trans 1,2 Dichloroethylene	0.1 mg/L
Dichloromethane	0.005 mg/L
1,2 Dichloropropane	0.005 mg/L
Ethylbenzene	0.7 mg/L
Methyl <i>tert</i> Butyl Ether (MTBE)	0.01 mg/L
Monochlorobenzene	0.1 mg/L
Styrene	0.1 mg/L
Tetrachloroethylene	0.005 mg/L
Toluene	1 mg/L
1,2,4-Trichlorobenzene	0.07 mg/L
1,1,1-Trichloroethane	0.2 mg/L
1,1,2-Trichloroethane	0.005 mg/L
Trichloroethylene	0.005 mg/L
Vinyl Chloride	0.002 mg/L
Xylenes (total)	10 mg/L

22.612

Sampling, Analytical Requirements and Compliance Determination For Contaminants Listed in 22.611A and C: Monitoring of the contaminants listed in Section 22.611(A) and (C) for the purposes of determining compliance with the MCLs shall be conducted as follows:

- A. Groundwater systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after treatment (hereafter called a sampling point). Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.
- B. Surface water systems shall take a minimum of one sample at points in the distribution system that are representative of each source or at each entry point to the distribution system after treatment (hereafter called a sampling point). Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant. (NOTE: For purposes of this paragraph, surface water systems include systems with a combination of surface and ground sources).
- C. If the system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating condition (i.e., when water representative of all sources is being used).
- D. Monitoring frequency:

1. Each community and non-transient non-community water system shall take four consecutive quarterly samples for each contaminant listed in Section 22.611(A) and (C) during each compliance period beginning with the compliance period starting January 1, 1993.
 2. Systems serving more than 3,300 persons which do not detect a contaminant in the initial compliance period may reduce the sampling frequency to a minimum of two quarterly samples in one year during each repeat compliance period.
 3. Systems serving less than or equal to 3,300 persons which do not detect a contaminant in the initial compliance period may reduce the sampling frequency to a minimum of one sample during each repeat compliance period.
- E. Each community and non-transient water system which does not detect a contaminant listed in Section 22.611(A) and (C) may apply to the Division for a waiver from the requirement of paragraph (D)(1) of this section upon completion of the initial monitoring. A system must reapply for a waiver at the end of each compliance period.
- F. The Division may grant a waiver after evaluating the following factors: Knowledge of previous use (including transport, storage, or disposal) of the contaminant within the watershed or zone of influence of the system. If a determination by the Division reveals no previous use of the contaminant within the watershed or zone of influence, a waiver may be granted. If previous use of the contaminant is unknown, or it has been used previously, then the following factors shall be used to determine whether a waiver is granted:
1. Previous analytical results.
 2. The proximity of the system to a potential point or non-point source of contamination. Point sources include spills and leaks of chemicals at or near a water treatment facilities or at manufacturing, distribution, or storage facilities, or from hazardous and municipal waste landfills and other waste handling or treatment facilities. Non-point sources include the use of pesticides to control insect and weed pests on agricultural areas, forest lands, home and gardens, and other land application uses.
 3. The environmental persistence and transport of the pesticide or PCBs.
 4. How well the water source is protected against contamination due to such factors as depth of the well, the type of soil and the integrity of the well casing.
 5. Elevated nitrate levels at the water supply source.
 6. Use of PCBs in equipment used in the production, storage or distribution of water (i.e., PCBs used in pumps, transformers, etc).
- G. If an organic contaminant listed in Section 22.611(A) and (C) is detected in any sample then:
1. Each system must monitor quarterly at each sampling point which resulted in a detection.
 2. The Division may decrease the quarterly monitoring requirement specified in paragraph (1) of this section provided it has determined that the system

is reliably and consistently below the maximum contaminant level. In no case shall the Division make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface water system take a minimum of four quarterly samples.

3. After the Division determines the system is reliably and consistently below the maximum contaminant level the Division may allow the system to monitor annually. Systems which monitor annually must monitor during the quarter that previously yielded the highest analytical result.
 4. Systems which have 3 consecutive annual samples with no detection of a contaminant may apply to the Division for a waiver as specified in paragraph (F) of this section.
 5. If monitoring results in detection of one or more of certain related contaminants (aldicarb, aldicarb sulfone, aldicarb sulfoxide and heptachlor, heptachlor epoxide), then subsequent monitoring shall analyze for all related contaminants.
- H. Systems which violate the MCL listed in Section 22.611(A) and (C) must monitor quarterly. After a minimum of four quarterly samples show the system is in compliance and the Division determines the system to be reliably and consistently below the MCL as specified in paragraph (K), the system shall monitor at the frequency specified in paragraph (G)(3) of this section.
- I. The Division may require a confirmation sample for positive or negative results. If a confirmation sample is required by the Division, the result must be averaged with the first sampling result and the average used for the compliance determination as specified in paragraph (K). The Division has the discretion to delete results of obvious sampling errors from this calculation.
- J. The Division may reduce the total number of samples a system must analyze by allowing the use of compositing. Composite samples from a maximum of five sampling points are allowed. Detection Limit must be less than one-fifth of the MCL. Compositing of samples must be done in the laboratory and analyzed within 14 days of sample collections.
1. If the concentration in the composite sample detects one or more contaminants listed in Section 22.611(A) and (C), then a follow-up sample must be taken and analyzed within 14 days from each sampling point included in the composite.
 2. If duplicates of the original sample taken from each sampling point used in the composite are available, the system may use these duplicates instead of resampling. The duplicate must be analyzed and the results reported to the Division within 14 days of collection.
 3. If the population served by the system is >3,300 persons, then compositing may only be permitted by the Division at sampling points within a single system. In systems serving <3,300 persons, the Division may permit compositing among different systems provided the 5-sample limit is maintained.

- K. Compliance with Section 22.611(A) and (C) shall be determined based on the analytical results obtained at each sampling point. If one sampling point is in violation of the MCL, the system is in violation of the MCL.
1. For systems which are conducting monitoring at a frequency greater than annually, compliance is determined by a running annual average of all samples taken at each sampling point. If the annual average of any sampling point is greater than the MCL, then the system is out of compliance. If the initial sample or a subsequent sample would cause the annual average to be exceeded, then the system is out of compliance immediately. Any samples below the detection limit shall be calculated as zero for purposes of determining the annual average.
 2. If monitoring is conducted annually, or less frequently, the system is out of compliance if the level of a contaminant at any sampling point is greater than the MCL. If a confirmation sample is required by the Division, the determination of compliance will be based on the average of two samples.
 3. If any sample result will cause the running annual average to exceed the MCL at any sampling point, the system is out of compliance with the MCL immediately.
 4. If a system fails to collect the required number of samples, compliance will be based on the total number of samples collected.
 5. If a sample result is less than the detection limit, zero will be used to calculate the annual average.
 36. If a public water system has a distribution system separable from other parts of the distribution system with no interconnections, the Division may allow the system to give public notice to only that portion of the system which is out of compliance.
- L. Analysis for the contaminants listed in Section 22.611(A) and (C) shall be conducted in accordance with 40 CFR 141.24(e). Copies may be obtained from the Office of Drinking Water.
- M. Analysis for PCBs shall be conducted as follows:
1. Each system which monitors for PCBs shall analyze each sample in accordance with 40 CFR 141.24(h)(13)(i) (see paragraph (M)(2) of this section). Copies may be obtained from the Office of Drinking Water.
 2. If PCBs (as one of seven Aroclors) are detected (as designated in this paragraph) in any sample analyzed using in paragraph (M)(1) of this section, the system shall reanalyze the sample in accordance with 40 CFR 141.24(h)(13)(ii) to quantitate PCBs (as decachlorobiphenyl). Copies may be obtained from the Office of Drinking Water.
 3. Compliance with the PCB MCL shall be determined based upon the quantitative results of analyses conducted in accordance with 40 CFR 141.24(h)(13)(iii). Copies may be obtained from the Office of Drinking Water.
- N. If monitoring data collected after January 1, 1990, are generally consistent with the requirements of Section 22.612, then the Division may allow systems to use that data to satisfy the monitoring requirement for the initial compliance period beginning January 1, 1993.

- O. The Division may increase the required monitoring frequency, where necessary, to detect variations within the system (e.g., fluctuations in concentration due to seasonal use, changes in water source).
- P. The Division has the authority to determine compliance or initiate enforcement action based upon analytical results and other information compiled by their sanctioned representatives and agencies.
- Q. Each public water system shall monitor at the time designated by the Division within each compliance period.
- R. Detection as used in this paragraph shall be defined as found in 40 CFR 141.24(h)(18). Copies may be obtained from the Office of Drinking Water.
- S. Analysis under this section shall only be conducted by laboratories that have received certification by EPA or the Division and have met the following conditions:
 - 1. To receive certification to conduct analyses for the contaminants in Section 22.611A the laboratory must:
 - a. Analyze Performance Evaluation samples annually in accordance with 22.214.
 - b. The laboratory shall achieve quantitative results on the analyses that are within the acceptance limits specified in 40 CFR 141.24(h)(19)(i)(B). Copies may be obtained from the Office of Drinking Water.
- T. All new systems or systems that use a new source of water that begin operation after January 22, 2004 must demonstrate compliance with the MCL within a period of time specified by the Division. The system must also comply with the initial sampling frequencies specified by the Division to ensure a system can demonstrate compliance with the MCL. Routine and increased monitoring frequencies shall be conducted with the requirements in this section.

22.613

Sampling, Analytical Requirements and Compliance Determination for TTHMs Contaminants Listed in 22.611(B): Monitoring of TTHMs contaminants listed in 22.611(B) for the purpose of determining compliance with the MCLs listed in Section 22.611(B) shall be conducted as follows:

- A. Community water systems which serve a population of 10,000 or more individuals and which add a disinfectant (oxidant) to the water in any part of the drinking water treatment process shall analyze for total trihalomethanes in accordance with this Section. For the purpose of this Section, the minimum number of samples required to be taken by the system shall be based on the number of treatment plants used by the system, except that multiple wells drawing raw water from a single aquifer may, with the Division's approval, be considered one treatment plant for determining the minimum number of samples. All samples taken within an established frequency shall be collected within a twenty-four (24) hour period.
- B. For all community water systems utilizing surface water sources in whole or part, and for all community water systems utilizing only ground water sources that have not been determined by the Division to qualify for the monitoring requirements of paragraphs(E) and (F) of this Section, analyses for total trihalomethanes shall be performed at quarterly intervals on at least four (4) water samples from each treatment plant used by the systems. At least twenty-five (25) percent of the

samples shall be taken at locations within the distribution system reflecting the maximum residence time of the water in the system. The remaining seventy-five (75) percent shall be taken at representative locations in the distribution system taking into account number of persons served, different sources of water and different treatment methods employed. The results of all analyses per quarter shall be arithmetically averaged and reported to the division within thirty (30) days of the system's receipt of such results. All samples collected shall be used in the computation of the average, unless the analytical results are invalidated for technical reasons. Sampling and analyses shall be conducted in accordance with the methods listed in paragraph (H) of this Section.

- C. The monitoring frequency required by paragraph B of this Section may be reduced by the Division to a minimum of one (1) sample analyzed for ~~TTHMs~~ contaminants listed in 22.611(B) per quarter taken at a point in the distribution system reflecting the maximum residence time of the water in the system, upon written determination by the Division that the data from at least one (1) year of monitoring in accordance with paragraph (B) of this Section and local conditions demonstrate that total trihalomethane concentrations will be consistently below the PMCL.
- D. If at any time during which the reduced monitoring frequency prescribed under this paragraph applies, the results from any analysis exceed 0.10 mg/L of TTHMs and such results are confirmed by at least one (1) check sample taken promptly after such results are received, or if the system makes any significant change to its source of water or treatment program, the system shall immediately begin monitoring in accordance with the requirements of paragraph B of this Section, which monitoring shall continue for at least one (1) year before the frequency may be reduced again. At the option of the Division, a system's monitoring frequency may and should be increased above the minimum in those cases where it is necessary to detect variations of TTHM levels within the distribution system.
- E. The monitoring frequency required by paragraph (B) of this Section may be reduced by the Division for ground water supplies to a minimum of one (1) sample for maximum TTHM potential per year for each treatment plant used by the system taken at a point in the distribution system reflecting maximum residence time of the water in the system. The system shall submit to the Division the results of at least one (1) sample analyzed for maximum TTHM potential for each treatment plant used by the system taken at a point in the distribution system. The system's monitoring frequency may only be reduced by the Division when, based upon the data, the system has a maximum TTHM potential of less than 0.10 mg/L and when, based upon an assessment of local conditions of the system, the system is not likely to approach or exceed the PMCL for TTHMs. The results of all analyses shall be reported to the Division within thirty (30) days of the system's receipt of such results. All samples collected shall be used for determining whether the system must comply with the monitoring requirements of paragraphs B, C and D of this Section, unless the analytical results are invalidated for technical reasons. Sampling and analyses shall be conducted in accordance with the methods listed in paragraph (H) of this Section.
- F. If at any time during which the reduced monitoring frequency prescribed under paragraph E of this Section applies, the results from any analyses taken by the system for maximum TTHM potential are equal to or greater than 0.10 mg/L, and

such results are confirmed by at least one (1) check sample taken promptly after such results are received, the system shall immediately begin monitoring in accordance with the requirements of paragraphs (B), (C) and (D) of this Section and such monitoring shall continue for at least one (1) year before the frequency may be reduced again. In the event of any significant change to the system's raw water or treatment program, the system shall immediately analyze an additional sample for maximum TTHM potential taken at a point in the distribution system reflecting maximum residence time of the water in the system for the purpose of determining whether the system must comply with the monitoring requirements of paragraphs (B), (C) and (D) of this Section. At the option of the Division, monitoring frequencies may and should be increased above the minimum in those cases where this necessary to detect variations of TTHM levels within the distribution system.

- G. Compliance with Section 22.611(B) shall be determined based on running annual average of quarterly samples collected by the system as prescribed in paragraphs B or C of this Section. If the average of samples covering any twelve (12) month period exceeds the PMCL, the supplier of water shall report to the Division pursuant to Section 22.40 and notify the public pursuant to Section 22.41. Monitoring after public notification shall be at a frequency designated by the Division and shall continue until a monitoring schedule as a condition to a variance, exemption or enforcement action shall become effective.
- H. Sampling and analyses pursuant to this Section shall be conducted in accordance with 40 CFR 141.24(e). Copies may be obtained from the Office of Drinking Water.
- I. Before a community water system makes any significant modifications to its existing treatment process for the purposes of achieving compliance with Section 22.611(B), such system must submit and obtain Division approval of a detailed plan setting forth its proposed modification and those safeguards that it will implement to ensure that the bacteriological quality of the drinking water served by such system will not be adversely affected by such modification. Each system shall comply with the provisions set forth in the Division approved plan. At a minimum, a Division approved plan shall require the system modifying its disinfection practice to:
 - 1. Evaluate the water system for sanitary defects and evaluate the source water for biological quality.
 - 2. Evaluate its existing treatment practice and consider improvements that will minimize disinfectant demand and optimize finished water quality throughout the distribution system.
 - 3. Provide baseline water quality survey data of the distribution system. Such data should include the results from monitoring for coliform and fecal coliform bacteria, fecal streptococci, standard plate counts at 35°C and 20°C, phosphate, ammonia, nitrogen and total organic carbon. Virus studies should be required where source waters are heavily contaminated with sewage effluent.
 - 4. Conduct additional monitoring to assure continued maintenance of optimal biological quality in finished water, for example, when chloramines are introduced as disinfectants or when pre-chlorination is being discontinued. Additional monitoring should also be required by the Division for chlorate,

chlorite and chlorine dioxide when chlorine dioxide is used as a disinfectant. Standard plate count analyses should also be required by the division as appropriate before and after any modifications.

5. Demonstrate an active disinfectant residual throughout the distribution system at all times during and after the modification.
- J. The requirements in paragraphs (A) through (G) of this section apply to subpart H community water systems which serve a population of 10,000 or more until December 16, 2001. The requirements in paragraphs (A) through (G) of this section apply to community water systems which use only ground water not under the direct influence of surface water that add a disinfectant (oxidant) in any part of the treatment process and serve a population of 10,000 or more until December 16, 2003. After December 16, 2003, this section is no longer applicable.
- K. Compliance dates for DBPs.
 1. CWSs and NTNCWS. Subpart H systems serving 10,000 or more persons must comply with this section beginning December 16, 2001. Subpart H systems serving fewer than 10,000 persons and systems using only ground water not under the direct influence of surface water must comply with this section beginning December 16, 2003.
 2. A system that is installing GAC or membrane technology to comply with this section may apply to the State for an extension of up to 24 months past the dates in paragraphs ~~(b)~~(K)(1) of this section, but not beyond December 16, 2003. In granting the extension, States must set a schedule for compliance and may specify any interim measures that the system must take. Failure to meet the schedule or interim treatment requirements constitutes a violation of a National Primary Drinking Water Regulation.

22.614

Sampling, Analytical Requirements and Compliance Determination for VOCs: Monitoring of the contaminants listed in Section 22.611C for the purpose of determining compliance with the MCLs shall be conducted as follows:

- A. Groundwater systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after treatment (hereafter called a sampling point). If conditions warrant, the Division may designate additional sampling points within the distribution system or at the consumer's tap which more accurately determine consumer exposure. Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.
- B. Surface water systems shall take a minimum of one sample at points in the distribution system that are representative of each source or at each entry point to the distribution system after treatment (hereafter called a sampling point). If conditions warrant, the Division may designate additional sampling points within the distribution system or at the consumer's tap which more accurately determines consumer exposure. Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source, treatment plan, or within the distribution system. NOTE: For purposes of this paragraph, surface water systems include systems with a combination of surface and ground surfaces.

- C. If the system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water representative of all sources is being used).
- D. Each community and non-transient non-community water system shall take four consecutive quarterly samples for each contaminant listed in Section 22.611C, during each compliance period beginning in the initial compliance period.
- E. Groundwater and surface water systems which do not detect one of the contaminants listed in Section 22.611C after conducting the initial round of monitoring required in paragraph D of this Section may take one sample annually.
- F. For groundwater and surface water systems, if the initial monitoring for contaminants listed in Section 22.611C as allowed in paragraph R of this section has been completed by December 31, 1992 and the system did not detect any contaminant listed in Section 22.611C then the system shall take one sample annually. After a minimum of three years of annual sampling, the Division may allow groundwater systems which have no previous detection of any contaminant listed in Section 22.611C to take one sample during each compliance period.
- G. Each community and non-transient non-community groundwater system which does not detect a contaminant listed in Section 22.611C may apply to the Division for a waiver from the requirement of paragraph E and F of this Section after completing the initial monitoring. (For the purposes of this section, detection is defined as >0.0005 mg/L). A waiver shall be effective for no more than six years (two compliance periods).
 - 1. The Division may also issue waivers to small systems (those serving $\leq 3,300$ persons) for the initial round of monitoring for 1,2,4-trichlorobenzene.
- H. The Division may grant a waiver after evaluating the following factor(s):
 - 1. Knowledge of previous use (including transport, storage, or disposal) of the contaminant within the watershed or zone of influence of the system. If a determination by the Division reveals no previous use of the contaminant within the watershed or zone of influence, a waiver may be granted.
 - 2. If previous use of the contaminant is unknown or it has been used previously, then the following factors shall be used to determine whether a waiver is granted.
 - a. Previous analytical results.
 - b. The proximity of the system to potential point or non-point source of contamination. Point sources include spills and leaks of chemicals at or near a water treatment facility or at manufacturing, distribution, or storage facilities, or from hazardous and municipal waste landfills and other waste handling or treatment facilities.
 - c. The environmental persistence and transport of the contaminants.
 - d. The number of persons served by the public water system and the proximity of a smaller system to a larger system.
 - e. How well the water source is protected against contamination such as whether it is a surface or groundwater system. Groundwater systems must consider factors such as depth of the well, the type of soil, and well head protection. Surface water systems must consider watershed protection.

- I. As a condition of the waiver a system must take one sample at each sampling point during the time the waiver is effective (i.e., one sample during two compliance periods or six years) and update its vulnerability assessment considering the factors listed in paragraph H of this section. Based on this vulnerability assessment the Division must confirm that the system is non-vulnerable. If the Division does not make this reconfirmation within three years of the initial determination, then the waiver is invalidated and the system is required to sample annually as specified in paragraph E of this section.
- J. Each community and not-transient non-community surface water system which does not detect a contaminant listed in Section 22.611C may apply to the Division for a waiver from the requirements of Paragraph F of this Section after completing the initial monitoring. Composite samples from a maximum of five sampling points are allowed, provided that the detection limit of the method used for analysis is less than one-fifth of the MCL. Systems meeting this criterion must be determined by the Division to be non-vulnerable based on a vulnerability assessment during each compliance period. Each system receiving a waiver shall sample at the frequency specified by the Division (if any).
- K. If a contaminant listed in Section 22.611C, excluding vinyl chloride, is detected at a level exceeding 0.0005 mg/L in any sample then:
1. The system must monitor quarterly at each sampling point which resulted in a detection.
 2. The Division may decrease the quarterly monitoring requirement specified in paragraph K(1) of this section provided it has determined that the system is reliably and consistently below the maximum contaminant level. In no case shall the Division make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface water system takes a minimum of four quarterly samples.
 3. If the Division determines that the system is reliably and consistently below the MCL, the Division may allow the system to monitor annually. Systems which monitor annually must monitor during the quarter(s) which previously yielded the highest analytical result.
 4. Systems which have three consecutive annual samples with no detection of a contaminant may apply to the Division for a waiver as specified in paragraph G of this section.
 5. Groundwater systems which have detected one or more of the following two-carbon organic compounds: trichloroethylene, tetrachloroethylene, 1,2-dichloroethane, trans-1,2-dichloroethylene, 1,1,1-trichloroethane, cis-1,2-dichloroethylene or 1,1-dichloroethylene shall monitor quarterly for vinyl chloride. A vinyl chloride sample shall be taken at each sampling point at which one or more of the two-carbon organic compounds was detected. If the results of the first analysis do not detect vinyl chloride, the Division may reduce the quarterly monitoring frequency of vinyl chloride monitoring to one sample during each compliance period. Surface water systems are required to monitor for vinyl chloride as specified by the Division.
- L. Systems which violate the requirements of Section 22.611C as determined by paragraph O of this section must monitor quarterly. After a minimum of four consecutive quarterly samples shows the system is in compliance as specified in

- paragraph O of this Section, and the Division determines that the system is reliably and consistently below the maximum contaminant level, the system may monitor at the frequency and time specified in paragraph K (3) of this section.
- M. The Division may require a confirmation sample for positive or negative results. If a confirmation sample is required by the Division, the result must be averaged with the first sampling result and the average is used for the compliance determination as specified by Paragraph O of this Section. The Division has the discretion to delete results of obvious sampling errors from this calculation.
- N. The Division may reduce the total number of samples a system must analyze by allowing the use of compositing. Composite samples from a maximum of five sampling points are allowed, providing that the detection limit of the method used for analysis is less than one-fifth of the MCL. Compositing of samples must be done in the laboratory and analyzed within 14 days of sample collection.
1. If the concentration in the composite sample is >0.0005 mg/L for any contaminant listed in Section 22.611C, then a follow-up sample must be taken and analyzed within 14 days from each sampling point included in the composite.
 2. If duplicates of the original sample taken from each sampling point used in the composite are available, the system may use these instead of resampling. The duplicate must be analyzed and the results reported to the Division within 14 days of collection.
 3. If the population served by the system is $>3,300$ persons, then compositing may only be permitted by the Division at sampling points within a single system. In systems serving $<3,300$ persons, the Division may permit compositing among different systems provided the 5-sample limit is maintained.
 4. Compositing samples prior to GC analysis:
 - a. Add 5 ml or equal larger amounts of each sample (up to 5 samples are allowed) to a 25 ml glass syringe. Special precautions must be made to maintain zero headspace in the syringe.
 - b. The samples must be cooled at 4° C during this step to minimize volatilization losses.
 - c. Mix well and draw out a 5-ml aliquot for analysis.
 - d. Follow sample introduction, purging and desorption steps described in the method.
 - e. If less than five samples are used for compositing, a proportionately small syringe may be used.
 5. Compositing samples prior to GC/MS analysis:
 - a. Inject 5-ml or equal larger amounts of each aqueous sample (up to 5 samples are allowed) into a 25-ml purging device using the sample introduction technique described in the method.
 - b. The total volume of the sample in the purging device must be 25 ml.
 - c. Purge and desorb as described in the method.
- O. Compliance with Section 22.611C shall be determined based on the analytical results obtained at each sampling point:
1. For systems which are conducting monitoring at a frequency greater than annual, compliance is determined by a running annual average of all

samples taken at each sampling point. If the annual average of any sampling point is greater than the MCL, then the system is out of compliance. If the initial sample or a subsequent sample would cause the annual average to be exceeded, then the system is out of compliance immediately. Any samples below the detection limit shall be calculated as zero for purposes of determining the annual average.

2. If monitoring is conducted annually, or less frequently, the system is out of compliance if the level of a contaminant at any sampling point is greater than the MCL. If a confirmation sample is required by the Division, the determination of compliance will be based on the average of two samples.
 3. If a public water system has a distribution system separable from other parts of the distribution system with no interconnections, the Division may allow the system to give public notice to only that area served by that portion of the system which is out of compliance.
- P. Analysis for the contaminants listed in Section 22.611C shall be conducted in accordance with 40 CFR 141.24(e). Copies may be obtained from the Office of Drinking Water.
- Q. Analysis under this section shall only be conducted by laboratories that have received approval by EPA or the Division according to the following conditions:
1. To receive conditional approval to conduct analyses for the contaminants in Section 22.611 C, excluding vinyl chloride, the laboratory must:
 - a. Analyze Performance Evaluation samples annually.
 - b. Achieve the quantitative acceptance limits for at least 80 percent of the regulated organic chemicals listed in Section 22.611 C.
 - c. Achieve quantitative results on the analyses performed under paragraph (P) of this section that are within ± 20 percent of the actual amount of the substances in the Performance Evaluation sample when the actual amount is greater than or equal to 0.010 mg/L.
 - d. Achieve quantitative results on the analyses performed under paragraph (P) of this section that are within ± 40 percent of the actual amount of the substance in the Performance Evaluation sample when the actual amount is less than 0.010 mg/L.
 - e. Achieve a method detection limit of 0.0005 mg/L according to the procedures listed in Appendix B of 40 CFR Part 136. Copies may be obtained from the Office of Drinking Water.
 - (1). {Reserved}.
 2. To receive certification for vinyl chloride, the laboratory must:
 - a. Analyze Performance Evaluation samples annually.
 - b. Achieve quantitative results on the analyses performed under paragraph (2) (a) of this Section that are within ± 40 percent of the actual amount of vinyl chloride in the Performance Evaluation sample.
 - c. Achieve a method detection limit of 0.0005 mg/l, according to the procedures listed in Appendix B of 40 CFR Part 136. Copies may be obtained from the Office of Drinking Water.

- d. Obtain certification for the contaminants listed in Section 22.611 (C).
- R. The Division may allow the use of monitoring data collected after January 1, 1988 for purposes of initial monitoring compliance. If the data are generally consistent with the other requirements in this section, the Division may use those data (i.e., a single sample rather than four quarterly samples) to satisfy the initial monitoring requirement of paragraph D of this section.
 - 1. Systems which use grandfathered samples and did not detect any contaminant listed in Section 22.611 (C), excluding vinyl chloride, shall begin monitoring annually in accordance with paragraph (F) of this Section beginning with the initial compliance period.
- S. The Division may increase required monitoring where necessary to detect variations within the system.
- T. Each approved laboratory must determine the method detection limit (MDL), as defined in Appendix B of 40 CFR Part 136, copies may be obtained from the Office of Drinking Water, at which it is capable of detecting VOCs. The acceptable MDL is 0.0005 mg/L. This concentration is the detection concentration for purposes of this section.
- U. Each public water system shall monitor at the time designated by the Division within each compliance period.

22.62

Best Available Technologies (BAT):

- A. The Division hereby identifies as indicated in the table below either granular activated carbon (GAC), packed tower aeration (PTA), or oxidation (OX) through chlorination or ozonation as the best technology, treatment technique, or other means available for achieving compliance with the maximum contaminant level for organic contaminants identified in Section 22.611 paragraphs (A) and (C).

BAT for Organic Contaminants Listed in
Section 22.611 (A) and (C)

Chemical	gac	pta	ox
Alachlor		X	
Aldicarb		X	
Aldicarb sulfone		X	
Aldicarb sulfoxide		X	
Atrazine		X	
Benzene		X	X
Benzo(a)pyrene	X		
Carbofuran		X	
Carbon tetrachloride		X	X
Chlordane		X	
2,4-D	X		
Dalapone	X		
Dibromochloropropane (DBCP)		X	X
o-Dichlorobenzene	X	X	

1,2-Dichloroethane	X	X	
cis-1,2-Dichloroethylene	X	X	
trans-1,2-Dichloroethylene	X	X	
1,1-Dichloroethylene	X	X	
Dichloromethane		X	
1,2-Dichloropropane	X	X	
Di(2-ethylhexyl)adipate	X	X	
Di(2-ethylhexyl)phthalate	X		
Dinoseb	X		
Diquat	X		
Endothall	X		
Endrin	X		
Ethylene Dibromide (EDB)		X	X
Ethylbenzene		X	X
Glyphosate			X
Heptachlor		X	
Heptachlor epoxide		X	
Hexachlorobenzene	X		

BAT for Organic Contaminants Listed in
Section 22.611 (A) and (C) (Cont.)

Chemical	gac	pta	ox
Hexachlorocyclopentadiene	X	X	
Lindane		X	
Methoxychlor		X	
Monochlorobenzene		X	X
Oxamyl (Vydate)	X		
para-Dichlorobenzene	X		
Polychlorinated biphenyls (PCB)		X	
Pentachlorophenol		X	
Picloram		X	
Simazine	X		
Styrene	X		
2,4,5-TP (Silvex)		X	X
Tetrachloroethylene		X	X
1,2,4-Trichlorobenzene	X	X	
1,1,1-Trichloroethane	X	X	
1,1,2-Trichloroethane	X	X	
Trichloroethylene		X	X
Toluene		X	
Toxaphene		X	X
2,3,7,8-TCDD (Dioxin)	X		
Vinyl chloride		X	
Xylene		X	X

BAT for Organic Contaminants Listed in Section 22.611 (B)

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

B. BAT for Inorganic Contaminants Listed in Section 22.601 (A)

Chemical Name	BAT(s)
Antimony	2,7
<u>Arsenic</u> ⁴	<u>1,2,5,6,7,9, 12</u> 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 ug/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 = Chlorine
- 11 = Ultraviolet
- 12 = Oxidation/Filtration

- C. Treatment techniques for acrylamide and epichlorohydrin.
1. Each public water system must certify annually in writing to the Division (using a third party or manufacturer's certification) that when acrylamide and epichlorohydrin are used in drinking water systems, the combination (or product) of dose and monomer level does not exceed the levels specified as follows:
 - Acrylamide = 0.05% dosed at 1 PPM (or equivalent).
 - Epichlorohydrin = 0.01% dosed at 20 PPM (or equivalent).
- D. The Administrator, U.S. Environmental Protection Agency, pursuant to section 1412 of the Safe Drinking Water Act, hereby identifies in the following table the affordable technology, treatment technique, or other means available to systems serving 10,000 persons or fewer for achieving compliance with the MCL for arsenic:

SMALL SYSTEM COMPLIANCE TECHNOLOGIES (SSCTs)¹ FOR ARSENIC²

<u>Small system compliance technology</u>	<u>Affordable for listed small systems categories³</u>
<u>Activated Alumina (centralized).....</u>	<u>All size categories</u>
<u>Activated Alumina (Point-of-Use)⁴.....</u>	<u>All size categories</u>
<u>Coagulation/Filtration⁵.....</u>	<u>501-3,300, 3,301-10,000</u>
<u>Coagulation-assisted Microfiltration.....</u>	<u>501-3,300, 3,301-10,000</u>
<u>Electrodialysis reversal⁶.....</u>	<u>501-3,300, 3,301-10,000</u>
<u>Enhanced coagulation/filtration.....</u>	<u>All size categories</u>
<u>Enhanced lime softening (pH> 10.5).....</u>	<u>All size categories</u>
<u>Ion exchange.....</u>	<u>All size categories</u>
<u>Lime softening⁵.....</u>	<u>501-3,300, 3,301-10,000</u>
<u>Oxidation/Filtration⁷.....</u>	<u>All size categories</u>
<u>Reverse osmosis (centralized)⁶.....</u>	<u>501-3,300, 3,301-10,000</u>
<u>Reverse osmosis (Point-of-Use)⁴.....</u>	<u>All size categories</u>

1. Section 1412(b)(4)(E)(ii) of the Safe Drinking Water Act specifies that SSCTs must be affordable and technically feasible for small systems.
2. SSCTs for Arsenic V. Pre-oxidation may be required to convert Arsenic III to Arsenic V.
3. The Safe Drinking Water Act specifies three 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 ration must be at least 20:1.

22.63

Maximum Contaminant Level (MCL) Effective Dates:

Fluoride - October 2, 1987
Phase I (VOCs) - January 9, 1989
Phase II - July 30, 1992
Phase IIB - January 1, 1993
Phase V - January 17, 1994

SECTION 22.7 TURBIDITY AND CORROSIVITY

22.70

Turbidity MCL, Sampling and Analytical Methodology: (Effective no later than June 29, 1993)

22.701

Turbidity MCL: The PMCLs for turbidity are applicable to both CWSs and NCWSs utilizing surface water sources in whole or in part. The PMCLs for turbidity in drinking water, measured at a representative entry point(s) to the distribution system are:

- A. One (1) NTU, as determined by a monthly average pursuant to Section 22.702, except that five (5) or fewer NTUs may be allowed if the supplier of water can demonstrate to the Division that the higher turbidity does not do any of the following:
 - 1. Interfere with disinfection;
 - 2. Prevent maintenance of an effective disinfectant agent throughout the distribution system or;
 - 3. Interfere with microbiological determinations.
- B. Five (5) NTUs based on an average for two (2) consecutive days pursuant to Section 22.702.

22.702

Turbidity Sampling and Analytical Methodology:

- A. Samples shall be taken by suppliers of water for both CWSs and NCWSs using surface water in whole or in part at a representative entry point(s) to the water distribution system at least once per day, for the purpose of making turbidity measurements to determine compliance with Section 22.701. The turbidity measurements shall be made by Method 214A (Nephelometric Method-Nephelometric Turbidity Units), pp. 134-136, as set forth in Standard Methods for the Examination of Water and Wastewater, 1986, American Public Health Association et al., 16th edition, or any alternate analytical technique approved by the Division.
- B. If the result of a turbidity analysis indicates that the MCL has been exceeded, the sampling and measurement shall be confirmed by resampling as soon as practicable and preferably within one (1) hour. If the repeat sample confirms that the MCL has been exceeded, the supplier of water shall report to the Division within forty-eight (48) hours. The repeat sample shall be the sample used for the purpose of calculating the monthly average. If the monthly average of the daily samples exceeds the MCL, or if the average of two (2) samples taken on consecutive days exceeds five (5) NTU, the supplier of water shall report to the Division and notify the public as directed in Section 22.40 and Section 22.41.

- C. When required by the Division, samples shall be taken by suppliers of water for both CWSs and NCWSs utilizing ground water only, at representative points in the distribution system.

22.71 **Corrosivity Sampling, Reporting and Analytical Methodology:** Suppliers of water for community public water systems shall collect samples from a representative entry point to the water distribution system for the purpose of analyses to determine the corrosivity characteristics of the water.

22.711 **Sampling Requirements:** For water suppliers utilizing surface water wholly or in part, two (2) samples per plant are required, one (1) during mid-winter and one (1) during mid-summer. For water suppliers utilizing wholly ground water sources, one (1) sample per plant per year shall be required.

- A. The minimum number of samples required to be taken by the system shall be based on the number of treatment plants used by the system, except that multiple wells drawing raw water from a single aquifer may be considered one (1) treatment plant for determining the minimum number of samples.
- B. Determination of the corrosivity characteristics of the water shall include measurement of pH, calcium hardness, alkalinity, temperature, total dissolved solids (total filterable residue) and the calculation of the Langelier Index (LI) in accordance with Section 22.713A. The determination of corrosivity characteristics shall only include one (1) round of sampling (two (2) samples per plant for surface water and one sample per plant for ground water sources). However, the Division may require addition or more frequent monitoring as appropriate. In addition, the Division has the discretion to require monitoring for additional parameters which may indicate corrosivity characteristics such as sulfates and chlorides. In certain cases, the Aggressive Index (AI) as described in Section 22.713B can be used instead of the LI. The Division will make this determination. Waters exhibiting a LI of less than -2.0 or an AI of less than 10.0 shall be considered highly corrosive/aggressive.

22.712 **Reporting to the Division:** The supplier of water shall report to the Division the results of the analyses for corrosivity characteristics pursuant to Section 22.401.

22.713 **Analytical Methodology:** Analyses conducted to determine the corrosivity of the water shall be made in accordance with the following methods:

- A. **Langelier Index** -- "Standard Methods for the Examination of Water and Wastewater," 19th Edition, Method 203.
- B. **Aggressive Index** -- "AWWA Standard for Asbestos-Cement Pipe, 4 in. through 24 in. for Water Other Liquids," AWWA C400-77, Revision of C400-75, AWWA, Denver, Colorado.
- C. **Total Filterable Residue** -- "Standard Methods for the Examination of Water and Wastewater," 19th Edition, Method 208B; or "Methods of Chemical Analysis of Water and Wastes," Method 160.1.

- D. **Temperature** -- "Standard Methods for the Examination of Water and Wastewater," 19th Edition, Method 212.
- E. **Calcium** -- EDTA Titrimetric Method "Standard Methods for the Examination of Water and Wastewater," 19th Edition, Method 306C; or "Annual Book of ASTM Standards," Method D-1126-67B; "Methods for Chemical Analysis of Water and Wastes," Method 215.2.
- F. **Alkalinity** -- Methyl Orange end point pH 4.5 "Standard Methods for the Examination of Water and Wastewater," 19th Edition, Method 403; or "Annual Book of ASTM Standards," Method D1067-70B; or Methods for Chemical Analysis of Water and Wastes," Method 310.1.
- G. **pH** -- "Standard Methods for the Examination of Water and Wastewater," 19th Edition, Method 424; or "Methods for Chemical Analysis of Water and Wastes," Method 150.1; or "Annual Book of ASTM Standards," Method D-1293-78A or B.
- H. **Chloride** -- Potentiometric Method, "Standard Methods for the Examination of Water and Wastewater," 19th Edition.
- I. **Sulfate** -- Turbidimetric Method, "Methods for Chemical Analysis of Water and Wastes," pp. 277-278, EPA, Office of Technology Transfer, Washington, D.C. 20460, 1974, or "Standard Methods for the Examination of Water and Wastewater," 19th Edition.
- J. Any alternate analytical technique approved by the Division.

22.714

Reporting of Construction Materials: PWSs shall identify whether the following construction materials are present in their distribution system and report to the Division:

- A. Lead from piping, solder, caulking, interior lining of distribution mains, alloys and home plumbing.
- B. Copper from piping and alloys, service lines and home plumbing.
- C. Galvanized piping, service lines and home plumbing.
- D. Ferrous piping materials such as cast iron and steel.
- E. Asbestos cement pipe.
- F. Vinyl lined asbestos cement pipe.
- G. Coal tar lined pipes and tanks.
- H. In addition, the Division may require identification and reporting of other materials of construction present in distribution systems that may contribute contaminants to the drinking water.

SECTION 22.8 PUBLIC WATER SYSTEM CLASSIFICATION AND TREATMENT REQUIREMENTS

22.801

Regulatory Classification:

- A. Class I - All public water systems shall:
 - 1. Meet all bacteriological requirements;
 - 2. Meet the nitrate and nitrite requirements and;
 - 3. Conform with provisions of Section 22.5.

- B. Class II - All public water systems as defined in ~~[22.157]~~**[22.10(66)]**(A) and (B) shall:
 - 1. Meet all the Class I requirements and;
 - 2. Meet all other Primary Standards and;
 - 3. Meet all requirements of Section 22.607.

- C. Class III - All public water systems as defined in ~~[22.157]~~**[22.10(66)]** (A) and serve more than 500 service connections within the state shall:
 - 1. Meet all Class I requirements and;
 - 2. Meet all Class II requirements and;
 - 3. Meet all other primary and secondary standards.

NOTE - All public water systems should meet all secondary MCLs.

22.802 **Disinfection:** When it is specifically required by these regulations, or when it is deemed to be required to ensure compliance with Section 22.304 or where it is demonstrated through bacteriological testing that there is a need for disinfection, continuous disinfection shall be provided. The disinfection shall be chlorine, unless a substitute is approved prior to installation. Plans and specifications for the disinfection system shall be approved in accordance with Section 22.211. When the disinfection is instituted, it shall be operated such that a free chlorine residual of at least 0.3 mg/L is maintained throughout the water distribution system. The supplier of water shall keep accurate records of the amount of chlorine used and shall have an approved test kit for measuring both free and total chlorine residuals. The supplier of water shall be required to conduct chlorine residual testing at least daily, and shall report these results to the Division on a monthly basis in accordance with Section 22.401. If a substitute disinfectant is approved, the operational and monitoring requirements shall be specified by the Division.

22.803 **Maximum Residual Disinfection Levels (MRDLs):**

- A. Maximum residual disinfection levels are as follows:

Disinfectant residual	MRDL (mg/L)
Chlorine	4.0 (as CL ₂)
Chloramines	4.0 (as Cl ₂)
Chlorine Dioxide	0.8 (as ClO ₂)

- B. Compliance dates:
 - 1. CWSs and NTNCWSs. Subpart H systems serving 10,000 or more persons must comply with this section beginning December 16, 2001. Subpart H systems serving fewer than 10,000 persons and systems using only ground water not under the direct influence of surface water must comply with this subpart beginning December 16, 2003.

2. Transient NCWSs. Subpart H systems serving 10,000 or more persons and using chlorine dioxide as a disinfectant or oxidant must comply with the chlorine dioxide MRDL beginning December 16, 2001. Subpart H systems serving fewer than 10,000 persons and using chlorine dioxide as a disinfectant or oxidant and systems 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 December 16, 2003.

C. The Administrator, U.S. Environmental Protection Agency, pursuant to Section 1412 of the Safe Drinking Water Act, hereby identifies the following as the best technology, treatment techniques, or other means available for achieving compliance with the maximum residual disinfectant levels identified in paragraph (A) of this section: control of treatment processes to reduce disinfectant demand and control of disinfection treatment processes to reduce disinfectant levels.

22.804

Sampling, Analytical Requirements, and Compliance Determinations for Disinfectant Residuals, Disinfection Byproducts, and Disinfection Precursors:

- A. General requirements: The requirements of this subpart constitute national primary drinking water regulations.
 1. The regulations in this subpart establish criteria under which community water systems (CWSs) and nontransient, noncommunity water systems (NTNCWSs) which add a chemical disinfectant to the water in any part of the drinking water treatment process must modify their practices to meet MCLs and MRDLs in Secs. 22.611(B) and 22.803, respectively, and must meet the treatment technique requirements for disinfection byproduct precursors in Sec. 22.807.
 2. The regulations in this subpart establish criteria under which transient NCWSs that use chlorine dioxide as a disinfectant or oxidant must modify their practices to meet the MRDL for chlorine dioxide in Sec. 22.803.
 3. EPA has established MCLs for TTHM and HAA5 and treatment technique requirements for disinfection byproduct precursors to limit the levels of known and unknown disinfection byproducts which may have adverse health effects. These disinfection byproducts may include chloroform; bromodichloromethane; dibromochloromethane; bromoform; dichloroacetic acid; and trichloroacetic acid.
- B. Compliance Dates
 1. CWSs and NTNCWSs. Unless otherwise noted, systems must comply with the requirements of this subpart as follows. Subpart H systems serving 10,000 or more persons must comply with this subpart beginning December 16, 2001. Subpart H systems serving fewer than 10,000 persons and systems using only ground water not under the direct influence of surface water must comply with this subpart beginning December 16, 2003.
 2. Transient NCWSs. Subpart H systems serving 10,000 or more persons and using chlorine dioxide as a disinfectant or oxidant must comply with any requirements for chlorine dioxide and chlorite in this subpart beginning December 16, 2001. Subpart H systems serving fewer than 10,000 persons

and using chlorine dioxide as a disinfectant or oxidant and systems using only ground water not under the direct influence of surface water and using chlorine dioxide as a disinfectant or oxidant must comply with any requirements for chlorine dioxide and chlorite in this subpart beginning December 16, 2003.

- C. Each CWS and NTNCWS regulated under paragraph A of this section must be operated by qualified personnel who meet the requirements specified by the State and are included in a State register of qualified operators.
- D. Control of disinfectant residuals. Notwithstanding the MRDLs in Sec. 22.803, systems may increase residual disinfectant levels in the distribution system of chlorine or chloramines (but not chlorine dioxide) to a level and for a time necessary to protect public health, to address specific microbiological contamination problems caused by circumstances such as, but not limited to, distribution line breaks, storm run-off events, source water contamination events, or cross-connection events.
- E. For compliance with this section systems must use analytical methods in accordance with 40 CFR 141.131(a - d). Copies may be obtained from the Office of Drinking Water.
- F. Monitoring requirements – General requirements:
 - 1. Systems must take all samples during normal operating conditions.
 - 2. Systems may consider multiple wells drawing from a single aquifer as one treatment plant for determining the minimum of TTHM and HAA5 samples required, with the approval of the Division in accordance with criteria developed under Sec. 22.613(A).
 - 3. Failure to monitor in accordance with the monitoring plan required under paragraph J ~~K~~ of this section is a monitoring violation.
 - 4. Failure to monitor will be treated as a violation for the entire period covered by the annual average where compliance is based on a running annual average of monthly or quarterly samples or averages and the system's failure to monitor makes it impossible to determine compliance with MCLs or MRDLs.
 - 5. Systems may use only data collected under the provisions of this subpart or ~~subpart M of this part~~ 61 FR 24368, May 14, 1996 to qualify for reduced monitoring.
- G. Monitoring requirements for disinfection byproducts:
 - 1. TTHM and HAA5
 - a. Routine monitoring. Systems must monitor at the frequency indicated in the following table:

Type of system	Minimum monitoring frequency	Sample location in the distribution system
Subpart H system serving at least 10,000 persons	Four water samples per quarter per treatment plant	At least 25% of all samples collected each quarter at locations representing maximum residence time. Remaining samples taken at locations representative of at least average

		residence time in the distribution system and representing the entire distribution system, taking into account number of persons served, different sources of water, and different treatment methods. ¹
Subpart H systems serving from 500 to 9,999 persons.	One water sample per quarter per treatment plant.	Locations representing maximum residence time. ¹
Subpart H system serving fewer than 500 persons.	One sample per year per treatment plant during month of warmest water temperature.	Location representing maximum residence time. ¹ If the sample (or average of annual samples, if more than one sample is taken) exceeds MCL, system must increase monitoring to one sample per treatment plant per quarter, taken at a point reflecting the maximum residence time in the distribution system, until system meets reduced monitoring criteria in paragraph H (G)(1)(d) of this section.
Systems using only groundwater not under the direct influence of surface water using chemical disinfectant and serving at least 10,000 persons.	One sample per quarter per treatment plant. ²	Locations representing maximum residence time. ¹
Systems using only groundwater not under the direct influence of surface water using chemical disinfectant and serving fewer than 10,000 persons.	One sample per year per treatment plant ² during the month of warmest water temperature.	Locations representing maximum residence time. ¹ If the sample (or average of annual samples, if more than one sample is taken) exceeds MCL, system must increase monitoring to one sample per treatment plant per quarter, taken at a point reflecting the maximum residence time in the distribution system, until system meets reduced monitoring criteria in paragraph H (G)(1)(d) of this section.

1 If a system elects to sample more frequently than the minimum required, at least 25% of all samples collected each quarter (including those taken in excess of the required frequency) must be taken at locations that represent the maximum residence time of the water in the distribution system. The remaining samples must be taken at locations representative of at least average residence time in the distribution system.

2 Multiple wells drawing from a single aquifer may be considered one treatment plant for determining the minimum number of samples required, with Division approval in accordance with criteria developed under Sec. 22.613(A).

- b. Reduced monitoring. Systems may reduce monitoring, except as otherwise provided, in accordance with the following table:

If you are a...	If you have monitored at least one year and your...	You may reduce monitoring to this level.
Subpart H system serving at least 10,000 persons which has a source water annual average TOC level, before any treatment, ≤ 4.0 mg/L.	TTHM annual average ≤ 0.040 mg/L and HAA5 annual average ≤ 0.030 mg/L.	One sample per treatment plant per quarter at distribution system location reflecting maximum residence time.
Subpart H system serving from 500 to 9,999 persons which has a source water annual average TOC level, before any treatment, ≤ 4.0 mg/L.	TTHM annual average ≤ 0.040 mg/L and HAA5 annual average ≤ 0.030 mg/L.	One sample per treatment plant per year at distribution system location reflecting maximum residence time during month of warmest water temperature.
Systems using only groundwater not under the direct influence of surface water using chemical disinfectant and serving at least 10,000 persons.	TTHM annual average ≤ 0.040 mg/L and HAA5 annual average ≤ 0.030 mg/L.	One sample per treatment plant per year at distribution system location reflecting maximum residence time during month of warmest water temperature.
Systems using only groundwater not under the direct influence of surface water using chemical disinfectant and serving fewer than 10,000 persons.	TTHM annual average ≤ 0.040 mg/L and HAA5 annual average ≤ 0.030 mg/L for two consecutive years or TTHM annual average ≤ 0.020 mg/L and HAA5 annual average ≤ 0.015 mg/L for one year.	One sample per treatment plant per three year monitoring cycle at distribution system location reflecting maximum residence time during month of warmest water temperature, with the three-year cycle beginning January 1 following the quarter in which the system qualifies for reduced monitoring.

Note: Any Subpart H system serving fewer than 500 persons may not reduce its monitoring to less than one sample per treatment plant per year.

- c. Systems on a reduced monitoring schedule may remain on that reduced schedule as long as the average of all samples taken in the year (for systems which must monitor quarterly) or the result of the sample (for systems which must monitor no more frequently than annually) is no more than 0.060 mg/L and 0.045 mg/L for TTHMs and HAA5, respectively. Systems that do not meet these levels must resume monitoring at the frequency identified in paragraph (B)(1)(a) of this section in the quarter immediately following the quarter in which the system exceeds 0.060 mg/L and 0.045 mg/L for TTHMs and HAA5, respectively.
- d. Systems on increased monitoring may return to routine monitoring if, after at least one year of monitoring their TTHM annual average is < 0.060 mg/L and their HAA5 annual average is < 0.045 mg/L.
- de. The Division may return a system to routine monitoring at the Division's discretion.

2. Chlorite. Community and nontransient noncommunity water systems using chlorine dioxide, for disinfection or oxidation, must conduct monitoring for chlorite.
 - a. Routine monitoring
 1. Daily monitoring. Systems must take daily samples at the entrance to the distribution system. For any daily sample that exceeds the chlorite MCL, the system must take additional samples in the distribution system the following day at the locations required by paragraph ~~(B)~~(G)(2)(b) of this section, in addition to the sample required at the entrance to the distribution system.
 2. Monthly monitoring. Systems must take a three-sample set each month in the distribution system. The system must take one sample at each of the following locations: near the first customer, at a location representative of average residence time, and at a location reflecting maximum residence time in the distribution system. Any additional routine sampling must be conducted in the same manner (as three-sample sets, at the specified locations). The system may use the results of additional monitoring conducted under paragraph ~~(B)~~(G)(2)(b) of this section to meet the requirement for monitoring in this paragraph.
 - b. Additional monitoring. On each day following a routine sample monitoring result that exceeds the chlorite MCL at the entrance to the distribution system, the system is required to take three chlorite distribution system samples at the following locations: as close to the first customer as possible, in a location representative of average residence time, and as close to the end of the distribution system as possible (reflecting maximum residence time in the distribution system).
 - c. Reduced monitoring.
 1. Chlorite monitoring at the entrance to the distribution system required by paragraph ~~(B)~~(G)(2)(a)(1) of this section may not be reduced.
 2. Chlorite monitoring in the distribution system required by paragraph ~~(B)~~(G)(2)(a)(2) of this section may be reduced to one three-sample set per quarter after one year of monitoring where no individual chlorite sample taken in the distribution system under paragraph ~~(B)~~(G)(2)(a)(2) of this section has exceeded the chlorite MCL and the system has not been required to conduct monitoring under paragraph ~~(B)~~(G)(2)(b) of this section. The system may remain on the reduced monitoring schedule until either any of the three individual chlorite samples taken quarterly in the distribution system under paragraph ~~(B)~~(G)(2)(a)(2) of this section exceeds the chlorite MCL or the system is required to conduct monitoring under paragraph ~~(B)~~(G)(2)(b) of this

section, at which time the system must revert to routine monitoring.

3. Bromate.
 - a. Routine monitoring. Community and nontransient noncommunity systems using ozone, for disinfection or oxidation, must take one sample per month for each treatment plant in the system using ozone. Systems must take samples monthly at the entrance to the distribution system while the ozonation system is operating under normal conditions.
 - b. Reduced monitoring. Systems required to analyze for bromate may reduce monitoring from monthly to once per quarter, if the system demonstrates that the average source water bromide concentration is less than 0.05 mg/L based upon representative monthly bromide measurements for one year. The system may remain on reduced bromate monitoring until the running annual average source water bromide concentration, computed quarterly, is equal to or greater than 0.05 mg/L based upon representative monthly measurements. If the running annual average source water bromide concentration is >0.05 mg/L, the system must resume routine monitoring required by paragraph ~~(B)~~(G)(3)(a) of this section.
- H. Monitoring requirements for disinfectant residuals.
 1. Chlorine and Chloramines.
 - a. Routine monitoring. Systems must measure the residual disinfectant level at the same points in the distribution system and at the same time as total coliforms are sampled, as specified in Sec. 22.5. Subpart H systems may use the results of residual disinfectant concentration sampling conducted under Sec. ~~22.505~~ 22.1005(c), in lieu of taking separate samples.
 - b. Reduced monitoring. Monitoring may not be reduced.
 2. Chlorine dioxide.
 - a. Routine monitoring. Community, nontransient noncommunity, and transient noncommunity water systems that use chlorine dioxide for disinfection or oxidation must take daily samples at the entrance to the distribution system. For any daily sample that exceeds the MRDL, the system must take samples in the distribution system the following day at the locations required by paragraph ~~(G)~~(H)(2)(b) of this section, in addition to the sample required at the entrance to the distribution system.
 - b. Additional monitoring. On each day following a routine sample monitoring result that exceeds the MRDL, the system is required to take three chlorine dioxide distribution system samples. If chlorine dioxide or chloramines are used to maintain a disinfectant residual in the distribution system, or if chlorine is used to maintain a disinfectant residual in the distribution system and there are no disinfection addition points after the entrance to the distribution system (i.e., no booster chlorination), the system must take three samples as close to the first customer as possible, at intervals of at least six hours. If chlorine is used to maintain a disinfectant residual

in the distribution system and there are one or more disinfection addition points after the entrance to the distribution system (i.e., booster chlorination), the system must take one sample at each of the following locations: as close to the first customer as possible, in a location representative of average residence time, and as close to the end of the distribution system as possible (reflecting maximum residence time in the distribution system).

- c. Reduced monitoring. Chlorine dioxide monitoring may not be reduced.
- I. Monitoring requirements for disinfection byproduct precursors (DBPP).
 1. Routine monitoring. Subpart H systems which use conventional filtration treatment (as defined in Sec. 22.1) must monitor each treatment plant for TOC no later than the point of combined filter effluent turbidity monitoring and representative of the treated water. All systems required to monitor under this paragraph (D)(1) must also monitor for TOC in the source water prior to any treatment at the same time as monitoring for TOC in the treated water. These samples (source water and treated water) are referred to as paired samples. At the same time as the source water sample is taken, all systems must monitor for alkalinity in the source water prior to any treatment. Systems must take one paired sample and one source water alkalinity sample per month per plant at a time representative of normal operating conditions and influent water quality.
 2. Reduced monitoring. Subpart H systems with an average treated water TOC of less than 2.0 mg/L for two consecutive years, or less than 1.0 mg/L for one year, may reduce monitoring for both TOC and alkalinity to one paired sample and one source water alkalinity sample per plant per quarter. The system must revert to routine monitoring in the month following the quarter when the annual average treated water TOC \geq 2.0 mg/L.
 - J. Bromide. Systems required to analyze for bromate may reduce bromate monitoring from monthly to once per quarter, if the system demonstrates that the average source water bromide concentration is less than 0.05 mg/L based upon representative monthly measurements for one year. The system must continue bromide monitoring to remain on reduced bromate monitoring.
 - K. Monitoring plans. Each system required to monitor under this subpart must develop and implement a monitoring plan. The system must maintain the plan and make it available for inspection by the State and the general public no later than 30 days following the applicable compliance dates in Sec. ~~22.613(J)~~ 22.804(B). All Subpart H systems serving more than 3300 people must submit a copy of the monitoring plan to the State no later than the date of the first report required under Sec. ~~22.613(J)~~ 22.806. The State may also require the plan to be submitted by any other system. After review, the State may require changes in any plan elements. The plan must include at least the following elements.
 1. Specific locations and schedules for collecting samples for any parameters included in this subpart.
 2. How the system will calculate compliance with MCLs, MRDLs, and treatment techniques.

3. If approved for monitoring as a consecutive system, or if providing water to a consecutive system, under the provisions of ~~Sec. 22.4~~ Section 22.216(A), the sampling plan must reflect the entire distribution system.

22.805

Compliance requirements:

A. General requirements.

1. Where compliance is based on a running annual average of monthly or quarterly samples or averages and the system's failure to monitor for TTHM, HAA5, or bromate, this failure to monitor will be treated as a monitoring violation for the entire period covered by the annual average. Where compliance is based on a running annual average of monthly or quarterly samples or averages and the system's failure to monitor makes it impossible to determine compliance with MRDLs for chlorine and chloramines, this failure to monitor will be treated as a monitoring violation for the entire period covered by the annual average.
2. All samples taken and analyzed under the provisions of this ~~subpart~~ section must be included in determining compliance, even if that number is greater than the minimum required.
3. If, during the first year of monitoring under ~~sec. 22.4~~ 22.804(F), any individual quarter's average will cause the running annual average of that system to exceed the MCL, the system is out of compliance at the end of that quarter.

B. Disinfection byproducts.

1. TTHMs and HAA5s
 - a. For systems monitoring quarterly, compliance with MCLs in Sec. 22.611(B) must be based on a running annual arithmetic average, computed quarterly, of quarterly arithmetic averages of all samples collected by the system as prescribed by Sec. 22.804(G)(1). If the running annual arithmetic average of quarterly averages covering any consecutive four-quarter period exceeds the MCL, the system is in violation of the MCL and must notify the public pursuant to Sec. 22.4, in addition to reporting to the State pursuant to ~~Sec. 22.804~~ 22.806. If a PWS fails to complete four consecutive quarters' monitoring, compliance with the MCL for the last four-quarter compliance period must be based on an average of the available data.
 - b. For systems monitoring less frequently than quarterly, compliance must be based on an average of samples taken that year under the provisions of Sec. 22.804(G)(1). If the average of these samples exceeds the MCL, the system must increase monitoring to once per quarter per treatment plant and such a system is not in violation of the MCL until it has completed one year of quarterly monitoring, unless the result of fewer than four quarters of monitoring will cause the running annual average to exceed the MCL, in which case the system is in violation at the end of that quarter. Systems required to increase monitoring frequency to quarterly monitoring must calculate compliance by including the sample that triggered

the increased monitoring plus the following three quarters of monitoring.

- c. Systems on a reduced monitoring schedule whose annual average exceeds the MCL will revert to routine monitoring immediately. These systems will not be considered in violation of the MCL until they have completed one year of routine monitoring.
 2. Bromate. Compliance must be based on a running annual arithmetic average, computed quarterly, of monthly samples (or, for months in which the system takes more than one sample, the average of all samples taken during the month) collected by the system as prescribed by Sec. 22.804(G)(3). If the average of samples covering any consecutive four-quarter period exceeds the MCL, the system is in violation of the MCL and must notify the public pursuant to Sec. 22.4, in addition to reporting to the State pursuant to Sec. 22.806. If a PWS fails to complete 12 consecutive months' monitoring, compliance with the MCL for the last four-quarter compliance period must be based on an average of the available data.
 3. Chlorite. Compliance must be based on an arithmetic average of each three sample set taken in the distribution system as prescribed by Sec. 22.804(G)(2)(a)~~(1)~~(2) and Sec. 22.804(G)(2)(b). If the arithmetic average of any three sample set exceeds the MCL, the system is in violation of the MCL and must notify the public pursuant to Sec. 22.4, in addition to reporting to the State pursuant to Sec. 22.806.
- C. Disinfectant residuals.
1. Chlorine and chloramines.
 - a. Compliance must be based on a running annual arithmetic average, computed quarterly, of monthly averages of all samples collected by the system under Sec. 22.804(H)(1). If the average of quarterly averages covering any consecutive four-quarter period exceeds the MRDL, the system is in violation of the MRDL and must notify the public pursuant to Sec. 22.4, in addition to reporting to the State pursuant to Sec. 22.806.
 - b. In cases where systems switch between the use of chlorine and chloramines for residual disinfection during the year, compliance must be determined by including together all monitoring results of both chlorine and chloramines in calculating compliance. Reports submitted pursuant to Sec. 22.806 must clearly indicate which residual disinfectant was analyzed for each sample.
 2. Chlorine dioxide
 - a. Acute violations. Compliance must be based on consecutive daily samples collected by the system under Sec. 22.804(H)(2). If any daily sample taken at the entrance to the distribution system exceeds the MRDL, and on the following day one (or more) of the three samples taken in the distribution system exceed the MRDL, the system is in violation of the MRDL and must take immediate corrective action to lower the level of chlorine dioxide below the MRDL and must notify the public pursuant to the procedures for acute health risks in Sec. 22.4 in addition to reporting to the Division pursuant to Section 22.806. Failure to take samples in the

distribution system the day following an exceedance of the chlorine dioxide MRDL at the entrance to the distribution system will also be considered an MRDL violation and the system must notify the public of the violation in accordance with the provisions for acute violations under Sec. 22.4 in addition to reporting to the Division in accordance with Sec. ~~22.402~~ 22.806.

- b. Nonacute violations. Compliance must be based on consecutive daily samples collected by the system under Sec. 22.804(H)(2). If any two consecutive daily samples taken at the entrance to the distribution system exceed the MRDL and all distribution system samples taken are below the MRDL, the system is in violation of the MRDL and must take corrective action to lower the level of chlorine dioxide below the MRDL at the point of sampling and will notify the public pursuant to the procedures for nonacute health risks in Sec. 22.412(E)(83)(6)(c) in addition to reporting to the Division pursuant to Section 22.806. Failure to monitor at the entrance to the distribution system the day following an exceedance of the chlorine dioxide MRDL at the entrance to the distribution system is also an MRDL violation and the system must notify the public of the violation in accordance with the provisions for nonacute violations under Sec. 22.412(E)(83) in addition to reporting to the Division in accordance with Sec. ~~22.402~~ 22.806.

- D. Disinfection byproduct precursors (DBPP). Compliance must be determined as specified by Sec. 22.807(~~B~~)(C). Systems may begin monitoring to determine whether Step 1 TOC removals can be met 12 months prior to the compliance date for the system. This monitoring is not required and failure to monitor during this period is not a violation. However, any system that does not monitor during this period, and then determines in the first 12 months after the compliance date that it is not able to meet the Step 1 requirements in Sec. 22.807(B)(2) and must therefore apply for alternate minimum TOC removal (Step 2) requirements, is not eligible for retroactive approval of alternate minimum TOC removal (Step 2) requirements as allowed pursuant to Sec. 22.807(B)(3) and is in violation. Systems may apply for alternate minimum TOC removal (Step 2) requirements any time after the compliance date. For systems required to meet Step 1 TOC removals, if value calculated under 22.807(C)(1)(d) is less than 1.00, the system is in violation of the treatment technique requirements and must notify the public pursuant to Sec. 22.4, in addition to reporting to the Division pursuant to Sec. 22.806.

22.806

Reporting and recordkeeping requirements:

- A. Systems required to sample quarterly or more frequently must report to the State within 10 days after the end of each quarter in which samples were collected, notwithstanding the provisions of Sections 22.401, 22.402, 22.403, 22.407 and 22.408. Systems required to sample less frequently than quarterly must report to the State within 10 days after the end of each monitoring period in which samples were collected.
- B. Disinfection byproducts. Systems must report the information specified in the following table:

If you are a...

You must report¹...

System monitoring for TTHM and HAA5 under the requirements of Secs. 22.804(G) on a quarterly or more frequent basis	<ol style="list-style-type: none"> 1. The number of samples taken during the last quarter 2. The location, date, and result of each sample taken during the last quarter 3. The arithmetic average of all samples taken in the last quarter. 4. The annual arithmetic average of the quarterly arithmetic averages of this section for the last four quarters. 5. Whether the MCL was exceeded.
System monitoring for TTHMs and HAA5 under the requirements of Sec. 22.804(G) less frequently than quarterly (but at least annually).	<ol style="list-style-type: none"> 1. The number of samples taken during the last year. 2. The location, date, and result of each sample taken during the last quarter. 3. The arithmetic average of all samples taken over the last year. 4. Whether the MCL was exceeded.
System monitoring for TTHMs and HAA5 under the requirements of Sec. 22.804(G) less frequently than annually.	<ol style="list-style-type: none"> 1. The location, date, and result of the last sample taken. 2. Whether the MCL was exceeded.
System monitoring for chlorite under the requirements of Sec. 22.804(G).	<ol style="list-style-type: none"> 1. The number of samples taken each month for the last three months. 2. The location, date, and result of each sample taken during the last quarter. 3. For each month in the reporting period, the arithmetic average of all samples taken in the month. 4. Whether the MCL was exceeded, and in which month it was exceeded.
System monitoring for bromate under the requirements of Sec. 22.804(G).	<ol style="list-style-type: none"> 1. The number of samples taken during the last quarter. 2. The location, date, and result of each sample taken during the last quarter. 3. The arithmetic average of the monthly arithmetic averages of all samples taken in the last year. 4. Whether the MCL was exceeded.

¹ The Division may choose to perform calculations and determine whether the ~~MRDL~~ MCL was exceeded, in lieu of having the system report that information.

C. Disinfectants. Systems must report the information specified in the following table:

If you are a...

You must report¹...

System monitoring for chlorine or chloramines under the requirements of Sec. 22.804(H).	<ol style="list-style-type: none"> 1. The number of samples taken during the month of the last quarter. 2. The monthly arithmetic average of all samples taken in each month for the last 12 months. 3. The arithmetic average of all monthly averages
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	for the last 12 months. 4. Whether the MRDL was exceeded.
System monitoring for chlorine dioxide under the requirements of Sec. 22.804(H).	1. The dates, results, and locations of samples taken during the last quarter. 2. Whether the MRDL was exceeded. 3. Whether the MRDL was exceeded in any two consecutive daily samples and whether the resulting violation was acute or nonacute.

¹ The Division may choose to perform calculations and determine whether the MRDL was exceeded, in lieu of having the system report that information.

D. Disinfection byproduct precursors and enhanced coagulation or enhanced softening. Systems must report the information specified in the following table:

If you are a... You must report¹...

System monitoring monthly or quarterly for TOC under the requirements of Sec. 22.804(I) and required to meet the enhanced coagulation or enhanced softening requirements in Sec. 22.807(B)(2) or (3).	1. The number of paired (source water and treated water, prior to continuous disinfection) samples taken during the last quarter. 2. The location, date, and result of each paired sample and associated alkalinity taken during the last quarter. 3. For each month in the reporting period that paired sample were taken, the arithmetic average of the percent reduction of TOC for each paired sample and the required TOC percent removal. 4. Calculations for determining compliance with the TOC percent removal requirements, as provided in Sec. 22.807(C)(1). 5. Whether the system is in compliance with the enhanced coagulation or enhanced softening percent removal requirements in Sec. 22.807(B) for the last four quarters.
System monitoring monthly or quarterly for TOC under the requirements of Sec. 22.804(I) and meeting one or more of the alternative compliance criteria in Sec. 22.807(A)(2) or (3).	1. The alternative compliance criterion that the system is using. 2. The number of paired (source water and treated water, prior to continuous disinfection) samples taken during the last quarter. 3. The location, date, and result of each paired sample and associated alkalinity taken during the last quarter. 4. The running annual arithmetic average based on monthly averages (or quarterly samples) of source water TOC for systems meeting a criterion in Secs. 22.807(A)(2)(a) or (c) or of treated water TOC for systems meeting the criterion in Sec. 22.807(A)(2)(b). 5. The running annual arithmetic average based on monthly averages (or quarterly samples) of source water SUVA for systems meeting the

	<p>criterion in Sec. 22.807 (A)(2)(e) or of treated water SUVA for systems meeting the criterion in Sec. 22.807(A)(2)(f).</p> <p>6. The running annual average of source water alkalinity for systems meeting the criterion in Sec. 22.807(A)(2)(c) and of treated water alkalinity for systems meeting the criterion in Sec. 22.807(A)(3)(a).</p> <p>7. The running annual average for both TTHM and HAA5 for systems meeting the criterion in Sec. 22.807(A)(2)(c) or (d).</p> <p>8. The running annual average of the amount of magnesium hardness removal (as CaCO₃, in mg/L) for systems meeting the criterion in Sec. 22.807(A)(3)(b).</p> <p>9. Whether the system is in compliance with the particular alternative compliance criterion in Sec. 22.807(A)(2) or (3).</p>
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1 The Division may choose to perform calculations and determine whether the treatment technique was met, in lieu of having the system report the information.

22.807

Treatment Technique for Control of Disinfection Byproduct (DBP) Precursors:

A. Applicability.

1. Subpart H systems using conventional filtration treatment (as defined in Sec. 22.1) must operate with enhanced coagulation or enhanced softening to achieve the TOC percent removal levels specified in paragraph (B) of this section unless the system meets at least one of the alternative compliance criteria listed in paragraph (A)(2) or (A)(3) of this section.
2. Alternative compliance criteria for enhanced coagulation and enhanced softening systems. Subpart H systems using conventional filtration treatment may use the alternative compliance criteria in paragraphs (A)(2)(a) through (f) of this section to comply with this section in lieu of complying with paragraph (B) of this section. Systems must still comply with monitoring requirements in 22.804(I).
 - a. The system's source water TOC level, measured according to 40 CFR 141.131(d)(3), is less than 2.0 mg/L, calculated quarterly as a running annual average.
 - b. The system's treated water TOC level, measured according to 40 CFR 141.131(d)(3), is less than 2.0 mg/L, calculated quarterly as a running annual average.
 - c. The system's source water TOC level, measured as required by 40 CFR 141.131(d)(3), is less than 4.0 mg/L, calculated quarterly as a running annual average; the source water alkalinity, measured according to 40 CFR 141.131(d)(1), is greater than 60 mg/L (as CaCO₃), calculated quarterly as a running annual average; and either the TTHM and HAA5 running annual averages are no greater than 0.040 mg/L and 0.030 mg/L, respectively; or prior to the effective date for compliance in Sec. 22.804(B), the system has

made a clear and irrevocable financial commitment not later than the effective date for compliance in Sec. 22.804(B) to use of technologies that will limit the levels of TTHMs and HAA5 to no more than 0.040 mg/L and 0.030 mg/L, respectively. Systems must submit evidence of a clear and irrevocable financial commitment, in addition to a schedule containing milestones and periodic progress reports for installation and operation of appropriate technologies, to the State for approval not later than the effective date for compliance in Sec. 22.804(B). These technologies must be installed and operating not later than June 16, 2005. Failure to install and operate these technologies by the date in the approved schedule will constitute a violation of National Primary Drinking Water Regulations.

- d. The TTHM and HAA5 running annual averages are no greater than 0.040 mg/L and 0.030 mg/L, respectively, and the system uses only chlorine for primary disinfection and maintenance of a residual in the distribution system.
 - e. The system's source water SUVA, prior to any treatment and measured monthly according to 40 CFR 141.131(d)(4), is less than or equal to 2.0 L/mg-m, calculated quarterly as a running annual average.
 - f. The system's finished water SUVA, measured monthly according to 40 CFR 141.131(d)(4), is less than or equal to 2.0 L/mg-m, calculated quarterly as a running annual average.
3. Additional alternative compliance criteria for softening systems. Systems practicing enhanced softening that cannot achieve the TOC removals required by paragraph (B)(2) of this section may use the alternative compliance criteria in paragraphs (A)(3)(a) and (b) of this section in lieu of complying with paragraph (B) of this section. Systems must still comply with monitoring requirements in Sec. 22.804(~~G~~) (I).
- a. Softening that results in lowering the treated water alkalinity to less than 60 mg/L (as CaCO₃), measured monthly according to 40 CFR 141.131(d)(1) and calculated quarterly as a running annual average.
 - b. Softening that results in removing at least 10 mg/L of magnesium hardness (as CaCO₃), measured monthly and calculated quarterly as an annual running average.
- B. Enhanced coagulation and enhanced softening performance requirements.
- 1. Systems must achieve the percent reduction of TOC specified in paragraph (B)(2) of this section between the source water and the combined filter effluent, unless the State approves a system's request for alternate minimum TOC removal (Step 2) requirements under paragraph (B)(3) of this section.
 - 2. Required Step 1 TOC reductions, indicated in the following table, are based upon specified source water parameters measured in accordance with 40 CFR 141.131(d). Systems practicing softening are required to meet the Step 1 TOC reductions in the far-right column (Source water alkalinity >120 mg/L) for the specified source water TOC:

Step 1 Required Removal of TOC by Enhanced Coagulation and Enhanced Softening for Subpart H Systems Using Conventional Treatment^{1,2}

Source Water TOC	Source water alkalinity, mg/L as CaCO ₃		
	0-60	>60-120	>120 ³
>2.0 – 4.0	35.0	25.0	15.0
4.0 –8.0	45.0	35.0	25.0
>8.0	50.0	40.0	30.0

1 Systems meeting at least one of the conditions in paragraph (A)(2)(a)-(f) of this section are not required to operate with enhanced coagulation.

2 Softening systems meeting one of the alternative compliance criteria in paragraph (A)(3) of this section are not required to operate with enhanced softening.

3 Systems practicing softening must meet the TOC removal requirements in this column.

3. Subpart H conventional treatment systems that cannot achieve the Step 1 TOC removals required by paragraph (B)(2) of this section due to water quality parameters or operational constraints must apply to the State, within three months of failure to achieve the TOC removals required by paragraph (B)(2) of this section, for approval of alternative minimum TOC (Step 2) removal requirements submitted by the system. If the State approves the alternative minimum TOC removal (Step 2) requirements, the State may make those requirements retroactive for the purposes of determining compliance. Until the State approves the alternate minimum TOC removal (Step 2) requirements, the system must meet the Step 1 TOC removals contained in paragraph (B)(2) of this section.
4. Alternate minimum TOC removal (Step 2) requirements. Applications made to the State by enhanced coagulation systems for approval of alternative minimum TOC removal (Step 2) requirements under paragraph (B)(3) of this section must include, as a minimum, results of bench- or pilot-scale testing conducted under paragraph (B)(4)(a) of this section and the submitted bench- or pilot-scale testing must be used to determine the alternate enhanced coagulation level.
 - a. Alternate enhanced coagulation level is defined as coagulation at a coagulant dose and pH as determined by the method described in paragraphs (B)(4)(a) through (e) of this section such that an incremental addition of 10 mg/L of alum ~~(as aluminum)~~ (or equivalent amount of ferric salt) results in a TOC removal of ≤ 0.3 mg/L. The percent removal of TOC at this point on the “TOC removal versus coagulant dose” curve is then defined as the minimum TOC removal required for the system. Once approved by the State Division, this minimum requirement supersedes the minimum TOC removal required by the table in paragraph (B)(2) of this section. This requirement will be effective until such time as the State Division approves a new value based on the results of a new bench- and pilot-scale test. Failure to achieve State Division-set alternative minimum TOC removal levels is a violation of National Primary Drinking Water Regulations.

- b. Bench- or pilot-scale testing of enhanced coagulation must be conducted by using representative water samples and adding 10 mg/L increments of alum (~~as aluminum~~) (or equivalent amounts of ferric salt) until the pH is reduced to a level less than or equal to the enhanced coagulation Step 2 target pH shown in the following table:

Enhanced Coagulation Step 2 Target pH

Alkalinity (mg/L as CaCO ₃)	Target pH
0 – 60	5.5
>60 – 120	6.3
>120 – 240	7.0
>240	7.5

- c. For waters with alkalinities of less than 60 mg/L for which addition of small amounts of alum or equivalent addition of iron coagulant drives the pH below 5.5 before significant TOC removal occurs, the system must add necessary chemicals to maintain the pH between 5.3 and 5.7 in samples until the TOC removal of 0.3 mg/L per 10 mg/L alum added (~~as aluminum~~) (or equivalent addition of iron coagulant) is reached.
- d. The system may operate at any coagulant dose or pH necessary (consistent with other NPDWRs) to achieve the minimum TOC percent removal approved under paragraph (B)(3) of this section.
- e. If the TOC removal is consistently less than 0.3 mg/L of TOC per 10 mg/L of incremental alum dose (~~as aluminum~~) at all dosages of alum (or equivalent addition of iron coagulant), the water is deemed to contain TOC not amenable to enhanced coagulation. The system may then apply to the State Division for a waiver of enhanced coagulation requirements.

C. Compliance Calculations:

- 1. Subpart H systems other than those identified in paragraph (A)(2) or (A)(3) of this section must comply with requirements contained in paragraph (B)(2) of this section. Systems must calculate compliance quarterly, beginning after the system has collected 12 months of data, by determining an annual average using the following method:
 - a. Determine actual monthly TOC removal, equal to: ~~$(1 - (\text{treated water TOC} / \text{source water TOC})) \times 100$~~ $(1 - (\text{treated water TOC} / \text{source water TOC})) \times 100$.
 - b. Determine the required monthly TOC percent removal (from either the table in paragraph (B)(2) of this section or from paragraph (B)(3) of this section).
 - c. Divide the value in paragraph (C)(1)(a) of this section by the value in paragraph (C)(1)(b) of this section.

- d. Add together the results of paragraph (C)(1)(c) of this section for the last 12 months and divide by 12.
 - e. If the value calculated in paragraph (C)(1)(d) of this section is less than 1.00, the system is not in compliance with the TOC percent removal requirements.
2. Systems may use the provisions in paragraphs (C)(2)(a) through (e) of this section in lieu of the calculations in paragraph (C)(1)(a) through (e) of this section to determine compliance with TOC percent removal requirements.
- a. In any month that the system's treated or source water TOC level, measured according to 40 CFR 141.131(d)(3), is less than 2.0 mg/L, the system may assign a monthly value of 1.0 (in lieu of the value calculated in paragraph (C)(1)(c) of this section) when calculating compliance under the provisions of paragraph (C)(1) of this section.
 - b. In any month that a system practicing softening removes at least 10 mg/L of magnesium hardness (as CaCO₃), the system may assign a monthly value of 1.0 (in lieu of the value calculated in paragraph (C)(1)(c) of this section) when calculating compliance under the provisions of paragraph (C)(1) of this section.
 - c. In any month that the system's source water SUVA, prior to any treatment and measured according to 40 CFR 141.131(d)(4), is ≤ 2.0 L/mg-m, the system may assign a monthly value of 1.0 (in lieu of the value calculated in paragraph (C)(1)(c) of this section) when calculating compliance under the provisions of paragraph (C)(1) of this section.
 - d. In any month that the system's finished water SUVA, measured according to 40 CFR 141.131(d)(4), is ≤ 2.0 L/mg-m, the system may assign a monthly value of 1.0 (in lieu of the value calculated in paragraph (C)(1)(c) of this section) when calculating compliance under the provisions of paragraph (C)(1) of this section.
 - e. In any month that a system practicing enhanced softening lowers alkalinity below 60 mg/L (as CaCO₃), the system may assign a monthly value of 1.0 (in lieu of the value calculated in paragraph (C)(1)(c) of this section) when calculating compliance under the provisions of paragraph (C)(1) of this section.
3. Subpart H systems using conventional treatment may also comply with the requirements of this section by meeting the criteria in paragraph (A)(2) or (3) of this section.
- D. Treatment technique requirements for DBP precursors. The Administrator identifies the following as treatment techniques to control the level of disinfection byproduct precursors in drinking water treatment and distribution systems: For Subpart H systems using conventional treatment, enhanced coagulation or enhanced softening.

SECTION 22.9 RADIOACTIVITY

22.91

Limits:

22.911 Primary MCLs for Radium 226, 228 and Gross Alpha Particles:

- A. The PMCL for radium 226 and 228 combined is five (5) pCi per liter.
- B. The PMCL for gross particle activity (including radium 226 but excluding radon and uranium) is fifteen (15) pCi per liter.

22.912 Beta Particle and Photon Concentration Limits: The average annual concentration of beta particle and photon radioactivity for man-made radionuclides in drinking water shall not produce an annual dose equivalent to the total body or any internal organ greater than four (4) millirems per year. Except for those listed in the Table below, the concentration causing four (4) millirems total body or organ dose equivalents shall be calculated on the basis of a two (2) liters per day drinking water intake using the 168 hour data listed in "Maximum Permissible Body Burdens and Maximum Permissible Concentration of Radionuclides in Air or Water for Occupational Exposure," NBS Handbook 69 as amended August 1963, U.S. Department of Commerce. If two (2) or more radionuclides are present, the sum of their annual dose equivalent to the total body or to any organ shall not exceed four (4) millirems per year.

Average Annual Concentrations Assumed to Produce a Total Body or Organ dose of 4 Millirems/Year

<u>Radionuclide</u>	<u>Critical Organ</u>	<u>pCi/L</u>
Tritium	Total Body	20,000
Strontium	Bone Marrow	8

22.911 Maximum contaminant level goals (MCLGs) for radionuclides. MCLGs for radionuclides are as indicated in the following table:

<u>Contaminant</u>	<u>MCLG</u>
1. Combined radium-226 and radium-228	Zero
2. Gross alpha particle activity (excluding radon and uranium)	Zero
3. Beta particle and photon radioactivity	Zero
4. Uranium	Zero

22.912 Maximum contaminant levels for radionuclides.

- A. [Reserved]
- B. MCL for combined radium-226 and -228: The MCL for combined radium-226 and radium-228 is 5 pCi/L. The combined radium-226 and radium-228 value is determined by the addition of the results of the analysis for radium-226 and the analysis for radium-228.
- C. MCL for gross alpha particle activity (excluding radon and uranium): The MCL for gross alpha particle activity (including radium-226 but excluding radon and uranium) is 15 pCi/L.
- D. MCL for beta particle and photon radioactivity:
 - 1. The average annual concentration of beta particle and photon radioactivity from man-made radionuclides in drinking water must not produce an annual dose equivalent to the total body or any internal organ greater than 4 millirem/year (mrem/year).

2. Except for the radionuclides listed in Table A, the concentration of man-made radionuclides causing 4 mrem total body or organ dose equivalents must be calculated on the basis of 2 liters per day drinking water intake using the 168 hour data list in “Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure,” NBS (National Bureau of Standards) Handbook 69 as amended August 1963, U.S. Department of Commerce. 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 of this document are available from the National Technical Information Service, NTIS ADA 280 282, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161. The toll-free number is 800-552-6847. 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. If two or more radionuclides are present, the sum of their annual dose equivalent to the total body or to any organ shall not exceed 4 mrem/year.

Table A. Average Annual Concentrations Assumed to Produce: A Total Body or Organ Dose of 4 mrem/year

<u>1. Radionuclide.....</u>	<u>Critical Organ.....</u>	<u>PCi per liter</u>
<u>2. Tritium.....</u>	<u>Total Body.....</u>	<u>20,000</u>
<u>3. Strontium-90.....</u>	<u>Bone Marrow.....</u>	<u>8</u>

- E. MCL for uranium: The MCL for uranium is 30 ug/L.
- F. Compliance dates:
 1. Compliance dates for the combined radium-226 and –228, gross alpha particle activity, gross beta particle and photon radioactivity, and uranium: Community water systems must comply with the MCLs listed in paragraphs (B), (C), (D), and (E) of this section beginning December 8, 2003 and compliance shall be determined in accordance with the requirements of Sections 22.921 and 22.924. Compliance with reporting requirements for the radionuclides Section 22.4 is required on December 8, 2003.
 2. [Reserved]
- G. Best available technologies (BATs) for radionuclides: The Administrator of the U.S. Environmental Protection Agency, pursuant to Section 1412 of the Safe Drinking Water Act, hereby identifies as indicated in the following table the best technology available for achieving compliance with the MCLs for combined radium-226 and –228, uranium, gross alpha particle activity, and beta particle and photon radioactivity.

Table B. BAT for Combined Radium-226 and Radium-228, Uranium, Gross Alpha Particle Activity, and Beta Particle and Photon Radioactivity

<u>Contaminant</u>	<u>BAT</u>
<u>1. Combined radium-226 and radium-228</u>	<u>Ion exchange, reverse osmosis, lime softening</u>
<u>2. Uranium</u>	<u>Ion exchange, reverse osmosis, lime softening, coagulation/filtration</u>
<u>3. Gross alpha particle activity (Excluding Radon and Uranium)</u>	<u>Reverse osmosis</u>
<u>4. Beta particle and photon radioactivity</u>	<u>Ion exchange, reverse osmosis</u>

H. Small systems compliance technologies list for radionuclides.

Table C. List of Small Systems Compliance Technologies for Radionuclides and Limitations to Use

<u>Unit Technologies</u>	<u>Limitations (See Footnotes)</u>	<u>Operator Skill Level Required¹</u>	<u>Raw Water Quality Range and Considerations</u>
<u>1. Ion exchange (IE)</u>	<u>(a)</u>	<u>Intermediate</u>	<u>All ground waters</u>
<u>2. Point of use (POU²) IE</u>	<u>(b)</u>	<u>Basic</u>	<u>All ground waters</u>
<u>3. Reverse osmosis (RO)</u>	<u>(c)</u>	<u>Advanced</u>	<u>Surface waters usually require pre-filtration</u>
<u>4. POU² RO</u>	<u>(b)</u>	<u>Basic</u>	<u>Surface waters usually require pre-filtration</u>
<u>5. Lime softening</u>	<u>(d)</u>	<u>Advanced</u>	<u>All waters</u>
<u>6. Green sand filtration</u>	<u>(e)</u>	<u>Basic</u>	
<u>7. Co-precipitation with barium sulfate</u>	<u>(f)</u>	<u>Intermediate to advanced</u>	<u>Ground waters with suitable water quality</u>
<u>8. Electrodialysis/electrodialysis reversal</u>		<u>Basic to intermediate</u>	<u>All ground waters</u>
<u>9. Pre-formed hydrous manganese oxide filtration</u>	<u>(g)</u>	<u>Intermediate</u>	<u>All ground waters</u>
<u>10. Activated alumina</u>	<u>(a), (h)</u>	<u>Advanced</u>	<u>All ground waters; competing anion concentrations may effect regeneration frequency</u>
<u>11. Enhanced coagulation/filtration</u>	<u>(i)</u>	<u>Advanced</u>	<u>Can treat a wide range of water qualities</u>

1. National Research Council (NRC). Safe Water from Every Tap: Improving Water Service to Small Communities

2. A POU, or “point-of-use” technology is a treatment device installed at a single tap used for the purpose of reducing contaminants in drinking water at the one tap. POU devices are typically installed at the kitchen tap.

Limitations Footnotes: Technologies for Radionuclides

a. The regeneration solution contains high concentrations of the contaminant ions. Disposal options should be carefully considered before choosing this technology.

b. When POU devices are used for compliance, programs for long-term operation, maintenance, and monitoring must be provided by the water provider to ensure proper performance.

- c. Reject water disposal options should be carefully considered before choosing this technology. See other RO limitations described in the Surface Water Treatment Rule Compliance Technologies Table.
- d. The combination of variable source water quality and the complexity of the water chemistry involved may make this technology too complex for small surface water systems.
- e. Removal efficiencies can vary depending on water quality.
- f. This technology may be very limited in application to small systems. Since the process requires static mixing, detention basins, and filtration, it is most applicable to systems with sufficiently high sulfate levels that already have a suitable filtration treatment train in place.
- g. This technology is most applicable to small systems that already have filtration in place.
- h. Handling of chemicals required during regeneration and pH adjustment may be too difficult for small systems.
- i. Assumes modification to a coagulation/filtration process already in place.

Table D. Compliance Technologies by System Size Category for Radionuclide National Primary Drinking Water Regulations (NPDWR's)

<u>Contaminant</u>	<u>Compliance technologies¹ for system size categories (population served)</u>		<u>3,301-10,000</u>
	<u>25-500</u>	<u>501-3,300</u>	
<u>1. Combined radium-226 and radium-228</u>	<u>1, 2, 3, 4, 5, 6, 7, 8, 9</u>	<u>1, 2, 3, 4, 5, 6, 7, 8, 9</u>	<u>1, 2, 3, 4, 5, 6, 7, 8, 9</u>
<u>2. Gross alpha particle activity</u>	<u>3, 4</u>	<u>3, 4</u>	<u>3, 4</u>
<u>3. Beta particle and photon radioactivity</u>	<u>1, 2, 3, 4</u>	<u>1, 2, 3, 4</u>	<u>1, 2, 3, 4</u>
<u>4. Uranium</u>	<u>1, 2, 4, 10, 11</u>	<u>1, 2, 3, 4, 5, 10, 11</u>	<u>1, 2, 3, 4, 5, 10, 11</u>

1. Numbers correspond to those technologies found listed in Table C of 22.912.

22.913

Variances and exemptions from the MCLs for radionuclides.

- A. The Division shall require community water systems to install and/or use any treatment technology identified in Table A of Section 22.912(D), or in the case of small water systems (those serving 10,000 people or fewer), Table B and Table C of Sections 22.912(G) and (H) respectively, as a condition for granting a variance except as provided in paragraph (B) of this section. If, after the system's installation of the treatment technology, the system cannot meet the MCL, that system shall be eligible for a variance under the provisions of section 22.202 of these regulations.
- B. If a community water system can demonstrate through comprehensive engineering assessments, which may include pilot plant studies, that the treatment technologies identified in Section 22.912 would only achieve a de minimus reduction in the contaminant level, the Division may issue a schedule of compliance that requires the system being granted a variance to examine other treatment technologies as a condition of obtaining the variance.
- C. If the Division determines that a treatment technology identified under paragraph (B) of this section is technically feasible, the Administrator of the U.S. Environmental Protection Agency or the Division may require the system to install and/or use that treatment technology in connection with a compliance schedule issued under the provisions of Section 1415(a)(1)(A) of the Safe Drinking Water

Act or Section 22.209 of these regulations. The Division's determination shall be based upon studies by the system and other relevant information.

D. The Division may require a community water system to use bottled water, point-of-use devices, point-of-entry devices or other means as a condition of granting a variance or an exemption from the requirements of Section 22.912, to avoid an unreasonable risk to health.

E. Community water systems that use bottled water as a condition for receiving a variance or exemption from the requirements of Section 22.912 must meet the requirements specified in either Section 142.62(g)(1) or Section 142.62(g)(2) and (g)(3) of the Safe Drinking Water Act. Copies are available from the Office of drinking Water.

F. Community water systems that use point-of-use or point-of-entry devices as a condition for obtaining a variance or an exemption from the radionuclide NPDWRs must meet the conditions in Section 142.62(h)(1) through (h)(6) of the Safe Drinking Water Act. Copies are available from the Office of Drinking Water.

22.92 **Sampling Monitoring Frequency: Monitoring frequency and compliance requirements for radionuclides in community water systems.**

~~22.921 **Monitoring Frequency:** Compliance with Section 22.911 shall be based on the analyses of an annual composite of four (4) consecutive quarterly samples or the average of the analyses of four samples obtained at quarterly intervals. At the discretion of the Division, when an annual record taken in accordance with Section 22.911 has established that the average annual concentration is less than one (1) half of the PMCL under 22.911, analyses of a single sample may be substituted for the quarterly sampling procedure specified herein. A gross alpha particle activity measurement may be substituted for the required radium 226 and 228 analysis provided that the measured gross alpha particle activity does not exceed five (5) pCi/liter. If this limit is exceeded, the same or an equivalent sample shall be analyzed for radium 226. If the concentration of radium 226 exceeds three (3) pCi/L, the same or an equivalent sample shall be analyzed for radium 228. The water supply shall be monitored at least once every four (4) years. More frequent monitoring may be required by the Division if it is deemed necessary. A CWS using two (2) or more sources, having different concentrations or radioactivity, shall monitor source water, in addition to water from a free flowing tap, when ordered by the Division. If the average annual PMCL for gross alpha particle activity or total radium as set forth in Section 22.911 is exceeded, the supplier shall give notice to the Division pursuant to Section 22.40 and notify the public as required by Section 22.41. Monitoring at quarterly intervals shall be continued until the annual average concentration no longer exceeds the PMCL or until a monitoring schedule as a condition to a variance, exemption or enforcement action shall become effective.~~

~~22.922 **Surface Water Systems Serving a Population Greater than 100,000:** Surface water systems serving a population greater than 100,000 and such other CWSs are designated by the Division shall be monitored for compliance with Section 22.912 by analyses of four (4) consecutive quarterly samples or analyses of a composite of four (4) consecutive quarterly samples. Compliance with Section 22.912 may be assumed without further analysis if the average annual concentration of gross beta particle activity is less than fifty (50) pCi/liter and if the average annual concentrations of tritium and strontium 90 are less than those~~

~~listed in the table shown above, provided that if both radionuclides are present, the sum of their annual dose equivalents to bone marrow shall not exceed four (4) millirem/year. If the gross beta particle activity exceeds fifty (50) pCi/liter, an analysis of the sample must be performed to identify the major radioactive constituents present and the appropriate organ and total body doses shall be calculated to determine compliance with Section 22.912. Supplies shall be monitored at least once every four (4) years and more often if deemed necessary by the Division.~~

~~22.923 **Utilizing Water Contaminated By Effluents from Nuclear Facilities:** Any CWS designated by the Division as utilizing waters contaminated by effluents from nuclear facilities shall initiate quarterly monitoring for gross beta particles and iodine-131 radioactivity and annual monitoring for strontium 90 and tritium. Quarterly monitoring for gross beta particle activity shall be based on the analyses of monthly samples. If the gross beta particle activity in a sample exceeds fifteen (15) pCi/liter, the same or an equivalent sample shall be analyzed for Sr 89 and Cs 134. If the gross beta particle activity exceeds fifty (50) pCi/liter, an analysis of the sample must be performed to identify the major radioactive constituents present and the appropriate organ or total body doses shall be calculated to determine compliance with Section 22.912. For I-131, a composite of five (5) consecutive daily samples shall be analyzed for each quarter. As ordered by the Division, more frequent monitoring shall be conducted when iodine-131 is identified in the finished water. Annual monitoring for strontium 90 and tritium shall be conducted by means of analyses of a composite of four (4) consecutive quarterly samples. If the average annual PMCL for man-made radioactivity set forth in Section 22.912 is exceeded, the operator of the CWS shall give notice to the Division pursuant to Section 22.40 and to the public as required by Section 22.41. Monitoring at monthly intervals shall be continued until the concentration no longer exceeds the PMCL or until a monitoring schedule as a condition to a variance, exemption or enforcement action shall become effective.~~

22.921 **Monitoring and compliance requirements for gross alpha particle activity, radium-226, radium-228, and uranium.**

A. Community water systems (CWSs) must conduct initial monitoring to determine compliance with Section 22.91 by December 31, 2007. For the purpose of monitoring for gross alpha particle activity, radium-226, radium-228, uranium, and beta particle and photon radioactivity in drinking water, "detection limit" is defined as in 40 CFR 141.25(c).

1. Applicability and sampling location for existing community water systems or sources. All existing CWSs using groundwater, surface water or systems using both ground and surface water (for the purpose of this section hereafter referred to as systems) must sample at every entry point to the distribution system that is representative of all sources being used (hereafter called a sample point) under normal operating conditions. The system must take each sample at the sampling point unless conditions make another sampling point more representative of each source or the Division has designated a distribution system location, in Accordance with paragraph (B)(2)(c) of this section.
2. Applicability and sampling location for new community water systems or sources. All CWSs or CWSs that use a new source of water must begin to conduct initial monitoring for the new source within the first quarter after

initiating use of the source. CWSs must conduct more frequent monitoring when ordered by the Division in the event of possible contamination or when changes in the distribution system or treatment processes occur that may increase the concentration of radioactivity in finished water.

- B. Initial monitoring: Systems must conduct initial monitoring for gross alpha particle activity, radium-226, radium-228, and uranium as follows:
1. Systems without acceptable historical data, as defined below, must collect four consecutive quarterly samples at all sampling points before December 31, 2007.
 2. Grandfathering of data: The Division may allow historical monitoring data collected at a sampling point to satisfy the initial monitoring requirements for that sampling point, for the following situations.
 - a. To satisfy initial monitoring requirements, a community water system having only one entry point to the distribution system may use the monitoring data from the last compliance monitoring period that began between June 2000 and December 8, 2003.
 - b. To satisfy initial monitoring requirements, a community water system with multiple entry points and having appropriate historical monitoring data for each entry point to the distribution system may use the monitoring data from the last compliance monitoring period that began between June 2000 and December 8, 2003.
 - c. To satisfy initial monitoring requirements, a community water system with appropriate historical data for a representative point in the distribution system may use the monitoring data from the last compliance monitoring period that began between June 2000 and December 8, 2003, provided that the Division finds that the historical data satisfactorily demonstrate that each entry point to the distribution system is expected to be in compliance based upon the historical data and reasonable assumptions about the variability of contaminant levels between entry points. The Division must make a written finding indicating how the data conforms to these requirements.
 3. For gross alpha particle activity, uranium, radium-226, and radium-228 monitoring, the Division may waive the final two quarters of initial monitoring for a sampling point if the results of the samples from the previous two quarters are below the detection limit.
 4. If the average of the initial monitoring results for a sampling point is above the MCL, the system must collect and analyze quarterly samples at that sampling point until the system has results from four consecutive quarters that are at or below the MCL, unless the system enters into another schedule as part of a formal compliance agreement with the Division.
- C. Reduced monitoring: The Division may allow CWSs to reduce the future frequency of monitoring from once every three years to once every six or nine years at each sampling point, based on the following criteria.
1. If the average of the initial monitoring results for each contaminant (i.e., gross alpha particle activity, uranium, radium-226, or radium-228) is below the detection limit specified in section 22.91, the system must collect and

- analyze for that contaminant using at least one sample at that sampling point every nine years.
2. For gross alpha particle activity and uranium, if the average of the initial monitoring results for each contaminant is at or above the detection limit but at or below ½ the MCL, the system must collect and analyze for that contaminant using at least one sample at that sampling point every six years. For combined radium-226 and radium-228, the analytical results must be combined. If the average of the combined initial monitoring results for radium-226 and radium-228 is at or above the detection limit but at or below ½ the MCL, the system must collect and analyze for that contaminant using at least one sample at that sampling point every six years.
 3. For gross alpha particle activity and uranium, if the average of the initial monitoring results for each contaminant is above ½ the MCL but at or below the MCL, the system must collect and analyze at least one sample at that sampling point every three years. For combined radium-226 and radium-228, the analytical results must be combined. If the average of the combined initial monitoring results for radium-226 and radium-228 is above ½ the MCL but at or below the MCL, the system must collect and analyze at least one sample at that sampling point every three years.
 4. Systems must use the samples collected during the reduced monitoring period to determine the monitoring frequency for subsequent monitoring periods (e.g., if a system's sampling point is on a nine year monitoring period, and the sample result is above ½ the MCL, then the next monitoring period for that sampling point is three years).
 5. If a system has a monitoring result that exceeds the MCL while on reduced monitoring, the system must collect and analyze quarterly samples at that sampling point until the system has results from four consecutive quarters that are below the MCL, unless the systems enters into another schedule as part of a formal compliance agreement with the Division.
- D. Compositing: To fulfill quarterly monitoring requirements for gross alpha particle activity, radium-226, radium-228, or uranium, a system may composite up to four consecutive quarterly samples from a single entry point if analysis is done within a year of the first sample. The Division will treat analytical results from the composited as the average analytical result to determine compliance with the MCLs and the future monitoring frequency. If the analytical result from the composited sample is greater than ½ the MCL, the Division may direct the system to take additional quarterly samples before allowing the system to sample under a reduced monitoring schedule.
- E. A gross alpha particle activity measurement may be substituted for the required radium-226 measurement provided that the measured gross alpha particle activity does not exceed 5 pCi/L. A gross alpha particle activity measurement may be substituted for the required uranium measurement provided that the measured gross alpha particle activity does not exceed 15 pCi/L. The gross alpha measurement shall have a confidence interval of 95% (1.65, where is the standard deviation of the net counting rate of the sample) for radium-226 and uranium. When a system uses a gross alpha particle activity measurement in lieu of radium-226 and/or uranium measurement, the gross alpha particle activity analytical result

will be used to determine the future monitoring frequency for radium-226 and/or uranium. If the gross alpha particle activity result is less than detection, ½ the detection limit will be used to determine compliance and the future monitoring frequency.

22.922

Monitoring and compliance requirements for beta particle and photon radioactivity.

To determine compliance with the maximum contaminant levels in Section 22.91 for beta particle and photon radioactivity, a system must monitor at a frequency as follows.

A. Community water systems (both surface and ground water) designated by the Division as vulnerable must sample for beta particle and photon radioactivity. Systems must collect quarterly samples for beta emitters and annual samples for tritium and strontium-90 at each entry point to the distribution system (hereafter called a sampling point), beginning within one quarter after being notified by the Division. Systems already designated by the Division must continue to sample until the Division reviews and either reaffirms or removes the designation.

1. If the gross beta particle activity minus the naturally occurring potassium-40 beta particle activity at a sampling point has a running annual average (computed quarterly) less than or equal to 50 pCi/L (screening level), the Division may reduce the frequency of monitoring at that sampling point to once every three years. Systems must collect all samples required in paragraph (A) of this section during the reduced monitoring period.

2. For systems in the vicinity of a nuclear facility, the Division may allow the CWS to utilize environmental surveillance data collected by the nuclear facility in lieu of monitoring at the system's entry point(s), where the Division determines if such data is applicable to a particular water system. In the event that there is a release from a nuclear facility, systems that are using surveillance data must begin monitoring at the community water system's entry point(s) in accordance with paragraph (A) of this section.

B. Community water systems (both surface and ground water) designated by the Division as utilizing waters contaminated by effluents from nuclear facilities must sample for beta particle and photon radioactivity. Systems must collect quarterly samples for beta emitters and iodine-131 and annual samples for tritium and strontium-90 at each entry point to the distribution system (hereafter called a sampling point), beginning within one quarter after being notified by the Division. Systems already designated by the Division as systems using waters contaminated by effluents from nuclear facilities must continue to sample until the Division reviews and either reaffirms or removes the designation.

1. Quarterly monitoring for gross beta particle activity shall be based on the analysis of monthly samples or the analysis of a composite of three monthly samples. The former is recommended.

2. For iodine-131, a composite of five consecutive daily samples shall be analyzed once each quarter. As ordered by the Division, more frequent monitoring shall be conducted when iodine-131 is identified in the finished water.

3. Annual monitoring for strontium-90 and tritium shall be conducted by means of a composite of four consecutive quarterly samples or analysis of four quarterly samples. The latter procedure is recommended.

4. If the gross beta particle activity beta minus the naturally occurring potassium-40 beta particle at a sampling point has a running annual average (computed quarterly) less than or equal to 15 pCi/L, the Division may reduce the frequency of monitoring at that sampling point to every three years. Systems must collect all samples required in paragraph (A) of this section during the reduced monitoring period.
5. For systems in the vicinity of a nuclear facility, the Division may allow the CWS to utilize environmental surveillance data collected by the nuclear facility in lieu of monitoring at the system's entry point(s), where the Division determines if such data is applicable to a particular water system. In the event that there is a release from a nuclear facility, systems that are using surveillance data must begin monitoring at the community water system's entry point(s) in accordance with paragraph (B) of this section.
- C. Community water systems designated by the Division to monitor for beta particle and photon radioactivity can not apply to the Division for a waiver from the monitoring frequencies specified in paragraph (A) or (B) of this section.
- D. Community water systems may analyze for naturally occurring potassium-40 beta particle activity from the same or equivalent sample used for the gross beta particle activity analysis. Systems are allowed to subtract the potassium-40 beta particle activity value from the total gross beta particle activity value to determine if the screening level is exceeded. The potassium-40 beta particle activity must be calculated by multiplying elemental potassium concentrations (in mg/L) by a factor of 0.82.
- I. If the gross beta particle activity minus the naturally occurring potassium-40 beta particle activity exceeds the screening level, an analysis of the sample must be performed to identify the major radioactive constituents present in the sample and the appropriate doses must be calculated and summed to determine compliance with Section 22.91, using the formula in Section 22.91. Doses must also be calculated and combined for measured levels of tritium and strontium to determine compliance.
- J. Systems must monitor monthly at the sampling point(s) that exceed the MCL in Section 22.91 beginning the month after the exceedance occurs. Systems must continue monthly monitoring until the system has established, by a rolling average of three monthly samples, that the MCL is being met. Systems who establish that the MCL is being met must return to quarterly monitoring until they meet the requirements set forth in paragraph (A)(2) or (B)(1) of this section.

22.923

General monitoring and compliance requirements for radionuclides.

- A. The Division may require more frequent monitoring than specified in Sections 22.921 and 22.922, or may require confirmation samples at its discretion. The results of the initial and confirmation samples will be averaged for use in compliance determinations.
- B. Each public water system shall monitor at the time designated by the Division during each compliance period.
- C. Compliance: Compliance with Section 22.91 will be determined based on the analytical result(s) obtained at each sampling point. If one sampling point is in violation of a MCL, the system is in violation of the MCL.

1. For systems monitoring more than once per year, compliance with the MCL is determined by a running annual average at each sampling point. If the average of any sampling point is greater than the MCL, then the system is out of compliance with the MCL.
 2. For systems monitoring more than once per year, if any sample result will cause the running annual average to exceed the MCL at any sample point, the system is out of compliance with the MCL immediately.
 3. Systems must include all samples taken and analyzed under the provisions of this section in determining compliance, even if that number is greater than the minimum required.
 4. If a system does not collect all required samples when compliance is based on a running annual average of quarterly samples, compliance will be based on the running average of the samples collected.
 5. If a sample result is less than the detection limit, zero will be used to calculate the annual average, unless a gross alpha particle activity is being used in lieu of radium-226 and/or uranium. If the gross alpha particle activity result is less than detection, 1/2 the detection limit will be used to calculate the annual average.
- D. The Division has the discretion to delete results of obvious sampling or analytical errors.
- E. If the MCL for radioactivity set forth in Section 22.91 is exceeded, the operator of a community water system must give notice to the Division pursuant to Section 22.402 and to the public as required in Section 22.4

22.924

Analytical Methodology:

- A. The methods specified in 40 CFR 141.25~~[(a)]~~**[(a)]**, copies may be obtained from the Office of Drinking Water, are to be used to determine compliance with Section 22.911 and 22.912: 22.9
- ~~B. When the identification and measurement of radionuclides other than those listed in paragraph A are required, the following references are to be used:~~
- ~~1. Procedures for Radiochemical Analysis of Nuclear Reactor Aqueous Solution, H.L. Krieger and S. Gold, EPA-R4-73-074. U.S. EPA, Cincinnati, Ohio, May 1973.~~
 - ~~2. HASL Procedure Manual, Edited by John H. Harley. HASL 300 ERDA health and Safety Laboratory, New York, NY, 1973.~~
- ~~C. For the purpose of monitoring radioactivity concentrations in drinking water, the required sensitivity of the radioanalyses is defined in terms of a detection limit. The detection limit shall be that concentration which can be counted with a precision of plus or minus one hundred (100) percent at the ninety five (95) percent confidence level (1.96 where is the standard deviation of the net counting rate of the sample).~~
- ~~1. To determine compliance with Section 22.911A, the detection limit shall not exceed one (1) pCi/L. To determine compliance with Section 22.911B, the detection limit shall not exceed three (3) pCi/L.~~
 - ~~2. To determine compliance with Section 22.912, the detection limits shall not exceed the concentrations specified in 40 CFR 141.25(c)(2). Copies may be obtained from the Office of Drinking Water.~~

~~D. To judge compliance with the PMCLs listed in Sections 22.911 and 22.912, the averages of data shall be used and shall be rounded to the same number of significant figures as the PMCL for the substance in question.~~

~~E. Any other alternate analytical technique approved by the Division may also be used.~~

B. When the identification and measurement of radionuclides other than those listed in paragraph (A) of this section is required, the following references are to be used, except in cases where alternative methods have been approved in accordance with 40 CFR 141.27.

1. Procedures for Radiochemical Analysis of Nuclear Reactor Aqueous Solutions, H. L. Krieger and S. Gold, EPA-R4-73-014. USEPA, Cincinnati, Ohio, May 1973

2. HASL Procedure Manual, Edited by John H. Harley. HASL 300, ERDA Health and Safety Laboratory, New York, NY. 1973

C. For the purpose of monitoring radioactivity concentrations in drinking water, the required sensitivity of the radioanalysis is defined in terms of a detection limit. The detection limit shall be that concentration which can be counted with a precision of plus or minus one hundred (100) percent at the ninety-five (95) percent confidence level (1.96σ where σ is the standard deviation of the net counting rate of the sample).

1. To determine compliance with 22.912(B), (C), and (E) the detection limit shall not exceed the concentrations in Table A to this paragraph.

Table A. – Detection Limits for Gross Alpha Particle Activity, Radium 226, Radium 228, and Uranium

<u>Contaminant</u>	<u>Detection Limit</u>
<u>Gross alpha particle activity.....</u>	<u>3 pCi/L</u>
<u>Radium 226.....</u>	<u>1 pCi/L</u>
<u>Radium 228.....</u>	<u>1 pCi/L</u>
<u>Uranium.....</u>	<u>Reserve</u>

2. To determine compliance with 22.912(D) the detection limits shall not exceed the concentrations listed in Table B to this paragraph.

Table B. – Detection Limits for Man-Made Beta Particle and Photon Emitters

<u>Radionuclide</u>	<u>Detection Limit</u>
<u>Tritium.....</u>	<u>1,000 pCi/L</u>
<u>Strontium-89.....</u>	<u>10 pCi/L</u>
<u>Strontium-90.....</u>	<u>2 pCi/L</u>
<u>Iodine-131.....</u>	<u>1 pCi/L</u>
<u>Cesium-134.....</u>	<u>10 pCi/L</u>
<u>Gross beta.....</u>	<u>4 pCi/L</u>
<u>Other radionuclides.....</u>	<u>1/10 of the applicable limit</u>

D. To judge compliance with the maximum contaminant levels listed in 22.912(B) and (D), averages of the data shall be used and shall be rounded to

the same number of significant figures as the maximum contaminant level for the substance in question.

E. The Division has the authority to determine compliance or initiate enforcement action based on analytical results or other information compiled by sanctioned representatives and agencies.]

SECTION 22.10 SURFACE WATER TREATMENT RULE

22.1001 **Untreated Water:** The use of untreated (without filtration and disinfection) surface water or untreated ground water under the direct influence of surface water shall be prohibited.

22.1002 **General Requirements:** Each public water system with a surface water source or a ground water source under the direct influence of surface water must be operated by qualified personnel who meet the requirements of the Division and must provide treatment of that source water that complies with these treatment technique requirements. The treatment technique requirements consist of installing and properly operating water treatment processes which reliably achieve:

- A. At least 99.9 percent (3-log) removal and/or inactivation of *Giardia lamblia* cysts between a point where the raw water is not subject to recontamination by surface water runoff and a point downstream before or at the first customer; and
- B. At least 99.99 percent (4-log) removal and/or inactivation of viruses between a point where the raw water is not subject to recontamination by surface water runoff and a point downstream before or at the first customer.

22.1003 **Disinfection:** Each public water system with a surface water source or a ground water source under the direct influence of surface water must provide treatment consisting of both filtration as specified in Section 22.1004 and disinfection as follows:

- A. The disinfection treatment must be sufficient to ensure that the total treatment processes of that system achieve at least 99.9 percent (3-log) inactivation and/or removal of *Giardia lamblia* cysts and at least 99.99 percent (4-log) inactivation and/or removal of viruses, as determined by the Division.
- B. The residual disinfectant concentration in the water entering the distribution system, measured as specified in Section 22.1005 cannot be less than 0.3 mg/L for more than four (4) hours.
- C. The residual disinfectant concentration in the distribution system, measured as total chlorine, combined chlorine, or chlorine dioxide, as specified in Section 22.1005 cannot be undetectable in more than five (5) percent of the samples each month, for any two (2) consecutive months that the system serves water to the public. Water in the distribution system with a heterotrophic bacteria concentration less than or equal to five hundred (500) per milliliter, measured as heterotrophic plate count (HPC) as specified in Section 22.1006, is deemed to have a detectable disinfectant residual for purposes of determining compliance with this requirement. Thus, the value V in the following formula cannot exceed five (5) percent in one (1) month, for any two (2) consecutive months.

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

- where:
- a = number of instances where the residual disinfectant concentration is measured;
 - b = number of instances where the residual disinfectant concentration is not measured but HPC is measured;
 - c = number of instances where the residual disinfectant concentration is measured but not detected and no HPC is measured;
 - d = number of instances where no residual disinfectant concentration is detected and where the HPC is >500/ml; and
 - e = number of instances where the residual disinfectant concentration is not measured and HPC is >500/ml.

If the Division determines, based on site specific considerations, that a system has no means for having a sample transported and analyzed for HPC by an approved laboratory under the requisite time and temperature conditions specified in Section 22.1006, and that the system is providing adequate disinfection in the distribution system, the requirements of this Subsection do not apply.

22.1004 **Filtration:** Each public water system with a surface water source or a ground water source under the direct influence of surface water must provide treatment consisting of both disinfection as specified in Section 22.1003 and filtration that complies with any one (1) of the following by June 29, 1993:

- A. Conventional Filtration or Direct Filtration - For systems using conventional filtration or direct filtration, the turbidity level of representative samples of a system's filtered water must be less than or equal to 0.5 NTU in at least ninety-five (95) percent of the measurements taken each month, measured as specified in Section 22.1006, except that if the Division determines that the system is capable of achieving at least 99.9 percent removal and/or inactivation of Giardia lamblia cysts at some turbidity level higher than 0.5 NTU in at least ninety-five (95) percent of the measurements taken each month, the Division may substitute this higher turbidity limit for that system. However, in no case may the Division approve a turbidity limit that allows more than one (1) NTU in more than five (5) percent of the samples taken each month, measured as specified in Section 22.1006. The turbidity level of representative samples of a system's filtered water must at no time exceed five (5) NTU, measured as specified in Section 22.1006.
- B. Slow Sand Filtration - For systems using slow sand filtration, the turbidity level of representative samples of a system's filtered water must be less than or equal to one (1) NTU in at least ninety-five (95) percent of the measurements taken each month, measured as specified in Section 22.1006, except that if the Division determines there is no significant interference with disinfection at a higher turbidity level, the Division may substitute the higher turbidity limit for that system.
- C. Diatomaceous Earth Filtration - For systems using diatomaceous earth filtration, the turbidity level of representative samples of a system's filtered water must be less than or equal to one (1) NTU in at least ninety-five (95) percent of the measurements taken each month, measured as specified in Section 22.1006. The

turbidity level of representative samples of a system's filtered water must at no time exceed five (5) NTU, measured as specified in Section 22.1006.

- D. Other Filtration Technologies - A public water system may use a filtration technology not listed in this Section if it demonstrates to the Division, using pilot plant studies or other means, that the alternative filtration technology, in combination with disinfection treatment that meets the requirements of Section 22.1003, consistently achieves 99.9 percent removal and/or inactivation of Giardia lamblia cysts and 99.99 percent removal and/or inactivation of viruses. For a system that makes this demonstration, the requirements of paragraph B of this Section apply. Beginning January 1, 2002, systems serving at least 10,000 people must meet the requirements for other filtration technologies in 22.1009(B).

22.1005

Monitoring Requirements: A public water system that uses a surface water source or a ground water source under the direct influence of surface water must monitor in accordance with the following by June 29, 1993:

- A. Turbidity measurements as required by Section 22.1004 must be performed on representative samples of the system's filtered water at least every four (4) hours that the system serves water to the public. A public water system may substitute continuous turbidity monitoring for grab sample monitoring if it validates the continuous measurement for accuracy on a regular basis using a protocol approved by the Division. For any systems using slow sand filtration or filtration treatment other than conventional treatment, direct filtration or diatomaceous earth filtration, the Division may reduce the sampling frequency to once per day if it determines that less frequent monitoring is sufficient to indicate effective filtration performance. For systems serving five hundred (500) or fewer persons, the Division may reduce the turbidity sampling frequency to once per day, regardless of the type of filtration treatment used, if the Division determines that less frequent monitoring is sufficient to indicate effective filtration performance.
- B. The residual disinfectant concentration of the water entering the distribution system must be monitored continuously, and the lowest value must be recorded each day, except that if there is a failure in the continuous monitoring equipment, grab sampling every four (4) hours may be conducted in lieu of continuous monitoring, but for no more than five (5) working days following the failure of the equipment, and systems serving 3,300 or fewer persons may take grab samples in lieu of providing continuous monitoring on an ongoing basis at the frequencies each day prescribed below:

<u>System Population</u>	<u>Samples/Day*</u>
<500	1
501-1,000	2
<u>System Population</u>	<u>Samples/Day*</u>
1,001-2,500	3
2,501-3,300	4

*The day's samples cannot be taken at the same time. The sampling intervals are subject to Division review and approval.

If at any time the residual disinfectant concentration falls below 0.3 mg/L in a system using grab sampling in lieu of continuous monitoring, the system must take a grab sample every four (4) hours until the residual disinfectant concentration is equal to or greater than 0.3 mg/L.

- C. The residual disinfectant concentration must be measured at least at the same points in the distribution system and at the same time as total coliforms are sampled, as specified in Section 22.5, except that the Division may allow a public water system which uses both a surface water source or a ground water source under the direct influence of surface water, and a ground water source to take disinfectant residual samples at points other than the total coliform sampling points if the Division determines that such points are more representative of treated (disinfected) water quality within the distribution system. Heterotrophic bacteria, measured as HPC as specified in Section 22.1006, may be measured in lieu of residual disinfectant concentration. If the Division determines, based on site specific considerations, that a system has no means for having a sample transported and analyzed for HPC by an approved laboratory under the requisite time and temperature conditions specified in Section 22.1006 and that the system is providing adequate disinfection in the distribution system, the requirements of this Subsection do not apply.

22.1006

Analytical Methodology: Only the analytical method(s) specified in this Section, or otherwise approved by EPA, may be used to demonstrate compliance with Sections 22.1002, 22.1003 and 22.1004. Measurement for pH, temperature, turbidity and residual disinfectant concentration must be conducted by a party approved by the Division. Measurements for total coliforms, fecal coliforms and HPC must be conducted by an approved laboratory. Until laboratory approval criteria are developed for the analysis of HPC and fecal coliforms, any laboratory approved for total coliform analysis is deemed approved for HPC and fecal coliform analysis. The following procedures shall be performed in accordance with the publications listed in the following Section. 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 of the methods published in Standard Methods published in Standard Methods for the Examination of Water and Wastewater may be obtained from the American Public Health Association et al. 1015 Fifteenth Street, NW., Washington, D.C. 20005; copies of the Minimal Medium ONPG-MUG Method as set forth in the article "National Field Evaluation of a Defined Substrate Method for the Simultaneous Enumeration of Total Coliforms and *Escherichia coli* from Drinking Water: Comparison with the Standard Multiple Tube Fermentation Method" (Edberg et al), Applied and Environmental Microbiology, Volume 54, pp.1595-1601, June 1988 (as amended under Erratum, Applied and Environmental Microbiology, Volume 54, p. 3197, December 1988), may be obtained from the American Water Works Association Research Foundation, 6666 West Quincy Ave., Denver, Colorado 80235; and copies of the Indigo Method as set forth in the article "Determination of Ozone in Water by the Indigo Method" (Bader and Hoigne), may be obtained from Ozone Science and Engineering, Pergammon Press Ltd., Fairview Park, Elmsford, New York 10523. Copies may be inspected at the U.S.E.P.A., Room EB15, 401 M Street SW., Washington, D.C.

20460 or at the Office of the Federal register, 1100 L Street, NW., Room 8401, Washington, D.C.

- A. **Total Coliform Concentration:** See Section 22.52.
- B. **Fecal Coliform Concentration:** See Section 22.52.
- C. **Heterotrophic Plate Count:** Method 907A (Pour Plate Method), pp. 864-866, as set forth in Standard Methods for the Examination of water and Wastewater, 1986, American Public Health Association et al., 16th edition.
- D. **Turbidity:** See Section 22.702A
- E. **Residual Disinfectant Concentration:** Residual disinfectant concentrations for free chlorine and combined chlorine (chloramines) must be measured by Method 408C (Amperometric Titration Method), pp. 303-306, Method 408D (DPD Ferrous Titrametric Method), pp. 306-309, Method 408E (DPD Colorimetric Method), pp. 309-310, or Method 408F (Leuco Crystal Violet Method), pp. 310-313, as set forth in Standard Methods for the Examination of Water and Wastewater, 1985, American Public Health Association et al., 16th edition. Residual disinfectant concentrations for free chlorine and combined chlorine may also be measured by using DPD colorimetric test kits if approved by the Division. Residual disinfectant concentration for ozone must be measured by the Indigo Method as set forth in Bader, H., Hoigne, J., "Determination of Ozone in Water by the Indigo Method; A submitted Standard Method"; Ozone Science and Engineering, Vol. 4 pp. 169-176, Pergammon Press Ltd., 1982, or automated methods which are calibrated in reference to the results obtained by the Indigo Method on a regular basis, if approved by the Division (NOTE - This method will be published in the 17th edition of Standard Methods for the Examination of Water and Wastewater, 1985, American Public Health Association et al., the Iodometric Method in the 16th edition may not be used). Residual disinfectant concentrations for chlorine dioxide must be measured by Method 410B (Amperometric Method) or Method 410C (DPD Method), pp. 322-324, as set forth in Standard Methods for the Examination of Water and Wastewater, 1985, American Public Health Association et al., 16th edition.
- F. **Temperature:** Method 212 (Temperature), pp. 126-127, as set forth in Standard Methods for the Examination of Water and Wastewater, 1985, American Public Health Association et al., 16th edition.
- G. **pH:** Method 423 (pH Value), pp. 429-437, as set forth in Standard Methods for the Examination of Water and Wastewater, 1985, American Public Health Association et al., 16th edition.
 - 1. "Methods of Chemical analysis of Water and Wastes," EPA Environmental Monitoring and Support Laboratory, Cincinnati, Ohio 45268 (EPA-600/4-79-020), March 1985. Available from ORD Publications, CERL, EPA, Cincinnati, Ohio 45268

2. Annual Book of ASTM Standards, Volume 11.01, American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19013.
3. "Standard Methods for the Examination of Water and Wastewater," 16th Edition, American Public Health Association, American Water Works Association, Water Pollution Control Federation, 1985.
4. "Methods for Determination of Inorganic Substances in Water and Fluvial Sediments," Techniques of Water-Resources Investigations of the United States Geological Survey Books, Chapter A1, 1985, Open-File Report 85-495. Available from Open-File Services Section, Western Distribution Branch, U.S. Geological Survey, MS 306 Box 24525, Denver Federal Center, Denver, Colorado 80225.
5. "Fluoride in Water and Wastewater. Industrial Method #129-71 W." Technicon Industrial Systems. Tarrytown, New York 10591, December 1972.
6. "Fluoride in Water and Wastewater," Technicon Industrial Systems. Tarrytown, New York 10591, February 1976.
7. "Orion Guide to Water and Wastewater Analysis." Form WeEEG/5880, p. 5, 1985. Orion Research, Inc, Cambridge, Maryland.
8. "Inductively Coupled Plasma Atomic Emission Analysis of Drinking Water," Appendix to Method 200.7, September 1985. U.S.E.P.A. Environmental Monitoring and Support Laboratory, Cincinnati, Ohio 45268.
9. The addition of 1 ml of 30% of H₂O₂ to each 100 ml of standards and samples is required before analysis.
10. Prior to dilution of the Arsenic and Selenium calibration standards, add 2 ml of 30% H₂O₂ for each 100 ml of standard.
11. For approved analytical procedures for metals, the technique applicable to total metals must be used.

22.1007

General Requirements for the Interim Enhanced Surface Water Treatment Rule:

- A. The requirements of this section constitute national primary drinking water regulations. These regulations establish requirements for filtration and disinfection that are in addition to criteria under which filtration and disinfection are required by subpart H systems. The requirements of this subpart are applicable to subpart H systems serving at least 10,000 people, beginning December 17, 2001 unless otherwise specified in this subpart. The regulations in this subpart establish or extend treatment technique requirements in lieu of maximum contaminant levels for the following contaminants: *Giardia lamblia*, viruses, heterotrophic plate count

bacteria, Legionella, Cryptosporidium, and turbidity. Each subpart H system serving at least 10,000 people must provide treatment of its source water that complies with these treatment technique requirements and are in addition to those identified in Sec. ~~22.1003~~ 1002. The treatment technique requirements consist of installing and properly operating water treatment processes which reliably achieve:

1. At least 99 percent (2-log) removal of Cryptosporidium between a point where the raw water is not subject to recontamination by surface water runoff and a point downstream before or at the first customer for filtered systems, or Cryptosporidium control under the watershed control plan for unfiltered systems.
 2. Compliance with the profiling and benchmark requirements under the provisions of Sec. 22.1008.
- B. A public water system subject to the requirements of this subpart is considered to be in compliance with the requirements of paragraph (A) of this section if:
1. It meets the requirements for avoiding filtration in 40 CFR 141.71 and 141.171 and the disinfection requirements in 40 CFR 141.72 and 141.172. Copies may be obtained from the Office of Drinking Water; or
 2. It meets the applicable filtration requirements in either Sec. 22.1004 or Sec. 22.1009 and the disinfection requirements in Secs. 22.1003 and 22.1008.
- C. Systems are not permitted to begin construction of uncovered finished water storage facilities beginning February 16, 1999.

22.1008

Disinfection Profiling and Benchmarking:

- A. Determination of systems required to profile. A public water system subject to the requirements of this section must determine its TTHM annual average using the procedure in paragraph (A)(1) of this section and its HAA5 annual average using the procedure in paragraph (A)(2) of this section. The annual average is the arithmetic average of the quarterly averages of four consecutive quarters of monitoring.
1. The TTHM annual average must be the annual average during the same period as is used for the HAA5 annual average.
 - a. Those systems that collected data under the provisions of ~~subpart M (Information Collection Rule)~~ 61 FR 24368, May 14, 1996 must use the results of the samples collected during the last four quarters of required monitoring under the Information Collection Rule.
 - b. Those systems that use "grandfathered" HAA5 occurrence data that meet the provisions of paragraph (A)(2)(b) of this section must use TTHM data collected at the same time under the provisions of 40 CFR 141.12 and 141.30. Copies may be obtained from the Office of Drinking Water.
 - c. Those systems that use HAA5 occurrence data that meet the provisions of paragraph (A)(2)(c)(1) of this section must use TTHM data collected at the same time under the provisions of 40 CFR 141.12 and 141.30. Copies may be obtained from the Office of Drinking Water.
 2. The HAA5 annual average must be the annual average during the same period as is used for the TTHM annual average.

- a. Those systems that collected data under the provisions of ~~the Information Collection Rule 61 FR 24368, May 14, 1996~~ must use the results of the samples collected during the last four quarters of required monitoring under ~~the Information Collection Rule 61 FR 24368, May 14, 1996~~.
- b. Those systems that have collected four quarters of HAA5 occurrence data that meets the routine monitoring sample number and location requirements for TTHM in 40 CFR 141.12 and 141.30 and handling and analytical method requirements of ~~the Information Collection Rule 61 FR 24368, May 14, 1996~~ may use those data to determine whether the requirements of this section apply. Copies may be obtained from the Office of Drinking Water.
- c. Those systems that have not collected four quarters of HAA5 occurrence data that meets the provisions of either paragraph (A)(2)(a) or (b) of this section by March 16, 1999 must either:
 1. Conduct monitoring for HAA5 that meets the routine monitoring sample number and location requirements for TTHM in 40 CFR 141.12 and 141.30 and handling and analytical method requirements of ~~the Information Collection Rule 61 FR 24368, May 14, 1996~~. Copies may be obtained from the Office of Drinking Water, to determine the HAA5 annual average and whether the requirements of paragraph (B) of this section apply. This monitoring must be completed so that the applicability determination can be made no later than March 16, 2000, or
 2. Comply with all other provisions of this section as if the HAA5 monitoring had been conducted and the results required compliance with paragraph (B) of this section.
3. The system may request that the State approve a more representative annual data set than the data set determined under paragraph (A)(1) or (2) of this section for the purpose of determining applicability of the requirements of this section.
4. The State may require that a system use a more representative annual data set than the data set determined under paragraph (A)(1) or (2) of this section for the purpose of determining applicability of the requirements of this section.
5. The system must submit data to the State on the schedule in paragraphs (A)(5)(a) through (e) of this section.
 - a. Those systems that collected TTHM and HAA5 data under the provisions of ~~the Information Collection Rule 61 FR 24368, May 14, 1996~~, as required by paragraphs (A)(1)(a) and (A)(2)(a) of this section, must submit the results of the samples collected during the last 12 months of required monitoring under ~~the Information Collection Rule 61 FR 24368, May 14, 1996~~ not later than December 16, 1999. Copies may be obtained from the Office of Drinking Water.
 - b. Those systems that have collected four consecutive quarters of HAA5 occurrence data that meets the routine monitoring sample

number and location for TTHM in 40 CFR 141.12 and 141.30 and handling and analytical method requirements of ~~the Information Collection Rule 61 FR 24368, May 14, 1996~~, copies may be obtained from the Office of Drinking Water, as allowed by paragraphs (A)(1)(b) and (A)(2)(b) of this section, must submit those data to the State not later than April 16, 1999. Until the State has approved the data, the system must conduct monitoring for HAA5 using the monitoring requirements specified under paragraph (A)(2)(c) of this section.

- c. Those systems that conduct monitoring for HAA5 using the monitoring requirements specified by paragraphs (A)(1)(c) and (A)(2)(c)(1) of this section, must submit TTHM and HAA5 data not later than March 16, 2000.
 - d. Those systems that elect to comply with all other provisions of this section as if the HAA5 monitoring had been conducted and the results required compliance with this section, as allowed under paragraphs (A)(2)(c)(2) of this section, must notify the State in writing of their election not later than December 16, 1999.
 - e. If the system elects to request that the State approve a more representative annual data set than the data set determined under paragraph (A)(2)(a) of this section, the system must submit this request in writing not later than December 16, 1999.
6. Any system having either a TTHM annual average ≥ 0.064 mg/L or an HAA5 annual average ≥ 0.048 mg/L during the period identified in paragraphs (A)(1) and (2) of this section must comply with paragraph (B) of this section.
- B. Disinfection profiling.
1. Any system that meets the criteria in paragraph (A)(6) of this section must develop a disinfection profile of its disinfection practice for a period of up to three years.
 2. The system must monitor daily for a period of 12 consecutive calendar months to determine the total logs of inactivation for each day of operation, based on the $CT_{99.9}^{99.9}$ values in Tables 1.1-1.6, 2.1, and 3.1 of 40 CFR 141.74(b), as appropriate, through the entire treatment plant. This system must begin this monitoring not later than March 16, 2000. As a minimum, the system with a single point of disinfectant application prior to entrance to the distribution system must conduct the monitoring in paragraphs (B)(2)(a) through (d) of this section. A system with more than one point of disinfectant application must conduct the monitoring in paragraphs (B)(2)(a) through (d) of this section for each disinfection segment. The system must monitor the parameters necessary to determine the total inactivation ratio, using analytical methods in 40 CFR 141.74(a), copies may be obtained from the Office of Drinking Water, as follows:
 - a. The temperature of the disinfected water must be measured once per day at each residual disinfectant concentration sampling point during peak hourly flow.

- b. If the system uses chlorine, the pH of the disinfected water must be measured once per day at each chlorine residual disinfectant concentration sampling point during peak hourly flow.
 - c. The disinfectant contact time(s) ("T") must be determined for each day during peak hourly flow.
 - d. The residual disinfectant concentration(s) ("C") of the water before or at the first customer and prior to each additional point of disinfection must be measured each day during peak hourly flow.
3. In lieu of the monitoring conducted under the provisions of paragraph (B)(2) of this section to develop the disinfection profile, the system may elect to meet the requirements of paragraph (B)(3)(a) of this section. In addition to the monitoring conducted under the provisions of paragraph (B)(2) of this section to develop the disinfection profile, the system may elect to meet the requirements of paragraph (B)(3)(b) of this section.
- a. A PWS that has three years of existing operational data may submit those data, a profile generated using those data, and a request that the State approve use of those data in lieu of monitoring under the provisions of paragraph (B)(2) of this section not later than March 16, 2000. The State must determine whether these operational data are substantially equivalent to data collected under the provisions of paragraph (B)(2) of this section. These data must also be representative of Giardia lamblia inactivation through the entire treatment plant and not just of certain treatment segments. Until the State approves this request, the system is required to conduct monitoring under the provisions of paragraph (B)(2) of this section.
 - b. In addition to the disinfection profile generated under paragraph (B)(2) of this section, a PWS that has existing operational data may use those data to develop a disinfection profile for additional years. Such systems may use these additional yearly disinfection profiles to develop a benchmark under the provisions of paragraph (C) of this section. The State must determine whether these operational data are substantially equivalent to data collected under the provisions of paragraph (B)(2) of this section. These data must also be representative of inactivation through the entire treatment plant and not just of certain treatment segments.
4. The system must calculate the total inactivation ratio as follows:
- a. If the system uses only one point of disinfectant application, the system may determine the total inactivation ratio for the disinfection segment based on either of the methods in paragraph (B)(4)(a)(1) or (B)(4)(a)(2) of this section.
 - 1. Determine one inactivation ratio $CT_{calc}/CT_{99.9}$ before or at the first customer during peak hourly flow.
 - 2. Determine successive $CT_{calc}/CT_{99.9}$ values, representing sequential inactivation ratios, between the point of disinfectant application and a point before or at the first customer during peak hourly flow. Under this alternative, the system must calculate the total inactivation ratio by determining $(CT_{calc}/CT_{99.9})$ for each sequence and then

adding the $(CT_{calc}/CT_{99.9}^{99.9})$ values together to determine $(\sum (CT_{calc}/CT_{99.9}^{99.9}))$.

- b. If the system uses more than one point of disinfectant application before the first customer, the system must determine the CT value of each disinfection segment immediately prior to the next point of disinfectant application, or for the final segment, before or at the first customer, during peak hourly flow. The $(CT_{calc}/CT_{99.9}^{99.9})$ value of each segment and $(\sum (CT_{calc}/CT_{99.9}^{99.9}))$ must be calculated using the method in paragraph (B)(4)(a) of this section.
 - c. The system must determine the total logs of inactivation by multiplying the value calculated in paragraph (B)(4)(a) or (b) of this section by 3.0.
5. A system that uses either chloramines or ozone for primary disinfection must also calculate the logs of inactivation for viruses using a method approved by the State.
 6. The system must retain disinfection profile data in graphic form, as a spreadsheet, or in some other format acceptable to the State for review as part of sanitary surveys conducted by the State.
- C. Disinfection benchmarking.
1. Any system required to develop a disinfection profile under the provisions of paragraphs (A) and (B) of this section and that decides to make a significant change to its disinfection practice must consult with the State prior to making such change. Significant changes to disinfection practice are:
 - a. Changes to the point of disinfection;
 - b. Changes to the disinfectant(s) used in the treatment plant;
 - c. Changes to the disinfection process; and
 - d. Any other modification identified by the State.
 2. Any system that is modifying its disinfection practice must calculate its disinfection benchmark using the procedure specified in paragraphs (C)(2)(a) through (b) of this section.
 - a. For each year of profiling data collected and calculated under paragraph (B) of this section, the system must determine the lowest average monthly *Giardia lamblia* inactivation in each year of profiling data. The system must determine the average *Giardia lamblia* inactivation for each calendar month for each year of profiling data by dividing the sum of daily *Giardia lamblia* of inactivation by the number of values calculated for that month.
 - b. The disinfection benchmark is the lowest monthly average value (for systems with one year of profiling data) or average of lowest monthly average values (for systems with more than one year of profiling data) of the monthly logs of *Giardia lamblia* inactivation in each year of profiling data.
 3. A system that uses either chloramines or ozone for primary disinfection must also calculate the disinfection benchmark for viruses using a method approved by the State.
 4. The system must submit information in paragraphs (C)(4)(a) through (c) of this section to the State as part of its consultation process.

- a. A description of the proposed change;
- b. The disinfection profile for Giardia lamblia (and, if necessary, viruses) under paragraph (B) of this section and benchmark as required by paragraph (C)(2) of this section; and
- c. An analysis of how the proposed change will affect the current levels of disinfection.

22.1009

Filtration Interim Enhanced Surface Water Treatment Rule: A public water system subject to the requirements of this section that does not meet all of the criteria for avoiding filtration must provide treatment consisting of both disinfection, as specified in Sec. 22.1003, and filtration treatment which complies with the requirements of paragraph (A) or (B) of this section or Sec. 22.1004 by December 17, 2001.

- A. Conventional filtration treatment or direct filtration.
 - 1. For systems using conventional filtration or direct filtration, the turbidity level of representative samples of a system's filtered water must be less than or equal to 0.3 NTU in at least 95 percent of the measurements taken each month, measured as specified in 40 CFR 141.74(a) and (c).
 - 2. The turbidity level of representative samples of a system's filtered water must at no time exceed 1 NTU, measured as specified in 40 CFR 141.74(a) and (c).
 - 3. A system that uses lime softening may acidify representative samples prior to analysis using a protocol approved by the State.
- B. Filtration technologies other than conventional filtration treatment, direct filtration, slow sand filtration, or diatomaceous earth filtration. A public water system may use a filtration technology not listed in paragraph (A) of this section or in 40 CFR 141.73(b) or (c) if it demonstrates to the State, using pilot plant studies or other means, that the alternative filtration technology, in combination with disinfection treatment that meets the requirements of Sec. 22.1003, consistently achieves 99.9 percent removal and/or inactivation of Giardia lamblia cysts and 99.99 percent removal and/or inactivation of viruses, and 99 percent removal of Cryptosporidium oocysts, and the State approves the use of the filtration technology. For each approval, the State will set turbidity performance requirements that the system must meet at least 95 percent of the time and that the system may not exceed at any time at a level that consistently achieves 99.9 percent removal and/or inactivation of Giardia lamblia cysts, 99.99 percent removal and/or inactivation of viruses, and 99 percent removal of Cryptosporidium oocysts.

22.1010

Filtration sampling requirements:

- A. Monitoring requirements for systems using filtration treatment. In addition to monitoring required by 40 CFR 141.74, a public water system subject to the requirements of this subpart that provides conventional filtration treatment or direct filtration must conduct continuous monitoring of turbidity for each individual filter using an approved method in 40 CFR 141.74(a) and must calibrate turbidimeters using the procedure specified by the manufacturer. Systems must record the results of individual filter monitoring every 15 minutes.
- B. If there is a failure in the continuous turbidity monitoring equipment, the system must conduct grab sampling every four hours in lieu of continuous monitoring, but for no more than five working days following the failure of the equipment.

Reporting and recordkeeping requirements: In addition to the reporting and recordkeeping requirements in 40 CFR 141.75, a public water system subject to the requirements of this section that provides conventional filtration treatment or direct filtration must report monthly to the State the information specified in paragraphs (a) and (b) of this section beginning December 17, 2001. In addition to the reporting and recordkeeping requirements in 40 CFR 141.75, a public water system subject to the requirements of this subpart that provides filtration approved under Sec. 22.1009(B) must report monthly to the State the information specified in paragraph (A) of this section beginning December 17, 2001. The reporting in paragraph (A) of this section is in lieu of the reporting specified in 40 CFR 141.75(b)(1).

- A. Turbidity measurements as required by Sec. 22.1009 must be reported within 10 days after the end of each month the system serves water to the public. Information that must be reported includes:
1. The total number of filtered water turbidity measurements taken during the month.
 2. The number and percentage of filtered water turbidity measurements taken during the month which are less than or equal to the turbidity limits specified in Sec. 22.1009(A) or (B).
 3. The date and value of any turbidity measurements taken during the month which exceed 1 NTU for systems using conventional filtration treatment or direct filtration, or which exceed the maximum level set by the State under Sec. 22.1009(B).
- B. Systems must maintain the results of individual filter monitoring taken under 40 CFR 141.174 for at least three years. Systems must report that they have conducted individual filter turbidity monitoring under 40 CFR 141.174 within 10 days after the end of each month the system serves water to the public. Systems must report individual filter turbidity measurement results taken under 40 CFR 141.174 within 10 days after the end of each month the system serves water to the public only if measurements demonstrate one or more of the conditions in paragraphs (B)(1) through (4) of this section. Systems that use lime softening may apply to the State for alternative exceedance levels for the levels specified in paragraphs (B)(1) through (4) of this section if they can demonstrate that higher turbidity levels in individual filters are due to lime carryover only and not due to degraded filter performance.
1. For any individual filter that has a measured turbidity level of greater than 1.0 NTU in two consecutive measurements taken 15 minutes apart, the system must report the filter number, the turbidity measurement, and the date(s) on which the exceedance occurred. In addition, the system must either produce a filter profile for the filter within 7 days of the exceedance (if the system is not able to identify an obvious reason for the abnormal filter performance) and report that the profile has been produced or report the obvious reason for the exceedance.
 2. For any individual filter that has a measured turbidity level of greater than 0.5 NTU in two consecutive measurements taken 15 minutes apart at the end of the first four hours of continuous filter operation after the filter has been backwashed or otherwise taken offline, the system must report the filter number, the turbidity, and the date(s) on which the exceedance

- occurred. In addition, the system must either produce a filter profile for the filter within 7 days of the exceedance (if the system is not able to identify an obvious reason for the abnormal filter performance) and report that the profile has been produced or report the obvious reason for the exceedance.
3. For any individual filter that has a measured turbidity level of greater than 1.0 NTU in two consecutive measurements taken 15 minutes apart at any time in each of three consecutive months, the system must report the filter number, the turbidity measurement, and the date(s) on which the exceedance occurred. In addition, the system must conduct a self-assessment of the filter within 14 days of the exceedance and report that the self-assessment was conducted. The self assessment must consist of at least the following components: assessment of filter performance; development of a filter profile; identification and prioritization of factors limiting filter performance; assessment of the applicability of corrections; and preparation of a filter self-assessment report.
 4. For any individual filter that has a measured turbidity level of greater than 2.0 NTU in two consecutive measurements taken 15 minutes apart at any time in each of two consecutive months, the system must report the filter number, the turbidity measurement, and the date(s) on which the exceedance occurred. In addition, the system must arrange for the conduct of a comprehensive performance evaluation by the State or a third party approved by the State no later than 30 days following the exceedance and have the evaluation completed and submitted to the State no later than 90 days following the exceedance.

C. Additional Reporting Requirements:

1. If at any time the turbidity exceeds 1 NTU in representative samples of filtered water in a system using conventional filtration treatment or direct filtration, the system must inform the Division as soon as possible, but no later than the end of the next business day.
2. If at any time the turbidity in representative samples of filtered water exceeds the maximum level set by the Division under Section 22.1009(B) for filtration technologies other than conventional filtration treatment, direct filtration, slow sand filtration, or diatomaceous earth filtration, the system must inform the Division as soon as possible, but no later than the end of the next business day.

22.1012 Recycle Provisions.

- A. Applicability: All subpart H systems that employ conventional filtration or direct filtration treatment and that recycle spent filter backwash water, thickener supernatant, or liquids from dewatering processes must meet the requirements in paragraphs (B) through (D) of this section.
- B. Reporting: A system must notify the Division in writing by December 8, 2003 if the system recycles spent filter backwash water, thickener supernatant, or liquids from dewatering processes. This notification must include, at a minimum, the information specified in paragraphs (B)(1) and (2) of this section.
 1. A plant schematic showing the origin of all flows that are recycled (including, but not limited to, spent filter backwash water, thickener supernatant, and liquids from dewatering processes), the hydraulic

- conveyance used to transport them, and the location where they are reintroduced back into the treatment plant.
2. Typical recycle flow in gallons per minute (gpm), the highest observed plant flow experienced in the previous year (gpm), design flow for the treatment plant (gpm), and Division-approved operating capacity for the plant where the Division has made such a determination.
- C. Treatment Technique Requirement: Any system that recycles spent filter backwash water, thickener supernatant, or liquids from dewatering processes must return these flows through the processes of a system's existing conventional or direct filtration system as defined in Section 22.1 or at an alternate location approved by the Division by June 8, 2004. If capital improvements are required to modify the recycle location to meet this requirement, all capital improvements must be completed no later than June 8, 2006.
- D. Recordkeeping: The system must collect and retain on file recycle flow information specified in paragraphs (D)(1) through (6) of this section for review and evaluation by the Division beginning June 8, 2004.
1. Copy of the recycle notification and information submitted to the Division under paragraph (B) of this section.
 2. List of all recycle flows and the frequency with which they are returned.
 3. Average and maximum backwash flow rate through the filters and the average and maximum duration of the filter backwash process in minutes.
 4. Typical filter run length and a written summary of how filter run length is determined.
 5. The type of treatment provided for the recycle flow.
 6. Data on the physical dimensions of the equalization and/or treatment units, typical and maximum hydraulic loading rates, type of treatment chemicals used and average dose and frequency of use, and frequency at which solids are removed, if applicable.