UNOFFICIAL COMPILATION OF CODES, RULES AND REGULATIONS OF THE STATE OF NEWYORK
TITLE 10. DEPARTMENT OF HEALTH
CHAPTER I. STATE SANITARY CODE
PART 5. DRINKING WATER SUPPLIES SUBPART 5-1. PUBLIC WATER SYSTEMS
Text is current through December 28, 2022. (Rev. September 8, 2023)
(Statutory authority: Public Health Law, Section 225)

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This document presents an unofficial version of Subpart 5-1 of the State Sanitary Code under NYCRR Title 10. The New York State Department of State publishes the official compilation of State of New York Codes, Rules and Regulations, including 10 NYCRR Part 5, Subpart 5-1 Public Water Systems.

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General Provisions

Section 5-1.1 Definitions

(Effective Date: January 19, 2022)

As used in this Subpart, the following words and terms shall have the stated meaning, except as otherwise specifically provided:

(a) *-log treatment* means the reduction of a specified proportion of viruses, bacteria, protozoa or other organisms present in drinking water expressed as factors of 10, through disinfection (inactivation) and/or removal. For example, three-log treatment removes or inactivates 999 out of 1,000 organisms or 99.9 percent.

(b) *Action level* means the concentration of copper or lead that when exceeded triggers actions to be taken by a water system.

Copper action level = 1.3 milligrams per liter

Lead action level = 0.015 milligrams per liter

(c) *Approved method* means an analytical method, including sample preparation, of proven reliability which has been approved, or given similar recognition by the United States Environmental Protection Agency (EPA) or a New York State regulatory program in environmental or public health protection, for the specific purpose for which the method is to be used. Methods approved by the department pursuant to section 55-2.5 of this Title shall be deemed approved methods.

(d) *Auxiliary source* means a source of water supply which is not normally used but which has been approved for use by the department or other State agencies having jurisdiction, and has been developed for use when the normal source or sources fail to meet the water supply requirements.

(e) *Backflow* means a flow condition, induced by a pressure differential, which causes the reversal of flow of water or other liquids, solids, and/or gases into the distribution pipes of a potable water supply from any source other than the intended potable water source.

(f) *Backflow prevention device tester* (or tester) means a person who has met the certification requirements and been issued a certification as specified in section 5-1.31 of this Subpart.

(g) *Bag filter* means a pressure-driven separation device that removes particulate matter larger than one micrometer using an engineered porous filtration media.

(h) *Bank filtration* means a water treatment process that uses a well to recover surface water that has naturally infiltrated into ground water through a river bed or bank(s). Infiltration is typically enhanced by the hydraulic gradient imposed by a nearby pumping water supply or other well(s).

(i) *Cartridge filter* means a pressure-driven separation device that removes particulate matter larger than one micrometer using an engineered porous filtration media.

(j) *Clean compliance history* means a record of no MCL violations for E. coli, no total coliform or E. coli monitoring violations, no treatment technique trigger exceedances, and no treatment technique violations under section 5-1.52 table 6 of this Subpart.

(k) *Coagulation* means a process using coagulants and mixing by which colloidal and suspended material are destabilized and agglomerated into flocs.

(l) *Combined distribution system* means the interconnected distribution system consisting of the distribution systems of wholesale systems and of the consecutive systems that receive finished water.

(m) *Commissioner* means the Commissioner of Health of the State of New York.

(n) *Community water system (CWS)* means a public water system which serves at least five service connections used by year-round residents or regularly serves at least 25 year-round residents.

(o) *Comprehensive performance evaluation (CPE)* is a thorough review and analysis of a treatment plant's performance-based capabilities and associated administrative, operation and maintenance practices. For purposes of compliance with section 5.172(c)(2)(iv) of this Subpart, the CPE 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.

(p) *Consecutive system* means a public water system that receives some or all of its finished water from one or more wholesale systems. Delivery may be through a direct connection or through the distribution system of one or more consecutive systems.

(q) *Contaminant* means any physical, chemical, microbiological or radiological substance or matter in water.

(r) *Conventional filtration* means a series of processes including coagulation, flocculation, sedimentation and filtration.

(s) *Corrective action* means the action(s) taken by a water system consistent with the requirements of this code including one or more of the following: correcting significant

deficiencies; providing an alternate source of water; removing source(s) of contamination; providing treatment; or other action acceptable to the State.

(t) *Corrosion inhibitor* means a substance capable of reducing the corrosivity of water toward metal plumbing materials, especially lead and copper, by forming a protective coating on the interior surface of these materials.

(u) *Cross-connection* means an actual or potential connection between a potable water system and any other source or system through which a water supply could be contaminated.

(v) *CT means* the product of the free residual disinfectant concentration (C) in milligrams per liter determined before or at the first customer, and the corresponding disinfectant contact time (T) in minutes, expressed by the formula (C) × (T) = CT. Disinfectant contact time (T), is the time that it takes for water to move from the point of disinfectant application or the previous point of residual disinfectant measurement to a point before or at the point where residual disinfectant concentration (C) is measured.

(w) *Cyber attack* means deliberate actions to target computer information systems, infrastructures, computer networks, computer controlled mechanical devices and/or personal computers by various means of malicious acts that either steal, alter, disrupt or damage a target by gaining access into a susceptible electronic or electromechanical device.

(x) *Department* means the New York State Department of Health.

(y) *Designated representative* means the health commissioner or health officer of a city of 50,000 population or over, or the health commissioner or health officer of a county or part-county health district, the State regional health director, or district director having jurisdiction; a public health director or public health engineer qualified as duly appointed pursuant to Part 11 of this Title; or a county health commissioner, or county health director having the powers and duties prescribed in section 352 of the Public Health Law, or any other individual so designated by the commissioner.

(z) *Disinfection station* means a facility consisting of one or more points where water is routinely treated with an oxidant for disinfection, odor control or other purposes including the inactivation of pathogenic organisms and excluding treatment on a raw water transmission main.

(aa) *Distribution point* means a sampling point representative of drinking water within the distribution system.

(ab) *Diatomaceous earth filtration* means a process resulting in substantial particulate removal 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.

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

(ad) *Dose equivalent* means the product of the absorbed dose from ionizing radiation and such factors as account for differences in biological effectiveness because of the type of radiation and its distribution in the body as specified by the International Commission on Radiological Units and Measurements (ICRU).

(ae) *Dual sample set* means a set of two samples collected at the same time and same location, with one sample analyzed for total trihalomethanes (TTHM) and the other sample analyzed for haloacetic acids (five) (HAA5).

(af) *Dwelling unit* means one or more rooms with provisions for living, sanitary and sleeping facilities arranged for the use of one family.

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

(ah) *Emergency source* means a source of water supply which is not the regular source or auxiliary source and which is developed during an emergency for temporary use.

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

(aj) *Entry point* means a representative sampling location after the last point of treatment but before the first consumer connection.

(ak) *Fecal indicator* means a microorganism (for example a bacteriophage, coliphage, or bacterium) that is used to determine the sanitary quality of drinking water and the likelihood of the presence of pathogen contamination from the waste of warm-blooded animals. The most commonly used fecal indicator is Escherichia coli (E. coli).

(al) *Filter profile* is 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, that includes an assessment of filter performance while another filter is being backwashed.

(am) *Filtration* means a process for removing particulate matter from water by passage through porous material.

(an) *Finished water* means water that is introduced into the distribution system of a public water system and is intended for distribution and consumption without further treatment, except as necessary to maintain water quality in the distribution system (e.g., booster disinfection, addition of corrosion control chemicals).

(ao) *First draw tap sample for lead and copper* means a one liter sample of water collected from a cold water tap after the water has stood in the plumbing system for at least six hours and is collected without flushing the tap.

(ap) *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 mechanisms.

(aq) *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 or replacement frequency of every 180 days, except that the reactivation frequency for GAC10 used as a best available technology for compliance with total trihalomethanes (TTHM) and haloacetic acids (five) (HAA5) maximum contaminant levels (MCLs) shall be 120 days.

(ar) *GAC20* means granular activated carbon filter beds with an empty-bed contact time of 20 minutes based on average daily flow and a carbon reactivation frequency of every 240 days.

(as) *Gross alpha particle activity* means the total radioactivity because of alpha particle emission as inferred from measurements on a dry sample.

(at) *Gross beta particle activity* means the total radioactivity because of beta particle emission as inferred from measurements on a dry sample.

(au) *Groundwater directly influenced by surface water, also known as groundwater under the direct influence of surface water, or GWUDI*, means any water beneath the surface of the ground which exhibits significant and rapid shifts in water characteristics such as turbidity, temperature, conductivity or pH which closely correlates to climatological or surface water conditions and/or which contains microorganisms, algae, large diameter (three microns or greater) pathogens or insect parts of a surface water origin.

(av) *Groundwater source* means a source of water supply taken from a groundwater aquifer and developed in accordance with section 5-1.22 of this Subpart, but shall not include an admixture of surface water or water exposed to the ground surface. Any groundwater source at a system that uses surface water or groundwater under the direct influence of surface water that does not receive treatment as described in section 5-1.30(b) of this Subpart, prior to the first customer, is subject to all requirements applicable to groundwater systems and groundwater sources.

(aw) *Groundwater system* means a public water system that uses only groundwater, excluding any surface water or groundwater under the direct influence of surface water.

(ax) *Haloacetic acids (five) (HAA5)* mean the sum of the concentrations in milligrams per liter of five specific haloacetic acid compounds, rounded to two significant figures after addition. The five haloacetic acids that comprise the HAA5 are monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid.

(ay) *Internal protection* means isolation of a fixture, area or zone which requires backflow prevention at the source of the cross-connection or potential hazard, in accordance with the New York State Uniform Fire Prevention and Building Code and/or the local plumbing and building codes.

(az) *Large water system* means a water system that serves more than 50,000 persons.

(ba) *Lead service line* means a service line made of lead which connects the water main to the building inlet and any lead appurtenances connected to the lead service line.

(bb) *Lead service line sample* means a one liter sample for lead, collected after the water has stood in the service line for at least six hours. The sample must be collected directly from a tap on the service line or by calculating and wasting the amount of water in the plumbing system from the sampling point to the service line. At a single family structure, the sample may be collected by running the water until there is a significant change in water temperature.

(bc) *Level 1 assessment* is an evaluation to identify the possible presence of sanitary defects, defects in distribution system coliform monitoring practices, and (when possible) the likely reason that the system triggered the assessment. It is conducted by the system operator or owner. Minimum elements include review and identification of atypical events that could affect distributed water quality or indicate that distributed water quality was impaired; changes in distribution system maintenance and operation that could affect distributed water quality (including water storage); source and treatment considerations that bear on distributed water quality, where appropriate (e.g., whether a ground water system is disinfected); existing water quality monitoring data; and inadequacies in sample sites, sampling protocol, and sample processing. The system must conduct the assessment consistent with any State directives that tailor specific assessment elements with respect to the size and type of the system and the size, type, and characteristics of the distribution system.

(bd) *Level 2 assessment* is an evaluation to identify the possible presence of sanitary defects, defects in distribution system coliform monitoring practices, and (when possible) the likely reason that the system triggered the assessment. A Level 2 assessment provides a more detailed examination of the system (including the system's monitoring and operational practices) than does a Level 1 assessment through the use of more comprehensive investigation and review of available information, additional internal and external resources, and other relevant practices. It is conducted by an individual approved by the State, which may include the system operator. Minimum elements include review and identification of atypical events that could affect distributed water quality or indicate that distributed water quality was impaired; changes in distribution system maintenance and operation that could affect distributed water quality (including water storage); source and treatment considerations that bear on distributed water quality, where appropriate (e.g., whether a ground water system is disinfected); existing water quality monitoring data; and inadequacies in sample sites, sampling protocol, and sample processing. The system must conduct the assessment consistent with any State directives that tailor specific assessment elements with respect to the size and type of the system and the size,

type, and characteristics of the distribution system. The system must comply with any expedited actions or additional actions required by the State in the case of an E. coli MCL violation.

(be) *Locational running annual average or LRAA* means the average of sample analytical results during the previous four calendar quarters for samples taken at a particular monitoring location.

(bf) *Man-made beta particle and photon emitters* means all radionuclides emitting beta particles and/or photons, except the daughter products of thorium-232, uranium-235 and uranium-238, listed in Maximum Permissible Body Burdens and Maximum Permissible Concentration of Radionuclides in Air or Water for Occupational Exposure, National Bureau of Standards Handbook 69, as amended August 1963, U.S. Department of Commerce. Copies of this publication are available from N.C.R.P. Publications, 7910 Woodmont Avenue, Bethesda, MD, and a copy is available for inspection and copying at the offices of the records access officer of the Department of Health, Corning Tower, Empire State Plaza, Albany, NY 12237.

(bg) *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. For entry point turbidity and inorganic chemicals listed in section 5-1.52, tables 1 and 2, of this Subpart, the maximum permissible level is measured at the point of entry to the distribution system. For organic chemicals with MCLs listed in section 5-1.52, table 3, of this Subpart, the MCL is measured at the individual sources, unless otherwise specified by the State. Substances added to the water by the user, and limited to the premises of the user, are excluded from this definition.

(bh) *Maximum residual disinfectant level (MRDL)* means a level of disinfectant measured at a consumer's tap, above which the possibility of unacceptable health effects exists.

(bi) *Maximum total trihalomethane potential (MTP)* means the maximum concentration of total trihalomethane produced in a given water containing a free chlorine residual after seven days at a temperature of 25 degrees Celsius or above.

(bj) *Medium water system* means water system that serves greater than 3,300 and less than or equal to 50,000 persons.

(bk) *Membrane filtration* means a pressure- or vacuum-driven separation process in which particulate matter larger than one micrometer is rejected by an engineered barrier, primarily through a size-exclusion mechanism, and which has a measurable removal efficiency of a target organism that can be verified through the application of a direct integrity test. This definition includes the common membrane technologies of microfiltration, ultrafiltration, nanofiltration, and reverse osmosis.

(bl) *Method Detection Limit (MDL)* means the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte.

(bm) *Noncommunity water system (NCWS)* means a public water system that is not a community water system.

(bn) *Nontransient noncommunity water system (NTNC)* means a public water system that is not a community water system but is a subset of a noncommunity water system that regularly serves at least 25 of the same people, four hours or more per day, for four or more days per week, for 26 or more weeks per year.

(bo) *Optimal corrosion control treatment* means the corrosion control treatment that reduces the lead and copper concentrations at users' taps to the lowest reasonably achievable level while insuring that the treatment does not cause the water system to violate part 5 of the State Sanitary Code or cause adverse health or operational effects.

(bp) *Person* means an individual, corporation, company, association, partnership, State agency, municipality including a county, or Federal agency.

(bq) *Picocurie* means that quantity of radioactive material producing 2.22 nuclear transformations per minute.

(br) *Plant intake* means the works or structures at the head of a conduit through which water is diverted from a source, such as a river or lake, into the treatment plant.

(bs) *Potable water* means a water which meets the requirements established by this Subpart.

(bt) *Point of use* means the free-flowing outlet of the ultimate user of a public water system.

(bu) *Practical Quantitation Limit (PQL)* means the practical and routinely achievable method-specific measurable concentration limit achieved by a laboratory with a high degree of certainty (>99.9 per cent confidence) in the results.

(bv) *Presedimentation* means a preliminary treatment process used to remove gravel, sand, and other particulate material from the source water through settling before the water enters the primary clarification and filtration processes in a treatment plant.

(bw) *Principal organic contaminant (POC)* means any organic chemical compound belonging to the following classes, except for trichloromethane (chloroform), dibromochloromethane, bromodichloromethane, tribromomethane (bromoform) and any other organic contaminant with a specific MCL listed in section 5-1.52, table 3 of this Subpart:

(1) halogenated alkane: compound containing carbon (C), hydrogen (H) and halogen (X) where X = fluorine (F), chlorine (Cl), bromine (Br) and/or iodine (I), having the general formula $C_nH_yX_z$, where $y + z = 2n + 2$; n, y and z are integer variables; n and z are equal to or greater than one and y is equal to or greater than zero;

(2) halogenated ether: compound containing carbon (C), hydrogen (H), oxygen (O) and halogen X (where X = F, Cl, Br and/or I) having the general formula CnHyXzO, where y + z = 2n + 2; the oxygen is bonded to two carbons; n, y and z are integer variables; n is equal to or greater than two, y is equal to or greater than zero and z is equal to or greater than one;

(3) halobenzenes and substituted halobenzenes: derivatives of benzene which have at least one halogen atom attached to the ring and which may or may not have straight or branched chain hydrocarbon, nitrogen or oxygen substituents;

(4) benzene and alkyl- or nitrogen-substituted benzenes: benzene or a derivative of benzene which has either an alkyl- and/or a nitrogen-substituent;

(5) substituted, unsaturated hydrocarbons: a straight or branched chain unsaturated hydrocarbon compound containing one of the following: halogen, aldehyde, nitrile, amide; and

(6) halogenated nonaromatic cyclic hydrocarbons: a nonaromatic cyclic compound containing a halogen.

(bx) *Process compliance monitoring* means the State-approved measurements and records of water system operation and/or water quality parameters that demonstrate the effectiveness of the treatment process(es) employed by the public water system to achieve a treatment technique requirement.

(by) *Protective device* means an approved double check valve assembly, reduced pressure zone assembly, air gap or other type or method of backflow protection accepted by the department.

(bz) *Public health hazard* means an existing or imminent condition which can be responsible for or cause illness, injury or death and for which immediate corrective or remedial action is required. Public health hazards include, but are not limited to, the following:

(1) an Escherichia coli (E. coli) MCL violation, or failure to test for E. coli after any repeat sample tests positive for coliform.

(2) a nitrate/nitrite MCL violation, of failure to take a confirmation sample within 24 hours for nitrate or nitrite after an initial sample exceeds the MCL;

(3) an acute MRDL violation for chlorine dioxide as specified in section 5-1.52 table 3A of this Subpart, or failure to take the required samples in the distribution system the day after the MRDL is exceeded at the entry point as specified in section 5-1.52 table 15A of this Subpart;

(4) turbidity violations or exceedances specified in paragraph 5-1.78(d)(4) of this Subpart and determined by the State to present an existing or imminent condition which can be

responsible for or cause illness, injury or death and for which immediate corrective or remedial action is required;

(5) use of an unapproved or contaminated water supply source;

(6) insufficient quantity of water to meet drinking or sanitary demands;

(7) hazardous or toxic chemical contamination;

(8) disinfection which is inadequate to destroy harmful microorganisms or to maintain a specified chlorine residual;

(9) disruption of water service of four hours or more, determined by the State to present an existing or imminent condition which can be responsible for or cause illness, injury or death and for which immediate corrective or remedial action is required;

(10) cross-connections of sufficient hazard to adversely affect the health of a water consumer; and

(11) any other conditions, including a waterborne disease outbreak, determined to be a public health hazard by the commissioner.

(ca) *Public notification* means disseminating information about a problem with a public water system in a form and manner consistent with section 5-1.78 of this Subpart.

(cb) *Public water system* means a community, noncommunity or nontransient noncommunity water system which provides water to the public for human consumption through pipes or other constructed conveyances, if such system has at least five service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year. Such term includes:

(1) collection, treatment, storage and distribution facilities under control of the supplier of water of such system and used with such system; and

(2) collection or pretreatment storage facilities not under such control which are used with such system.

(cc) *Raw water* means water immediately before the first or only point of disinfection or other treatment.

(cd) *Regular source* means a source of water supply which is normally used and is approved by the department and other State agencies having jurisdiction.

(ce) *Rem* means the unit dose equivalent from ionizing radiation to the total body or any internal organ or organ system.

(cf) *Millirem (MREM)* means 0.001 of a rem.

(cg) *Reporting period* means a time period designated by the State for determining maximum contaminant level compliance.

(ch) *Sanitary defect* means a defect that could provide a pathway of entry for microbial contamination into the distribution system or that is indicative of a failure or imminent failure in a barrier that is already in place.

(ci) *Sanitary survey* means an onsite review of a water system including the water source, facilities, equipment, operations maintenance, and monitoring compliance of a public water system to evaluate the adequacy of the system, its sources and operations and the distribution of safe drinking water. The survey must include evaluation of the following components: source; treatment; distribution system; finished water storage; pumps, pump facilities, and controls; monitoring, reporting, and data verification; system management and operation; and operator compliance with State requirements. Review of each of these categories of system operation need not be completed in a single visit.

(cj) *Seasonal system* means a non-community water system that is not operated as a public water system on a year-round basis and starts up and shuts down at the beginning and end of each operating season.

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

(cl) *Service connection* means the pertinent pipes, valves and fittings that connect a distribution system to a consumer's facility.

(cm) *Service protection* means the installation of a protective device or method of backflow protection at the service connection, commensurate with the degree of hazard of the consumer's potable water system. Service protection is also known as containment.

(cn) *Significant deficiency* means a defect in a system's design, operation or maintenance, or a failure or malfunction of its source, treatment, storage, or distribution, that causes or is reasonably expected to cause the introduction of contamination into water delivered to consumers. Significant deficiencies also include: loss of ability to deliver an adequate quantity of water; inadequate barriers of protection including failure of monitoring; conditions that pose an obvious security risk to the water system; or any other condition with the potential to cause a future public health hazard (i.e. before the next scheduled sanitary survey).

(co) *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.

(cp) *Slow sand filtration* means a process involving passage of raw water through a bed of sand at low velocity resulting in particulate removal by physical or biological mechanisms.

(cq) *Small water system* means a water system that serves 3,300 or fewer persons.

(cr) *Source of water supply* means any groundwater aquifer or watercourse from which water is taken either periodically or continuously for drinking, culinary or food-processing purposes, or which has been designated for present or future use as a source of water supply for domestic or municipal purposes.

(cs) *State* means the State Commissioner of Health, or his designated representative.

(ct) *State notification* means notifying the State by telephone, facsimile (FAX) copy, e-mail or other means about the existence or potential existence of a public health hazard, or the existence of any other violation or situation that may pose a risk to public health.

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

(cv) *Surface water* means all water open to the atmosphere and subject to surface runoff.

(cw) *SUVA* means the UV absorption at 254 nanometers (measured in 1/meters) divided by the dissolved organic carbon concentration (measured in mg/l). SUVA is an indicator of the humic content of water and the ability of the water to be treated for the removal of disinfection byproduct precursors.

(cx) *Tier 1 notification* means the category for public notifications that are required within 24 hours of learning of a public health hazard. Section 5-1.78(c) of this Subpart lists the specific requirements for Tier 1 notifications.

(cy) *Tier 2 notification* means the category for public notifications that are required within 30 days of learning of a violation or situation with the potential to have serious adverse effects on human health after long term exposure, such as most MCL, MRDL and treatment technique violations that are not public health hazards. Section 5-1.52 table 13 of this Subpart lists violations and situations that require Tier 2 notification; section 5-1.78(d) of this Subpart lists the specific requirements for Tier 2 notifications.

(cz) *Tier 3 notification* means the category for public notifications that are required within one year (30 days for transient noncommunity water systems) of learning of a less serious violation or situation that does not require a Tier 1 or Tier 2 notification, such as most monitoring violations. Section 5-1.52 table 13 of this Subpart lists violations and situations that require Tier 3 notification; section 5-1.78(e) of this Subpart lists the specific requirements for Tier 3 notifications.

(da) *Total organic carbon (TOC)* means total organic carbon in mg/l, measured by converting organic carbon to carbon dioxide, rounded to two significant figures.

(db) *Total trihalomethane (TTHM)* means the sum of the concentration of trichloromethane (chloroform), dibromochloromethane, bromodichloromethane and tribromomethane (bromoform).

(dc) *Transient noncommunity water system (TNC)* means a noncommunity water system that does not regularly serve at least 25 of the same people over six months per year.

(dd) *Treatment technique* means any minimum treatment or action specified by this Part or designated by the State as necessary to prevent the entry of contamination into or to reduce the level of a contaminant in drinking water delivered by a public water system.

(de) *Two-stage lime softening* means a process in which chemical addition and hardness precipitation occur in each of two distinct unit clarification processes in series prior to filtration.

(df) *Uncovered finished water storage facility* means a tank, reservoir, or other facility used to store water that will undergo no further treatment to reduce microbial pathogens except residual disinfection and is directly open to the atmosphere.

(dg) *Unspecified organic contaminant (UOC)* means any organic chemical compound not otherwise specified in this Subpart.

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

(di) *Violation* means failure to comply with or conform to the provisions of this Subpart.

(dj) *Waterborne disease outbreak* means the occurrence of acute infectious illness epidemiologically associated with the ingestion of water from a public water system.

(dk) *Watercourse* means any surface water listed in 6 NYCRR, Chapter 10.

(dl) *Water supply emergency plan* means a plan approved by the State and filed with the State at such location as specified by the commissioner. The plan shall address the actions to be taken by a water supplier to anticipate water supply emergencies and the steps to be taken to ensure the delivery of potable water during a water supply emergency.

(dm) *Water treatment plant* means any plant or equipment which, through the addition of chemicals or through aeration, ion exchange, demineralization, coagulation, sedimentation or filtration, or through any other means or combinations of treatment, shall change the physical, chemical, radiological or microbiological quality of water.

(dn) *Wholesale system* means a public water system that treats source water as necessary to produce finished water and then delivers some or all of that finished water to another public water system. Delivery may be through a direct connection or through the distribution system of one or more consecutive systems.

Sources of Water Supply

5-1.10 Statement

(Effective Date: June 24, 1977)

The rules contained in this Subpart, together with the watershed rules and regulations set forth in Parts 100 through 158 of this Title, have been promulgated to protect present or future sources of water supply.

5-1.11 Applicability

(Effective Date: January 19, 1990)

The provisions of sections 5-1.10 through 5-1.15 of this Subpart shall apply, throughout the State of New York, to all existing and proposed sources of water supply.

10 CRR-NY 5-1.11

Current through February 28, 2021

5-1.12 Water quality for existing sources of water supply

(Effective Date: May 26, 2004)

(a) Whenever the supplier of water determines or is advised by the State that one or more of the MCLs set forth in this Subpart are or may be exceeded; or that effectiveness of treatment processes diminishes to the extent that a violation of the treatment techniques or MCLs set forth in this Subpart may occur; or that any deleterious changes in raw water quality have occurred; or that a change in the character of the watershed or aquifer has been observed which may affect water quality; or that any combination of the preceding exists, the supplier of water shall notify the State and do the following:

(1) undertake a study to determine the cause or causes of such conditions, independent of known or anticipated treatment technology;

(2) modify existing or install treatment to comply, to the extent practicable, with sections 5-1.30, 5-1.50, 5-1.51 and 5-1.60 of this Subpart;

(3) initiate water sampling as needed to delineate the extent and nature of the cause of concern;

(4) investigate all or part of the watershed or aquifer to verify any existing or potential changes in the character of the sources of water supply; and

(5) submit a written report to the State within 30 days of the onset of the foregoing conditions summarizing the findings outlined in paragraphs (1) through (4) of this subdivision.

(b) The State may require the supplier of water to conduct sanitary surveys and to conduct water sampling related to watersheds and groundwater aquifers which are sources of water supply to

identify and evaluate the significance of existing and potential sources of pollution and to report the results to the State. Also, sanitary surveys shall be used to evaluate the adequacy of the public water system, the source or sources of water supply and the water treatment plant to produce a potable water.

5-1.13 Sampling and analytical requirements

(Effective Date: January 17, 2018)

The supplier of water shall collect raw water samples at a frequency prescribed by the State and analyze such samples for contaminants using an approved method, with method exceptions as listed in the tables in section 5-1.52 of this Subpart, and by an approved laboratory as described in section 5-1.74 of this Subpart.

5-1.14 Water quality for proposed sources of water supply

(Effective Date: January 19, 1990)

Before the approval of a source of water supply for public water system purposes, a report shall be submitted to the State. Such report shall include, but may not be limited to, all of the following:

(a) a summary of available raw water quality data for at least 10 years before the date of the report or as otherwise required by the State;

(b) a sanitary survey of the watershed or aquifer, with particular emphasis on water quality as affected by existing or potential spills, point and nonpoint discharges, and natural seasonal occurrences; and

(c) a description of the proposed water treatment processes.

5-1.15 Limitation

(Effective Date: June 24, 1977)

If the information required is already available for the same source of water supply or if an emergency exists which requires the development of an emergency source, the requirements of section 5-1.14 of this Subpart shall not apply.

Planning, Siting, Treatment and Approval

5-1.20 Applicability

(Effective Date: December 30, 1992)

The provisions of sections 5-1.20 through 5-1.33 of this Subpart shall apply to all public water systems, provided the systems serve 15 or more service connections or serve 25 or more persons.

5-1.21 Siting requirements

(Effective Date: July 3, 1991)

Before a person shall enter a financial commitment for or initiate construction of a public water system, such person shall notify the State and, to the extent practicable, avoid locating part or all of the public water system at a site which:

(a) is subject to a significant risk from earthquake, floods, fires or other disasters; or

(b) except for intake structures, is within the floodplain of a 100-year flood or is lower than any recorded high tide.

5-1.22 Approval of plans and completed works

(Effective Date: January 17, 2018)

(a) No supplier of water shall make, install or construct, or allow to be made, installed or constructed, a public water system or any addition or deletion to or modification of a public water system until the plans and specifications have been submitted to and approved by the State. Materials used in the design, construction and repair of a public water system shall be lead-free. For this Subpart, lead-free shall mean:

(1) solder or flux which contains no more than 0.2 percent lead;

(2) pipes, pipe fittings, plumbing fittings and fixtures which contain no more than a weighted average of 0.25 percent lead with respect to the wetted surfaces.

The weighted average lead content of a pipe, pipe fitting, plumbing fitting, or fixture shall be calculated by using the following formula: For each wetted component, the percentage of lead is multiplied by the ratio of the wetted surface area of that component to the total wetted surface area of the entire product to arrive at the weighted percentage of lead of the component. The weighted percentage of lead of each wetted component is added together, and the sum of these weighted percentages constitutes the weighted average lead content of the product. The lead content of the material used to produce wetted components is used to determine compliance with paragraph (2) of this subdivision. For lead content of materials that are provided as a range, the maximum content of the range must be used for calculating the weighted average lead content.

(b) Approval of plans and specifications for public water systems shall be based on the following standards in their entirety. The State may allow deviations from these standards in accordance with procedures established by the commissioner.

(1) Recommended Standards for Water Works, (Appendix 5-A).

(2) Standards for Water Wells (Appendix 5-B).

(3) Special Requirements for Wells Serving Public Water Systems (Appendix 5-D).

(c) The State may approve such plans or may require such modification which is deemed necessary to protect public health or safety. Application for plan approval shall be made on a form prescribed by the department.

(d) A supplier of water shall receive the approval of the State before placing into service any public water system constructed under the requirements of this section.

5-1.23 Reporting emergencies

(Effective Date: March 11, 1992)

(a) The supplier of water shall not take, use, or cause to be taken for use water from any emergency source or stop or alter disinfection or other treatment processes without first having notified by telephone or telegram, and received the approval of, the State. On receipt of such notification, the State shall advise the supplier of water and interested local officials of the approved action or proposed action by the supplier of water to protect the public health during the emergency.

(b) The supplier of water must make State notification when he determines that the delivery of water is interrupted to a minimum of 25 individuals or 15 service connections, or to a minimum of one percent of the total number of individuals served or service connections, whichever is larger, for a period of four hours or more.

(c) A printed copy of this section shall be conspicuously posted in the office used by the supplier of water.

5-1.24 Approval of fluoridation of public water systems

(Effective Date: April 6, 1987)

Fluorine compounds shall not be added to a public water system until a written application has been submitted to, and written approval is granted by, the State.

5-1.25 Disinfection/start-up of facilities

(Effective Date: May 16, 2018)

(a) No spring basin, collecting basin, well, infiltration gallery, water main, pumping station, standpipe or reservoir shall be placed in service following cleaning or repairs until it has been disinfected in a manner approved by the State.

(b) For each operational period, before serving water to the public, all seasonal systems must demonstrate completion of a State approved start-up procedure.

5-1.26 Dewatering trenches

(Effective Date: January 19, 1990)

No repair to the public water system shall be made until the trench has been dewatered to a point below the mains, valves or other structures. Every effort shall be made to prevent the entrance of foreign material and seepage into the public water system.

5-1.27 Adequacy of distribution system

(Effective Date: June 24, 1981)

The public water system shall be maintained and operated by the supplier of water to assure a minimum working pressure of 20 pounds per square inch at ground level at all points in the distribution system. Measurement of pressure may be obtained from representative points of use.

5-1.28 Blowoff facilities

(Effective Date: June 24, 1977)

All blowoff drains or discharge pipes connected to the public water system should be terminated at points where these structures will not be subject to flooding or otherwise subject to contamination.

5-1.29 Pumping equipment.

(Effective Date: July 3, 1991)

Pumping equipment of a public water system, for water which is not subject to later treatment, shall be installed and operated to prevent contamination of the public water system. Whenever priming is necessary, such pump shall be primed with water meeting the requirements of sections 5-1.51 and 5-1.52 of this Subpart.

5-1.30 Providing treatment for public water systems.

(Effective Date: January 19, 2022)

The supplier of water shall provide such treatment as necessary to deliver to the consumer a water conforming to the requirements of this section and determined using an approved method, with method modifications as listed in the tables in section 5-1.52 of this Subpart, and by an approved laboratory as described in section 5-1.74 of this Subpart.

(a) Minimum treatment for a ground water source shall be disinfection by chlorination or other microbial contaminant treatment acceptable to the State in accordance with the provisions of section 5-1.22 of this Subpart. If chemical disinfection is used, the disinfectant residual concentration must be maintained at all times and under no circumstances shall be less than the

required concentration for more than four hours. Unless other corrective action is approved by the State, any ground water source where fecal contamination has been observed, or where a significant deficiency may be causing or has the potential to cause the introduction of contamination into the water delivered to customers, must be treated to remove or inactivate 99.99 percent (four-log) of viruses. Continuous monitoring of active microbial treatment processes is required, except as provided in section 5-1.52 table 15 of this Subpart.

(b) Minimum treatment for surface water sources or ground water sources directly influenced by surface water shall be filtration and disinfection techniques, approved by the State in accordance with section 5-1.22 of this Subpart, capable of at least 99 percent removal of Cryptosporidium oocysts, 99.9 percent removal and/or inactivation of Giardia lamblia cysts, and 99.99 percent removal and/or inactivation of viruses, between a point where the raw water is no longer subject to recontamination by surface water runoff and a point downstream before or at the first consumer. Compliance with this treatment technique is required for surface water sources or within 18 months after ground water sources are determined to be directly influenced by surface water, unless the department determines that the supplier of water can meet specific avoidance criteria as defined in subdivision (c) of this section. Required performance monitoring shall be conducted in accordance with section 5-1.52 table 10A of this Subpart. Compliance with these treatment technique requirements shall also include:

(1) filtration facilities designed and operated to meet performance standards in accordance with section 5-1.52 table 4A of this Subpart;

(2) for systems using chlorine, the free chlorine residual disinfection concentration in the water entering the distribution system must be at least 0.2 milligrams per liter and may not be less than the required minimum concentration for compliance for more than four hours. Systems using other chemical disinfectants shall maintain residual disinfection levels entering the distribution system comparable to requirements for systems using chlorination. Continuous monitoring is required, except as provided in section 5-1.52 table 15 of this Subpart; and

(3) by June 8, 2004, any system that recycles spent filter backwash water, thickener supernatant, or liquids from dewatering process must return these flows through the processes of a system's existing conventional or direct filtration system.

(c) A public water system that uses a surface water source or a ground water source directly influenced by surface water which fails to comply with any of the following avoidance criteria shall develop and submit to the State, within three months of such failure to comply, a written plan for installing filtration and disinfection. Also, filtration and disinfection shall be installed, in accordance with subdivision (b) of this section, within 18 months of such failure to comply.

(1) Raw water fecal coliform concentrations must be equal to or less than 20 colonies per 100 milliliters or total coliform concentration must be equal to or less than 100 colonies per 100 milliliters in at least 90 percent of measurements made over the previous six months that the system was in operation. Monitoring shall be conducted in accordance with section 5-1.52

table 11A of this Subpart. If both fecal and total coliform analyses are performed, the fecal coliform results will take precedence.

(2) Raw water turbidity levels must not exceed five nephelometric turbidity units unless the department determines that the turbidity was caused by an unusual and unpredictable event. No more than two such events in the previous 12 months or no more than five events in the previous 120 months that the system was in operation are allowed. An event means a series of consecutive days during which at least one turbidity measurement each day exceeds five nephelometric turbidity units. Monitoring is to be conducted in accordance with section 5-1.52 table 10A of this Subpart.

(3) Disinfection must be sufficient to ensure at least 99.9 percent inactivation of Giardia lamblia cysts, and 99.99 percent inactivation of viruses, and 99 or 99.9 percent inactivation of Cryptosporidium (per section 5-1.83(c)(2) of this Subpart), between a point where the raw water is no longer subject to recontamination by surface water runoff and a point downstream before or at the first consumer. Actual CT values must be equal to or greater than the required values found in section 5-1.52 tables 14A through 14K of this Subpart, except for one day in each month that the system served water to the public, or except where the State determines that an additional failure in one month in the previous 12 months was caused by circumstances that were unusual and unpredictable. The supplier of water must calculate the CT values of the system for each day the system is in operation to document satisfactory disinfection. The necessary parameters and related monitoring frequencies to conduct this evaluation include:

(i) temperature of the disinfected water measured at least once per day at each residual disinfectant concentration sampling point;

(ii) pH of the disinfected water, measured at least once per day at each chlorine residual disinfectant concentration sampling point by systems using chlorine;

(iii) the disinfectant contact time (T), determined daily during peak hourly flow; and

(iv) the residual disinfectant concentration (C), before or at the first customer, measured daily during peak hourly flow.

(4) The disinfection system must have redundant components to ensure continuous disinfection. Auxiliary power with automatic start and alarm is required at all disinfection facilities where a power outage would result in a loss or reduction in the ability of the system to maintain a disinfection concentration as required by this Subpart.

(5) For systems using chlorine, the free chlorine residual disinfection concentration in the water entering the distribution system must be at least 0.2 milligram per liter and may not be less than the required minimum concentration for compliance for more than four hours, unless the State determines that any such failure was caused by circumstances that were unusual and unpredictable. Systems using other chemical disinfectants shall maintain residual disinfection levels entering the distribution system comparable to requirements for

systems using chlorination. Continuous monitoring is required, except as provided in section 5-1.52 table 15 of this Subpart.

(6) The disinfection residuals or the heterotrophic plate count results in the water in the distribution system must meet the requirements outlined in subdivision (g) of this section and section 5-1.52 table 11 of this Subpart unless the State determines that the failure to meet the requirements was not caused by a deficiency in the treatment of the source water.

(7) The watershed control program must provide natural or man made barriers to the occurrence, transport and/or survival of Cryptosporidium oocysts, Giardia lamblia cysts and viruses. The watershed control program must include, but is not limited to the following:

(i) ownership or protective controls of the watershed, except where the supplier of water submits written justification to show that the travel time of the water to the intake is greater than 60 days under all but emergency conditions. Protective controls can include written agreements with landowners within the watershed but must include as a minimum the absence of any bathing beach as defined in Subpart 6-2 of this Title, except for a bathing beach owned and/or maintained by an individual for use by the individual's family or friends;

(ii) no new sewage discharges to any watercourse shall be allowed where the time of travel from the point of discharge to the intake is 60 days or less. Existing sewage discharges with a current State Pollutant Discharge Elimination System (SPDES) permit issued by the New York State Department of Environmental Conservation, where the time of travel from the point of discharge to the intake is 60 days or less, shall, as a minimum, have secondary treatment followed by sand filtration and disinfection at facilities designed to achieve 99.9 percent removal and/or inactivation of Giardia lamblia cysts and 99.99 percent removal and/or inactivation of viruses by June 29, 1993. Existing or new sewage discharges with a SPDES permit issued by the New York State Department of Environmental Conservation, where the time of travel from the point of discharge to the intake is greater than 60 days, shall, as a minimum, have secondary treatment followed by sand filtration and disinfection at facilities designed to achieve 99.9 percent removal and/or inactivation of Giardia lamblia cysts and 99.99 percent removal and/or inactivation of viruses by June 29, 1993 or a later date set forth in a plan submitted to the commissioner and approved using the criteria for the long term plan as described in subparagraph (vii) of this paragraph. The sewage treatment facilities required herein shall be operated in conformance with their design specifications and the conditions of their SPDES permit;

(iii) watershed rules and regulations promulgated and enforced in accordance with title I of article 11 of the Public Health Law; including as a minimum prohibition or controls on waste discharges which contain or potentially may contain Cryptosporidium oocysts, Giardia lamblia cysts and/or viruses;

(iv) identification and evaluation of pertinent geological, hydrological and physical characteristics or features and potential conditions or activities which may influence water quality;

(v) a monitoring and surveillance program to assess water quality and water quantity trends;

(vi) an annual report submitted by the supplier of water to the department describing watershed activities, especially activities that affect water quality, identifying new and existing water quality concerns and remediation efforts taken and any other reports required pursuant to adopted watershed rules and regulations. The annual report must be submitted to the department no later than the 10th of October of each year; and

(vii) a long-term plan for the implementation of the watershed control program, including a description of the commitment of human and financial resources for such program shall be submitted to the commissioner for approval from systems that serve more than 100,000 persons, obtain water from a watershed or watersheds that involve multiple political subdivisions and own less than 25 percent of the land in the watershed. The approval shall be based on the exercise of a reasonable discretion by the commissioner in reviewing and accepting the proposed levels of human and fiscal resources to be committed for successful implementation of the plan, measured by projected cost of the administration, inspection, enforcement, land acquisition, sewage treatment plant upgrading and other activities and/or services related to such watershed control program, including the resolution of inherent water quality and quantity questions and the reliability of the method of funding. Failure to obtain the approval of the long term plan or failure to secure the required human or financial resources will result in a requirement to provide filtration, in accordance with the provisions of this Subpart. The approval of the long-term plan shall be for a period of 10 years, subject to further review and approval for successive 10-year periods. Notwithstanding any approval granted pursuant hereto, if Federal or State law or regulation shall henceforth unconditionally mandate filtration of surface water sources, then any such approvals shall forthwith cease and terminate with filtration thereafter to be provided, in accordance with the provisions of this Subpart, when reasonably feasible.

(8) The public water system must not have been identified as a source of a water-borne disease outbreak since 1980.

(9) The public water system shall comply with the trihalomethane, haloacetic acid, bromate and chlorite maximum contaminant levels and the maximum residual disinfectant levels in accordance with section 5-1.52 of this Subpart.

(10) The public water system must not exceed a total coliform treatment technique trigger in accordance with section 5-1.52 of this Subpart in 11 months of the 12 previous months that the system served water to the public on an ongoing basis, unless the State determines that failure to meet this requirement was not caused by a deficiency in treatment of the source water.

(d) Notwithstanding anything to the contrary in section 5-1.12, 5-1.23, 5-1.51 or 5-1.77 of this Subpart, if the public water system fails to comply with the treatment technique and/or the monitoring requirements of subdivision (a), (b), (c) or (g) of this section, fails to install the filtration and/or disinfection treatment required by this section or fails to comply with the avoidance criteria requirements contained in subdivision (c) of this section, the system violates this Subpart and shall make State and public notification, including any required mandatory health effects language. Pursuant to subdivision (c) of this section, if at any time the raw water turbidity exceeds five nephelometric turbidity units, the system shall consult with the State within 24 hours of learning of the exceedance. Based on this consultation, the State may determine that the exceedance constitutes a public health hazard, as found in section 5-1.1(bz)(4) of this Subpart, which requires a Tier 1 notification. When consultation does not take place within the 24-hour period, the water system must distribute a Tier 1 notification no later than 48 hours after the system learns of the violation. Ground water systems that are required to provide 4-log virus treatment, surface water systems and ground water under the direct influence of surface water (GWUDI) systems that use chemical disinfection must notify the State whenever residual disinfectant levels in the water entering the distribution system are less than the specified concentration pursuant to subdivisions (b) and (c) of this section. Any water system that uses chemical disinfection must make State notification whenever disinfectant residual levels entering the distribution system are not restored within four hours.

(e) The State may grant a waiver, on the submission of a written application, renewable for a period up to three years, to the disinfection rule established by this section for a ground water source if:

(1) the record of the microbiological and physical characteristics for the ground water source or sources not directly influenced by surface water demonstrates that they conformed to the MCL's of this Subpart, for the 12 months immediately preceding the date of application for waiver; such record shall be established under procedures provided by the department;

(2) an environmental laboratory approved pursuant to Subpart 55-2 of this Title, is used by the supplier of water to provide monitoring of drinking water quality and delivery of drinking water in conformity with this Subpart;

(3) an active cross-connection control program to prevent the backflow or entry of undesirable and toxic substances into the water distribution system is adopted and maintained by the supplier of water, and such cross-connection control program shall include the maintenance of adequate distribution system pressures, in accordance with section 5-1.27 of this Subpart;

(4) watershed rules and regulations to protect such ground water source are adopted pursuant to the provisions of article 11 of the Public Health Law, updated as necessary, and administered by the supplier of water, or other watershed controls satisfactory to the State are adopted, updated and administered;

(5) all water storage facilities are adequately protected pursuant to section 5-1.32 of this Subpart; and

(6) all sources of the water supply are properly located, constructed and effectively protected and maintained.

(f) The State may waive the requirements of paragraphs (e)(3) through (6), of this section for a ground water source at a noncommunity water system or a community water system serving fewer than 50 dwelling units, based on periodic evaluation of a sanitary survey and the geology of the area; the chemical characteristics of the water; the location, construction and protection of the ground water source; and the method of water storage and distribution.

(g) When a chlorine-based chemical disinfectant is used, the residual disinfectant concentration in the distribution system, measured as free or combined chlorine shall be maintained at detectable concentrations at representative points in the distribution system, in accordance with the monitoring requirements in section 5-1.52 table 11 of this Subpart. No more than five percent of the free chlorine residual samples shall be undetectable in any two consecutive months that the system serves water to the public. Chlorine residual or heterotrophic bacteria analyses shall be performed in accordance with section 5-1.52 table 11 of this Subpart. Monitoring for heterotrophic bacteria may be substituted for free chlorine residuals. A heterotrophic plate count result equal to or less than 500 colonies per milliliter is considered to be equivalent to a measurable free chlorine residual.

5-1.31 Cross-connection control

(Effective Date: January 17, 2018)

(a) The supplier of water shall implement a service protection program (also known as containment) which includes the following:

(1) requiring a protective device commensurate with the degree of hazard posed by any service connection;

(2) requiring the user of such connections to submit plans for the installation of protective devices to the supplier of water and/or the State for approval; and

(3) assuring all protective devices are inspected and tested by a certified backflow prevention device tester, as prescribed in subdivision (b) of this section, at the time of initial installation, after each repair, and annually thereafter. Records of such tests shall be made available to, reviewed by, and maintained by the supplier of water. All protective device tests and inspections shall be conducted by a certified backflow prevention device tester (“tester”).

(b) A certified backflow prevention device tester shall meet the following requirements:

(1) Initial certification and renewal requirements. Initial and/or renewal certifications for a certified backflow prevention device tester will be issued by a department-approved entity, when the applicant provides proof of satisfactory completion of a department-approved certified backflow prevention training course. The certification shall be valid for a period of three years.

(2) Conditions of certification.

(i) Upon issuance of a certification by a department-approved entity, the tester shall inform the department and the department-approved entity, within 30 days, of any changes in address or employment.

(ii) The department has the authority to require any individual applying for certification or renewal certification as a certified backflow prevention device tester or any certified backflow prevention device tester to take a written, oral and/or practical skills validated examination, if the department deems such examination to be reasonably necessary to determine the applicant's qualifications or to determine the certified tester's knowledge, skills, ability and judgment. The results of the examination may be the sole basis for approval, disapproval or suspension of such certification or the basis for additional requirements, deemed appropriate by the department, before certification will be issued or reinstated.

(3) Recertification requirements.

(i) An individual that allows his or her certification renewal to lapse after the expiration date is no longer certified to test applicable protective devices as outlined in this Subpart. If the individual meets the requirements outlined in this subdivision, within one year of the expiration date, the certification will be reinstated with a renewal period starting upon the date of expiration of the original certification and ending three years later.

(ii) An individual that allows his or her certification renewal to lapse for more than one year after the expiration date will be required to repeat the initial certification requirements set forth in paragraph (1) of this subdivision.

(c) Enforcement.

Upon notice and opportunity for a hearing, a tester's certification may be suspended or revoked. Revocation or suspension may be based on, but not limited to, fraud or misrepresentation by the certified tester; gross incompetence or gross negligence on a particular occasion; or negligence or incompetence on more than one occasion. Examples of such conduct include, but are not limited to:

(1) making false statements or notations on legal or official records required by the department; or

(2) providing misleading statements to government officials or agents of the government regarding protective device testing/certification.

(d) The supplier of water may not allow a user to establish a separate source of water. However, if a user justifies the need for a separate source of water, the supplier of water shall protect the public water system from such separate source of water by ensuring that such source does not pose a hazard in the following manner:

(1) by requiring the user to regularly examine the quality of the separate water source;

(2) by approving the use of only those separate water sources which are properly developed, constructed, protected and found to meet the requirements of sections 5-1.51 and 5-1.52 of this Subpart; and

(3) by filing such approvals with the State annually.

(e) All users of a public water system shall prevent cross-connections between the potable water piping system and any other piping system within the premises by installing internal protection in accordance with the New York State Uniform Fire Prevention and Building Code and/or the local plumbing and building codes.

(f) Any installation, service, maintenance, testing, repair or modification of a protective device shall be performed in accordance with the provisions of any relevant county, city, town or village plumbing code. All individuals who perform testing of protective devices shall be certified in accordance with subdivision (b) of this section.

5-1.32 Protection of finished water storage facilities.

(Effective Date: January 19, 2022)

No later than April 1, 2009, finished water storage facilities which deliver water to the user without later treatment shall be covered, or the water from an uncovered finished water storage facility shall be continuously treated to achieve inactivation or removal of at least 99.99 percent virus, 99.9 percent Giardia lamblia, and 99 percent Cryptosporidium in a manner approved by the State, in accordance with section 5-1.22(b) of this Subpart, before being discharged to the distribution system or be in compliance with a State approved schedule to meet these requirements.

5-1.33 Water supply emergency plans.

(Effective Date: January 17, 2018)

(a) All community water systems that supply drinking water to more than 3,300 people shall submit a water supply emergency plan to the State. The plan shall identify and outline the steps necessary to ensure that potable water is available during all phases of a water supply emergency.

(b) The water supply emergency plan shall include:

(1) procedures to notify consumers during all phases of a water supply emergency;

(2) criteria and procedures for determining, and the subsequent reporting of, critical water levels or safe yield of the source or sources of water;

(3) the identification of existing and future sources of water available during normal nonemergency and water supply emergency conditions;

(4) the identification of all available water storage. Available water storage includes source, transmission and distribution system storage;

(5) the identification, capacity and location of existing inter-connections. Identification of additional inter-connections needed to provide potable water during a water supply emergency;

(6) a specific action plan outlining all the steps to be carried out, taken or followed during a water supply emergency. The plan shall include a process for State notification, emergency notification rosters of key water supply personnel with current telephone numbers both business and home, and details of the follow-up corrective action process to minimize the reoccurrence of an emergency;

(7) the identification and implementation of procedures for water conservation and water use restrictions to be put in place during a water supply emergency;

(8) the identification of and the procedures for prioritization of potable water users during a water supply emergency;

(9) the identification and availability of emergency equipment needed during a water supply emergency;

(10) the system's capacity and ability to meet peak water demands and fire-flow conditions concurrently during a water supply emergency.

(c) An all-hazard vulnerability analysis, including an analysis of vulnerability to terrorist attack and cyber attack, shall be performed on all components of the water system. System components include but are not limited to: the source or sources of water supply; water treatment plants; disinfection stations; pipes and valves; storage tanks; and system operations and management. The system shall take whatever steps are necessary to ensure that potable water can be and is available during a water supply emergency.

(d) Before the final submission of the water supply emergency plan to the State, the system shall publish a notice in a newspaper of general circulation in the area served by the community water system stating that the proposed water supply emergency plan is available for review and comment. The notice shall be printed at least once in each of two successive weeks. Public comment shall be accepted for at least 14 days following the date of first publication. All public comment shall be submitted with the water supply emergency plan to the State.

(e) The water supply emergency plan shall be submitted to the State for review at least once every 5 years and within 30 days after major water facility infrastructure changes have been made. The system shall keep the emergency plan up to date, and shall provide updated communication and notification information to the State by December 31st of each year.

(f) Community water systems that supply drinking water to 3,300 or fewer people, non-transient noncommunity water systems, and noncommunity water systems may be required to prepare, update and submit to the State, a written water supply emergency plan for providing potable water during a water supply emergency.

(g) If more than one system is responsible for providing potable water to a community water system, the water supply emergency plan shall be prepared and submitted jointly by the systems.

(h) Information shall be exempt from public disclosure for public review and comment if it is determined by the water supplier that the information will pose a security risk to the operation of the water system. Upon the commissioner's request, the system shall provide a copy of the exempt information and justification for why said information should not be subject to public review and comment. A person who, without authorization, discloses any such assessment or information to another person who has not been authorized to receive such assessment or information shall be subject to criminal penalties pursuant to section 1125 of the Public Health Law.

Control of Copper and Lead in Drinking Water

5-1.40 General requirements and action levels.

(Effective Date: January 19, 2022)

(a) Applicability.

The requirements of sections 5-1.40 through 5-1.48 of this Subpart shall apply to all community water systems and nontransient, noncommunity water systems serving 15 or more service connections or serving 25 or more persons.

(b) Lead and copper action levels.

(1)

Analyte	Action Level[1,2]
Lead	0.015 mg/L
Copper	1.3 mg/L

[1] Analysis of lead and copper samples must be done by an approved laboratory as prescribed in section 5-1.74(a), that demonstrates the ability to achieve a Practical Quantitation Level (PQL) for lead equal to 0.005 milligrams/Liter (mg/L) and a PQL for copper equal to 0.050 mg/L.

[2]All lead and copper samples measured between the PQL and Method Detection Limit (MDL) must be either reported as measured or one-half the PQL specified in note 1. All levels below the lead and copper MDLs must be reported as zero.

(2) The lead action level is exceeded if the concentration of lead in more than 10 percent (90th percentile) of the tap water samples collected in accordance with section 5-1.42 of this Subpart during any monitoring period exceeds 0.015 mg/L.

(3) The copper action level is exceeded if the concentration of copper in more than 10 percent (90th percentile) of the tap water samples collected in accordance with section 5-1.42 of this Subpart during any monitoring period exceeds 1.3 mg/L.

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

(i) Place the results of all lead and copper samples taken during a monitoring period in ascending order from the sample with the lowest concentration to the sample with the highest concentration. Each sampling result will be assigned a number, ascending by single integers beginning with the number one for the sample with the lowest contaminant level. The number assigned to the sample with the highest contaminant level will be equal to the total number of samples taken.

(ii) Multiply the number of samples taken during the monitoring period by 0.9.

(iii) The contaminant concentration of the numbered sample obtained by the calculation in subparagraph (ii) of this paragraph is the 90th percentile contaminant level.

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

(v) For a public water system that has been allowed by the State to collect fewer than five samples under section 5-1.42(a)(3) of this Subpart, the sample result with the highest concentration is considered the 90th percentile value.

5-1.41 Corrosion control treatment steps and requirements.

(Effective Date: January 19, 2022)

(a) Each system shall complete the applicable corrosion control treatment requirements found in subdivision (c) of this section unless it is deemed to have optimized corrosion control as provided under subdivision (b) of this section.

(b) Optimized corrosion control.

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 water system satisfies the criteria specified in one of the paragraphs (1) through (3) of this subdivision. Any such system deemed to have optimized corrosion control under this subdivision, and which has treatment in place, shall continue to operate and maintain optimal corrosion control treatment and meet any requirements that the State determines appropriate to ensure optimal corrosion control treatment is maintained.

(1) Any water system that serves 50,000 or fewer people is considered to have optimal corrosion control treatment if the water system meets the lead and copper action levels during each of two consecutive six-month monitoring periods conducted in accordance with section 5-1.42 of this Subpart.

(2) Any water system may be deemed by the State to have optimized corrosion control treatment if the system demonstrates to the satisfaction of the State that it has conducted activities equivalent to applicable corrosion control steps. Water systems deemed to have optimized corrosion control under this paragraph shall operate in compliance with State-designated optimal water quality parameters and continue to conduct lead and copper tap and water quality parameter sampling in accordance with sections 5-1.42(b)(3) and 5-1.43(b)(3) of this Subpart. A system shall provide information to the State to support a determination under this subdivision which includes, but is not limited to:

(i) the results of all samples collected for each of the water quality parameters in section 5-1.43 of this Subpar;

(ii) a report explaining the test methods used by the water system to evaluate the corrosion control treatments listed in subdivision (c)(3)(ii) of this section, the results of all tests conducted, and the basis for the system's selection of optimal corrosion control treatment;

(iii) a report explaining how corrosion control has been installed and how it is being maintained to insure minimal lead and copper concentrations at consumers' taps; and

(iv) the results of first draw lead and copper tap water samples collected in accordance with section 5-1.42 of this Subpart for two consecutive six-month monitoring periods after corrosion control has been installed.

(3) A water system is deemed to have optimized corrosion control if it meets the copper action level and can demonstrate:

(i) the difference between the results of the 90th percentile tap water lead level and the highest source water lead level is less than 0.005 mg/L for two consecutive six-month monitoring periods. The 90th percentile tap water lead level shall be sampled in accordance with section 5-1.42 of this Subpart and source water lead level shall be sampled in accordance with section 5-1.44 of this Subpar; and

(ii) a system's highest source water lead level is below the method detection limit, and the 90th percentile tap water lead level is less than or equal to 0.005 mg/L for two consecutive 6-month monitoring periods.

(4) Any water system deemed to have optimized corrosion control in accordance with this section shall continue monitoring for lead and copper in tap water no less frequently than once every three calendar years using the reduced number of sites specified in section 5-1.42(a)(3) of this Subpart and collecting the samples at times and locations specified in section 5-1.42(c) of this Subpart, unless it meets the requirements for a nine year waiver as specified in section 5-1.42(f) of this Subpart.

(5) Any system triggered into corrosion control because it is no longer deemed to have optimized corrosion control under this section shall implement corrosion control treatment in accordance with the deadlines in paragraph (c)(2) of this section. Any such system serving more than 50,000 persons shall adhere to the schedule specified in paragraph (c)(2) of this section for systems serving 50,000 or fewer persons, 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 section.

(6) Any water system deemed to have optimized corrosion control shall notify the State in writing, pursuant of section 5-1.48(i) of this Subpart of any change in treatment or addition of a new source. The water system shall obtain approval from the State before implementing the addition of a new source or change in water treatment. The State may require any such system to conduct additional monitoring or to take other action the State deems appropriate to ensure that such systems maintain minimal levels of corrosion in the distribution system.

(c) Corrosion control treatment steps and deadlines.

(1) A system serving more than 50,000 persons shall complete the following corrosion control treatment steps, unless it is deemed to have optimized corrosion control as provided in paragraphs (b)(2) and (3) of this section:

(i) Step 1. The water system shall conduct initial first draw lead and copper tap sampling and water quality parameter sampling in accordance with sections 5-1.42 and 5-1.43 of

this Subpart. If the lead or copper action level exceeds the 90th percentile, the water system shall conduct source water sampling in accordance with section 5-1.44 of this Subpart within a schedule specified by the State.

(ii) Step 2. The water system shall complete corrosion control studies as specified by the State within 18 months after the end of the monitoring period during which the system exceeds one of the action levels.

(iii) Step 3. The water system shall install optimal corrosion control treatment within 24 months after the State designates such treatment.

(iv) Step 4. After installation of optimal corrosion control treatment, the water system shall complete first draw lead and copper tap sampling and water quality parameter follow-up sampling in accordance with sections 5-1.42(b)(2) and 5-1.43(b)(2) of this Subpart during the two consecutive six-month monitoring periods immediately following installation of treatment.

(v) Step 5. After State designation of water quality parameters for optimal corrosion control treatment, the water system shall operate in compliance with State-designated optimal water quality parameter values in accordance with subdivision (g) of this section; and continue to conduct first draw lead and copper tap sampling and water quality parameter sampling in accordance with sections 5-1.42(b)(3) and 5-1.43(b)(3) of this Subpart.

(2) Systems serving 50,000 or fewer persons. Except as provided in subdivision (b) of this section, a system that serves 50,000 or fewer persons shall complete the following corrosion control treatment steps:

(i) Step 1. The water system shall conduct initial first draw lead and copper tap sampling in accordance with section 5-1.42 within a schedule specified by the State. If the lead or copper action level is exceeded at the 90th percentile the water system shall conduct water quality parameter sampling and source water sampling in accordance with sections 5-1.43 and 5-1.44.

(ii) Step 2. The water system shall recommend optimal corrosion control treatment within six months after the end of the monitoring period during which the system exceeds one of the action levels. Within 12 months after the end of the monitoring period during which a system exceeds the lead or copper action level, the State may designate optimal corrosion control treatment or require the system to perform corrosion control studies. If the State requires corrosion control studies to be conducted, the water system shall complete corrosion control studies as specified in paragraph (3) of this subdivision.

(a) Systems serving populations greater than 3,300 but less than 50,000 shall perform such studies within 18 months after the end of the monitoring period during which the system exceeds the lead or copper action level.

(b) Systems serving 3,300 or fewer persons shall perform such studies within 24 months after the end of the monitoring period during which the system exceeds the lead or copper action level.

(iii) Step 3. The water system shall install optimal corrosion control treatment within 24 months after the State designates such treatment.

(iv) Step 4. After installation of optimal corrosion control treatment, the water system shall complete first draw lead and copper tap sampling and water quality parameter follow-up sampling in accordance with sections 5-1.42(b)(2) and 5-1.43(b)(2) of this Subpart during the two consecutive six-month monitoring periods immediately following installation of treatment.

(v) Step 5. After State designation of water quality parameters for optimal corrosion control treatment, the water system shall operate in compliance with State-designated optimal water quality parameter values in accordance with subdivision (g) of this section; and continue to conduct first draw lead and copper tap sampling and water quality parameter sampling in accordance with sections 5-1.42(b)(3) and 5-1.43(b)(3) of this Subpart.

(3) Content of corrosion control studies. Corrosion control studies shall follow methods that include but are not limited to the following:

(i) an evaluation of the effectiveness of each of the following treatments, and, if appropriate, combinations of the following treatments using standard engineering tests on other systems of similar size, water chemistry and distribution system configuration:

(a) alkalinity and pH adjustment;

(b) calcium hardness adjustment; and

(c) 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;

(ii) measurements of appropriate water quality parameters to assess performance of corrosion control including: lead; copper; pH; alkalinity; calcium; conductivity; temperature; silica or orthophosphate;

(iii) an assessment of effectiveness of treatment including the potential for adverse effects on other water quality treatment processes; and

(iv) identification of the optimal corrosion control treatment(s) for the system, including a rationale of the treatment steps for consideration by the State.

(4) Conditions for ceasing treatment steps. Any water system that serves 50,000 or fewer people and 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 water system meets both action levels during each of two consecutive six-month monitoring periods. The lead and copper results from both monitoring periods shall be submitted to the

State for approval for ceasing treatment steps. If an action level is exceeded in a later monitoring period the water system shall complete the remaining applicable treatment steps.

(d) Designation of optimal corrosion control treatment.

Based upon consideration of available information including, where applicable, corrosion control studies performed under subdivision (c) of this section and a system's proposed treatment alternative, the State will either:

(1) approve the corrosion control treatment option recommended by the system; or

(2) require alternative corrosion control treatment(s) as specified by the State. The State may also ask for additional information or modifications.

(e) Installation of optimal corrosion control.

Each system shall properly install and operate throughout its distribution system the optimal corrosion control treatment(s) approved by the State under subdivision (d) of this section.

(f) State review of treatment and designation of optimal water quality control parameters.

Based upon a review of the results of lead and copper tap water samples and water quality parameter samples submitted to the State by the water system from both before and after the installation of optimal corrosion control treatment, the State shall determine whether the system has properly installed and operated the optimal corrosion control treatment, and designate water quality parameter values, or a range of values, within which the system must operate. Such water parameters shall include:

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

(2) a minimum pH value, measured in all tap samples. Such value shall be equal to or greater than 7.0, unless the State determines that meeting a pH level of 7.0 is not technologically feasible or is not necessary for the system to optimize corrosion control;

(3) 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 State determines is necessary to form a passivating film on the interior walls of the pipes of the distribution system;

(4) 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; and

(5) 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 State determines to reflect optimal corrosion control treatment for the system. The State may designate values for additional water quality control parameters determined by the State

to reflect optimal corrosion control for the system. The State shall notify the system in writing of these determinations and explain the basis for its decisions.

(g) Continued operation and monitoring.

(1) All systems optimizing corrosion control shall continue to operate and maintain optimal corrosion control treatment, including maintaining water quality parameters at or above minimum values or within ranges designated by the State under subdivision (f) of this section for all samples collected in accordance with sections 5-1.43(b)(3) and (c) of this Subpart. Compliance with the requirements of this paragraph shall be determined every six months, as specified in section 5-1.42(b)(3) of this Subpart. A water system is out of compliance with the requirements of this paragraph if it has excursions for any State-designated parameter on more than nine days during any six-month 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 State. The State has the discretion to delete results of obvious sampling errors from this calculation. Daily values are calculated as follows:

(i) 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.

(ii) On days when only one measurement for the water quality parameter is collected at the sampling location, the daily value shall be the result of that measurement.

(iii) 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 site.

(2) Modification of State treatment decisions. A water system may request a modification of its State designated optimal corrosion control treatment. The request shall be submitted in writing and include the reason for the modification along with supporting data.

5-1.42 Monitoring requirements for lead and copper in tap water.

(Effective Date: January 19, 2022)

(a) Sample requirements.

(1) Sample site location.

(i) 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 to ensure that the water system can collect the number of lead and copper tap samples required in paragraph (3) of this subdivision. 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.

(ii) The public water system shall review 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 material when reading water meters or performing maintenance activities):

(a) 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;

(b) 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

(c) 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.

(iii) The pool of targeted sampling sites for community water systems shall consist of:

(a) structures containing lead pipes, copper pipes with lead solder installed after 1982; and/or served by a lead service line. Sampling sites shall be selected from the following building types, in this order, until each building type is exhausted before moving to the next building type:

(1) residential single family (Tier 1 sample sites);

(2) multiple-family residence where at least 20 percent of the structures served by the water system are multiple-family residences (Tier 1 sample sites);

(3) 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 contain copper pipes with lead solder installed after 1982 or lead pipes; and/or served by a lead service line: (Tier 2 sample sites);

(b) where insufficient sites are available meeting the criteria of clause (a) of this subparagraph, the sampling pool shall be completed using single family residences that contain copper pipes with lead solder installed before 1983 (Tier 3 samples sites);

(c) where insufficient sampling sites are available meeting the criteria of clauses (a) and (b) of this subparagraph, the sampling pool shall be completed using representative sites that contain plumbing materials commonly found throughout the water system's distribution system;

(iv) The pool of targeted sampling sites for a nontransient noncommunity water system shall consist of structures that:

(a) contain copper pipes with leaded solder joints installed after 1982 or contain lead pipes; and/or

(b) are served by a lead service line.

(v) A nontransient noncommunity water system with insufficient Tier 1 sampling sites shall complete its sampling pool with sampling sites having copper pipes with lead solder joints installed before 1983. If additional sites are needed to complete the sampling pool, the nontransient noncommunity water system shall use representative sites throughout the distribution system.

(vi) 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 the 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 collect first-draw samples from all of the sites identified as being served by such lines.

(2) Sample collection methods. Samples shall be collected in a manner that will reasonably reflect potential lead levels delivered to user taps in accordance with 40 CFR 141.86(b)(2).

(i) All samples for lead and copper shall be collected from user taps and shall be first draw samples with the following exceptions: lead service line samples collected under section 5-1.42(a)(2)(iii); or, if a system meets the criteria in section 5-1.42(a)(2)(v) (e.g., prisons and hospitals).

(ii) 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 nonresidential 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 subparagraph (a)(2)(iii) of this paragraph 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.

(iii) 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:

(a) 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;

(b) tapping directly into the lead service line; or

(c) 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.

(iv) 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 to collect a follow-up tap sample, the system may collect the follow-up tap sample from another sampling site in its sampling pool as long as the new site meets the same targeting criteria, and is within reasonable proximity of the original site.

(v) A nontransient noncommunity water system, or a community water system that meets the criteria of 40 CFR 141.85(b)(7), that does not have enough taps that can supply first draw samples, as defined in 40 CFR 141.2, may apply to the State 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 State has the discretion to waive the requirement for prior State approval of non-first-draw sample sites selected by the system, either through State regulation or written notification to the system.

(3) Number of samples. A water system conducting standard monitoring shall collect at least one lead and copper tap sample during each monitoring period specified in subdivision (b) of this section from the number of sampling sites listed in the table below under Standard Monitoring. A water system conducting reduced monitoring shall collect at least one lead and copper tap sample during each monitoring period specified in subdivision (c) of this section from the number of sampling sites listed in the table below under Reduced Monitoring. Such reduced monitoring sites shall be representative of the sites required for standard monitoring.

If a public water system has fewer than five drinking water taps that can be used for human consumption and that meet the sample site criteria of subparagraph (1)(iii) of this subdivision to reach the required number of sample sites listed in the following table, the system may collect at least one sample from each tap and then collect additional samples from those taps on different days during the monitoring period to meet the required number of sites; or, with written State approval, collect fewer samples provided that all taps that can be used for human consumption are sampled. The State must approve this reduction of the minimum number of samples in writing based on a request from the system or onsite verification by the State. The State must specify sampling locations when a system is conducting reduced monitoring. A public water system may also apply to the State 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.

Population Served	Standard Monitoring Number of Sites	Reduced Monitoring Number of Sites
>100,000	100	50
10,001 to 100,000	60	30
3,301 to 10,000	40	20
501 to 3,300	20	10
101-500	10	5
≤100	5	5

(b) Standard monitoring.

Required samples shall be collected during six-month monitoring periods, beginning January 1st or July 1st of each calendar year.

(1) All systems shall monitor during each six-month monitoring period until:

(i) the system exceeds the lead or copper action level and is therefore required to implement the corrosion control treatment requirements under section 5-1.41, of this subpart in which case the system shall continue standard monitoring in accordance with paragraph (b)(2) of this section; or

(ii) the system is deemed to have optimized corrosion control in accordance with section 5-1.41(b) of this Subpart in which case the system may reduce monitoring in accordance with subdivision (c) of this section.

(2) Monitoring after installation of corrosion control and/or source water treatment. Any system which installs corrosion control treatment or source water treatment shall monitor during each six-month monitoring period following the installation of treatment with the first monitoring period to begin either January 1st or July 1st, whichever comes first.

(i) Any system which installs source water treatment pursuant to section 5-1.45(a)(2)(i) of this Subpart shall monitor during two consecutive six-month monitoring periods by the date specified in section 5-1.45(a)(2)(ii) of this Subpart.

(3) Monitoring after State designates water quality parameter values for optimal corrosion control. After the State designates the values for water quality parameters under section 5-1.41(f) of this Subpart, the system shall monitor during each six-month monitoring period following designation of water quality parameter values with the first monitoring period to begin either January 1st or July 1st, whichever comes first.

(c) Reduced monitoring.

(1) A system serving 50,000 or fewer persons 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 (a)(3) of this section, and reduce the frequency of

sampling to once per year. A system serving 50,000 or fewer persons that meets the lead and copper action levels during three consecutive years under reduced monitoring may reduce the frequency of monitoring for lead and copper from annually to once every three years. Samples collected during the initial two six-month monitoring periods may be accepted as monitoring for the first year of a three-year reduced monitoring frequency. A system serving 50,000 or fewer persons collecting fewer than five samples as specified in paragraph (a)(3) of this section that meets the lead and copper action levels during each of two consecutive six-month monitoring periods may reduce the frequency of sampling to once per year. The system may not reduce the number of samples required to below the minimum of one sample per available tap. This sampling shall begin during the calendar year immediately following the end of the second consecutive six-month monitoring period.

(2) Any water system that has optimal corrosion control treatment installed that meets the lead action level and maintains the range of values for optimal corrosion control treatment during each of two consecutive six-month monitoring periods may reduce the frequency of monitoring to once per year and reduce the number of lead and copper samples in accordance with paragraph (a)(3) of this section if it receives written approval from the State. This sampling shall begin during the calendar year immediately following the end of the second consecutive six-month monitoring period. Samples collected during the initial two six-month monitoring periods can be applied to the first year of a three-year reduced monitoring frequency.

Upon written approval from the State, any water system that has optimal corrosion control treatment installed that meets the lead action level and maintains the range of values for the water quality control parameters reflecting optimal corrosion control treatment during three consecutive years of monitoring may reduce the frequency of monitoring for lead and copper from annually to once every three years. Samples collected once every three years shall be collected no later than every third calendar year.

(3) A water system on a reduced monitoring schedule shall collect these samples from representative sites included in the pool of targeted sampling sites identified in subdivision (a) 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 State has approved a different sampling period in accordance with subparagraph (i) of this paragraph.

(i) The State, upon request by a water system, may approve a different period for conducting the lead and copper tap sampling for systems on a reduced monitoring schedule. Such a period shall be no longer than four consecutive months and shall represent a time of normal operation where the highest levels of lead are most likely to occur. This sampling shall begin during the calendar year immediately following the end of the second consecutive six-month monitoring period for systems initiating annual monitoring and during the three-year period following the end of the third consecutive calendar year of annual monitoring for systems initiating triennial monitoring.

(ii) Systems monitoring annually, that have been collecting samples during the months of June through September and that receive State approval to alter their sample monitoring period under subparagraph (i) of this paragraph, shall 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 subparagraph (i) of this paragraph, shall 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 shall be collected annually or triennially, as required by this section. Water systems with waivers that serve 50,000 or fewer persons that have been collecting samples during the months of June through September and choose to alter their sample collection period under subparagraph (i) of this paragraph shall collect their next round of samples before the end of the 9-year period.

(4) Any water system that demonstrates for two consecutive 6-month monitoring periods that the tap water lead level is less than or equal to 0.005 mg/L and the tap water copper level is less than or equal to 0.65 mg/L, at the 90th percentile calculated in accordance with section 5-1.40(b)(4) of this Subpart may reduce the number of samples in accordance with subdivision (a)(3) of this section and reduce the frequency of sampling to once every three calendar years.

(5) Conditions requiring a return to standard monitoring.

(i) A system serving 50,000 or fewer persons subject to reduced monitoring that does not have corrosion control treatment installed and that exceeds the lead or copper action level shall resume standard monitoring at the standard number of sampling sites every six months in accordance with subdivision (b) of this section. Such a system shall also conduct water quality parameter monitoring in accordance with section 5-1.43(b) of this Subpart. This monitoring shall begin during the six-month monitoring period immediately following the lead or copper action level exceedance with the first monitoring period to begin either January 1st or July 1st, whichever comes first. Any such system may resume reduced monitoring if it meets the reduced monitoring criteria as specified in paragraph (1) of this subdivision.

(ii) Any water system that has optimal corrosion control treatment installed that fails to meet the lead action level during any four-month monitoring period, or that fails to operate at or above the minimum value or within the range of values for the water quality parameters specified by the State under section 5-1.41(f) of this Subpart for more than nine days in any six-month monitoring period specified in section 5-1.43(b)(3) of this Subpart shall resume standard monitoring at the standard number of sampling sites every six months in accordance with subdivision (b) of this section, and resume standard monitoring for water quality parameters in accordance with section 5-1.43(b) of this Subpart. This standard monitoring shall begin during the six-month monitoring period immediately following the water quality parameter excursion or lead action level

exceedance with the first monitoring period to begin either January 1st or July 1st, whichever comes first. Any such 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:

(a) The system may resume reduced monitoring for lead and copper at the tap if it meets the reduced monitoring criteria as specified in subdivision (c)(2) of this section and it has received written approval from the State. This sampling shall begin during the calendar year immediately following the end of the second consecutive six-month monitoring period.

(b) The system may reduce the number of water quality parameter tap water samples required and the frequency with which it collects such samples in accordance with section 5-1.43(c)(2) of this Subpart. 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 5-1.43(c)(2)(ii) of this Subpart, that it has re-qualified for triennial monitoring.

(6) Any water system subject to reduced monitoring that either adds a new source of water or changes any water treatment shall notify the State in writing within 60 days of any proposed changes. The State may require any system that makes treatment or source changes to resume standard monitoring in accordance with subdivision (b) 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. Any proposed changes to add a new source or long-term change in treatment must be consistent with section 5-1.22(a) of this Subpart and approved by the State prior to implementation.

(d) 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 State in making any determinations (i.e., calculating the 90th percentile lead or copper level) under sections 5-1.40 through 5-1.48 of this Subpart.

(e) Invalidation of lead or copper tap water samples.

The State may invalidate a lead or copper tap water sample if one of the following conditions is met:

(1) the laboratory establishes that improper sample analysis caused erroneous results;

(2) the State determines that the sample was taken from a site that did not meet the site selection criteria of this section;

(3) the sample container was damaged in transit;

(4) there is substantial reason to believe that the sample was subject to tampering.

If a sample is invalidated, it does not count toward determining lead or copper 90th percentile levels or toward meeting the minimum monitoring requirements for that system. To invalidate a

sample, the decision and the rationale for the decision must be documented in writing. The system shall submit to the State, for invalidation determination, the results it believes should be invalidated along with supporting documentation and the rationale for supporting invalidation of the samples. If after invalidation of sample results, the system has too few samples to meet minimum sampling requirements, replacement samples shall be taken as soon as possible, but no later than 20 days after invalidation or by the end of the applicable monitoring period, whichever is later. Replacement samples apply only to the monitoring period associated with the original sample, and shall be taken from the same location. If resampling from the same location is not possible or the sample site was invalidated, the resample may be taken from other sites in the sampling pool not already used for sampling during that monitoring period.

(f) Monitoring waivers for systems serving 3,300 or fewer persons. Any water system that serves 3,300 or fewer persons and meets the criteria in this subdivision may be eligible for a waiver to reduce monitoring of lead and copper to once every nine years (full waiver), or only for lead, or only for copper (partial waiver). 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 subparagraphs (f)(1)(i) and (ii) and/or (f)(2)(i) of this section. In addition, the system must meet the monitoring criteria in subparagraphs (f)(1)(iii) and/or (f)(2)(ii).

(1) Lead. To qualify for a full waiver or a waiver of the tap water monitoring requirements of lead (i.e. a lead waiver), the water system must provide certification and supporting documentation to the State that the system is free of all lead-containing materials, as follows:

(i) It contains no plastic pipes which contain lead plasticizers, or plastic service lines which contain lead plasticizers; and

(ii) 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 section 5-1.22(a) (Approval of plans and completed works).

(iii) After completing at least one 6-month round of standard tap water monitoring for lead and copper at sites approved by the State as described in subdivisions 5-1.42(a) and (b) of this Subpart, the system must demonstrate that the 90th percentile lead level does not exceed 0.005 mg/l.

(2) Copper.

(i) To qualify for a full waiver or a waiver of the tap water monitoring requirements of copper (i.e. a copper waiver), the water system must provide certification and supporting documentation to the State that the system contains no copper pipes or copper service lines.

(ii) After completing at least one 6-month round of standard tap water monitoring for lead and copper at sites approved by the State as described in subdivisions 5-1.42(a) and (b) of

this Subpart, the system must demonstrate that the 90th percentile copper level does not exceed 0.65 mg/l.

(3) Approval of waiver application. The system will be notified of the State's determination in writing, setting forth the basis for its decision and any condition of the waiver. The system may be required to perform specific activities (e.g., limited monitoring, periodic outreach to customers to remind them to avoid installation of materials that might void reduced monitoring) to avoid the risk of lead or copper concentration of concern in tap water. A system serving fewer than 3,300 persons must continue monitoring for lead and copper at the tap as required in subdivisions (b) and (c) of this section, as appropriate, until it receives written notification that the reduced monitoring has been approved.

(4) Monitoring frequency for systems with waivers.

(i) A system with a full waiver must conduct tap water monitoring for lead and copper in accordance with paragraph (c)(4) of this section at the reduced number of sampling sites identified in paragraph (a)(3) of this section at least once every nine years and provide the materials certification specified in this subdivision for both lead and copper to the State along with the monitoring results. Samples collected every nine years must be collected no later than every ninth calendar year.

(ii) A system with a partial waiver monitoring for a single contaminant must conduct tap water monitoring for that contaminant in accordance with paragraph (c)(4) of this section at the reduced number of sampling sites specified in paragraph (a)(3) of this section at least once every nine years and provide the materials certification specified in this subdivision pertaining to the contaminant along with the monitoring results. Such systems must also continue to monitor for the contaminant not on reduced monitoring in accordance with requirements of paragraphs (b)(1) through (3) and subdivision (c) of this section, as appropriate.

(iii) Any water system with a full or partial wavier must notify the State in writing in accordance with section 5-1.48(a)(3) of this Subpart of any upcoming long-term change in treatment or addition of a new source. The State must review and approve the addition of a new source or change in water treatment before it is implemented by the water system. The State has the authority to require the system to add or 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.

(iv) 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 must notify the State in writing no later than 60 days after becoming aware of such a change.

(5) Continued eligibility. Systems may continue to be eligible for a waiver, and such waiver will renew automatically, unless any of the conditions listed in subparagraphs (i)-(iii) of this

paragraph occurs. If a waiver is not renewed, the system shall meet the requirements for action level exceedances or for the three-year reduced monitoring cycle, as appropriate. 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 paragraphs (1) and (2) of this subdivision.

(i) A system with a full waiver or a lead waiver no longer satisfies the materials criteria of subparagraph (1)(i) of this subdivision or has a 90th percentile lead level greater than 0.005 mg/L.

(ii) A system with a full waiver or a copper waiver no longer satisfies the materials criteria of paragraph (2) of this subdivision or has a 90th percentile copper level greater than 0.65 mg/L.

(iii) The State notifies the system, in writing, that the waiver has been revoked, setting forth the basis of its decision.

(6) Requirements following waiver revocation. A system whose full or partial waiver has been revoked by the State is subject to the corrosion control treatment and lead and copper tap water monitoring requirements, as follows:

(i) if the system exceeds the lead and/or copper action level, the system must implement corrosion control treatment as specified in section 5-1.41(c)(2) of this Subpart, and any other applicable requirements;

(ii) if the system meets both the lead and the 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 section 5-1.43(a)(2) of this Subpart.

(7) Any water system with a full or partial waiver shall notify the State in writing of any upcoming long-term change in treatment or addition of a new source, consistent with section 5-1.22(a) of this Subpart and approved by the State prior to implementation. The State must review and approve the addition of a new source or long-term change in water treatment before it is implemented by the water system. The State may require the system to add or modify waiver conditions (e.g., require recertification that the system is free of lead-containing and/or copper-containing materials, require additional round of monitoring), if it deems such modifications are necessary to address treatment or source water changes at the system.

5-1.43 Monitoring requirements for water quality parameters.

(Effective Date: December 28, 2022)

All systems serving over 50,000 persons and systems that exceed the lead or copper action level shall monitor water quality parameters in addition to lead and copper in tap water in accordance with this section.

(a) Sample requirements.

(1) Sample collection method.

(i) Distribution system (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. Distribution system sampling under this section is not required to be conducted at taps targeted for lead and copper sampling under section 5-1.42(a) of this Subpart.

(ii) Entry point samples 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 shall sample at entry point(s) representative of normal operating conditions.

(2) Number of samples.

(i) A water system conducting standard monitoring shall collect two samples for applicable water quality parameters during each monitoring period specified in subdivision (b) of this section from the number of distribution system sampling sites listed in the table below under Standard Monitoring. A water system conducting reduced monitoring shall collect two samples for applicable water quality parameters during each monitoring period specified in subdivision (c) of this section from the number of distribution system sampling sites listed in the table below under Reduced Monitoring. Such reduced monitoring sites shall be representative of the sites required for standard monitoring

	STANDARD MONITORING	REDUCED MONITORING
Population served	*(Sample sites)*	*(Sample sites)*
>100,000	25	10
10,001 to 100,000	10	7
3,301 to 10,000	3	3
501 to 3,300	2	2
101 to 500	1	1
<101	1	1

(ii) A water system conducting monitoring in accordance with paragraph (b)(1) of this section shall collect two entry point samples for each applicable water quality parameter at each entry point to the distribution system during each six-month monitoring period. A water system conducting monitoring in accordance with paragraphs (b)(2), (3), and subdivision (c) of this section shall collect one entry point sample for each applicable water quality parameter at each entry point to the distribution system, or each applicable entry point in accordance with subparagraph (b)(2)(iii) of this section, at the frequency specified in subparagraph (b)(2)(ii) of this section.

(b) Standard monitoring.

Required samples shall be collected during six-month monitoring periods, beginning January 1st or July 1st of each calendar year.

(1) Initial sampling. All systems serving more than 50,000 persons shall measure the applicable water quality parameters during each six-month monitoring period specified in section 5-1.42(b)(1) of this Subpart. All systems serving 50,000 or fewer persons shall measure the applicable water quality parameters during each six-month monitoring period during which the system exceeds the lead or copper action level. Applicable water quality parameters at taps and entry points include: pH; alkalinity; conductivity; water temperature; calcium; and orthophosphate or silica, as appropriate to the corrosion control treatment used.

(2) Monitoring after installation of corrosion control. Any system which installs optimal corrosion control treatment shall measure the water quality parameters at the locations and frequencies specified below during each six-month monitoring period specified in section 5-1.42(b)(2) of this Subpart.

(i) Two samples shall be collected at taps in the distribution system for the following parameters: pH; alkalinity; calcium; and orthophosphate or silica, as appropriate to the corrosion control treatment used.

(ii) one sample shall be collected at each entry point: Except as provided in subparagraph (iii) of this paragraph, at least one sample no less frequently than every two weeks (biweekly) for pH; alkalinity (and a reading of the dosage rate of the chemical used to adjust alkalinity, and the alkalinity concentration is adjusted); calcium; orthophosphate or silica, as appropriate to the corrosion control treatment used; and a reading of the dosage rate of the corrosion control treatment chemical used.

(iii) A ground water system may limit entry point sampling described in subparagraph (ii) of this paragraph to those entry points that are representative of water quality and treatment conditions throughout the system. If water from untreated ground water sources mixes with water from treated ground water sources, the system shall monitor for water quality parameters both at representative entry points receiving treatment and representative entry points receiving no treatment. Prior to the start of any monitoring under this paragraph, the system shall provide to the State 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.

(3) Monitoring after State specifies water quality parameter values for optimal corrosion control. After the State specifies the values for applicable water quality control parameters reflecting optimal corrosion control treatment, all systems serving more than 50,000 persons and any system serving 50,000 or fewer persons that has optimal corrosion control treatment installed shall measure the applicable water quality parameters during each six-month monitoring period specified in section 5-1.42(b)(3) of this Subpart, in accordance with

subparagraphs (2)(i)-(iii) of this subdivision, and determine compliance with the requirements of section 5-1.41(g) of this Subpart during each six-month monitoring period specified in section 5-1.42(b)(3) of this Subpart.

(c) Reduced monitoring.

(1) Reducing the number of sampling sites. Any water system that maintains the range of State specified values for the water quality parameters reflecting optimal corrosion control treatment during each of two consecutive six-month monitoring periods under paragraph (b)(3) of this section shall continue monitoring at the entry point(s) to the distribution system as specified in subparagraphs (b)(2)(ii)-(iii) of this section. Such system may collect two distribution system samples for applicable water quality parameters from the reduced number of sites in accordance with subparagraph (a)(2)(i) of this section during each six-month monitoring period.

(2) Reducing sampling frequency.

(i) Any water system that maintains the range of State-specified values for the water quality parameters reflecting optimal corrosion control treatment during three consecutive years of monitoring in accordance with paragraph (1) of this subdivision may reduce the frequency with which it collects the number of distribution system samples for applicable water quality parameters specified in paragraph (1) of this subdivision from every six months to annually. This sampling shall begin during the calendar year immediately following the end of the monitoring period in which the third consecutive year of six-month monitoring occurs. Any water system that maintains the range of State-specified values for the water quality parameters reflecting optimal corrosion control treatment during three consecutive years of annual monitoring under this paragraph may reduce the frequency with which it collects the number of distribution system samples for applicable water quality parameters specified in paragraph (1) of this subdivision from annually to every three years. This sampling begins no later than the third calendar year following the end of the monitoring period in which the third consecutive year of monitoring occurs.

(ii) A water system may reduce the frequency with which it collects the number of distribution system samples for applicable water quality parameters specified in subdivision (c)(1) 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 for lead specified in section 5-1.40(b)(1) of this Subpart, that its tap water copper level at the 90th percentile is less than or equal to 0.65 mg/L for copper, and that it also has maintained the range of values for the water quality parameters reflecting optimal corrosion control treatment specified by the State under section 5-1.41(f) of this Subpart.

(iii) Monitoring conducted every three years shall be done no later than every third calendar year.

(3) A water system that conducts reduced sampling frequency shall collect these samples evenly throughout monitoring period in which samples are taken so as to reflect seasonal variability.

(4) Any water system subject to the 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 State under section 5-1.41(f) of this Subpart for more than nine days in any six-month period shall resume distribution system tap water sampling in accordance with the number and frequency requirements in paragraph (b)(3) of this section. The water system may resume annual monitoring for water quality parameters at the tap at the reduced number of sites specified in subparagraph (a)(2)(i) of this section after it has completed two subsequent consecutive six-month rounds of monitoring that meet the criteria of that subdivision and/or may resume triennial monitoring for water quality parameters at taps in the distribution system at the reduced number of sites after it demonstrates through subsequent rounds of monitoring that it meets the criteria of either subparagraph (2)(i) or (ii) of this subdivision.

(d) 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 State in making any compliance determinations (i.e., determining concentrations of water quality parameters).

5-1.44 Monitoring requirements for lead and copper in source water.

(Effective Date: January 17, 2018)

A water system that exceeds the lead or copper action level based on first draw tap water samples collected in accordance with section 5-1.42 of this Subpart shall collect lead and copper source water samples in accordance with the following requirements:

(a) Sample requirements.

(1) Water systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each source after treatment. The system shall collect each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant. If a system draws water from more than one source and the sources are combined before distribution, the system shall sample at entry point(s) to be representative of normal operating conditions, when water is representative of all sources being used.

(2) The State may reduce the total number of samples which shall be analyzed by allowing the use of compositing. Compositing of samples shall be done by certified laboratory personnel. Composite samples from a maximum of five samples are allowed, provided that the method detection limit (MDL) for lead of 0.001 mg/L is achieved. 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:

(i) a follow-up sample shall be taken and analyzed within 14 days at each sampling point included in the composite; or

(ii) if duplicates of or sufficient quantities from the original samples from each sampling point used in the composite are available, the system may use these instead of resampling.

(3) Where the results of sampling indicate an exceedance of State-specified maximum permissible source water levels established under section 5-1.45(a)(4) of this Subpart, the State may require that one follow-up sample be collected as soon as possible after the initial sample was taken (but not to exceed two weeks) at the same sampling point. If a State-required follow-up sample is taken for lead or copper, then the results of the initial and follow-up samples shall be averaged to determine compliance with the State-specified maximum permissible levels. Any sample value below the detection limit shall be considered to be zero. Any value above the detection limit but below the practical quantitation limit (PQL) shall either be considered as the measured value or be considered one-half the PQL.

(b) Standard monitoring.

(1) Monitoring frequency after system exceeds tap water action level. Any system which exceeds the lead or copper action level shall collect one source water sample from each entry point to the distribution system no later than six months after the end of the monitoring period during which the lead or copper action level was exceeded. For monitoring periods that are annual or less frequent, the end of the monitoring period is September 30th of the calendar year in which the sampling occurs, or if the State has established an alternate monitoring period, the last day of that period.

(2) Monitoring frequency after installation of source water treatment. Any system which installs source water treatment pursuant to section 5-1.45 of this Subpart shall collect an additional source water sample from each entry point to the distribution system during the two consecutive six-month monitoring periods immediately following the installation of treatment with the first monitoring period to begin either January 1st or July 1st, whichever comes first.

(3) Monitoring frequency after State specifies maximum permissible source water levels or determines that source water treatment is not needed.

(i) A system shall monitor at the frequency specified below in cases where the State specifies maximum permissible source water levels or determines that the system is not required to install source water treatment under section 5-1.45 of this Subpart.

(a) A water system using only ground water shall collect samples once every three years with the first three year monitoring period to begin January 1st of the year in which the State determination is made under this subparagraph. Such systems shall collect samples once during each subsequent compliance period. Triennial samples shall be collected in the third calendar year.

(b) A water system using surface water (or a combination of surface and ground water) shall collect samples once during each calendar year with the first annual monitoring period to begin January 1st of the year in which the applicable State determination is made under this subparagraph.

(ii) A system is not required to conduct source water sampling for lead and/or copper if the system meets the action level for the specific contaminant in tap water samples during the entire source water sampling period applicable to the system under clause (i)(*a*) or (*b*) of this paragraph.

(c) Reduced monitoring**.**

(1) A water system using only ground water may reduce the monitoring frequency for lead and copper in source water to once every nine-years provided that the samples are collected no later than every ninth calendar year and the system meets one of the following criteria:

(i) 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 State under section 5-1.45(a) of this Subpart during at least three consecutive years in which sampling was conducted under subparagraph (b)(3)(i) of this section; or

(ii) the State has determined that source water treatment is not needed and the system demonstrates that 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 during at least three consecutive applicable monitoring periods in which sampling was conducted under subparagraph (b)(3)(i) of this section.

(2) A water system using surface water (or a combination of surface water and ground water) may reduce the monitoring frequency for lead and copper in source water to once during each nine-year compliance cycle provided that the samples are collected no later than every ninth calendar year and if the system meets one of the following criteria:

(i) 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 State for at least three consecutive years; or

(ii) the State 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.

(3) 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 in accordance with paragraph (b)(2) or (3) of this section are below the maximum permissible lead and copper concentrations specified by the State.

5-1.45 Source water treatment requirements.

(Effective Date: January 19, 2022)

A water system that exceeds the lead or copper action level based on first draw tap water samples collected in accordance with section 5-1.42 of this Subpart shall complete the applicable source water monitoring and treatment requirements and operate appropriate treatment to maintain lead and copper below levels specified by the State in accordance with the following requirements.

(a) Source water treatment requirements.

(1) A water system exceeding the lead or copper action level shall complete required lead and copper source water monitoring in accordance with section 5-1.44(b)(1) of this Subpart and make an appropriate treatment recommendation to the State no later than 180 days after the end of the monitoring period during which the system exceeds the lead or copper action level. 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 users' taps.

(2) Based on an evaluation of the results of all required source water sampling, the State shall make a determination if source water treatment is necessary and may require:

(i) source water treatment as recommended by the system; or

(ii) alternative source water treatment that would minimize lead and copper levels at user's taps. Completion of proper installation and operation of the State specified source water treatment shall occur within 24 months of State determination and notification of the specified treatment to the water system.

(3) The water system shall complete standard monitoring for tap water in accordance with section 5-1.42(b) of this Subpart and source water in accordance with section 5-1.44(b)(2) of this Subpart following installation of source water treatment.

(4) Based on a review of the source water samples taken by the water system both before and after the system installs source water treatment, the State shall:

(i) determine whether the system has properly installed and operated the source water treatment designated by the State; and

(ii) specify maximum permissible source water concentrations for water entering the distribution system. Such levels shall reflect the contaminant removal capability of the treatment when properly operated and maintained.

(b) Operation and maintenance requirements.

(1) Each water system shall operate in a manner that minimizes lead and copper levels at user's taps by maintaining lead and copper levels below State-specified maximum permissible concentrations at each of the required source water sampling locations in accordance with section 5-1.44 of this Subpart. The system is out of compliance with this

paragraph if the level of lead or copper at any sampling point is greater than the State-specified maximum permissible concentration.

(2) The State may modify its determination of the source water treatment under paragraph (a)(2) of this section, or maximum permissible lead and copper concentrations for finished water entering the distribution system under paragraph (a)(4) of this section where it concludes that such change is necessary to ensure that the system continues to minimize lead and copper concentrations in source water.

5-1.46 Lead service line replacement.

(Effective Date: January 19, 2022)

(a) Water systems that fail to meet the lead action level in tap samples collected after installing corrosion control treatment and/or source water treatment (whichever sampling occurs later) shall replace lead service lines in accordance with the requirements of this section. Water systems that fail to install optimal corrosion control treatment in accordance with section 5-1.41(c) of this Subpart or source water treatment in accordance with section 5-1.45(a)(2) of this Subpart by the date(s) specified by the State may be required to begin replacement of lead service lines.

(b) Determining number of lead service lines for replacement.

(1) A water system shall replace annually at least seven 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 system 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 on materials evaluation, including the evaluation required under section 5-1.42(a) of this Subpart 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 first day following the end of the monitoring period in which the action level was exceeded in tap sampling referenced in subdivision (a) of this section. If monitoring is required annually or less frequently, the end of the monitoring period is September 30th of the calendar year in which the sampling occurs. If an alternate monitoring period applies, then the end of the monitoring period will be the last day of that period.

(2) A water system is not required to replace an individual lead service line if the results of all samples representative of water in the lead service line, collected in accordance with section 5-1.42(a)(2)(iii) of this Subpart, are less than or equal to 0.015 mg/L.

(3) The total number of lines replaced, either entirely or partially per subdivision (c) of this section, shall equal at least seven percent of the initial number of lead lines identified under paragraph (1) of this subdivision or the percentage specified by the State as per subdivision (d) of this section.

(4) Any water system resuming a lead service line replacement program after the cessation of its lead service line replacement program as allowed by subdivision (e) of this section shall update its inventory of lead service lines to include those sites that were previously determined not to require replacement through the sampling provision under subdivision (b)(2) of this section. The system will then divide the updated number of remaining lead service lines by the number of remaining years in the program to determine the number of lines that shall be replaced per year (7-percent lead service line replacement is based on a 15-year replacement program). For those systems that have completed a 15-year lead service line replacement program, the State will determine a schedule for replacing or re-testing lines that were previously tested under the replacement program if the system re-exceeds the action level.

(c) A water system shall replace the 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 owner's 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, 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:

(1) At least 45 days prior to commencing with 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 of lead levels in their drinking water, along with guidance on measures consumers can take to minimize their exposure to lead. The State may allow the water system to provide notice of less than 45 days prior to commencing partial lead service line replacement, if such replacement is done 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 in section 5-1.42(a)(2)(iii) of this Subpart, within 72 hours after the 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.

(2) The water system shall provide the information required by paragraph (1) of this subdivision to the residents of individual dwellings by mail or by other methods approved by the State. In instances where multi-family dwellings are served by the service line, the water system shall have the option to post the information at a conspicuous location.

(d) The State 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 a shorter replacement schedule is feasible. The State shall make this determination in writing and notify the system of its finding within six months after the system is triggered into lead service line replacement based on monitoring results referenced in subdivision (a) of this section.

(e) Any water system may cease replacing lead service lines whenever first draw tap water samples meet the lead action level during each of two consecutive six-month monitoring periods. If subsequent rounds of first draw tap water sampling exceed the lead action level the water system shall recommence replacing lead service lines in accordance with subdivision (b) of this section.

(f) To demonstrate compliance with subdivisions (a) through (d) of this section, a system shall report to the State the information specified and no later than the schedule described in 40 CFR 141.90(e).

5-1.47 Notification and public education requirements.

(Effective Date: December 28, 2022)

(a) Notification of results to consumers.

All water systems shall provide notice of the individual tap results from lead tap water monitoring carried out under the requirements of section 5-1.42 of this Subpart to the persons served by the water system at the specific sampling site from which the sample was taken (i.e., the occupants of the residence where the tap was tested). Water systems that exceed the lead action level shall sample the tap water of any customer who requests it in accordance with subdivision (i) of this section.

(1) Notice shall be provided as soon as practical, but no later than 30 days after the system learns of the tap monitoring results.

(2) Notice shall be provided either by mail or by another method approved by the State.

(3) Notice shall include the lead levels for the tap that was tested, an explanation of the health effects of lead, a list of steps consumers can take to reduce exposure to lead in drinking water, and contact information for the water utility. The notice shall also provide the maximum contaminant level goal and the action level for lead and the definitions for these two terms from section 5-1.72(f) of this Subpart.

(b) Public education material content and delivery.

A water system that exceeds the lead action level based on tap water samples collected in accordance with section 5-1.42 of this Subpart shall deliver public education materials in accordance with paragraphs (1) and (2) of this subdivision.

(1) Content of public education materials.

(i) Community water systems and nontransient noncommunity water systems. Water systems shall include the following elements in printed materials (e.g., brochures and pamphlets) in the same order as listed below. In addition, language in clauses (a) through (b) and (f) of this subparagraph shall be included in the materials, exactly as written, except for the text in brackets in these clauses for which the water system shall include system-specific information. Any additional information presented by a water system

shall be consistent with the information below and be in plain language that can be understood by the general public. Water systems shall submit all written public education materials to the State for approval prior to delivery.

(a) IMPORTANT INFORMATION ABOUT LEAD IN YOUR DRINKING WATER. [Insert Name of Water System] found elevated levels of lead in drinking water in some homes/buildings. Lead can cause serious health problems, especially for pregnant women and young children. Please read this information closely to see what you can do to reduce lead in your drinking water.

(b) Health effects of lead. Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and can interfere with the production of red blood cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants, young children, and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones, and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development.

(c) Provide information on sources of lead.

(1) explain what lead is;

(2) explain possible sources of lead in drinking water and how lead enters drinking water. Include information on home/building plumbing materials and service lines that may contain lead.

(3) discuss other important sources of lead exposure in addition to drinking water (e.g., lead-based paint).

(d) Discuss the steps consumers can take to reduce their exposure to lead in drinking water:

(1) encourage running the water to flush out lead;

(2) explain concerns with using hot water from the tap and specifically caution against the use of hot water for preparing baby formula;

(3) explain that boiling water does not reduce lead levels;

(4) discuss other options consumers can take to reduce exposure to lead in drinking water, such as alternative sources or treatment of water;

(5) suggest that parents have their child's blood tested for lead.

(e) Explain why there are elevated levels of lead in the system's drinking water (if known) and what the water system is doing to reduce the lead levels in homes/buildings in this area.

(f) For more information call us at [Insert Your Number] [(If Applicable), or visit our website at [Insert Your website Here]]. For more information on reducing lead exposure around your home/building and the health effects of lead, visit EPA's website at http://www.epa.gov/lead or contact your health care provider.

(ii) Community water systems. In addition to including the elements specified in this paragraph, community water systems shall:

(a) tell consumers how to get their water tested;

(b) discuss lead in plumbing components, the difference between low lead and lead free, the requirement to use lead-free materials, and the standards that materials shall meet in order to be considered lead free.

(iii) Each water system required to deliver public education materials through additional means specified in subparagraphs (2)(i) through (ii) of this subdivision shall include additional content as determined in consultation with the State.

(2) Delivery of public education materials.

(i) For public water systems serving a large proportion of non-English speaking consumers, as determined by the State, the public education materials shall 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 public education materials or to request assistance in the appropriate language.

(ii) A community water system that exceeds the lead action level and that is not already conducting public education tasks under this section, shall conduct the following public education tasks within 60 days after the end of the monitoring period in which the exceedance occurred. For systems that are required to conduct monitoring annually or less frequently, the end of the monitoring period is September 30th of the calendar year in which the sampling occurs or, if the State has established an alternate monitoring period, the last day of that period:

(a) Deliver printed materials meeting the content requirements of paragraph (b)(1) of this section to all bill paying customers.

(b) Contact consumers who are most at risk by delivering education materials that meet the content requirements of paragraph (b)(1) of this section as follows:

(1) contact the State for a list of community based organizations serving target populations, even if they are not located within the water system's service area, and deliver education materials to all appropriate organizations along with an informational notice that encourages distribution to all the organization's potentially affected customers or community water system's users as determined in consultation with the State. The water system must contact the State directly by phone or in person;

(2) contact customers who are most at risk by delivering materials to the following organizations that are located within the water system's service area, along with an informational notice that encourages distribution to all the organization's potentially affected customers or community water system's users:

(i) public and private schools or school boards;

(ii) women, infants and children (WIC) and Head Start programs;

(iii) public and private hospitals and medical clinics;

(iv) pediatricians;

(v) family planning clinics;

(vi) Social welfare agencies;

(3) make a good faith effort to locate the following organizations within the service area and deliver materials, along with an informational notice that encourages distribution to all potentially affected customers or users. The good faith effort to contact at-risk customers may include requesting a specific contact list of these organizations from the State:

(i) licensed childcare centers;

(ii) public and private preschools;

(iii) obstetricians-gynecologists and midwives;

(c) no less often than quarterly, provide information on or in each water bill as long as the system exceeds the action level for lead. The message on the water bill shall include the following statement exactly as written except for the text in brackets for which the water system shall include system-specific information: [Insert Name of Water System] found high levels of lead in drinking water in some homes. Lead can cause serious health problems. For more information please call [Insert Name of Water System] [or visit (Insert Your website Here)]. The message or delivery mechanism can be modified in consultation with the State; specifically, the State may allow a separate mailing of public education materials to customers if the water system cannot place the information on water bills;

(d) Post material meeting the content requirements of paragraph (b)(1) of this section on the water system's website if the system serves a population greater than 100,000 or if the water system maintains a publicly accessible website;

(e) submit a press release to newspaper, television and radio stations;

(f) in addition to the other requirements of this section, systems shall implement at least three activities from one or more categories listed below. The educational

content and selection of these activities must be determined in consultation with the State:

(1) public service announcements;

(2) paid advertisements;

(3) public area informational displays;

(4) e-mails to customers;

(5) public meetings;

(6) household deliveries;

(7) targeted individual customer contact;

(8) direct material distribution to all multi-family homes and institutions;

(9) other methods approved by the State.

(c) As long as a community water system exceeds the action level, it shall repeat the activities pursuant to subparagraph 5-1.47(b)(2)(ii) of this Subpart as described in paragraphs (c)(1) through (4) of this section.

(1) A community water system shall repeat the tasks contained in clauses 5-1.47(b)(2)(ii)(*a*), (*b*), and (*f*) of this section every 12 months.

(2) A community water system shall repeat tasks contained in clause 5-1.47(b)(2)(ii)(*c*) of this section with each billing cycle.

(3) A community water system serving a population greater than 100,000 shall post and retain material on a publicly accessible website pursuant to clause 5-1.47(b)(2)(ii)(*d*) of this section.

(4) The community water system shall repeat the task in clause 5-1.47(b)(2)(ii)*(e)* of this section twice every 12 months on a schedule agreed upon with the State. The State may allow activities in subparagraph 5-1.47 (b)(2)(ii) of this section to extend beyond the 60-day requirement if needed for implementation purposes on a case-by-case basis; however, this extension must be approved in writing by the State in advance of the 60-day deadline.

(d) A nontransient noncommunity water system that exceeds the lead action level and that is not already conducting public education tasks under this section shall conduct the following public education tasks within 60 days after the end of the monitoring period in which the exceedance occurred. For systems that are required to conduct monitoring annually or less frequently, the end of the monitoring period is September 30th of the calendar year in which the sampling occurs or, if the State has established an alternate monitoring period, the last day of that period:

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

(2) distribute informational pamphlets and/or brochures on lead in drinking water to each person served by the nontransient noncommunity water system. The State 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 nontransient noncommunity water system shall repeat the tasks contained in subdivision (d) of this section at least once during each calendar year in which the system exceeds the lead action level. The State may allow activities in this section to extend beyond the 60-day requirement if needed for implementation purposes on a case-by-case basis; however, this extension must be approved in writing by the State in advance of the 60-day deadline.

(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. Such a system shall recommence public education in accordance with this section if it exceeds the lead action level during any subsequent monitoring period.

(g) A community water system may use only the text specified in section 5-1.47(b)(1)(i) of this Subpart in lieu of the text in section 5-1.47(b)(1)(i) and 5-1.47(b)(1)(ii) of this Subpart, and to perform the tasks listed in subdivisions (d) and (e) of this section in lieu of the tasks in subparagraph (b)(2)(ii) and subdivision (c) 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;

(2) the system provides water as part of the cost of services provided and does not separately charge for water consumption; and

(3) the State has not directed the water system to conduct broader distribution of education material as needed if in its judgment education materials are not reaching the system's consumers.

(h) A community water system serving 3,300 or fewer people may limit certain aspects of their public education programs as follows:

(1) With respect to the requirements of clause (b)(2)(ii)(f) of this section, a system serving 3,300 or fewer shall implement at least one of the activities listed in that clause.

(2) With respect to the requirements of clause (b)(2)(ii)(b) of this section, a system serving 3,300 or fewer people may limit the distribution of the public education materials required under that clause to facilities and organizations served by the system that are most likely to be visited regularly by pregnant women and children.

(3) With respect to the requirements of clause (b)(2)(ii)(e) of this section, the State may waive this requirement for systems serving 3,300 or fewer persons as long as system distributes notices to every household served by the system.

(i) Consumer requests for lead sampling.

A water system that fails to meet the lead action level on the basis of tap samples collected in accordance with section 5-1.42 of this Subpart shall provide assistance in determining lead levels at the tap of any customer who requests it. Systems may collect and analyze the samples, but are not obligated to incur expenses. Systems are also not obligated to collect and analyze samples itself, but shall provide information about laboratories providing this service.

5-1.48 Reporting and recordkeeping requirements.

(Effective Date: January 19, 2022)

(a) Reporting requirements for tap water monitoring for lead and copper and for water quality parameter monitoring.

(1) Unless the State has specified a more frequent reporting requirement, a water system shall report the following information for all tap water samples specified in section 5-1.42 of this Subpart and for all water quality parameter samples specified in section 5-1.43 of this Subpart to the State within the first 10 days following the end of each applicable monitoring period; for monitoring periods with a duration of less than six months, the end of the monitoring period is the last date samples can be collected during that period as specified in sections 5-1.42 and 5-1.43 of this Subpart:

(i) results of all first draw lead and copper tap samples collected in accordance with section 5-1.42 of this Subpart, including site locations and the criteria used in selecting the site in accordance with section 5-1.42(a)(1) of this Subpart;

(ii) documentation for each tap water lead or copper sample for which the water system requests invalidation in accordance with section 5-1.42(e) of this Subpart;

(iii) the 90th percentile lead and copper concentrations measured from among all lead and copper tap water samples collected during each monitoring period and calculated in accordance with paragraph 5-1.40(b)(4) of this Subpart, unless the State calculates the system's 90th percentile under subdivision (h) of this section;

(iv) with the exception of initial tap sampling conducted pursuant to section 5-1.42(b)(1)-(3) of this Subpart, the system shall identify any site which was not sampled during previous monitoring periods, and include an explanation of changes in sampling sites if any;

(v) the results of all tap samples for applicable water quality parameters collected in accordance with section 5-1.43(b)-(d) of this Subpart; and

(vi) the results of all samples collected at the entry point(s) to the distribution system for applicable water quality parameters under section 5-1.43(b)-(d) of this Subpart.

(2) For a nontransient noncommunity water system, or a community water system meeting the criteria of section 5-1.47(g) of this Subpart that does not have enough taps that can provide first-draw samples, the system shall provide written documentation to the State identifying standing times and locations for enough first-draw samples to make up its

sampling pool by the start of the first applicable monitoring period in accordance with section 5-1.42(a)(3) of this Subpart or, identify in writing, each site that did not meet the six-hour minimum standing time and the length of time for that particular substitute sample collected, and include this information with the lead and copper tap sample results that are required to be submitted pursuant to subparagraph (a)(1)(i) of this subdivision.

(3) At a time specified by the State, or if no specific time is designated by the State, then as early as possible prior to the addition of a new source or any long-term change in water treatment, a water system deemed to have optimized corrosion control, a water system subject to reduced monitoring pursuant, or a water system subject to a monitoring waiver pursuant, shall submit written documentation to the State describing the change or addition as required under section 5-1.22(a) of this Subpart. A water system shall obtain approval from the State before implementing the addition of a new source or long-term change in water treatment. Examples of long-term treatment changes include the addition of a new treatment process or modification of an existing treatment process. Examples of modifications include switching secondary disinfectants, switching coagulants (*e.g.*, alum to ferric chloride), and switching corrosion inhibitor products (*e.g.*, orthophosphate to blended phosphate). Long-term changes can include dose changes to existing chemicals if the system is planning long-term changes to its finished water pH or residual inhibitor concentration. Long-term treatment changes would not include chemical dose fluctuations associated with daily raw water quality changes.

(4) Any system serving 3,300 or fewer persons applying for a monitoring waiver pursuant to section 5-1.42(f) of this Subpart, shall provide the following information to the State in writing by the specified deadline:

(i) by the start of the first applicable monitoring period, any system serving 3,300 or fewer persons applying for a monitoring waiver shall provide the documentation required to demonstrate that it meets the requirements of section 5-1.42(f) of this Subpart;

(ii) no later than nine years after the monitoring previously conducted pursuant to section 5-1.42(b) or (c) of this Subpart, each system serving 3,300 or fewer persons desiring to maintain its monitoring waiver shall provide the information required by section 5-1.42(f)(1)-(3) of this Subpart;

(iii) 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 system serving 3,300 or fewer persons with a monitoring waiver shall provide written notification to the State, stating 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.

(5) Each ground water system that limits water quality parameter monitoring to a subset of entry points under section 5-1.43(b)(2)(iii) of this Subpart shall provide by the commencement of such monitoring, written correspondence to the State that identifies the

selected entry points and includes information sufficient to demonstrate that the sites are representative of water quality and treatment conditions throughout the system.

(b) Source water monitoring reporting requirements.

(1) A water system shall report the sampling results for all source water samples collected in accordance with section 5-1.44 of this Subpart within the first 10 days following the end of each source water monitoring period.

(2) With the exception of the first round of source water sampling conducted, 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.

(c) Corrosion control treatment reporting requirements.

By the applicable dates under section 5-1.41(c) of this Subpart or a date specified by the State, systems shall report the following:

(1) for systems demonstrating that they have already optimized corrosion control, information required in section 5-1.41(b) of this Subpart;

(2) for systems required to optimize corrosion control, their recommendation regarding optimal corrosion control treatment in accordance with section 5-1.41(c)(3) of this Subpart;

(3) for systems required to evaluate the effectiveness of corrosion control treatments, the information required for corrosion control studies in accordance with section 5-1.41(c)(3) of this Subpart;

(4) for systems required to install optimal corrosion control designated by the State, a letter certifying that the system has completed installing that treatment in accordance with section 5-1.41(e) of this Subpart.

(d) Source water treatment reporting requirements.

In accordance with section 5-1.45 of this Subpart, systems shall report the following:

(1) for systems required to make a source water treatment recommendation in accordance with section 5-1.45(a)(1) of this Subpart, the information required by that section;

(2) for systems required to install source water treatment in accordance with section 5-1.45(a)(2) of this Subpart, a letter certifying that the system has completed installing the treatment designated by the State within 24 months after the State designated the treatment.

(e) Lead service line replacement reporting requirements.

Water systems subject to the requirements of section 5-1.46 of this Subpart shall report the following to demonstrate compliance with that section:

(1) No later than 12 months after the end of a monitoring period in which a system exceeds the lead action level in sampling referred to in section 5-1.46(a) of this Subpart, the system

shall submit written documentation to the State of the material evaluation conducted as required in section 5-1.42(a) of this Subpart, identify the initial number of lead service lines in its distribution system at the time the system exceeds the lead action level, and provide the system's schedule for annually replacing at least seven percent of the initial number of lead service lines in its distribution system.

(2) No later than 12 months after the end of a monitoring period in which a system exceeds the lead action level in sampling referred to in section 5-1.46(a) of this Subpart, and every 12 months thereafter, the system shall demonstrate to the State in writing that the system has either:

(i) replaced in the previous 12 months at least 7 percent of the initial lead service lines in its distribution system; or

(ii) conducted sampling which demonstrates that the lead concentration in all service line samples from an individual line(s), meeting the requirements of section 5-1.46(b)(2) of this Subpart, 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 5-1.46(b)(2) of this Subpart shall equal at least seven percent of the initial number of lead lines identified under paragraph (1) of this subdivision or the percentage specified by the State under section 5-1.46(d) of this Subpart.

(3) The annual letter submitted to the State under paragraph (2) of this subdivision shall contain the following information:

(i) the number of lead service lines replaced during the previous year of the system's replacement schedule;

(ii) the number and location of each lead service line replaced during the previous year of the system's replacement schedule; and

(iii) if measured, the lead concentration in the water and the location of each lead service line sampled, the sampling method, and the date of sampling.

(4) Any system which collects lead service line samples following partial lead service line replacement in accordance with section 5-1.46(c)(1) of this Subpart shall report the results to the State within the first ten days of the month following the month in which the system receives the laboratory results, or as specified by the State. Systems shall also report any additional information as specified by the State, and in a time and manner prescribed by the State, to verify that all partial lead service line replacement activities have taken place.

(f) Public education reporting requirements.

Water systems shall report the following to demonstrate compliance with requirements of section 5-1.47 of this Subpart:

(1) Each system shall mail a sample copy of the consumer notification of tap results to the State along with a certification that the notification has been provided no later than three months following the end of the monitoring period.

(2) Any water system that is subject to the public education requirements under section 5-1.47 of this Subpart shall, within 10 days after the end of each period in which the system is required to perform public education, send written documentation to the State that contains:

(i) a demonstration that the system has delivered the public education materials that meet the content requirements in section 5-1.47(b)(1) of this Subpart and the delivery requirements in section 5-1.47(b)(2) of this Subpart; and

(ii) a list of all 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.

(3) Unless required by the State, a system that previously has submitted the information required by subparagraph (2)(ii) of this subdivision need not resubmit the information required, 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.

(g) Reporting of additional monitoring data.

Any system which collects sampling data in addition to that required by this sections 5-1.40 through 5-1.48 of this Subpart, including data collected in accordance with sections 5-1.41(b)(6), 5-1.42(d), and 5-1.43(d) of this Subpart, shall report the results to the State within the first 10 days following the end of the applicable monitoring period during which the samples were collected.

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

(1) the State 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 subparagraph (2)(i) of this subdivision, and has specified a date before the end of the applicable monitoring period by which the system shall provide the results of lead and copper tap water samples; and

(2) the system has provided the following information to the State by the date specified in paragraph (1) of this subdivision:

(i) the results of all tap samples for lead and copper including the location of each site and the criteria under section 5-1.42(a)(1)(iii)-(iv) of this Subpart under which the site

was selected for the system's sampling pool, pursuant to subparagraph (a)(1)(i) of this section; and

(ii) 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 changed; and

(3) the State 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.

(i) Prior to the addition of a new source or any long-term change in water treatment, a water system deemed to have optimized corrosion control under section 5-1.41(b) of this Subpart, a water system subject to reduced monitoring under section 5-1.42(c) of this Subpart, or a water system subject to a monitoring waiver under section 5-1.42(f) of this Subpart shall submit written documentation to the State describing the proposed change or addition within a timeframe specified by the State, or if no specific time is designated by the State, then as early as possible.

(j) Recordkeeping requirements.

Any system subject to the requirements of sections 5-1.40 through 5-1.48 of this Subpart shall retain on its premises original records of all sampling data and analyses, reports, surveys, letters, evaluations, schedules, State approvals and determinations, and any other information required by sections 5-1.41 through 5-1.48 of this Subpart. Each water system shall retain the records required by this section for no fewer than 12 years.

Public Water Systems; Maximum Contaminant Levels; Monitoring Requirements; Notifications Required

5-1.50 Applicability and responsibility.

(Effective Date: December 30, 1992)

The provisions of this section and sections 5-1.51-5-1.52 of this Subpart shall apply to all public water systems. The supplier of water of a public water system is responsible for completion of the monitoring requirements set forth in such sections and for performing all analyses in accordance with the analytical requirements set forth in Appendix 5-C of this Subpart. At the discretion of the State, analyses performed by the State may be used for monitoring purposes.

5-1.51 Maximum contaminant levels, maximum residual disinfectant levels and treatment technique requirements.

(Effective Date: January 19, 2022)

(a) The maximum contaminant levels, maximum residual disinfectant levels and treatment technique requirements are listed in section 5-1.52 tables 1 through 7 of this Subpart. In the case where an MCL, MRDL or treatment technique requirement is exceeded, notwithstanding anything to the contrary contained in section 5-1.12 of this Subpart, the supplier of water will take the necessary steps to comply with this section, to ensure the protection of the public health, including the undertaking of remedial feasibility studies and the installation of a suitable treatment process. Compliance with the MCLs, MRDLs and treatment technique requirements shall be determined by the procedures contained in section 5-1.52 tables 1 through 7 of this Subpart.

(b) The minimum monitoring requirements for each contaminant are listed in section 5-1.52 tables 8A through 12 and 15A of this Subpart, except for public water systems with fewer than 15 service connections and which serve fewer than 25 persons, where monitoring will be at State discretion. For this section, *State discretion* shall mean requiring monitoring when the State has reason to believe an MCL, MRDL or treatment technique requirement has been violated, the potential exists for an MCL, MRDL or treatment technique violation or a contaminant may present a risk to public health.

(c) Each system shall develop and implement a monitoring plan that includes all monitoring requirements specified in this Subpart. The system shall maintain the plan and make it available for inspection by the State and the general public. After review, the State may require changes in any plan elements. Failure to monitor in accordance with the monitoring plan is a monitoring violation. Systems may only use data collected in accordance with the monitoring plan to qualify for reduced monitoring. The monitoring plan shall include at least the following elements, as applicable:

(1) specific locations and schedules for collecting samples for all applicable parameters listed in section 5-1.42, section 5-1.43, tables 8A-12, 15 and 15A of section 5-1.52, section 5-1.61, and section 5-1.81 of this Subpart;

(2) how the system will calculate compliance with MCLs, MRDLs, and treatment techniques;

(3) if the system is a consecutive system, or it is providing water to a consecutive system, and has been approved for modified monitoring under the provisions of section 5-1.76 of this Subpart, the sampling plan must reflect the entire distribution system for any analytes approved for modified monitoring;

(4) consecutive ground water systems must define and implement a protocol for notifying the system from which they receive water of any total coliform positive samples so the source can be tested for fecal contamination, unless the wholesale ground water system provides four-log virus treatment at peak flow before or at the first customer as confirmed through process compliance monitoring.

(5) Disinfection byproduct monitoring.

(i) The following requirements of this subdivision apply to community and nontransient noncommunity water systems that use or deliver water that has been treated with a primary or residual disinfectant other than ultraviolet light, provided they serve 15 or more service connections or serve 25 or more persons:

(a) if a new community or nontransient noncommunity water system begins operation, or an existing community or nontransient noncommunity water system begins using a disinfectant other than ultraviolet light, the system shall consult with the State to identify compliance monitoring locations for disinfection byproducts to include in the system's monitoring plan, consistent with the requirements in 40 CFR 141.601 and 141.602, and for new systems that need an Initial Distribution System Evaluation (IDSE), consistent with 40 CFR 141.605; and

(b) if a community or nontransient noncommunity water system adds or removes compliance monitoring locations, the system shall identify additional locations by alternating selection of locations representing high TTHM levels and high HAA5 levels until the required number of compliance monitoring locations have been identified, as specified in section 5-1.52 table 9A. Systems shall also provide the rationale for identifying the locations as having high levels of TTHM or HAA5.

(ii) Systems shall revise monitoring plans to reflect changes in treatment, distribution system operations and layout (including new service areas), other factors that may affect TTHM or HAA5 formation or upon consultation with the State.

(a) If a system changes monitoring locations, it shall replace existing compliance monitoring locations with the lowest LRAA with new locations that reflect the current distribution system locations with expected high TTHM or HAA5 levels.

(b) The State may require modifications in the monitoring plan.

(c) Surface water or GWUDI systems serving more than 3,300 people shall submit a copy of their modified monitoring plan to the State prior to the date they are required to comply with the revised monitoring plan.

(iii) A system is in violation of the monitoring requirements for each quarter that a monitoring result would be used in calculating a LRAA if the system fails to monitor.

(6) Copies of monitoring plans developed pursuant to this subdivision shall be kept for the same period of time as the records of analyses of samples collected under the plan are required to be kept under this subpart.

(d) The notification requirements for each contaminant are listed in section 5-1.52 table 13 of this Subpart.

(e) The CT values for inactivation of Giardia lamblia cysts by free chlorine at various pH and temperature levels are listed in section 5-1.52 tables 14A through 14F of this Subpart. The CT values for inactivation of Giardia lamblia cysts by chlorine dioxide and ozone at various temperature levels are listed in section 5-1.52 table 14G of this Subpart. The CT values for inactivation of Giardia lamblia cysts by chloramines at various temperature levels are listed in section 5-1.52 table 14H of this Subpart. The CT values for inactivation of Cryptosporidium by chlorine dioxide at various temperature levels are listed in section 5-1.52 table 14I of this Subpart. The CT values for inactivation of Cryptosporidium by ozone at various temperature levels are listed in section 5-1.52 table 14J of this Subpart. The UV doses for Cryptosporidium, Giardia lamblia, and virus inactivation credit are listed in section 5-1.52 table 14K of this Subpart.

(f) The alternative disinfection monitoring frequency requirements using grab samples instead of continuous chlorine concentration monitoring is listed in section 5-1.52 table 15 of this Subpart.

(g) Monitoring and reporting frequencies for specific contaminants may be established at State discretion whenever the State believes that a potential exists for an MCL or MRDL violation or a contaminant may present a risk to public health.

(h) Notwithstanding anything to the contrary in subdivision (a) of this section, the commissioner may recommend values lower than the MCL's if sufficient valid information based on commonly accepted scientific standards and principles demonstrates an increased public health concern. Within one year from the date of such recommendation, the State shall hold a public hearing regarding the justification for the lower value, and whether a new MCL is warranted.

(i) Notwithstanding anything to the contrary in section 5-1.52 table 3 of this Subpart, the commissioner may in specific cases except specific organic chemicals from the MCL's for general organic chemicals if the supplier of water can demonstrate that sufficient valid scientific information exists to show that the organic chemical does not pose an unreasonable risk to human health, the organic chemical is present at a level and under circumstances not indicative of contamination, and the cost of compliance is unreasonable in light of the risk to human health.

(j) Notwithstanding anything to the contrary in section 5-1.52 table 3 of this Subpart, the commissioner may, based on receipt and review of a justification submitted by the supplier of water, allow a higher MCL for a period of up to 60 days following application of a paint or lining to a potable water structure, if he determines that an unreasonable risk to human health does not exist.

(k) Notwithstanding anything to the contrary in section 5-1.52 table 3A of this Subpart, systems 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, but not limited to, distribution line breaks, storm run-off events, source water contamination events, or cross-connection events.

(l) A system that is installing granular activated carbon (GAC) or membrane technology to comply with the trihalomethane and haloacetic acid MCLs listed in section 5-1.52 table 3 of this Subpart may apply to the State for an extension of up to 24 months past the compliance dates for those MCLs. Systems must comply with any interim measures and schedules of compliance set by the State.

(m) Each public water system must certify annually in writing to the State 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)

Certification can rely on manufacturers or third parties, as approved by the State.

(n) For microbiological analysis, a standard sample size of 100 milliliters shall be used.

(o) Disinfection byproduct monitoring.

The requirements of this subdivision apply to community and nontransient noncommunity water systems that use a primary or residual disinfectant other than ultraviolet light, or deliver water that has been treated with a primary or residual disinfectant other than ultraviolet light in accordance with monitoring requirements in table 9A of section 5-1.52 of this Subpart.

(1) Systems required to conduct quarterly monitoring shall calculate compliance at the end of each quarter or earlier if the LRAA calculated based on fewer than four quarters of data would cause the MCL to be exceeded regardless of the monitoring results of subsequent quarters in accordance with table 3 of section 5-1.52 of this Subpart.

(2) Systems required to conduct monitoring at a frequency that is less than quarterly shall monitor in the calendar month identified in the monitoring plan developed under subdivision (c) of this section. Compliance calculations shall be made beginning with the first compliance sample taken after the compliance date.

(p) A system implementing corrective actions to comply with the MCL for Perfluorooctanesulfonic acid (PFOS), Perfluorooctanoic acid (PFOA), and 1,4-dioxane listed in section 5-1.52 table 3 of this subpart may request that the State defer actions for determining MCL violations prescribed in section 5-1.52 table 3 of this subpart for up to 24 months past the effective date of the PFOS, PFOA or 1,4-dioxane MCL. The system shall make such requests in writing within 90 days of the effective date of such MCL. Requests shall document that a deferral period is necessary for a system to implement corrective actions to achieve compliance with the MCL for PFOS, PFOA or 1,4-dioxane and include a timeline with specific milestones for State review and approval. A public notice shall be distributed within 30 days of receiving notification from the State that a deferral has been granted. Systems operating with a deferral approved by the State shall comply with any interim monitoring, public notification or other conditions required by the State, including but not limited to a timeline for implementation of a corrective action plan. Deferrals granted under this subdivision may be renewed, upon request, for up to an additional twelve months if the system establishes to the satisfaction of the State that it is taking all practical steps to meet the corrective action plan on which the initial deferral was conditioned. Failure to meet any deferral conditions shall constitute a violation of this section and may result in immediate deferral revocation. Notice of revocation of a deferral shall will be issued in writing by the State.

5-1.52 Tables.

(Effective Date: December 28, 2022)

Table 1. Inorganic Chemicals and Physical Characteristics Maximum Contaminant Level Determination

Contaminants[1,2]	**MCL (mg/L)[3]**	**Determination of MCL violations**
Asbestos	7.0 million fibers/liter (MFL) (longer than 10 microns)	If the results of a monitoring sample analysis exceed the MCL, the supplier of water shall collect one more sample from the same sampling point within 2 weeks or as soon as practical. An MCL violation for all contaminants listed in this table, except for Arsenic, occurs when the average[4] of the initial sample and any confirmation sample exceeds the MCL. MCL violations for Arsenic will be determined as follows: Compliance with the Arsenic MCL shall be determined based on the analytical result(s) obtained at each sampling point. For systems which are conducting monitoring at a frequency greater than annual, an Arsenic MCL violation occurs when the running annual average[11,12,13] at any sampling point is greater than the MCL. If any one sample would cause the annual average to exceed the MCL at any sampling point, the system is out of compliance with the MCL immediately. Systems monitoring annually or less frequently whose sample result exceeds the Arsenic MCL[11] must begin quarterly sampling[14]. The system will not be considered in violation of the MCL until it has completed one year of quarterly sampling and the running annual average [11,12,13] at that sampling point is greater than the Arsenic MCL. If any one sample would cause the annual average to exceed the MCL at any sampling point, the system is out of compliance with the MCL immediately.
Antimony	0.006	
Arsenic	0.010	
Barium	2.00	
Beryllium	0.004	
Cadmium	0.005	
Chromium	0.10	
Cyanide (as free cyanide)	0.2[5,6]	
Mercury	0.002	
Selenium	0.05	
Silver	0.1	
Thallium	0.002	
Fluoride	2.2	
Chloride	250.0	
Iron	0.3[7]	
Manganese	0.3[7]	
Sodium	No designated limits[8]	
Sulfate	250.0	
Zinc	5.0	
Color	15 Units	
Odor	3 Units	
Bromate[9]	0.010	Compliance is based on a running annual average of monthly samples, computed quarterly. 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.
Chlorite[10]	1.0	Compliance is based on an average of each three-sample set taken in the distribution system in accordance with Table 8B. If the average exceeds the MCL, the system is in violation of the MCL and must notify the public.

Table 1, Cont.

[1] If EPA Methods 200.7 or 200.9 are used, the MDLs determined when samples are analyzed by direct analysis (i.e., no sample digestion) will be higher, because they were determined using a 2x preconcentration step during sample digestion. Consider the need to preconcentrate, or the use of multiple in-furnace depositions to achieve required MDLs. For direct analysis of cadmium by Method 200.7, sample preconcentration using pneumatic nebulization may be required to achieve lower detection limits. Preconcentration may also be required for direct analysis of antimony, lead, and thallium by Method 200.9; antimony and lead by Standard Methods 3113 B; and lead by ASTM Method D3559–90D, unless multiple in-furnace depositions are made.
[2]When metals or nitrate samples are collected, they may be acidified with a concentrated acid or a dilute (50% by volume) solution of the applicable concentrated acid. This acidification may be done at the laboratory rather than at the time of sampling, provided the shipping time and other instructions in Section 8.3 of EPA Methods 200.7, 200.8, or 200.9 are followed.
[3]mg/L = milligrams per liter
[4]Rounded to the same number of significant figures as the MCL for the contaminant in question.
[5]If Ligand Exchange and Amperometry is used for cyanide analysis; either ASTM Method D6888-04 or Method OIA–1677, DW, "Available Cyanide by Flow Injection, Ligand Exchange, and Amperometry," January 2004 are approved. EPA–821–R–04–001, is available from ALPKEM, A Division of OI Analytical, P.O. Box 9010, College Station, TX 77842–9010; sulfide levels below those detected using lead acetate paper may produce positive method interferences. Samples should be tested using a more sensitive sulfide method to determine if a sulfide interference is present, and samples shall be treated accordingly.
[6]Cyanide samples must be adjusted with sodium hydroxide to pH 12 at the time of collection. The sample must be shipped and stored at 4°C or less.
[7]If iron and manganese are present, the total concentration of both should not exceed 0.5 mg/L. Higher levels may be allowed by the State when justified by the supplier of water.
[8]Water containing more than 20 mg/L of sodium should not be used for drinking by people on severely restricted sodium diets. Water containing more than 270 mg/L of sodium should not be used for drinking by people on moderately restricted sodium diets.
[9]Community and nontransient noncommunity water systems using ozone for disinfection or oxidation must comply with the bromate standard.
[10]Community and nontransient noncommunity water systems using chlorine dioxide as a disinfectant or oxidant must comply with the chlorite standard.
[11]Arsenic sampling results shall be reported to the nearest 0.001 mg/L.
[12]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.
[13]If confirmation samples are collected, the average of the initial sample and any confirmation samples will be used for the determination of compliance and future monitoring requirements.
[14]Systems are only required to conduct the increased monitoring frequency at the sampling point where the MCL was exceeded and for only the specific contaminant(s) that triggered the system into the increased monitoring frequency.

Table 2 - Nitrate, Nitrite, Total Nitrate/Nitrite Maximum Contaminant Level Determination

Contaminants	MCL (mg/L)	Determination of MCL violation
Nitrate[1]	10 (as Nitrogen)[2]	If the results of a monitoring sample analysis exceed the MCL, the supplier of water shall collect another sample from the same sampling point, within 24 hours of the receipt of results or as soon as practical.[3] An MCL violation occurs when the average of the two results exceeds the MCL.
Nitrite	1 (as Nitrogen)	
Total Nitrate and Nitrite	10 (as Nitrogen)	

[1] Nitrate samples are to be shipped and stored at 4 °C or less and analyzed within 48 hours of collection. If the sample is chlorinated, the holding time for an unacidified sample kept at 4 °C is extended to 14 days.

[2] An MCL of 20 mg/L may be permitted at a noncommunity water system if the supplier of water demonstrates that:

(a) the water will not be available to children under six months of age;

(b) a notice that nitrate levels exceed 10 mg/L and the potential health effects of exposure will be continuously posted according to the requirements of a Tier 1 notification;

(c) the State will be notified annually of nitrate levels that exceed 10 mg/L; and

(d) no adverse health effects shall result.

[3] Systems unable to collect an additional sample within 24 hours must issue a Tier 1 notification and must collect the additional sample within two weeks of receiving the initial sample results.

Table 3. Organic Chemicals Maximum Contaminant Level Determination

Contaminants	MCL (mg/L)	Type of water system	Determination of MCL violation
General organic chemicals		Community, NTNC and Noncommunity	If the results of a monitoring sample analysis exceed the MCL, the supplier of water shall collect one to three more samples from the same sampling point, as soon as practical, but within 30 days. An MCL violation occurs when at least one of the confirming samples is positive[1] and the average of the initial sample and all confirming samples exceeds the MCL.
Principal organic contaminant (POC)	0.005		
Unspecified organic contaminant (UOC)	0.05		
Total POCs and UOCs	0.1		
Disinfection byproducts[2,3]		Community and NTNC	For systems required to monitor quarterly, the results of all analyses at each monitoring location per quarter shall be arithmetically averaged and shall be reported to the State within 30 days of the public water system's receipt of the analyses. A violation occurs if the average of the four most recent sets of quarterly samples at a particular monitoring location (12-month locational running annual average (LRAA)) exceeds the MCL. If a system collects more than one sample per quarter at a monitoring location, the system shall average all samples taken in the quarter at that location to determine a quarterly average to be used in the LRAA calculation. If a system fails to complete four consecutive quarters of monitoring, compliance with the MCL will be based on an average of the available data from the most recent four quarters. An MCL violation for systems on annual or less frequent monitoring that have been increased to quarterly monitoring as outlined in Table 9A, is determined after four quarterly samples are taken.
Total trihalomethanes	0.080		
Haloacetic acids	0.060		
		Transient noncommunity	Not applicable.

Table 3, Cont.

Contaminants	MCL (mg/L)	Type of Water System	Determination of MCL violation
Specific Organic Chemicals		Community, NTNC and Noncommunity	If the results of a monitoring sample analysis exceed the MCL, the supplier of water shall collect one to three more samples from the same sampling point, as soon as practical, but within 30 days. An MCL violation occurs when at least one of the confirming samples is positive[1] and the average of the initial sample and all confirming samples exceeds the MCL.
Alachlor	0.002		
Aldicarb	0.003		
Aldicarb sulfone	0.002		
Aldicarb sulfoxide	0.004		
Atrazine[4]	0.003		
Benzo(a)pyrene	0.0002		
Carbofuran	0.04		
Chlordane	0.002		
Di(2-ethylhexyl)phthalate	0.006		
Dibromochloropropane (DBCP)	0.0002		
2,4-D	0.05		
Dinoseb	0.007		
1,4-Dioxane	0.0010		
Diquat	0.02		
Endrin	0.002		
Ethylene dibromide (EDB)	0.00005		
Heptachlor	0.0004		
Heptachlor epoxide	0.0002		
Hexachlorobenzene	0.001		
Lindane	0.0002		
Methoxychlor	0.04		
Methyl-tertiary-butyl-ether (MTBE)	0.010		
Pentachlorophenol	0.001		
Perfluorooctanesulfonic acid (PFOS)	0.0000100		
Perfluorooctanoic acid (PFOA)	0.0000100		
Polychlorinated biphenyls (PCBs)[5]	0.0005		
Propylene glycol	1.0		
Simazine	0.004		
Toxaphene	0.003		
2,4,5-TP (Silvex)	0.01		
2,3,7,8-TCDD (Dioxin)	0.00000003		
Vinyl chloride	0.002		

Table 3, Cont.

[1] A sample is considered positive when the quantity reported by the State approved laboratory is greater than or equal to the method detection limit.
[2] For systems monitoring yearly or less frequently, the sample results for each monitoring location is considered the LRAA for that monitoring location. Systems required to conduct monitoring at a frequency that is less than quarterly shall monitor in the calendar month identified in the monitoring plan developed under section 5- 1.51(c). Compliance calculations shall be made beginning with the first compliance sample taken after the compliance date.
[3] Systems that are demonstrating compliance with the avoidance criteria in section 5-1.30(c), shall comply with the TTHM and HAA5 LRAA MCLs; however the LRAA MCLs are not considered for avoidance purposes. For avoidance purposes, TTHMs and HAA5s are based on a running annual average of analyses from all monitoring locations.
[4] Syngenta Method AG–625, "Atrazine in Drinking Water by Immunoassay," February 2001, available from Syngenta Crop Protection, Inc., 410 Swing Road, P.O. Box 18300, Greensboro, NC 27419. Telephone: 336–632–6000, may not be used for the analysis of atrazine in any system where chlorine dioxide is used for drinking water treatment. In samples from all other systems, any result for atrazine generated by Method AG–625 that is greater than one-half the maximum contaminant level (MCL) (in other words, greater than 0.0015mg/L or 1.5 µg/L) must be confirmed using another approved method for this contaminant and should use additional volume of the original sample collected for compliance monitoring. In instances where a result from Method AG–625 triggers such confirmatory testing, the confirmatory result is to be used to determine compliance
[5] If PCBs (as one of seven Aroclors) are detected in any sample analyzed using EPA Method 505 or 508, the system shall reanalyze the sample using EPA Method 508A to quantitate PCBs (as decachlorobiphenyl). Compliance with the PCB MCL shall be determined based upon the quantitative results of analyses using Method 508A.

Table 3A. Maximum Residual Disinfectant Level (MRDL) Determination

Disinfectant	MRDL[1] (mg/L)	Type of water system	Determination of MRDL violation
Chlorine	4.0 (as Cl_2)	Community and NTNC using chlorine or chloramines as disinfectant or oxidant	Compliance is based on a running annual arithmetic average, computed quarterly, of monthly averages of all samples collected by the system. If the running annual average exceeds the MRDL, the system is in violation and must notify the public.
Chloramines[2]	4.0 (as Cl_2)		
Chlorine Dioxide	0.8 (as ClO_2)	Community, NTNC, and Transient Noncommunity using chlorine dioxide as disinfectant or oxidant	Public Health Hazard (Acute Violation) Compliance is based on daily samples collected by the system. 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 exceeds the MRDL, the system is in violation.
			Nonacute Violation Compliance is based on daily samples collected by the system. 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.

[1] The monitoring and MRDL requirements for chlorine and chloramines in this column apply to community or nontransient noncommunity water systems that are consecutive systems that do not add a disinfectant, but deliver water that has been treated with primary or residual disinfection other than ultraviolet light.
[2] 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 Cl_2 monitoring results of both chlorine and chloramines.

Table 4. Entry Point Turbidity Maximum Contaminant Level Determination for Unfiltered Systems [1,2]

Contaminant	MCL	Determination of MCL violation
Entry point turbidity (surface water and ground water directly influenced by surface water)	1 NTU [3,5] (Monthly Average) 5 NTU [4,5]	A violation occurs when the average of all daily entry point analyses for the month exceeds the MCL rounded off to the nearest whole number. A violation occurs when the average of two consecutive daily entry point analyses exceeds the MCL rounded off to the nearest whole number.

[1] The requirements of this table apply to unfiltered systems that the State had determined, in writing pursuant to section 5-1.30 of this Subpart, must install filtration, until filtration is installed.
[2] If formazin is used for turbidity testing, styrene divinyl benzene beads (e.g., AMCO-AEPA–1 or equivalent) and stabilized formazin (e.g., Hach StablCalTMor equivalent) may be substituted for formazin.
[3] If the daily entry point analysis exceeds one NTU, a repeat sample must be taken as soon as practicable and preferably within one hour. If the repeat sample exceeds one NTU, the supplier of water must make State notification. The repeat sample must be used for the monthly average and the two consecutive day average.
[4] If the two consecutive day average exceeds the MCL, the supplier of water shall analyze for microbiological contamination at a point downstream of the first consumer, but as close to the first consumer as is feasible. The additional microbiological sample should be taken within one hour as soon as feasible after determining the two consecutive day average. The supplier of water shall report the result of this microbiological analysis to the State within 48 hours of obtaining the result. The result of this analysis shall not be used for monitoring purposes
[5] NTU = Nephelometric Turbidity Units

Table 4A. Surface Water Turbidity Performance Standards [1]

Contaminant	Filtration type	Performance standard[1]	Determination of treatment technique violation	
Filtered water turbidity[2]	Conventional filtration and Direct Filtration	0.3 NTU[3,5]	A treatment technique violation occurs if more than five percent of the composite filter effluent measurements taken each month exceed the performance standard values.	The turbidity level of representative samples of the filtered water must at no time exceed 1 NTU.[4,5]
	Slow sand filtration	1.0 NTU[3]	A treatment technique violation occurs if more than five percent of the composite filter effluent measurements taken each month exceed the performance standard values.	The turbidity level of representative samples of the filtered water must at no time exceed 5 NTU.
	Diatomaceous earth filtration	1.0 NTU[3]		
	Alternative filtration	1.0 NTU[3,4]		

[1] The standards apply to systems with surface water sources or ground water sources directly influenced by surface water.
[2] If formazin is used for turbidity testing, styrene divinyl benzene beads (e.g., AMCO-AEPA–1 or equivalent) and stabilized formazin (e.g., Hach StablCalTMor equivalent) may be substituted for formazin.
[3] NTU= Nephelometric Turbidity Unit
[4] The performance standard applies to alternative filtration technologies capable of complying with requirement of section 5-1.30(b) of this Subpart as demonstrated to the department by pilot studies, unless the department sets a turbidity performance standard for a specific system.
[5] If the combined filter effluent turbidity exceeds 1 NTU, the system must consult with the State in accordance with section 5-1.78(d)(4) of this Subpart.

Table 5. Distribution System Turbidity Maximum Contaminant Level Determination

Contaminant	MCL	Determination of MCL violation
Distribution point turbidity	5 NTU	A violation occurs when the monthly average of the results of all distribution samples collected in any calendar month exceeds the MCL rounded off to the nearest whole number.

Table 6. Microbiological Contaminants Maximum Contaminant Level (MCL)/Treatment Technique Trigger (TTT)/ Treatment Technique Violation (TTV) Determination[1]

Contaminant/ Trigger/Violation	Sample Location	MCL or TTT or TTV	Performance Standard	Determination of MCL/TTV and TTT[10]
Total coliform[2]	Distribution Sample Sites	TTT[3]	No positive sample[4,5]	A Level 1 TTT occurs at systems collecting 40 or more samples per month when more than 5.0 percent of the samples are total coliform positive.[11]
		TTT[3]		A Level 1 TTT occurs at systems collecting less than 40 samples per month when two or more samples are total coliform positive.[11]
		TTT[3]		A Level 1 TTT occurs at any system that fails to collect every required repeat sample after any single total coliform positive sample.[11]
		TTT[6]		A Level 2 TTT occurs at any system that has a second Level 1 trigger within a rolling 12-month period, unless the State has determined a likely reason that the samples that caused the first Level 1 TTT were total coliform positive and has established that the system has corrected the problem.[11]
Escherichia coli (E. Coli)		MCL/ TTT[4,6]	No positive sample[5,7]	An MCL violation and Level 2 TTT occurs when a total coliform sample is positive for *E. coli* and a repeat total coliform sample is positive.[13]
		MCL/ TTT[4,6]	No positive sample[5,7]	An MCL violation and Level 2 TTT occurs when a total coliform sample is positive for total coliform but negative for *E. coli* and a repeat total coliform sample is positive for *E. coli*.[13]
		MCL/ TTT[4,6]		An MCL violation and Level 2 TTT occurs when a total coliform sample is positive for total coliform but negative for *E. coli* and a repeat total coliform positive sample is not analyzed for *E. coli*.[13]
		MCL/ TTT[4,6]		An MCL violation occurs when a system fails to collect every required repeat sample after any *E. coli* positive routine sample.
Fecal indicator: *E. coli*, and/or enterococci, and/or coliphage[8]	Untreated Water from a Ground Water Source	TTV	No fecal indicator in samples collected from raw source water from a ground water source.[9,10]	A TTV occurs when a raw water sample is positive for the fecal indicator contaminant and system does not provide and document, through process compliance monitoring, 4-log virus treatment during peak flow at first customer. If repeat sampling of the raw water is directed by the State and all additional samples are negative for fecal indicator, there is no TTV.[9,13]
Other trigger or violation		TTV[4]		A TTV occurs when a system exceeds a TTT and then fails to conduct the required assessment or corrective actions.[12]
		TTV[4]		A TTV occurs when a seasonal system fails to complete a State-approved start-up procedure prior to serving water to the public.[14]

[1] All samples collected in accordance with Table 11 footnotes 1 and 2 and Table 11B of this section and samples collected in accordance with subdivision 5-1.51(g) of this Subpart shall be included in determining compliance with the MCL, TTT, and/or TTV unless any of the samples have been invalidated by the State. In accordance with 40 CFR 141.852(a)(2) systems need only determine the presence or absence of total coliforms and *E. coli*; a determination of density is not required.

Table 6, Cont.

[2] Total coliform method additions or modifications to approved methods

For total coliform (TC) samples collected from untreated surface water or GWUDI sources, the time from sample collection to initiation of analysis may not exceed 8 hours and the samples must be held below 10 degrees C during transit to the laboratory. For other TC samples, the time from collection to initiation of analysis may not exceed 30 hours. Systems are encouraged, but not required, to hold TC samples below 10 degrees C during transit.

- If the Total Coliform Fermentation Technique using standard methods 9221A or B is used, and if inverted tubes are used to detect gas production, the media should cover these tubes at least one half to two-thirds after the sample is added. Also, no requirement exists to run the completed phase on 10 percent of all TC-positive confirmed tubes. Additionally, lactose broth, as commercially available, may be used in lieu of lauryl tryptose broth, if the system conducts at least 25 parallel tests between this medium and lauryl tryptose broth using the water normally tested, and this comparison demonstrates that the false-positive rate and false-negative rate for TC, using lactose broth, is less than 10 percent.
- If Membrane Filter Technique Standard Methods 9222A, B, and optionally C are used, MI agar also may be used. Verification of colonies is not required.
- If the Standard Methods Presence-Absence (P-A) Coliform Test, 9221D is used, six-times formulation strength may be used if the medium is filter-sterilized rather than autoclaved.
- If the Total Coliform Membrane Filter Technique, Standard Methods 9222 A, B, C is used, MI agar also may be used. Verification of colonies is not required.
- For any TC testing it is strongly recommended that laboratories evaluate the false-positive and negative rates for the method(s) they use for monitoring TC. Laboratories are also encouraged to establish false-positive and false-negative rates within their own laboratory and sample matrix (drinking water or source water) with the intent that if the method they choose has an unacceptable false-positive or negative rate, another method can be used. It is suggested that laboratories perform these studies on a minimum of 5% of all TC-positive samples, except for those methods where verification/confirmation is already required. Methods for establishing false-positive and negative-rates may be based on lactose fermentation, the rapid test for β-galactosidase and cytochrome oxidase, multi-test identification systems, or equivalent confirmation tests. False-positive and false-negative information is often available in published studies and/or from the manufacturer(s).

[3] The system must complete a Level 1 assessment as soon as practical after exceeding a Level 1 TTT. The system must submit the completed Level 1 assessment form to the State within 30 days after the system learns that it has exceeded a trigger. Corrective actions shall be addressed in accordance with section 5-1.71(e) of this Subpart.

[4] See Table 13 for public notification requirements

[5] If any total coliform or *E. Coli* sample is positive, repeat samples must be collected in accordance with Table 11B of this section.

[6] A Level 2 assessment must be completed within 30 days after the system learns that it has exceeded a trigger. Corrective actions shall be addressed in accordance with section 5-1.71(e) of this Subpart.

[7] For notification purposes, an E. coli MCL violation in the distribution system is a public health hazard requiring Tier 1 notification. At a ground water system, Tier 1 notification is required after initial detection of *E. coli* or other fecal indicator in raw source water, if the system does not provide 4-log virus treatment and process compliance monitoring, even if not confirmed with additional sampling

[8] For any fecal indicator sample collected as described in section 5-1.52, Table 6, the time from sample collection to initiation of analysis may not exceed 30 hours. The system is encouraged but is not required to hold samples below 10 °C during transit.

[9] If raw water source sample is fecal indicator positive, the water system, in consultation with the State, may collect an additional 5 samples within 24 hours at each source that tested fecal indicator positive. If none of the additional samples are fecal indicator positive, then there is no TTV. Note that Tier 1 notification must be made after the initial raw water fecal indicator positive sample, even if it is not confirmed with additional sampling.

[10] Failure to take every required routine or additional routine sample in a compliance period is a monitoring violation.

[11] Failure to analyze for *E. coli* following a total coliform positive routine sample is a monitoring violation.

[12] Failure to submit a monitoring report or completed assessment form after a system properly conducts monitoring or assessment in a timely manner is a reporting violation.

[13] Failure to notify the State following an *E. coli*-positive sample as required by 5-1.52 Table 13 and 5-1.77(a) of this Subpart in a timely manner is a reporting violation.

[14] Failure to submit certification of completion of State approved start-up procedure by a seasonal system is a reporting violation.

Table 7. Radiological Maximum Contaminant Level Determination

Contaminant	MCL	Type of water system	Determination of MCL violation[2]
Combined radium-226 and radium-228	5 picocuries per liter	Community	A violation occurs when a sample or the annual average of samples at any sampling point exceeds the MCL[3,4,5,6,7].
Gross alpha activity (including radium-226 but excluding radon and uranium)	15 picocuries per liter	Community	
Uranium[8]	30 micrograms per liter	Community	
Beta particle and photon radioactivity from manmade radionuclides	Four millirems (mrem) per year as the annual dose equivalent to the total body or any internal organ[9].	Community Water Systems designated by the State as vulnerable	A violation occurs when a sample or the annual average of samples at any sampling point exceeds the MCL[3,4,5,7,9,10,11]
		Community systems designated by the State as utilizing waters contaminated by effluents from nuclear facilities	A violation occurs when a sample or the annual average of samples at any sampling point exceeds the MCL[3,4,5,7,9,10,11]

[1] The Radionuclides Rule including the MCLs and minimum monitoring requirements applies to only community water systems.
[2] To judge compliance with the maximum contaminant levels, averages of 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.
[3] 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.
[4] For systems monitoring more than once a year, if any sample result will cause the running average to exceed the MCL at any sample point, e.g., a single sample result is greater than four times of the MCL, the system is out of compliance with the MCL immediately.
[5] 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.
[6] 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 and is substituted for radium-226 and/or uranium, ½ the detection limit will be used to calculate the annual average.
[7] If the MCL for radionuclides in this Table is exceeded, the community water system must give notice to the State.
[8] If uranium (U) is determined by mass-type methods (i.e., fluorometric or laser phosphorimetry), a 0.67 pCi/µg of uranium conversion factor must be used.
[9] A system must determine compliance with the MCL for beta particle and photon radioactivity by using the calculation described below:
[pCi/L found in sample (from laboratory results) / pCi/L equivalent of 4 mrem of exposure] = fraction of the maximum 4 mrem/year exposure limit
[10] To determine compliance with the MCL, a system must monitor at a frequency as described in Table 12.
[11] If the results show an MCL violation for any of the constituents, the system must conduct monthly monitoring for all species at any sampling point that exceeds the MCL. Monitoring must be conducted in accordance with Table 12 in this section. A system can resume quarterly monitoring if the rolling average of three months of samples is at or below the MCL.

Table 8A. Inorganic Chemicals and Physical Characteristics Minimum Monitoring Requirements for Asbestos

Contaminant	Type of water system	Initial frequency by source type[5]		Repeat sampling and compliance
		Groundwater only	Surface only or surface and groundwater	
Asbestos[1]	Community and NTNC	One sample at entry point by 12/31/95 [2,3,4]	One sample at entry point by 12/31/95 [2,3,4]	If GT MCL, one sample quarterly.[6, 7] If LT MCL, one sample every nine years.

GT = Greater Than LT = Less Than

[1] If a system is not vulnerable to asbestos contamination, either at its source or due to corrosion of asbestos cement pipe, it is not required to monitor if granted a waiver by the State. The waiver must be renewed by the State every nine years. The basis for a waiver must include the following:
Lack of potential asbestos contamination of the water source
No use of asbestos cement pipe for finished water distribution and noncorrosive nature of the water.

[2] If asbestos monitoring data collected after January 1, 1990 are consistent with the requirements of this table, the State may allow systems to use that data to satisfy the initial monitoring requirement beginning January 1, 1993.

[3] If a system is vulnerable to asbestos contamination due to source water and corrosion of asbestos cement pipe or solely to corrosion of asbestos cement pipe, it shall take one sample at a tap served by asbestos cement pipe and under conditions where asbestos contamination is most likely to occur.

[4] If a system is vulnerable to asbestos contamination due to source water only, monitoring shall be conducted as follows:
Groundwater - Collect a minimum of one sample at every entry point to the distribution system representative of each well after treatment.
Surface water - Collect a minimum of one sample at each 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.

[5] For both types of water sources 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. 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 when water is representative of all sources.

[6] A system which exceeds the MCL for asbestos shall monitor quarterly beginning in the next quarter after the violation occurred.

[7] State may decrease the quarterly monitoring requirement to the initial sampling requirement provided that the State has determined that the system is reliably and consistently below the MCL on the basis of a minimum of two quarterly groundwater samples and a minimum of four quarterly samples for surface water.

Table 8B. Inorganic Chemicals and Physical Characteristics Minimum Monitoring Requirements

Contaminant	Type of water system	Initial frequency of source type[1]		Accelerated sampling[2]
		Groundwater only	Surface only or surface and ground water	
Antimony Arsenic Barium Beryllium Cadmium	Community and NTNC[3,4,5]	One sample per entry point every 3 years	One sample per entry point per year[9]	If GT MCL, one sample quarterly.[6,7] If LT MCL, maintain initial frequency.
Chromium Cyanide Mercury Nickel Selenium Thallium Fluoride	Transient noncommunity	State discretion[8]	State discretion[8]	State discretion[8]
Bromate[9]	Community and NTNC using ozone for disinfection or oxidation	One sample per month at each entry point[10, 11]	One sample per month at each entry point[10, 11]	State discretion[8]
Chlorite[12]	Community and NTNC using chlorine dioxide for disinfection or oxidation	Daily samples at each entry point. Additional three-sample set monthly in the distribution System[11,13,14, 15]	Daily samples at each entry point. Additional three-sample set monthly in the distribution System[11,13,14, 15]	State discretion[8]

GT = Greater Than; LT = Less Than

[1] For all types of water sources 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. 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 when water is representative of all sources, or separately at the individual sources. The State may allow systems to composite samples in accordance with the conditions in Appendix 5-C. All samples taken and analyzed in accordance with the monitoring plan must be included in determining compliance, even if the number is greater than the minimum required.

[2] The average of the initial and confirmation sample contaminant concentration at each sampling point shall be used to determine compliance with the MCL.

[3] A waiver from the required initial monitoring frequencies may be granted by the State, based upon the following conditions:

a. A minimum of one sample shall be collected while the waiver is effective;

b. Surface water systems must have monitored annually for at least three years and ground water systems must have conducted a minimum of three rounds of monitoring with at least one sample taken since January 1, 1990;

c. All results must be less than the MCL;

d. New sources are not eligible for a waiver until completion of three rounds of sampling; and

e. Waivers issued by the State shall be made in writing, shall cite the basis for determination and shall not exceed a maximum of nine years

Table 8B, Cont.

d. New sources are not eligible for a waiver until completion of three rounds of sampling; and
e. Waivers issued by the State shall be made in writing, shall cite the basis for determination and shall not exceed a maximum of nine years
[4] To determine the appropriate reduced monitoring frequency, the State shall consider:
a. Reported concentrations from all previous monitoring;
b. Variations in reported concentrations; and
c. Other factors which may affect contaminant concentrations such as changes in ground water pumping rates, changes in the system's configuration, operating procedures, stream flows or other characteristics.
[5] The State may require or the water system may request more frequent monitoring frequencies than is minimally required. The State, at its discretion, may require confirmation samples.
[6] The State may decrease the quarterly monitoring requirement to the initial sampling requirement provided that it is determined that the system is reliably and consistently below the MCL on the basis of a minimum of two quarterly ground water samples and a minimum of four quarterly samples for surface water.
[7] If concentrations of a listed contaminant exceed the MCL, the department requires the collection of an additional sample as soon as possible but not to exceed two weeks.
[8] State discretion shall mean requiring monitoring when the State has reason to believe the MCL has been violated, the potential exists for an MCL violation or the contaminant may present a risk to public health.
[9] Community and nontransient noncommunity water systems using ozone for disinfection or oxidation must comply with the bromate monitoring requirement.
[10] Systems required to analyze for bromate may reduce monitoring from monthly to once per quarter, if the system's running annual average bromate concentration is ≤0.0025 mg/l based on monthly bromate measurements for the most recent four quarters. A system may remain on reduced bromate monitoring until the running annual average source water bromide concentration, computed quarterly, is greater than 0.0025 mg/L. If the average bromide concentration is greater than 0.0025 mg/L, the system must resume routine monthly bromate monitoring.
[11] Failure to monitor will be treated as a monitoring violation for the entire period covered by an annual average where compliance is based on an annual average of monthly or quarterly samples or averages and a system's failure to monitor makes it impossible to determine MCL compliance.
[12] Community and nontransient noncommunity water systems using chlorine dioxide as a disinfectant or oxidant must comply with the chlorite monitoring requirement.
[13] On each day following a sample result that exceeds the chlorite MCL at the entrance to the distribution system, the system must 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 in a location representative of maximum residence time. The samples comprising the three-sample set required for routine monitoring must be collected at the same three locations in the distribution system that are used when following up on a daily MCL exceedance at the entry point. The system may use results of additional monitoring, conducted as the result of an entry point MCL exceedance, to meet the requirement for routine monthly monitoring.
[14] Daily chlorite monitoring at the entrance to the distribution system may not be reduced. Monthly chlorite monitoring in the distribution system 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 has exceeded the chlorite MCL. If the system has had to conduct distribution system monitoring as a result of an MCL exceedance at the entry point, the system cannot reduce monitoring. The system may remain on a reduced monitoring schedule until either any of the three individual chlorite samples taken quarterly in the distribution system exceeds the chlorite MCL or the system is required to conduct distribution system monitoring because of an entry point chlorite MCL exceedance.
[15] A system must monitor according to its monitoring plan as described in section 5-1.51(c) of this Subpart. Failure to monitor in accordance with the monitoring plan is a monitoring violation.

Table 8C. Inorganic Chemicals and Physical Characteristics Minimum Monitoring Requirements - Nitrates, Nitrites

Contaminant	Type of water system	Initial frequency of source type[1,6]		Accelerated sampling[7]
		Groundwater only	Surface only or surface and ground water	
Nitrate	Community and Noncommunity[2]	One sample per entry point per year	One sample per entry point quarterly	For Groundwater: if equal to or GT 50 percent MCL, quarterly for one year[3] For Surface Water: If LT 50 percent MCL, one sample per year[3,4]
Nitrite	Community and Noncommunity	One sample per entry point by 12/31/95	One sample per entry point by 12/31/95	If equal to or GT 50 percent MCL, repeat quarterly for at least one year[3,4] If LT 50 percent MCL, sample frequency at State discretion[5]

GT = Greater Than LT = Less Than

[1] The State may require, or the water system may request, more frequent monitoring frequencies than is minimally required. The State at its discretion may require confirmation samples for positive and negative results.

[2] Noncommunity water systems must sample annually beginning 1/1/93 regardless of the water source.

[3] The frequency may be reduced to annual if the State determines the systems contaminant concentration is consistently and reliably less than the MCL and annual samples are collected during the quarter(s) having the highest analytical results.

[4] A surface water shall return to quarterly monitoring if any one sample is GT 50 percent of MCL.

[5] State discretion shall mean requiring monitoring when the State has reason to believe the MCL has been violated, the potential exists for an MCL violation or the contaminant may present a risk to public health.

[6] For both types of water sources 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. 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 systems during periods of normal operating conditions when water is representative of all sources.

[7] The average of the initial and confirmation sample contaminant concentration at each sampling point shall be used to determine compliance with the MCL.

Table 8D. Inorganic Chemicals and Physical Characteristics Minimum Monitoring Requirements - Other Chemicals

Contaminant	Type of water system	Initial frequency of source type		Sampling and compliance
		Groundwater only	Surface only or surface and ground water	
Chloride Iron Manganese Silver Sodium[1] Sulfate Zinc Color Odor	Community and NTNC	State discretion[2]	State discretion[2]	State discretion[2]

[1] All community systems with sodium levels exceeding 20 mg/l will be required to sample for sodium analysis.

[2] State discretion shall mean requiring monitoring when the State has reason to believe the MCL has been violated, the potential exists for an MCL violation or the contaminant may present a risk to public health.

Table 9A. Organic Chemicals – Disinfection Byproducts Minimum Monitoring Requirements [1]

			Routine Monitoring		Reduced Monitoring[2]	
	Source Water Type	**Population Size**	**Distribution System monitoring location per monitoring period[3]**	**Frequency[4]**	**Distribution System monitoring locations per monitoring period**	**Frequency**
Total Trihalomethanes (TTHM) Haloacetic Acids (HAA5)	Surface water and GWUDI	<500	2 [5]	per year [6]	not allowed	not allowed
		500 – 3,300	2 [5]	per quarter	2 [5]	per year [6]
		3,301 – 9,999	2	per quarter	2 [7]	per year [6]
		10,000 – 49,999	4	per quarter	2 [8]	per quarter
		50,000 – 249,999	8	per quarter	4 [9]	per quarter
		250,000 – 999,999	12	per quarter	6 [10]	per quarter
		1,000,000 – 4,999,999	16	per quarter	8 [11]	per quarter
		≥5,000,000	20	per quarter	10 [12]	per quarter
	Ground water	<500	2 [5]	per year [6]	2 [5]	every third year [6]
		500 – 9,999	2	per year [6]	2 [5]	per year [6]
		10,000 – 99,999	4	per quarter	2 [7]	per year [6]
		100,000 – 499,999	6	per quarter	2 [8]	per quarter
		≥500,000	8	per quarter	4 [9]	per quarter

[1] To comply with monitoring requirements, certain conditions must be applied to test methods. The following apply to any samples collected for compliance with section 5-1.51(o) of this Subpart:

• Total Organic Carbon (TOC) samples. Inorganic carbon must be removed from TOC samples prior to analysis. TOC samples may not be filtered prior to analysis. TOC samples must be acidified at the time of sample collection to achieve pH less than or equal to 2 with minimal addition of the acid specified in the method or by the instrument manufacturer. Acidified TOC samples must be analyzed within 28 days.

Table 9A, Cont.

- SUVA Samples:

  For Specific Ultraviolet Absorbance (SUVA) samples, SUVA must be determined on water prior to the addition of disinfectants/oxidants by the system. Dissolved Organic Carbon (DOC) and Ultraviolet Absorption at 254 nm (UV254) samples used to determine a SUVA value must be taken at the same time and at the same location.

  DOC samples must be filtered through the 0.45 µm pore-diameter filter as soon as practical after sampling, not to exceed 48 hours. After filtration, DOC samples must be acidified to achieve pH less than or equal to 2 with minimal addition of the acid specified in the method or by the instrument manufacturer. Acidified DOC samples must be analyzed within 28 days of sample collection. Inorganic carbon must be removed from the samples prior to analysis. Water passed through the filter prior to filtration of the sample must serve as the filtered blank. This filtered blank must be analyzed using procedures identical to those used for analysis of the samples and must meet the following criteria: DOC < 0.5 mg/L.

  For UV254 samples, UV absorption must be measured at 253.7 nm (may be rounded off to 254 nm). Prior to analysis, UV254 samples must be filtered through a 0.45 µm pore-diameter filter. The pH of UV254 samples may not be adjusted. Samples must be analyzed as soon as practical after sampling, not to exceed 48 hours.

[2] Systems may reduce monitoring if, at all monitoring locations, the TTHM LRAA is ≤0.040 mg/L and the HAA5 LRAA is ≤0.030 mg/L. In addition, the source water annual average TOC level, before any treatment, shall be ≤4.0 mg/L at each treatment plant treating surface water or GWUDI. A system with quarterly reduced monitoring may remain on reduced monitoring as long as the TTHM LRAA is ≤0.040 mg/L and the HAA5 LRAA is ≤0.030 mg/L at each monitoring location. For systems with annual or less frequent monitoring, each TTHM sample shall be ≤0.060 mg/L and each HAA5 sample shall be ≤0.045 mg/L. In addition, the source water annual average TOC level, before any treatment, shall be ≤4.0 mg/L at each treatment plant treating surface water or GWUDI. If these conditions are not met, or at the State's discretion, the system shall resume routine monitoring in the quarter immediately following the exceedance (for quarterly systems) or in the year immediately following the exceedance (for systems that monitor annually or less frequently).

[3] A system shall monitor according to its monitoring plan as described in section 5-1.51(c) of this Subpart. Failure to monitor in accordance with the monitoring plan is a monitoring violation. All systems shall monitor during the month of highest Disinfection Byproducts concentrations. Monitoring shall be increased to quarterly at all locations if a TTHM sample is > 0.080 mg/L or a HAA5 sample is >0.060 mg/L.

[4] Systems on quarterly monitoring shall take dual sample sets every 90 days at each monitoring location, except for surface water and GWUDI systems serving a population of 500 -3,300. Ground water systems serving a population of 500 – 9,999 on annual monitoring shall take dual sample sets at each monitoring location. All other systems on annual monitoring and surface water and GWUDI systems serving a population of 500 – 3,300 are required to take individual TTHM and HAA5 samples (instead of dual sample set) at the locations with the highest TTHM and HAA5 concentrations, respectively. For systems serving fewer than 500 people, only one location with a dual sample set per monitoring period is needed if the highest TTHM and HAA5 concentrations occur at the same location and month.

[5] Collect one TTHM sample at the location and during the quarter with the highest TTHM single measurement, and one HAA5 sample at the location and during the quarter with the highest HAA5 single measurement; alternatively, collect one dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter.

[6] If a system is required to monitor a particular location annually or less frequently, and a TTHM sample is >0.080 mg/L or a HAA5 sample is >0.060 mg/L at any location, the system shall increase monitoring to dual sample sets once per quarter (taken every 90 days) at all locations. The system may return to routine monitoring if at least four consecutive quarters of increased monitoring have been conducted and for every monitoring location the TTHM LRAA ≤0.060 mg/L and the HAA5 LRAA is ≤0.045 mg/L.

Table 9A, Cont.

[7] Collect one dual sample set at the location and during the quarter of the highest TTHM single measurement, and one dual sample set at the location and during the quarter of the highest HAA5 single measurement.

[8] Collect dual sample sets at the locations with the highest TTHM and HAA5 LRAAs.

[9] Collect dual sample sets at the locations with the two highest TTHM and two highest HAA5 LRAAs.

[10] Collect dual sample sets at the locations with the three highest TTHM and three highest HAA5 LRAAs.

[11] Collect dual sample sets at the locations with the three highest TTHM and three highest HAA5 LRAAs.

[12] Collect dual sample sets at the locations with the five highest TTHM and five highest HAA5 LRAAs.

Table 9B. Organic Chemicals - POCs, Vinyl Chloride, Methyl-tertiary-butyl-ether (MTBE), UOCs, Propylene Glycol Minimum Monitoring Requirements

Contaminant	Type of water system	Initial requirement[1]	Continuing requirement where detected[1]	Continuing requirement where not detected and vulnerable to contamination[1]	Continuing requirement where not detected and invulnerable to contamination[1]
Principal Organic Contaminants listed on Table 9D and Vinyl chloride and Methyl-tertiary-butyl either (MTBE)[2]	Community and Nontransient Noncommunity serving 3,300 or more persons	Quarterly sample per source for one year[3]	Quarterly[4]	Annually[5]	Once every six years[6] for groundwater sources. State discretion[7] for surface water sources.
	Community and Nontransient Noncommunity serving fewer than 3,300 persons	Quarterly sample per source for one year[3]	Quarterly[4]	Annually[5]	Once every six years[6] for groundwater sources. State discretion[7] for surface water sources.
	Noncommunity excluding NTNC	State discretion[7]	State discretion[7]	State discretion[7]	State discretion[7]
Unspecified Organic Contaminants and other POCs not listed on Table 9C or 9D and Propylene Glycol	Community and Noncommunity	State discretion[7]	State discretion[7]	State discretion[7]	State discretion[7]

Table 9B, Cont.

[1] The location for sampling of each ground water source of supply shall be between the individual well and at or before the first service connection and before mixing with other sources, unless otherwise specified by the State to be at the entry point representative of the individual well. Public water systems which rely on a surface water shall sample at points in the distribution system representative of each source or at an entry point or points to the distribution system after any water treatment plant.

[2] The initial requirement does not apply to MTBE monitoring

[3] The State may reduce the initial monitoring requirement to one sample if the State determines that the system is invulnerable in accordance with footnote 4.

[4] The State may decrease the quarterly monitoring requirement to annually provided that the system is reliably and consistently below the MCL based on a minimum of two quarterly samples from a ground water source and four quarterly samples from a surface water source. Systems which monitor annually must monitor during the quarter which previously yielded the highest analytical result.

[5] The State may reduce the frequency of monitoring of a ground water source to once every three years for a public water system which has three consecutive annual samples with no detection of a contaminant.

[6] The State may determine that a public water system is invulnerable to a contaminant or contaminants after evaluating every three years the following factors:

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

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

1. Previous analytical results.

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

3. The environmental persistence and transport of the contaminants.

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

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

[7] State discretion shall mean requiring monitoring when the State has reason to believe the MCL has been violated, the potential exists for an MCL violation or the contaminant may present a risk to public health.

Table 9C. Additional Organic Chemicals - Minimum Monitoring Requirements

Contaminant		Type of water system	Initial requirement[1]	Continuing requirement where detected[1,2,3,4]	Continuing requirement where not detected[1]
Alachlor Aldicarb Aldicarb sulfone Aldicarb sulfoxide Aldrin Atrazine Benzo(a)pyrene Butachlor Carbaryl Carbofuran Chlordane Dalapon Di(2-ethylhexyl)adipate Di(2-ethylhexyl)phthalate Dibromochloropropane Dicamba 2,4-D Dieldrin Dinoseb 1,4-Dioxane Diquat Endothall Endrin	Ethylene Dibromide Glyphosate Heptachlor Heptachlor epoxide Hexachlorobenzene Hexachlorocyclopentadiene 3-Hydroxycarbofuran Lindane Methomyl Methoxychlor Metolachlor Metribuzin Oxamyl (vydate) Pentachlorophenol Perfluorooctanesulfonicacid (PFOS) Perfluorooctanoic acid (PFOA) Picloram Polychlorinated biphenyls Propachlor Simazine 2,3,7,8-TCDD (Dioxin) 2,4,5-TP (Silvex) Toxaphene	Community and Nontransient Noncommunity serving 3,300 or more persons[3]	Quarterly sample per source, for one year[5]	Quarterly	One sample every eighteen months per source[6,7,8]
		Community and Nontransient Noncommunity serving fewer than 3,300 persons and more than 149 service connections	Quarterly samples per entry point, for one year[6,7,8]	Quarterly	Once per entry point every three years[6,7,8]
		Community and Nontransient Noncommunity serving fewer than 3,300 persons and fewer than 150 service connections	Quarterly samples per entry point for one year[6,7,8]	Quarterly	Once per entry point every three years[6,7,8]
		Noncommunity excluding NTNC	State discretion[9]	State discretion[9]	State discretion[9]

Table 9C, Cont.

[1] The location for sampling of each ground water source of supply shall be between the individual well and at or before the first service connection and before mixing with other sources, unless otherwise specified by the State to be at the entry point representative of the individual well. Public water systems which take water from a surface water body or watercourse shall sample at points in the distribution system representative of each source or at entry point or points to the distribution system after any water treatment plant.

[2] The State may decrease the quarterly monitoring requirement to annually provided that system is reliably and consistently below the MCL based on a minimum of two quarterly samples from a ground water source and four quarterly samples from a surface water source. Systems which monitor annually must monitor during the quarter that previously yielded the highest analytical result. Systems serving fewer than 3,300 persons and which have three consecutive annual samples without detection may apply to the State for a waiver in accordance with footnote 6.

[3] If a contaminant is detected, repeat analysis must include all analytes contained in the approved analytical method for the detected contaminant.

[4] Detected as used in the table shall be defined as reported by the State approved laboratory to be greater than or equal to the method detection limit.

[5] The State may allow a system to postpone monitoring for a maximum of two years, if an approved laboratory is not reasonably available to do a required analysis within the scheduled monitoring period.

[6] The State may waive the monitoring requirement for a public water system that submits information every three years to demonstrate that a contaminant or contaminants was not used, transported, stored or disposed within the watershed or zone of influence of the system.

[7] The State may reduce the monitoring requirement for a public water system that submits information every three years to demonstrate that the public water system is invulnerable to contamination. 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 a potential point or nonpoint 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. Nonpoint 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.
c. The environmental persistence and transport of the pesticide, PCBs, PFOA, PFOS or 1,4-dioxane.
d. How well the water source is protected against contamination due to such factors as depth of the well and the type of soil and the integrity of the well casing.
e. Elevated nitrate levels at the water supply source.
f. Use of PCBs in equipment used in production, storage or distribution of water.

[8] The State may allow systems to composite samples in accordance with the conditions in Appendix 5-C of this Title.

[9] State discretion shall mean requiring monitoring when the State has reason to believe the MCL has been violated, the potential exists for an MCL violation or the contaminant may present a risk to public health.

Table 9D. Organic Chemicals - POCs Minimum Monitoring Requirements

Contaminant	Specific Contaminants for analysis	
POCs	Benzene[1] Bromobenzene Bromochloromethane Bromomethane N-Butylbenzene Sec-Butylbenzene Tert-Butylbenzene Carbon Tetrachloride[1] Chlorobenzene Chloroethane Chloromethane 2-Chlorotoluene 4-Chlorotoluene Dibromomethane 1,2-Dichlorobenzene[1] 1,3-Dichlorobenzene 1,4-Dichlorobenzene[1] Dichlorodifluoromethane 1,1-Dichloroethane 1,2-Dichloroethane[1] 1,1-Dichloroethene[1] cis-1,2-Dichloroethene[1] trans-1,2-Dichloroethene[1] 1,2-Dichloropropane[1] 1,3-Dichloropropane 2,2-Dichloropropane 1,1-Dichloropropene	cis-1,3-Dichloropropene Trans-1,3-Dichloropropene ethylbenzene[1] hexachlorobutadiene Isopropylbenzene p-Isopropyltoluene Methylene Chloride[1] n-Propylbenzene Styrene[1] 1,1,1,2-Tetrachloroethane 1,1,2,2-Tetrachloroethane Tetrachloroethene[1] Toluene[1] 1,2,3-Trichlorobenzene 1,2,4-Trichlorobenzene[1] 1,1,1-Trichloroethane[1] 1,1,2-Trichloroethane[1] Trichloroethene[1] Trichlorofluoromethane 1,2,3-Trichloropropane 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene m-Xylene[1] o-Xylene[1] p-Xylene[1]	

[1] Notification must contain mandatory health effect language.

Table 10. Turbidity Minimum Monitoring Requirements for Unfiltered Systems Pending Filtration [1]

Contaminant	Source Type		Surface only, surface and ground water, or ground water directly influenced by surface water
	Type of water system	Groundwater only	
Entry point turbidity	Community	State discretion[2]	Collect and analyze one sample per day from each entry point. All results must be recorded to two significant figures.
	Noncommunity	State discretion[2]	Collect and analyze one sample annually. Monitoring requirement may be increased at State discretion.[2]
Distribution point turbidity	Community	State discretion[2]	Five distribution samples each week unless otherwise determined by the State. No two samples may be obtained on the same day and no two samples are to be collected from the same distribution point during the week.
	Noncommunity	State discretion[2]	State discretion[2]

[1] The requirements of this table apply to unfiltered systems that the State has determined, in writing pursuant to section 5-1.30 of this Subpart, must install filtration. These requirements only apply until filtration is installed.

[2] State discretion shall mean requiring monitoring when the State has reason to believe the MCL has been violated, the potential exists for an MCL violation or the contaminant may present a risk to public health.

Table 10A. Turbidity Minimum Monitoring Requirements [1]

Contaminant	Type of water system	Source type	
		Groundwater	Surface water[1]
Filtered water turbidity	Community and Noncommunity	Not applicable	Continuous monitoring for composite filter effluent and individual filters.[2,3,4,5]
Raw water turbidity	Unfiltered surface: Community and Noncommunity	Not applicable	Every four hours or continuous monitoring.[5]

Table 10A, Cont.

Contaminant	Type of water system	Source type	
		Groundwater	Surface water[1]
Distribution point turbidity	Community	State discretion [6]	Five distribution samples each week unless otherwise determined by the State. No two samples may be obtained on the same day and no two samples are to be collected from the same distribution point during the same week.
	Noncommunity	State discretion [6]	State discretion [6]

[1] Surface water sources or groundwater sources directly influenced by surface water.

[2] Effective January 1, 2002 systems serving 10,000 or more people must record the results of individual filter monitoring every fifteen minutes, and combined filter effluent every four hours. Effective January 14, 2005 systems serving fewer than 10,000 persons must record the results of individual filter monitoring every fifteen minutes, and combined filter effluent every four hours. Until January 14, 2005, systems serving fewer than 10,000 persons must continuously monitor the composite filter effluent turbidity, or record the turbidity every four hours. The state may allow systems with two filters to monitor the combined filter effluent continuously (recording every 15 minutes) in lieu of monitoring individual filter turbidity. Results of individual filter monitoring must be maintained for at least three years.

[3] If there is a failure in the continuous turbidity monitoring equipment, the system must conduct grab sampling every four hours instead of continuous monitoring, but for no more than five working days following the failure of the equipment.

[4] For systems using slow sand filtration or filtration treatment, other than conventional treatment, direct filtration or D.E. filtration, the State may reduce sampling frequency to once per day if it determines that less frequent monitoring is sufficient to indicate effective filtration performance.

[5] If a system uses continuous monitoring, it must use the turbidity values recorded every four hours to determine if a treatment technique violation occurs, unless the State has approved in writing a different time interval.

[6] State discretion shall mean requiring monitoring when the State has reason to believe the MCL has been violated, the potential exists for an MCL violation or the contaminant may present a risk to public health.

Table 11. Microbiological Minimum Monitoring Requirements (Refer to Table 11B following any positive samples) [1,2,3,4]

Contaminant	Type of Water System	Number of Routine Samples Based on Population			
		Population Served	Minimum Number of Samples per Month[4]	Population Served	Minimum Number of Samples per Month[4]
Total coliform in distribution system[5]	Community	Up to 1,000[6,7]	1	59,001 to 70,000	70
		1,001 to 2,500	2	70,001 to 83,000	80
		2,501 to 3,300	3	83,001 to 96,000	90
		3,301 to 4,100	4	96,001 to 130,000	100
		4,101 to 4,900	5	130,001 to 220,000	120
		4,901 to 5,800	6	220,001 to 320,000	150
		5,801 to 6,700	7	320,001 to 450,000	180
		6,701 to 7,600	8	450,001 to 600,000	210
		7,601 to 8,500	9	600,001 to 780,000	240
		8,501 to 12,900	10	780,001 to 970,000	270
		12,901 to 17,200	15	970,001 to 1,230,000	300
		17,201 to 21,500	20	1,230,001 to 1,520,000	330
		21,501 to 25,000	25	1,520,001 to 1,850,000	360
		25,001 to 33,000	30	1,850,001 to 2,270,000	390
		33,001 to 41,000	40	2,270,001 to 3,020,000	420
		41,001 to 50,000	50	3,020,001 to 3,960,000	450
		50,001 to 59,000	60	3,960,001 or more	480
Total coliform in distribution system[5]	Noncommunity using surface water or groundwater directly influenced by surface water	All	Same as community		
	Noncommunity using only groundwater not directly influenced by surface water[9]	≤1,000	Quarterly[8,9]		
		>1,000	Same as community		
	Seasonal	All	Monthly[9]		
Escherichia coli (E. coli)	Community and Noncommunity	All	Any routine or repeat samples that are Coliform positive must be analyzed for *E. coli*.[4,10]		
Fecal Indicator in Raw Source Water[10]	All ground water systems unless providing 4-log virus treatment and process compliance monitoring	All	State discretion[11]		

Table 11, Cont.

[1] Public water supply systems must collect total coliform samples at sites that are representative of water throughout the distribution system and throughout the reporting period, in accordance with a written monitoring plan which is subject to State review and revision as described in section 5-1.51(c) of this Subpart. A public water system that uses only groundwater and serves 4,900 or fewer people may collect all required samples on a single day if they are taken from different sites.

[2] Public water systems using surface water or groundwater directly influenced by surface water, and which do not provide filtration, must collect and analyze at least one sample for total coliforms near the first service connection each day the turbidity level of the raw water exceeds 1.49 NTU. This sample shall be collected within 24 hours. Results of this sample must be included in determining compliance with the MCLs and TTTs in Table 6 of this section.

[3] Samples taken to determine disinfection practices after pipe repair, replacement, or similar activity are not to be used for determining compliance with the MCLs or TTTs in Table 6 of this section.

[4] See Table 11B for repeat sampling requirements following any total coliform or *E. Coli* positive samples.

[5] If chlorine or chloramines are used as the disinfectant, a chlorine residual determination shall be made at the same time and location that the sample is collected for total coliform analysis. Monitoring for heterotrophic bacteria may be substituted for free chlorine residuals. The State may allow a public water system that uses both: (1) a surface water source, or a ground water source under direct influence of surface water, and (2) a ground water source, to take disinfectant residual samples at points other than the total coliform sampling points if the State determines that such points are more representative of treated (disinfected) water quality within the distribution system. A heterotrophic plate count result equal to or less than 500 colonies per milliliter is considered to be equivalent to a measurable free chlorine residual.

[6] The State may, in writing, reduce the monitoring frequency to quarterly for a community water system serving 1,000 or fewer persons and using ground water only if the system is in compliance with 10 NYCRR Subpart 5-4; has a clean compliance history for a minimum of 12-months; is free of sanitary defects; and has a protected water source. The system must meet at least one of the following criteria: an annual site visit by the State or State-approved party that is equivalent to a Level 2 assessment and correction of all identified sanitary defects; cross connection control, as approved by the State; continuous disinfection entering the distribution system and a residual in the distribution system in accordance with criteria specified by the State; or demonstration of maintenance of at least a 4-log removal or inactivation of viruses. Systems that have been granted a disinfection waiver are not eligible for reduced monitoring frequency.

[7] A community water system on quarterly monitoring must begin monthly monitoring if it meets any of the following conditions: a Level 2 assessment is triggered; two Level 1 assessments in a rolling 12-month period are triggered; an *E. coli* MCL violation; a coliform TTV; or two total coliform monitoring violations in a rolling 12-month period. Monthly monitoring must begin in the month following the event.

[8] A noncommunity water system on quarterly monitoring must begin monthly monitoring if it meets any of the following conditions: a Level 2 assessment is triggered; two Level 1 assessments in a rolling 12-month period are triggered; an *E. coli* MCL violation; a coliform TTV; two total coliform monitoring violations; or one total coliform monitoring violation and one Level 1 assessment in a rolling 12-month period. Monthly monitoring must begin in the month following the event.

[9] A noncommunity water system may return to quarterly monitoring if they meet the following criteria: within the last 12 months, the system must have a completed sanitary survey or Level 2 assessment, be free of sanitary defects, have a protected water source; and the system must have a clean compliance history for a minimum of 12 months.

[10] Fecal indicators include *E. coli*, enterococci, and coliphage. Only *E. coli* testing will be required, unless otherwise directed by the State.

[11] State discretion shall mean that monitoring is required when the State has reason to believe the MCL or TT has been violated, the potential exists for an MCL violation or TTV; or the contaminant may present a risk to public health.

Table 11A. Microbiological/Filtration Avoidance Criteria Minimum Monitoring Requirements [1]

Contaminant[2]	Type of water system	Population served	Minimum number of samples per week[3,4]
Raw water fecal or total coliform	Community and Noncommunity	Up to 500 501 to 3,300 3,301 to 10,000 10,001 to 25,000 25,001 or more	1 2 3 4 5

[1] The monitoring requirement applies to surface water sources and groundwater sources directly influenced by surface water.

[2] Either fecal or total coliform density measurements are acceptable. If both analyses are performed, the fecal coliform results will take precedence.

[3] Monitoring sampling must be performed on separate days.

[4] Samples must be taken and analyzed every day the system serves water to the public and the turbidity of the raw water exceeds 1 NTU. The samples count toward the weekly sampling requirement.

Table 11B. Repeat Microbiological Sampling Requirements Following Total Coliform Positive and/or Fecal Indicator Positive Sample(s) [1]

Type of Positive Sample	Type of Water System/Source	System Size	Number of Repeat Samples Required Within 24 Hours of Notification	Sampling Location	Required Action for Positive Repeat Samples
Routine total coliform sample(s) from distribution system	Surface water, GWUDI, or ground water performing 4-log virus treatment and process compliance monitoring	More than one service connection	Three distribution system samples	The same sampling site where the original coliform-positive sample was collected, one sample within five service connections upstream, one sample within five service connections downstream in accordance with a state approved sampling plan.	Distribution sampling must be repeated until total coliform is not detected in repeat samples, or it is determined that a treatment technique has been triggered or an MCL has been violated.[2, 3]
		One service connection	One distribution system sample[4]	Original sampling location	
	Ground water system or ground water source not providing (or not documenting) 4-log virus treatment[5]	Population >1,000	Three distribution system samples and one source water sample from each source collected in accordance with a	The same distribution system sampling site where the original coliform-positive sample was collected, one sample within five service connections upstream, one sample within five service connections downstream. An additional sample must be collected from each raw water	Distribution sampling must be repeated until total coliform is not detected in repeat samples, or it is determined that a

Type of Positive Sample	Type of Water System/Source	System Size	Number of Repeat Samples Required Within 24 Hours of Notification	Sampling Location	Required Action for Positive Repeat Samples
Routine total coliform sample(s) from distribution system	Ground water system or ground water source not providing (or not documenting) 4-log virus treatment[5]		State-approved sampling plan[6]	source or according to State approved sampling plan.[6, 7]	treatment technique has been triggered or an MCL has been violated.[2, 3]
		Population ≤1,000 and more than one service connection	Three distribution system samples and one source water sample from each source collected in accordance with a State-approved sampling plan.[5, 8]	The same distribution system sampling site where the original coliform-positive sample was collected, one sample within five service connections upstream, and one sample within five service connections downstream. An additional sample must be collected from each raw water source or according to State approved sampling plan.[6, 7, 8]	
		One service connection	One distribution system sample and source water sample(s) in accordance with a State-approved sampling plan[4, 6, 8]	Original sampling location. An additional sample must be collected from each raw water source or according to State approved sampling plan.[6, 7, 8]	Distribution sampling must be repeated until total coliform is not detected in repeat samples, or it is determined that a treatment technique has been triggered or an MCL has been violated.[2, 3]
		Wholesale System of any size	After notification by consecutive system of total coliform-positive sample[6, 7, 9, 11]	Collect one raw water sample at each source or in accordance with a State-approved sampling plan.[6, 7, 9]	As directed by State[10]
Source water sample(s) fecal indicator positive[7, 10]	Ground water system or ground water source not providing or not documenting 4-log virus treatment	All	Five raw water samples for fecal indicator or immediate corrective action as directed by State[6, 9, 11]	Fecal indicator sampling from source or sources with initial fecal indicator positive samples[6, 7]	As directed by State[10, 11]

Table 11, Cont.

[1] After any total coliform positive sample from the distribution system, the system must collect repeat samples on the same day and within 24 hours of being notified of the positive result. If *E. coli* are present, the system must notify the State by the end of the day when the system is notified of the test result.

[2] The month following a total coliform positive sample, systems collecting samples quarterly must collect a minimum of three routine distribution system samples. The State may waive, in writing, the requirement to collect three routine samples the following month the system provides water to the public, if the State carries out an onsite visit before the end of the following month and the State determines why the sample was total coliform positive and establishes that the system has corrected the problem. The State cannot waive the requirement to collect three routine samples solely on the basis that all the repeat samples were total coliform negative. Before the end of the following month the system serves water to the public, at least one routine sample to determine compliance with the MCLs and TTTs must be collected by the system as required in Table 11.

[3] Results of all routine and repeat microbiological samples not invalidated by the State must be used to determine whether a coliform TTT specified in Table 6 has been exceeded.

[4] The State may allow a system with a single service connection to collect the required set of repeat samples over a three-day period or to collect a larger volume repeat sample(s) in one or two more sample containers of any size, as long as the total volume collect is at least 300 mL. If *E. coli* is used as the fecal indicator at a ground water system with a single well, a single sample of two (2) times the minimum sample volume or two (2) bottles of minimum required sample volume may be collected consecutively from the tap and the third sample collected from the raw water source. This source water sample result must be used to determine compliance with all Table 6 requirements.

[5] If a consecutive system purchasing (or otherwise obtaining) ground water from a wholesale system has a total coliform-positive sample from the distribution system, the system must notify the wholesale system and collect distribution system repeat samples as specified in Table 11B within 24 hours. The wholesale system must collect raw source water sample(s) unless the system provides 4-log virus treatment at peak flow before or at the first customer as confirmed through process compliance monitoring.

[6] Sampling plan requirements are given in section 5-1.51 (c) of this Subpart.

[7] Fecal indicators include *E. coli*, enterococci and coliphage. Sampling for fecal indicators other than *E. coli* is at State discretion.

[8] A system with a single well or a ground water source serving 1,000 or fewer persons may collect a single raw water sample to serve as both a distribution repeat sample to replace the upstream location sample and a raw water sample taken following a routine total coliform positive sample, if *E. coli* is used as the fecal indicator. If this dual-purpose source water sample is collected, the sample result must be used to determine compliance with all Table 6 requirements.

[9] Wholesale system source water sampling requirements are in addition to distribution system sampling requirements for consecutive systems.

[10] In the event of a fecal indicator positive sample from the raw source water, the state must be notified immediately and may require immediate corrective action. In no case will notification be later than 24 hours as described in section 5-1.78(d)(5) of this Subpart.

[11] If a ground water wholesale system does not perform 4-log virus treatment and process compliance monitoring, and has a fecal indicator positive sample from a raw source water, the system must notify any consecutive systems as well as any of its own customers.

Table 12. Radiological Minimum Monitoring Requirements

Contaminant	Type of water system	Monitoring Requirement[1]	
		Initial	**Reduced monitoring[2,3]**
Combined Ra-226 and Ra-228, uranium and gross alpha particle activity	Community	Four consecutive quarterly samples at every entry point before December 31, 2007.[4,5,6]	One sample every nine years at every entry point when monitoring results are below the detection limit.[7,8] One sample every six years at every entry point when monitoring results are at or above the detection limit but below half of the MCL.[7,8] One sample every three years at every entry point when monitoring results are above half of the MCL but at or below the MCL.[7,8]
	Noncommunity	Not applicable	
Beta particle and photon radioactivity from manmade radionuclides	Community systems designated by the State as vulnerable[9]	Quarterly samples for beta particle and annual samples for tritium and Sr-90, beginning within one quarter after being notified by the State.[10,11]	If the gross beta particle activity minus the naturally occurring K-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 State may reduce the frequency of monitoring at that sampling point to once every 3 years.[14,15]
	Community systems designated by the State as utilizing waters contaminated by effluents from nuclear facilities[9]	Quarterly samples for beta emitters and I-131 and annual samples for tritium and Sr-90, beginning within one quarter after being notified by the State.[10,11,12,13]	If the gross beta particle activity minus the naturally occurring K-40 beta particle activity at a sampling point has a running annual average (computed quarterly) less than or equal to 15 pCi/L (screening level), the State may reduce the frequency of monitoring at that sampling point to once every 3 years.[14,15]

Table 12, Cont.

[1] All radiological samples must be collected at every entry point to distribution system (EPTDS).
[2] The State may allow systems to reduce the frequency of monitoring based on initial monitoring or historical results as noted in footnote 4 below.
[3] Systems on a reduced monitoring schedule must perform quarterly sampling if a sample result exceeds the MCL.
[4] The State may allow historical monitoring data collected between June 2000 and December 8, 2003 for systems with;
(1) only one entry point to the distribution system;
(2) multiple entry points and having appropriate historical monitoring data for each entry point to the distribution system;
(3) appropriate historical data for a representative point in the distribution system, provided that the State 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.
[5] The State 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.
[6] 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 the sampling point until the system has results from four consecutive quarters that are at or below the MCL.
[7] 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 % (1.65σ, where σ 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 a 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 can be used to substitute to radium-226 and determine compliance for future monitoring frequency.
[8] Radium-228 measurement can not be substituted by the gross alpha particle activity result.
[9] For systems in the vicinity of a nuclear facility, the State may allow the CWS to utilize environmental surveillance data collected by the nuclear facility in lieu of monitoring the systems entry point(s), where the State determines that such data is applicable.
[10] Systems already designated by the State must continue to sample until the State reviews and either reaffirms or removes the designation.
[11] 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
[12] Annual monitoring for Sr-90 and tritium shall be conducted by means of the analysis of a composite of four consecutive quarterly samples or analysis of four quarterly samples.
[13] For iodine-131, a composite of five consecutive daily samples shall be analyzed once each quarter. As ordered by the State, more frequent monitoring shall be conducted when iodine-131 is identified in the finished water.
[14] Systems must collect all samples for beta emitters, tritium and strontium-90 during the reduced monitoring period.
[15] A system that exceeds the gross beta particle activity minus the naturally occurring potassium-40 beta particle screening level (50 pCi/L for vulnerable systems or 15 pCi/L for systems utilizing waters contaminated by effluents from nuclear facilities), must further analyze the sample for the major radioactive constituents. The potassium-40 beta particle activity must be calculated by multiplying elemental potassium concentrations in mg/L by a factor of 0.82

Table 13. Required Notifications

Contaminant/Situation (Subpart 5-1 citations)	**Single sample exceeds MCL/MRDL[1]**	**MCL/MRDL/TT[1] violation**	**Failure to meet monitoring requirements and/or failure to use applicable testing procedure**
Public Health Hazard (Section 5-1.1(bz))[2]	Not applicable	State Tier 1	State Tier 1
Escherichia coli (E. coli) in distribution system (Section 5-1.52, Tables 6, 11 and 11B)	State[3] Not applicable, or Tier 1[4]	State Tier 1	State Tier 3, or Tier 1[5]
E. coli or other fecal indicator detected in ground water source at system not providing both 4-log virus treatment and process compliance monitoring (Section 5-1.52, Tables 6, 11 and 11B)	Tier 1[2,3,5,6]	Tier 1[6]	State Tier 3, or Tier 1[2,5,7]
Total coliform in distribution system (Section 5-1.52, Tables 6, 11 and 11B)	Not applicable	State[8] Tier 2, or Tier 1[9]	State Tier 3, or Tier 2 as directed by State
Entry Point Turbidity monthly average (Section 5-1.52, Tables 4 and 10)	State[10]	State Tier 2	State Tier 3
Entry Point Turbidity two-day average (Section 5-1.52, Tables 4 and 10)	State	State Tier 2, or Tier 1[11]	State Tier 3
Raw Water Turbidity (Subdivision 5-1.30(d) and Section 5-1.52, Table 10A)	State	State Tier 2, or Tier 1[11]	State Tier 3
Filtered Water Turbidity Single exceedance of the maximum allowable Turbidity level (Section 5-1.52, Tables 4A and 10A)	State	State Tier 2, or Tier 1[11]	State Tier 3
Filtered Water Turbidity Treatment Technique violation (Section 5-1.52, Tables 4A and 10A)	Not applicable	State Tier 2	State Tier 3

Table 13, Cont.

Contaminant/Situation (Subpart 5-1 citations)	**Single sample exceeds MCL/MRDL[1]**	**MCL/MRDL/TT[1] violation**	**Failure to meet monitoring requirements and/or failure to use applicable testing procedure**
Distribution Point Turbidity (Section 5-1.52, Tables 5, 10 and 10A)	Not applicable	State Tier 2	State Tier 3
Treatment Technique violations other than turbidity[12,13] (Sections 5-1.12, 5-1.30, 5-1.32, 5-1.81, and 5-1.83 and Subdivision 5-1.71(d))	Not applicable	State Tier 2, or Tier 1[2,13]	State Tier 3[13], or Tier 2[12]
Free chlorine residual less than 0.2 mg/L at the entry point[14] (Subdivision 5-1.30(d))	Not applicable	State	Not applicable
Free chlorine residual less than required minimum for a ground water system or ground water source required to provide 4-log virus treatment[15] (Subdivision 5-1.30(a))	Not applicable	State Tier 2, or Tier 1[9]	Tier 2
Inorganic chemicals and physical characteristics listed in Tables 8A and 8B (Section 5-1.52, Tables 1, 8A, and 8B)	State	State Tier 2	State Tier 3
Chloride, iron, manganese, silver, sulfate, and zinc (Section 5-1.52, Tables 1 and 8D)	Not applicable	State Tier 3	State Tier 3
Sodium (Section 5-1.52, Tables 1 and 8D)	State if the level exceeds 20 mg/L	Tier 2 if the level exceeds 270 mg/L	Tier 3
Nitrate, Nitrite, Total Nitrate and Nitrite (Section 5-1.52, Tables 2 and 8C)	State	State Tier 1	State Tier 1, or Tier 3[16]
Lead and Copper (Sections 5-1.40 to 1.48)	Not applicable	State Tier 2	State Tier 3

Table 13, Cont.

Contaminant/Situation (Subpart 5-1 citations)	**Single sample exceeds MCL/MRDL[1]**	**MCL/MRDL/TT[1] violation**	**Failure to meet monitoring requirements and/or failure to use applicable testing procedure**
Organic Chemicals Group 1 and 2 (Section 5-1.52, Table 9C)	State	State Tier 2	State Tier 3
Principal Organic Contaminants Unspecified Organic Contaminants Total POCs and UOCs (Section 5-1.52, Tables 3, 9B and 9D)	State	State Tier 2	State Tier 3
Radiological Contaminants (Section 5-1.52, Tables 7 and 12)	State	State Tier 2	State Tier 3
Monitoring and Control of Disinfection Byproduct Precursors (Sections 5-1.60 to 5-1.64)	Not applicable	State Tier 2	State Tier 3
Disinfectant residuals Chlorine and Chloramine (Section 5-1.52, Tables 3A and 15A)	State	State Tier 2	State Tier 3
Disinfectant residual Chlorine dioxide at entry point (Section 5-1.52, Tables 3A, 15 and 15A)	State	State Tier 2	State Tier 3, or Tier 2[17]
Disinfectant residual Chlorine dioxide in distribution system (Section 5-1.52, Tables 3A, 15 and 15A)	State	State Tier 1[18]	State Tier 1[18]

Table 13, Cont.

Contaminant/Situation (Subpart 5-1 citations)	**Single sample exceeds MCL/MRDL1**	**MCL/MRDL/TT[1] violation**	**Failure to meet monitoring requirements and/or failure to use applicable testing procedure**
Disinfection byproducts Trihalomethanes Haloacetic acids (Section 5-1.52, Tables 3 and 9A) and Bromate and Chlorite (Section 5-1.52, Tables 1 and 8B)	Not applicable	State Tier 2	State Tier 3
Acrylamide and Epichlorohydrin (Subdivision 5-1.51(m))	Not applicable	State Tier 2	Not applicable
Operation under a variance, exemption or deferral (sections 5-1.90 to 5-1.96 and section 5-1.51(p))	Not applicable	Tier 3	Not applicable
Violation of conditions of a variance, exemption or deferral (sections 5-1.90 to 5-1.96 and section 5-1.51(p))	Not applicable	State Tier 2	Not applicable
Disruption of water service of four hours or more (Subdivision 5-1.23(b))	Not applicable	State[19]	Not applicable

Table 13, Cont.

[1] MCL-maximum contaminant level, MRDL-maximum residual disinfectant level, TT-treatment technique

[2] Community systems must describe in their annual water supply statement (see section 5-1.72(e) and (f)) any Public Health Hazard that is determined to be a violation, and any uncorrected significant deficiency, and must indicate whether corrective action has been completed. This notice must be repeated every year until the annual report documents that corrective action has been completed in accordance with section 5-1.22 of this Subpart.

[3] State notification must be made by the supplier of water by the end of the day when the system is notified of an E. coli positive test result in the distribution system. State notification must be made by the supplier of water within 24 hours when the system is notified of an E. coli positive test result in the ground water source.

[4] Public notification normally does not have to be issued for an *E. coli* positive sample prior to the results of the repeat samples. However, there may be situations where the State determines that a Tier 1 notification is necessary to protect the public health. The supplier of water must provide the Tier 1 notification no later than 24 hours after learning of the State's determination.

[5] Failure to test for *E. coli* requires a Tier 1 notification if testing is not performed after any repeat sample tests positive for coliform. All other *E. coli* monitoring and testing procedure violations require Tier 3 notification.

[6] At a ground water system, Tier 1 notification is required after initial detection of *E. coli* or other fecal indicator in raw source water, if the system does not provide 4-log virus treatment and process compliance monitoring. Confirmation of *E. coli* or other fecal indicator in the source water requires Tier 1 notification. Failure to take confirmatory samples may be a public health hazard requiring Tier 1 notification.

[7] Notice of the fecal indicator positive raw water sample must be made in the annual water supply statement (see section 5-1.72(e)), until the annual report documents that corrective action has been completed.

[8] State notification must be made by the supplier of water within 24 hours of learning of the violation.

[9] Tier 2 notification is normally required; however, there may be situations where the State determines that a Tier 1 notification is necessary to protect the public health. The supplier of water must provide the Tier 1 notification no later than 24 hours after learning of the State's determination.

[10] If the daily entry point analysis exceeds one NTU, a repeat sample must be taken as soon as practicable, and preferably within one hour. If the repeat sample exceeds one NTU, the supplier of water must make state notification.

[11] Systems must consult with the State within 24 hours after learning of the violation. Based on this consultation, the State may subsequently decide to elevate the violation from a Tier 2 to a Tier 1 notification. If consultation does not take place within the 24-hour period, the water system must distribute a Tier 1 notification no later than 48 hours after the system learns of the violation.

Table 13, Cont.

[12] These violations include the following: failure to comply with the treatment technique or monitoring requirements in section 5-1.30(a), (b), (c), and (g) of this Subpart; failure to comply with the avoidance criteria in section 5-1.30(c) of this Subpart; failure to cover a finished water storage facility or treat its discharge required in section 5-1.32 of this Subpart; failure to report to the state information required in section 5-1.72(c)(3) of this Subpart; failure to maintain records required in section 5-1.72(d)(7) of this Subpart; and failure to meet the treatment and bin classification requirements associated with *Cryptosporidium* in section 5-1.83 of this Subpart. Failure to collect three or more samples for *Cryptosporidium* analysis as required in section 5-1.81 of this Subpart is a Tier 2 violation requiring public notification. Failure to perform any other monitoring and testing procedure as required in section 5-1.81 of this Subpart is a Tier 3 violation.

[13] Any significant deficiency that is not corrected, or where correction has not begun according to a State-approved corrective action plan within 120 days, or as directed by the State, is a TTV and must be addressed in accordance with section 5-1.12. If the deficiency is a public health hazard, the deficiency must be addressed as directed by the State and Tier 1 notification is required.

[14] Applies to systems that have surface water or groundwater directly influenced by surface water as a source and use chlorine. The system must make State notification whether the residual was restored to at least 0.2 mg/L within four hours.

[15] Required minimum chlorine residual at point that demonstrates adequate CT for disinfected water from ground water sources at first customer.

[16] Failure to take a confirmation sample within 24 hours for nitrate or nitrite after an initial sample exceeds the MCL requires a Tier 1 notification. Other monitoring violations for nitrate or nitrite require a Tier 3 notification.

[17] 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 requires a Tier 2 notification. Other monitoring violations for chlorine dioxide at the entrance to the distribution system require a Tier 3 notification.

[18] 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 the day after the MRDL is exceeded at the entry point also triggers Tier 1 notification.

[19] Tier 1 notification is required if the situation meets the definition of a public health hazard.

Table 14A. CT Values (CT99.9) for 99.9 Percent Inactivation of Giardia Lamblia Cysts by Free Chlorine at 0.5 Degrees Celsius or Lower [1]

Free chlorine residual (mg/L)	pH						
	≤6.0	6.5	7.0	7.5	8.0	8.5	≤9.0
≤0.4	137	163	195	237	277	329	390
0.6	141	168	200	239	286	342	407
0.8	145	172	205	246	295	354	422
1.0	148	176	210	253	304	365	437
1.2	152	180	215	259	313	376	451
1.4	155	184	221	266	321	387	464
1.6	157	189	226	273	329	397	477
1.8	162	193	231	279	338	407	489
2.0	165	197	236	286	346	417	500
2.2	169	201	242	297	353	426	511
2.4	172	205	247	298	361	435	522
2.6	175	209	252	304	368	444	533
2.8	178	213	257	310	375	452	543
3.0	181	217	261	316	382	460	552

[1] These CT values achieve greater than a 99.99 percent inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature, and at the higher pH.

Table 14B. CT Values (CT99.9) for 99.9 Percent Inactivation of Giardia Lamblia Cysts by Free Chlorine at 5.0 Degrees Celsius[1]

Free chlorine residual (mg/L)	pH						
	≤6.0	6.5	7.0	7.5	8.0	8.5	≤9.0
≤0.4	97	117	139	166	198	236	279
0.6	100	120	143	171	204	244	291
0.8	103	122	146	175	210	252	301
1.0	105	125	149	179	216	260	312
1.2	107	127	152	183	221	267	320
1.4	109	130	155	187	227	274	329
1.6	111	132	158	192	232	281	337
1.8	114	135	162	196	238	287	345
2.0	116	138	165	200	243	294	353
2.2	118	140	169	204	248	300	361
2.4	120	143	172	209	253	306	368
2.6	122	146	175	213	258	312	375
2.8	124	148	178	217	263	318	382
3.0	126	151	182	221	268	324	389

[1] These CT values achieve greater than a 99.99 percent inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature, and at the higher pH.

Table 14C. CT Values (CT99.9) for 99.9 Percent Inactivation of Giardia Lamblia Cysts by Free Chlorine at 10.0 Degrees Celsius[1]

Free chlorine residual (mg/L)	pH						
	≤6.0	6.5	7.0	7.5	8.0	8.5	≤9.0
≤0.4	73	88	104	125	149	177	209
0.6	75	90	107	128	153	183	218
0.8	78	92	110	131	158	189	226
1.0	79	94	112	134	162	195	234
1.2	80	95	114	137	166	200	240
1.4	82	98	116	140	170	206	247
1.6	83	99	119	144	174	211	253
1.8	86	101	122	147	179	215	259
2.0	87	104	124	150	182	221	265
2.2	89	105	127	153	186	225	271
2.4	90	107	129	157	190	230	276
2.6	92	110	131	160	194	234	281
2.8	93	111	134	163	197	239	287
3.0	95	113	137	166	201	243	292

[1] These CT values achieve greater than a 99.99 percent inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature, and at the higher pH.

Table 14D. CT Values (CT99.9) for 99.9 Percent Inactivation of Giardia Lamblia Cysts by Free Chlorine at 15.0 Degrees Celsius [1]

Free chlorine residual (mg/L)	pH						
	≤6.0	6.5	7.0	7.5	8.0	8.5	≤9.0
≤0.4	49	59	70	83	99	118	140
0.6	50	60	72	86	102	122	146
0.8	52	61	73	88	105	126	151
1.0	53	63	75	90	108	130	156
1.2	54	64	76	92	111	134	160
1.4	55	65	78	94	114	137	165
1.6	56	66	79	96	116	141	169
1.8	57	68	81	98	119	144	173
2.0	58	69	83	100	122	147	177
2.2	59	70	85	102	124	150	181
2.4	60	72	86	105	127	153	184
2.6	61	73	88	107	129	156	188
2.8	62	74	89	109	132	159	191
3.0	63	76	91	111	134	162	195

[1] These CT values achieve greater than a 99.99 percent inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature, and at the higher pH.

Table 14E. CT Values (CT99.9) for 99.9 Percent Inactivation of Giardia Lamblia Cysts by Free Chlorine at 20.0 Degrees Celsius [1]

Free chlorine residual (mg/L)	pH						
	≤6.0	6.5	7.0	7.5	8.0	8.5	≤9.0
≤0.4	36	44	52	62	74	89	105
0.6	38	45	54	64	77	92	109
0.8	39	46	55	66	79	95	113
1.0	39	47	56	67	81	98	117
1.2	40	48	57	69	83	100	120
1.4	41	49	58	70	85	103	123
1.6	42	50	59	72	87	105	126
1.8	43	51	61	74	89	108	129
2.0	44	52	62	75	91	110	132
2.2	44	53	63	77	93	113	135
2.4	45	54	65	78	95	115	138
2.6	46	55	66	80	97	117	141
2.8	47	56	67	81	99	119	143
3.0	47	57	68	83	101	122	146

[1] These CT values achieve greater than a 99.99 percent inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature, and at the higher pH.

Table 14F. CT Values (CT99.9) for 99.9 Percent Inactivation of Giardia Lamblia Cysts by Free Chlorine at 25.0 Degrees Celsius and Higher [1]

Free chlorine residual (mg/L)	pH						
	≤6.0	6.5	7.0	7.5	8.0	8.5	≤9.0
≤0.4	24	29	35	42	50	59	70
0.6	25	30	36	43	51	61	73
0.8	26	31	37	44	53	63	75
1.0	26	31	37	45	54	65	78
1.2	27	32	38	46	55	67	80
1.4	27	33	39	47	57	69	82
1.6	28	33	40	48	58	70	84
1.8	29	34	41	49	60	72	86
2.0	29	35	41	50	61	74	88
2.2	30	35	42	51	62	75	90
2.4	30	36	43	52	63	77	92
2.6	31	37	44	53	65	78	94
2.8	31	37	45	54	66	80	96
3.0	32	38	46	55	67	81	97

[1] These CT values achieve greater than a 99.99 percent inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature, and at the higher pH.

Table 14G. CT Values (CT99.9) for 99.9 Percent Inactivation of Giardia Lamblia Cysts by Chlorine Dioxide and Ozone [1,2]

	Degrees Celsius					
	≤1	**5**	**10**	**15**	**20**	**≥25**
Chlorine dioxide	63	26	23	19	15	11
Ozone	2.9	1.9	1.4	0.95	0.72	0.48

[1] These CT values achieve greater than a 99.99 percent inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature for determining $CT_{99.9}$ values between indicated temperatures.
[2] The use of these alternative disinfectants shall be approved in accordance with the provisions of section 5-1.22 of this Section.

Table 14H. CT Values (CT 99.9) for 99.9 Percent Inactivation of Giardia Lamblia Cysts by Chloramines [1]

Water Temperature, in Degrees Celsius					
<1	5	10	15	20	25
3,800	2,200	1,850	1,500	1,100	750

[1] These values are for pH values of 6 to 9. These CT values may be assumed to achieve greater than 99.99 percent inactivation of viruses only if chlorine is added and mixed in the water prior to the addition of ammonia. If this condition is not met, the system must demonstrate, based on on-site studies or other information, as approved by the State, that the system is achieving at least 99.99 percent inactivation of viruses. CT values between the indicated temperatures may be determined by linear interpolation. If no interpolation is used, use the $CT_{99.9}$ value at the lower temperature for determining $CT_{99.9}$ values between indicated temperatures.

Table 14I. CT Values (mg·min/L) for Cryptosporidium Inactivation by Chlorine Dioxide[1]

Log Credit	Water Temperature, in Degrees Celsius										
	<=0.5	1	2	3	5	7	10	15	20	25	30
0.25	159	153	140	128	107	90	69	45	29	19	12
0.5	319	305	279	256	214	180	138	89	58	38	24
1.0	637	610	558	511	429	360	277	179	116	75	49
1.5	956	915	838	767	643	539	415	268	174	113	73
2.0	1275	1220	1117	1023	858	719	553	357	232	150	98
2.5	1594	1525	1396	1278	1072	899	691	447	289	188	122
3.0	1912	1830	1675	1534	1286	1079	830	536	347	226	147

[1] Systems may use this equation to determine log credit between the indicated values: Log credit = (0.001506 x (1.09116)Temp) x CT.

Table 14J. CT Values (mg·min/L) for Cryptosporidium Inactivation by Ozone[1]

Log Credit	Water Temperature, in Degrees Celsius										
	<=0.5	1	2	3	5	7	10	15	20	25	30
0.25	6.0	5.8	5.2	4.8	4.0	3.3	2.5	1.6	1.0	0.6	0.39
0.5	12	12	10	9.5	7.9	6.5	4.9	3.1	2.0	1.2	0.78
1.0	24	23	21	19	16	13	9.9	6.2	3.9	2.5	1.6
1.5	36	35	31	29	24	20	15	9.3	5.9	3.7	2.4
2.0	48	46	42	38	32	26	20	12	7.8	4.9	3.1
2.5	60	58	52	48	40	33	25	16	9.8	6.2	3.9
3.0	72	69	63	57	47	39	30	19	12	7.4	4.7

[1] Systems may use this equation to determine log credit between the indicated values:
Log credit = $(0.0397 \times (1.09757)^{Temp}) \times CT$.

Table 14K. UV Dose Table for Cryptosporidium, Giardia lamblia, and Virus Inactivation Credit [1,2,3,4]

Log Credit	*Cryptosporidium* UV dose (mJ/cm^2)	*Giardia lamblia* UV dose (mJ/cm^2)	Virus UV dose (mJ/cm^2)
0.5	1.6	1.5	39
1.0	2.5	2.1	58
1.5	3.9	3.0	79
2.0	5.8	5.2	100
2.5	8.5	7.7	121
3.0	12	11	143
3.5	15	15	163
4.0	22	22	186

[1] Ultraviolet light. Systems receive *Cryptosporidium, Giardia lamblia,* and virus treatment credits for ultraviolet (UV) light reactors by achieving the corresponding UV dose values shown in this table. Systems must use validated UV reactors and monitor UV reactors as described in footnotes 3 and 4 of this table to demonstrate that they are achieving a particular UV dose value for treatment credit.

[2] UV dose table. The treatment credits listed in this table are for UV light at a wavelength of 254 nm as produced by a low pressure mercury vapor lamp. To receive treatment credit for other lamp types, systems must demonstrate an equivalent germicidal dose through reactor validation testing, as described in footnote 3 of this table. The UV dose values in this table are applicable only to unfiltered systems (either by filtration waiver or those that do not require filtration) and to post-filter applications of UV in filtered systems.

[3] Reactor validation testing. Systems must use UV reactors that have undergone validation testing to determine the operating conditions under which the reactor delivers the UV dose required in footnote 2 of this table (*i.e.*, validated operating conditions). These operating conditions must include flow rate, UV intensity as measured by a UV sensor, and UV lamp status.

When determining validated operating conditions, systems must account for the following factors: UV absorbance of the water; lamp fouling and aging; measurement uncertainty of on-line sensors; UV dose distributions arising from the velocity profiles through the reactor; failure of UV lamps or other critical system components; and inlet and outlet piping or channel configurations of the UV reactor.

Validation testing must include full scale testing of a reactor that conforms uniformly to the UV reactors used by the system and inactivation of a test microorganism whose dose response characteristics have been quantified with a low pressure mercury vapor lamp. The State may approve an alternative approach to validation testing.

[4] Reactor monitoring.

Table 14K, Cont.

To receive treatment credit for UV light, systems must treat at least 95 percent of the water delivered to the public during each month by UV reactors operating within validated conditions for the required UV dose, as described in footnotes 2 and 3 of this table. Systems must demonstrate compliance with this condition by monitoring UV intensity as measured by a UV sensor, flow rate, lamp status, and other parameters designated by the State.

Table 15. Entry Point Disinfectant Monitoring Frequency for Systems Using Chemical Disinfection [1]

Water System Source Type	**Population served**	**Samples per day[4]**
Surface Water or Ground Water under the Direct Influence of Surface Water (GWUDI)[2, 3]	Up to 500	1
	501 - 1,000	2
	1,001 - 2,500	3
	2,501 - 3,300	4
	> 3,300	Continuous monitoring required[5]
Ground Water System or ground water source required to provide 4-log virus treatment and process compliance monitoring[6, 7, 8]	≤ 3,300	1[9]
	> 3,300	Continuous monitoring required[5]
Ground Water System or ground water source with other than 4-log virus treatment	Any	1[9]

[1] See also Table 15A for distribution system disinfectant residual sampling locations and frequency depending on disinfectant used.

[2] If at any time chlorine residual concentration falls below 0.2 mg/L at the entry point for a surface water or GWUDI system, the system must collect and analyze a grab sample every four hours until the chlorine residual concentration is again equal to or greater than 0.2 mg/L.

[3] Entry point samples collected at Surface Water or GWUDI systems

[4] The day's grab samples may not be conducted at the same time.

[5] If there is a failure in the continuous monitoring equipment, grab samples, every four hours, may be conducted in lieu of continuous monitoring, but for no more than five working days (fourteen working days for ground water systems) following the failure of the equipment.

Table 15, Cont.

[6] If at any time the disinfectant concentration at a ground water system falls below the minimum required in the process compliance monitoring plan approved by the State, the system must collect and analyze a grab sample every four hours until the disinfectant residual concentration is again at or above minimum required levels, without exceeding other applicable concentration requirements in Table 3A.

[7] Any ground water system required to provide 4-log virus treatment because of fecal contamination of the source or because of significant deficiencies in system operation, and using chemical disinfection, must demonstrate minimum disinfectant residual at a location that demonstrates adequate concentration to provide the required treatment at the first customer during peak flow according to the sampling plan developed for the system. These samples to confirm the minimum disinfection residual are to be collected at the frequency in this table.

[8] Lowest daily concentration must be recorded on operation report.

[9] A minimum of one disinfectant residual concentration must be recorded on operation report every day.

Table 15A. Disinfectant Residual Minimum Distribution System Monitoring Requirements for Systems Using Chemical Disinfection

Disinfectant	Type of Water System	Routine Monitoring
Chlorine Chloramines	Community and Nontransient Noncommunity	Sample at the same time and same points in the distribution system as total coliform sampling[1]
Chlorine Dioxide[2]	Community, Nontransient Noncommunity and Transient Noncommunity	Daily sample at the entrance to the distribution system[3]

[1]Community Water Systems using surface water or ground water under the direct influence of surface water may use heterotrophic plate count results of equal to or less than 500 colonies per milliliter as equivalent to a free chlorine residual as outlined in table 11, footnote 5, in lieu of taking separate samples for disinfection residuals.

[2]Monitoring is required if chlorine dioxide is used for either oxidation or disinfection.

[3]If the Maximum Residual Disinfectant Level (MRDL) of 0.8 mg/L is exceeded, the system must take three samples in the distribution system on the following day. If chlorine dioxide or chloramines are used to maintain a disinfectant residual in the distribution system, or if chlorine is used and there are no rechlorination stations, the system must take 3 samples as close to the first customer as possible, at intervals of at least 6 hours. If chlorine is used and there is a rechlorination station, the system must take one sample as close to the first customer as possible, one sample representing average residence time, and one sample representing maximum residence time.

Table 16. Additional Contaminants for which Reporting is Required Pursuant to 5-1.72 (e)-(h) of this Subpart

Contaminant Name		
2,4-dinitrotoluene 2,6-dinitrotoluene DCPA monoacid DCPA di acid 4,4'-DDE EPTC Molinate MTBE Nitrobenzene Terbacil Acetochlor Perchlorate	Diuron Linuron Prometon 2,4,6-trichlorophenol 2,4-dichlorophenol 2,4-dinitrophenol 2-methyl-1-phenol Alachlor ESA 1,2-diphenylhydrazine Diazinon Disulfoton Fonofos Terbufos	Aeromonas Hydrophilia Polonium-210 Microsporidia Caliciviruses Adenoviruses Lead – 210 Napthalene RDX Algae and toxins Echoviruses Coxsackie viruses Helicobacter pylori

Table 17. Information Collection Rule Contaminant Reporting Requirements

Contaminant	**Reporting Requirements for Finished Water**
Total Trihalomethanes (chloroform, bromodichloromethane, dibromochloromethane, and bromoform)	Report as a group if detected
Haleocetic Acids (mono-, di-, and trichloroacetic acid, and mono- and di-bromoacetic acid)	Report as a group if detected
Haloacetilenitriles (dichloro-, trichloro-, bromochloro-, and dibromoacetonitrile)	Report as a group if detected
Haloketones (1,1-dichloropropanone and 1,1,1-trichloropropanine)	Report as a group if detected
Chloropicrin	Reporting required if detected
Chloral Hydrate	Reporting required if detected
Total Organic Halides	Reporting required if detected
Disinfectant Residual	Reporting required if detected
Cyanogen Chloride	Report if detected and treatment plant uses Chloramines
Chlorate	Report if detected and treatment plant uses Hypochlorite Solutions
Bromate, Aldehydes	Report if detected and treatment plant uses Ozone
Chlorine Dioxide residual, Chlorite, Chlorate, Bromate, Aldehydes	Report if detected and treatment plant uses Chlorine Dioxide
Total Coliforms	Report if detected
Fecal Coliforms or *Escherichia coli*	Report if detected
Giardia	Report if detected
Total Culturable Viruses	Report if detected

Table 17, Cont.

Contaminant	Reporting Requirements for Finished Water
Total Trihalomethanes (chloroform, bromodichloromethane, dibromochloromethane, and bromoform)	Report as a group if detected
Haleocetic Acids (mono-, di-, and trichloroacetic acid, and mono- and di-bromoacetic acid)	Report as a group if detected
Haloacetilenitriles (dichloro-, trichloro-, bromochloro-, and dibromoacetonitrile)	Report as a group if detected
Haloketones (1,1-dichloropropanone and 1,1,1-trichloropropanine)	Report as a group if detected
Chloropicrin	Reporting required if detected
Chloral Hydrate	Reporting required if detected
Total organic Halides	Reporting required if detected
Disinfectant Residual	Reporting required if detected
Cyanogen Chloride	Report if detected and treatment plant uses Chloramines
Chlorate	Report if detected and treatment plant uses Chloramines
Bromate, Aldehydes	Report if detected and treatment plant uses Ozone
Chlorine Dioxide residual, Chlorite, Chlorate, Bromate, Aldehydes	Report if detected and treatment plant uses Chlorine Dioxide
Total Coliforms	Report if detected
Fecal Coliforms of *Escherichia coli*	Report if detected
Giardia	Report if detected
Total Culturable Viruses	Report if detected

Monitoring and Control of Disinfection Byproducts and Disinfection Byproduct Precursors

5-1.60 Applicability.

(Effective Date: January 17, 2018)

Surface water systems or systems using ground water under the direct influence of surface water that are community or nontransient noncommunity water systems, serve 15 or more service connections or serve 25 or more persons, and use conventional filtration treatment shall operate with enhanced coagulation to achieve the total organic carbon (TOC) percent removal levels specified in section 5-1.63 of this Subpart, unless the system meets the alternative compliance criteria described in section 5-1.62 of this Subpart.

5-1.61 Monitoring requirements for disinfection byproduct precursors.

(Effective Date: January 19, 2022)

Monitoring for Disinfection byproduct precursors shall be in accordance with the following table.

Monitoring Requirements for Disinfection Byproduct Precursors							
Source Type	System Type	Filtration Type	Sampling location at each plant	Routine		Reduced[1]	
				Monitoring requirements	Frequency[2]	Running Annual Average TOC results	Frequency
Surface water and GWUDI	Community and NTNC	Conventional	Combined Filter effluent[3]	TOC[4]	Monthly	<2.0 mg/L for two consecutive years or <1.0 mg/L for one year	1 TOC (paired) per plant/quarter
			Raw	TOC[4]	Monthly		
				Alkalinity	Monthly		
		All other types	Raw	TOC	Monthly	≤4.0 mg/L	1 TOC quarterly

[1]Routine monitoring shall begin in the month following the quarter when the running annual average TOC in treated water is ≥2.0 mg/L for systems using conventional filtration and/or >4.0 mg/L in source water.
[2]TOC monitoring for disinfection precursors for both treated and source water shall be collected at the same time. These samples (source water and treated water) are referred to as paired samples
[3]Samples collected for TOC shall be collected no further downstream than point of combined filter effluent turbidity monitoring and representative of treated water.
[4]Systems shall take one paired TOC sample and one source water alkalinity sample per month per plant at a time representative of normal operating conditions and influent water quality. The alkalinity sample shall be collected at the same time as the source water TOC sample.

5-1.62 Alternative compliance criteria for enhanced coagulation.

(Effective Date: January 17, 2018)

Systems may use one of the following alternative compliance criteria instead of enhanced coagulation. Systems using the alternative compliance criteria shall still comply with the monitoring requirements stated in section 5-1.61 of this Subpart.

Water Type	Parameter	Concentration	Calculation Frequency
Source water	TOC	≤2.0 mg/L	Quarterly RAA
Treated water	TOC	≤2.0 mg/L	Quarterly RAA
Source water[1,2]	SUVA	≤2.0 L/mg-m	Quarterly RAA
Treated water[2]	SUVA	≤2.0 L/mg-m	Quarterly RAA
Source water	TOC	<4 mg/L	Quarterly RAA
	Alkalinity (as $CaCO_{3)}$	>60 mg/L	Quarterly RAA
	TTHM	≤0.040 mg/L	LRAA of all sites
	HAA5	≤0.030 mg/L	LRAA of all sites
Treated water in the distribution system[3]	TTHM	≤0.040 mg/L	LRAA of all sites
	HAA5	≤0.030 mg/L	LRAA of all sites

1 Prior to any treatment
2 Measured monthly
3 Systems uses only chlorine for primary disinfection and maintains a residual in the distribution system

5-1.63 Enhanced Coagulation performance requirements.

(Effective Date: May 26, 2004)

Systems must achieve the percent reduction of TOC specified in subdivision (a) of this section (Step 1) 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, which are provided in subdivision (d) of this section.

(a) Required (Step 1) TOC reductions, which are provided in the following table, are based upon specified source water TOC and alkalinity levels:

(Step 1) Required Removal of TOC by Enhanced Coagulation for Surface Water Systems or Systems Using Groundwater Under the Direct Influence of Surface Water that Use Conventional Filtration Treatment			
Source Water Alkalinity			
Source water TOC (mg/L)	0-60 mg/L as $CaCO_3$ (percent removal required)	>60-120 mg/L as $CaCO_3$ (percent removal required)	>120 mg/L as $CaCO_3$ (percent removal required)
>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

(b) Systems that must comply with the requirements contained in subdivision (a) of this section must calculate compliance using the method provided in either paragraph (1) of this subdivision or the applicable provisions of paragraph (2) of this subdivision.

(1) Systems must calculate compliance quarterly, beginning after the system has collected 12 months of data, by determining an annual average using the following method:

(i) determine actual monthly TOC percent removal, equal to: (1 - (treated water TOC/source water TOC) × 100;

(ii) determine the required monthly TOC percent removal from either subdivision (a) or (d) of this section;

(iii) divide the value in subparagraph (i) of this paragraph by the value in subparagraph (ii) of this paragraph;

(iv) add together the results of subparagraph (iii) of this paragraph for the last 12 months and divide by 12;

(v) if the value calculated in subparagraph (iv) of this paragraph is less than 1.00, the system is not in compliance with the TOC percent removal requirements.

(2) Systems may use the provisions in subparagraphs (i) through (iii) of this paragraph instead of the calculations in paragraph (1) of this subdivision to determine compliance with TOC percent removal requirements.

(i) In any month that the system's treated or source water TOC level is less than or equal to 2.0 mg/l, the system may assign a monthly value of 1.00 (instead of the value calculated in paragraph [1] of this subdivision) when calculating compliance under the provisions of subdivision (a) of this section.

(ii) In any month that the system's source water SUVA, prior to any treatment, is less than or equal to 2.0 l/mg-m, the system may assign a monthly value of 1.00 (instead of the value calculated in paragraph [1] of this subdivision) when calculating compliance under the provisions of subdivision (a) of this section.

(iii) In any month that the system's finished water SUVA is less than or equal to 2.0 l/mg-m, the system may assign a monthly value of 1.00 (instead of the value calculated in paragraph [1] of this subdivision) when calculating compliance under the provisions of subdivision (a) of this section.

(c) Systems that cannot achieve the (Step 1) TOC removals required by subdivision (a) 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 (Step 1), for approval of alternate minimum TOC removal (Step 2) requirements, described in subdivision (d) of this section. Until the State approves the alternate minimum TOC removal (Step 2) requirements, the system must meet the (Step 1) TOC removals contained in subdivision (a) of this section.

(d) Alternate minimum TOC removal (Step 2) requirements.

Applications made to the State by enhanced coagulation systems for approval of alternate minimum TOC removal (Step 2) requirements must include, as a minimum, results of bench- or pilot-scale testing conducted using the methodology prescribed in paragraph (1) of this subdivision to determine the alternate enhanced coagulation level. Applications for alternate minimum TOC (Step 2) requirements must be approved by the State before they can replace the previous (Step 1) TOC removal requirements. The alternate TOC removal is determined by the method described in paragraphs (1) through (5) of this subdivision.

(1) The alternate minimum TOC removal is the percentage of TOC removed at the point where an incremental addition of 10 mg/l of alum, or equivalent amount of iron coagulant (ferric salt), results in a TOC removal of ≤0.3 mg/l. This TOC removal percentage is then defined as the minimum TOC removal required for the system. Once approved by the State, this minimum TOC removal requirement supersedes the minimum TOC (Step 1) removal required by the table in subdivision (a) of this section. This requirement will be effective until such time as the State approves a new value based on the results of a new bench- and pilot-scale test. Failure to achieve State-set alternative minimum TOC removal levels is a violation.

(2) Bench- or pilot-scale testing of enhanced coagulation must be conducted by using representative water samples and adding 10 mg/l increments of alum, or equivalent amounts of iron coagulant, 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

(3) 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, or equivalent addition of iron coagulant, is reached.

(4) The system may operate at any coagulant dose or pH necessary (consistent with the State Sanitary Code) to achieve the minimum TOC percent removal approved under paragraph (1) of this section.

(5) If the TOC removal is consistently less than 0.3 mg/l of TOC per 10 mg/l of incremental alum dose 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 for a waiver of enhanced coagulation requirements.

5-1.64 Operational evaluation levels.

(Effective Date: January 17, 2018)

(a) If a system exceeds the operational evaluation level at any monitoring location when the sum of the two previous quarters' TTHM results plus twice the current quarter's TTHM result, divided by 4 to determine the average, exceeds 0.080 mg/L, or when the sum of the two previous quarters' HAA5 results plus twice the current quarter's HAA5 result, divided by 4 to determine the average, exceeds 0.060 mg/L.

(b) If a system exceeds the operational evaluation level, it shall conduct an operational evaluation and submit a written report of the evaluation to the State no later than 90 days after being notified of the analytical result that caused the exceedance of the operational evaluation level. The written report shall be made available to the public upon request.

(c) The operational evaluation shall include an examination of the operational practices for system treatment(s) and the distribution system, including storage tank operations, excess storage capacity, distribution system flushing, changes in sources or source water quality, and treatment changes or problems that may contribute to TTHM and HAA5 formation and what steps could be considered to minimize future exceedances.

(1) A system may request, and the State may allow, limiting the scope of the evaluation if the system is able to identify the cause of the operational evaluation level exceedance.

(2) The request to limit the scope of the evaluation does not extend the schedule in subdivision (b) of this section for submitting the written report. The State shall approve this limited scope of evaluation in writing, and the system shall keep that approval with the completed report.

5-1.65 Best available technologies (BAT) for disinfection byproduct control.

(Effective Date: January 17, 2018)

The following is a table of the best available technology, treatment techniques, or other means available for achieving compliance with the maximum contaminant levels for Bromate, Chlorite, TTHM and HAA5, for public water systems that disinfect their source water.

Water system type	Source type	Disinfection byproduct	Best available technology[1]
All systems that disinfect their source water	GW; SW; GWUDI	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.

All systems that disinfect their source water	GW; SW; GWUDI	Total trihalomethanes (TTHM); Haloacetic acids (five) (HAA5)	Enhanced coagulation or enhanced softening, plus GAC10; or nanofiltration with a molecular weight cutoff ≤1000 Daltons; or GAC20
Consecutive systems: applies only to the disinfected water that consecutive systems buy or otherwise receive	GW; SW; GWUDI	Total trihalomethanes (TTHM); Haloacetic acids (five)(HAA5)	Systems serving ≥10,000: Improved distribution system and storage tank management to reduce residence time, plus the use of chloramines for disinfectant residual maintenance Systems serving<10,000: Improved distribution system and storage tank management to reduce residence time

1 Softening that results in removing at least 10 mg/L of magnesium hardness as CaCO3), measured monthly and calculated quarterly as a running annual average can be the best available technology for controlling disinfection byproduct precursors.

Operation and Quality Control

5-1.70 Applicability

(Effective Date: November 9, 2011)

Sections 5-1.70 through 5-1.79 of this Subpart shall be applicable to all public water systems, provided the systems serve 15 or more service connections or serve 25 or more persons. Sections 5-1.71(c) and (d), 5-1.72(c), and 5-1.78(a)(4) of this Part apply to all public water systems.

5-1.71 Protection and supervision of public water systems.

(Effective Date: May 16, 2018)

(a) The supplier of water and the person or persons operating a public water system shall exercise due care and diligence in the maintenance and supervision of all sources of the public water systems to prevent, so far as possible, their pollution and depletion.

(b) The supplier of water and the person or persons operating a water treatment plant or distribution system shall exercise due care and diligence in the operation and maintenance of these facilities and their appurtenances to ensure continued compliance with the provisions of this Subpart. Facilities approved by the State shall be operated in general accordance with their design unless otherwise authorized under the provisions of section 5-1.22, 5-1.23 or 5-1.24 of this Subpart.

(c) If the State notifies the supplier of water that a significant deficiency exists, the supplier of water shall consult with the State within 30 days regarding corrective action. Within 120 days of being notified that a significant deficiency exists (or earlier if the State determines that action is necessary to protect public health), the supplier of water shall correct the significant deficiency or be in compliance with a corrective action plan to correct the deficiency. The corrective action plan must specify appropriate modifications and/or improvements to the existing system or facility as may be necessary to fully conform to the requirements of this Subpart.

(d) Any significant deficiency that is not corrected or where correction has not begun according to a corrective action plan prepared to meet the requirements of this code, within 120 days, or as directed by the State, is a treatment technique violation and must be addressed in accordance with the requirements in section 5-1.12 of this Subpart. If the deficiency is a public health hazard, the deficiency must be addressed as directed or approved by the State and tier 1 notification is required.

(e) Public water systems shall correct sanitary defects found through a Level 1 or 2 assessment. For corrections that have not been completed at the time that the assessment form is submitted the system shall complete the corrective action(s) within 120 days of identifying the sanitary defect or be in compliance with a timeframe approved by the State in consultation with the system. The system shall

5-1.72 Operation of a public water system.

(Effective Date: January 19, 2022)

(a) The supplier of water and the person or persons in charge of the operation of a public water system shall operate and maintain the public water system in such a manner to meet the requirements of this Subpart.

(b) The person or persons in charge of operation of a public water system shall be certified pursuant to Subpart 5-4 of this Part.

(c) Complete daily records shall be kept of the operation of a public water system.

(1) A copy of daily operation records in a format provided or approved by the State shall be sent to the State by the 10th calendar day of the next reporting period. These records shall include the results of all tests, measurements or analysis required to be made by this Subpart or as requested by the State. All operational records shall be available to the State either upon request or in conjunction with periodic sanitary surveys conducted by the State.

(2) Systems using conventional filtration treatment or direct filtration must conduct continuous turbidity monitoring for each individual filter, as described in section 5-1.52 table 10A of this Subpart. Systems must record the results of individual filler monitoring every 15 minutes. Systems must maintain individual filter monitoring results for at least three years. Systems must report to the State that they have conducted individual filter turbidity monitoring within 10 days after the end of each month the system serves water to the public. Systems must report to the State individual filter turbidity measurement results 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 following conditions, except that systems serving fewer than 10,000 persons are not required to comply with subparagraph (ii) of this paragraph:

(i) For any individual filter that has a measured turbidity level of greater than 1.0 nephelometric turbidity units (NTU) in two consecutive measurements taken 15 minutes apart, the system must report the filter identification 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 seven days of the exceedance (if the system is not able to identify an obvious reason for the abnormal filter performance) and submit the profile to the State, or report the obvious reason for the exceedance.

(ii) 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 seven days of the exceedance (if the system is not able to identify an obvious reason for the abnormal filter performance) and submit the profile to the State, or report the obvious reason for the exceedance.

(iii) 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 to the State the filter number, the turbidity measurement, and the dates on which the exceedance occurred. In addition, the system must conduct a self-assessment of the filter within 14 days of the exceedance and submit the self-assessment to the State. 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.

(iv) 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 to the State the filter number, the turbidity measurement, and the dates on which the exceedance occurred. In addition, the system must arrange for the conduct of a comprehensive performance evaluation (CPE) 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.

(3) Systems using conventional filtration treatment or direct filtration treatment must notify the State 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 following information:

(i) A plant schematic showing the origin of all flows which 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.

(ii) 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 the State-approved operating capacity for the plant where the State has made such determinations.

(4) Groundwater systems and groundwater sources that are required to conduct process compliance monitoring to assure the achievement of four-log virus treatment, must record the lowest treatment performance each day and record the date and duration of any failure to achieve four-log virus treatment for a period of more than four hours. In the event of failure to achieve required virus treatment, the system shall continue to monitor treatment performance every four hours until the system returns to compliance with minimum performance requirements. The State must be notified of any failure to meet process compliance monitoring requirements as well as any failure to achieve four-log virus treatment, as soon as possible, but no later than the end of the next business day.

(5) Surface water systems and ground water systems under the direct influence of surface water that are required to provide enhanced filtration and disinfection for Cryptosporidium,

shall report to the State in accordance with the treatment and/or management options used to comply with the treatment requirements under section 5-1.83(b) or (c) of this Subpart, as applicable. Alternatively, the State may approve a system to certify operation within required parameters for treatment credit, rather than reporting monthly operational data for Microbial Toolbox Component options in accordance with section 5-1.80(a) of this Subpart. The applicable treatment compliance dates are found in section 5-1.83(d) of this Subpart.

(i) For systems using the watershed control program option, notice of intention to develop a new or continue an existing watershed control program shall be submitted no later than two years before the treatment compliance date. The watershed control plan shall be submitted no later than one year before the treatment compliance date. The annual watershed control program status report shall be submitted every 12 months. For community water systems, the watershed sanitary survey report shall be submitted every three years. For noncommunity water systems, the watershed sanitary survey report shall be submitted every five years.

(ii) For systems using the alternative source/intake management option, verification that the system has relocated the intake or adopted the intake withdrawal procedure, reflected in monitoring results, shall be submitted.

(iii) For systems using the presedimentation option, monthly verification of the following shall be submitted within 10 days after the month in which the monitoring was conducted: continuous basin operation; treatment of 100 percent of the flow; continuous addition of coagulant; and at least 0.5-log mean reduction of influent turbidity or compliance with alternative State-approved compliance criteria.

(iv) For systems using the two-stage lime softening option, monthly verification of the following shall be submitted within 10 days after the month in which the monitoring was conducted: chemical addition and hardness precipitation occurred in two separate and sequential softening stages prior to filtration; and both stages treated 100 percent of the plant flow.

(v) For systems using the bank filtration option, initial demonstration of the following shall be submitted no later than treatment compliance date: aquifer shall be unconsolidated sand containing at least 10 percent fines; and setback distance of at least 25 feet (0.5-log credit) or 50 feet (1.0-log credit). If the monthly average of daily maximum turbidity is greater than 1 NTU, then the system shall report the result and submit an assessment of the cause within 30 days after the month in which the monitoring was conducted, beginning on the applicable treatment compliance date.

(vi) For systems using the combined filter performance option, monthly verification of the following shall be submitted within 10 days following the month in which the monitoring was conducted: combined filter effluent (CFE) turbidity levels less than or equal to 0.15 NTU in at least 95 percent of the four-hour CFE measurements taken each month.

(vii) For systems using the individual filter performance option, monthly verification of the following shall be submitted within 10 days following the month in which the monitoring was conducted: individual filter effluent (IFE) turbidity levels less than or equal to 0.15 NTU in at least 95 percent of samples each month for each filter; and no individual filter greater than 0.3 NTU in two consecutive readings 15 minutes apart.

(viii) For systems using the demonstration of performance option, the results from testing following a State-approved protocol shall be submitted no later than the treatment compliance date. Monthly verification of operation within the conditions of State approval for demonstration of performance credit, may be required to be submitted within 10 days after the month in which the monitoring was conducted, beginning on the applicable treatment compliance date.

(ix) For systems using the bag filter and cartridge filter option, demonstration that the following criteria are met shall be submitted no later than the treatment compliance date: the process meets the definition of bag or cartridge filtration; and the removal efficiency established through challenge testing that meets criteria approved by the State. Monthly verification that 100 percent of the plant flow was filtered shall be submitted within 10 days after the month in which monitoring was conducted, beginning on the applicable treatment compliance date.

(x) For systems using the membrane filtration option, results of verification testing demonstrating the following shall be submitted no later than the treatment compliance date: removal efficiency established through challenge testing that meets criteria approved by the State; and integrity test method and parameters, including resolution, sensitivity, test frequency, control limits, and associated baseline. A monthly report summarizing the following shall be submitted within 10 days after the month in which monitoring was conducted: all direct integrity tests above the control limit; and, if applicable, any turbidity or alternative State-approved indirect integrity monitoring results triggering direct integrity testing and the corrective action that was taken.

(xi) For systems using the second stage filtration option, monthly verification that 100 percent of flow was filtered through both stages, and that the first stage was preceded by a coagulation step, shall be submitted within 10 days after the month in which monitoring was conducted.

(xii) For systems using the slow sand filtration (as secondary filter) option, monthly verification that both a slow sand filter and a preceding separate stage of filtration treated 100 percent of surface water flow shall be submitted within 10 days after the month in which monitoring was conducted.

(xiii) For systems using the chlorine dioxide option, a summary of CT values for each day shall be submitted within 10 days after the month in which monitoring was conducted.

(xiv) For systems using the ozone option, a summary of CT values for each day shall be submitted within 10 days after the month in which monitoring was conducted.

(xv) For systems using the UV option, validation test results demonstrating operating conditions that achieve the required UV dose shall be submitted no later than the treatment compliance date. A monthly report, summarizing the percentage of water entering the distribution system that was not treated by UV reactors operating within validated conditions for the required dose shall be submitted within 10 days after the month in which monitoring was conducted.

(6) Within 10 days of the end of any quarter in which monitoring of disinfection byproducts (DBP) and/or disinfection byproduct precursors (DBPP) is required under section 5-1.52 table 9A and/or sections 5-1.60 and 5-1.61 of this Subpart, the following must be reported to the State:

(i) number of DBP and DBPP samples taken during the quarter;

(ii) date and results of each DBP and DBPP sample taken during the last quarter;

(iii) the arithmetic average of DBP quarterly results for the last four quarters for each monitoring location (LRAA). If the LRAA calculated based on fewer than four quarters of data would cause the MCL to be exceeded regardless of the monitoring results of subsequent quarters, the system must report this information to the State as part of the first report due following the end of the quarter or anytime thereafter that this determination is made. If the system is required to conduct monitoring at a frequency that is less than quarterly, the system must make compliance calculations beginning with the first compliance sample unless the system is required to conduct increased monitoring under section 5-1.52 table 9A or 5-1.51 of this Subpart;

(iv) whether the MCL for Total Trihalomethanes (TTHM) and/or Halo Acetic Acids (5) (HAA5) was violated at any monitoring location;

(v) any operational evaluation levels that were exceeded during the quarter and, if so, the location and date, and the calculated TTHM and HAA5 levels;

(vi) if the system is a surface water system or a system using a source of ground water under the direct influence of surface water, and seeking to qualify for or remain on reduced TTHM/HAA5 monitoring, source water Total Organic Carbon (TOC) information must be reported for each treatment plant that treats surface water or ground water under the direct influence of surface water, as follows:

(a) the number of source water TOC samples taken each month during last quarter;

(b) the date and result of each TOC sample taken during last quarter;

(c) the quarterly average of monthly TOC samples taken during the last quarter;

(d) the running annual average (RAA) of quarterly TOC averages from the past four quarters;

(e) whether the TOC RAA exceeded 4.0 mg/L.

(d) Any supplier of water of a public water system, subject to the provisions of this Subpart, shall retain at a convenient location the following records:

(1) Records of microbiological analyses made pursuant to this Subpart shall be retained for at least five years, and records of chemical and turbidity analyses made pursuant to this Subpart shall be retained for at least 10 years. Actual laboratory reports may be kept, or data may be transferred to tabular summaries, if the following information is included:

(i) the date, place and time of sampling, and the name of the person who collected the sample;

(ii) identification of the sample whether it was a routine distribution point sample, check sample, raw or process water sample or other special purpose sample;

(iii) date of analyses;

(iv) laboratory and person responsible for performing the analysis;

(v) the analytical technique or method used; and

(vi) the results of the analyses.

(2) All Level 1 and Level 2 assessment forms, documentation of corrective actions completed as a result of such assessments, and any other summary documentation of sanitary defects and corrective actions, shall be retained for at least five years.

(3) All records of repeat samples that are taken for the purpose of obtaining an extension of the 24-hour period for collecting such repeat samples shall be retained for at least five years.

(4) Records of action taken by the supplier of water to correct significant deficiencies and/or violations of the requirements of this Subpart shall be retained for at least 10 years.

(5) Copies of any written reports, including summaries or communications relating to sanitary surveys of the public water system shall be retained for at least 10 years.

(6) Records concerning a variance or exemption granted to the public water system shall be retained for at least five years following the expiration of such variance or exemption.

(7) Copies of the records or data summaries shall be provided to any consumer of the public water system within 15 days on written request by a consumer. The supplier of water may require prepayment of a fee to cover the cost of handling and reproduction of the records and data summaries requested.

(8) The supplier of water must provide the State with copies of all repeat or special total coliform sample results and all Escherichia coli (E. coli) sample results, within five days of receipt.

(9) Beginning June 8, 2004, systems using conventional filtration treatment or direct filtration that recycle spent backwash water, thickener supernatant or liquids from the dewatering processes must collect the following recycle flow information:

(i) copy of the recycle notification and information submitted to the State in accordance with paragraph (c)(3) of this section;

(ii) list of all recycle flows and the frequency with which they are returned;

(iii) average and maximum backwash flow rate through the filters and the average and maximum duration of the filter backwash process in minutes;

(iv) typical filter run length and a written summary of how filter run length is determined;

(v) the type of treatment provided for the recycle flow; and

(vi) 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.

(10) For surface water systems and ground water systems under the direct influence of surface water, the following records shall be maintained:

(i) Systems shall keep results from the initial round of source water monitoring under section 5-1.81(a)(1) of this Subpart and the second round of source water monitoring under section 5-1.81(a)(2) of this Subpart until three years after bin classification under section 5-1.83(a) of this Subpart for filtered systems, or determination of the mean Cryptosporidium level under section 5-1.83(c) of this Subpart for unfiltered systems for the particular round of monitoring.

(ii) Systems shall keep any notification to the State that they will not conduct source water monitoring due to meeting the criteria of section 5-1.81(a)(4) of this Subpart for three years.

(iii) Systems shall keep the results of treatment monitoring associated with Cryptosporidium and with uncovered finished water storage facilities under section 5-1.32 of this Subpart for three years.

(e) Each community water system which serves 15 or more service connections used by year-round residents or regularly serves at least 25 year-round residents shall prepare and provide an annual water supply statement (report) to the customers it serves. The report must contain information on the quality of the water delivered by the system and characterize the risks (if any) from exposure to contaminants detected in the drinking water in an accurate and understandable manner. For the purpose of this Subpart, *customers* are defined as billing units or service connections to which water is delivered by a community water system.

(f) The report shall contain such information as is required in this subdivision and any additional information required by the State, except that paragraph (7) and subparagraphs (13)(vii) through

(xi) of this subdivision shall not apply to systems serving fewer than 1,000 service connections. The information required to be included in the report is described in this subdivision.

(1) Information on the source of the water delivered. The report must identify the source(s) of the water delivered by the community water system by providing information on:

(i) the type of the water source (*e.g.*, surface water, groundwater); and

(ii) the commonly used name (if any) and location of the body (or bodies) of water or aquifer(s).

If the State has completed a source water assessment, the report must notify consumers of the availability of this information and the means to obtain it. The report must include a brief summary of the system's susceptibility to potential sources of contamination, using language provided by the State.

(2) Definitions for maximum contaminant level, maximum contaminant level goal, maximum residential disinfectant level and maximum residual disinfectant level goal. Each report must include the definitions set forth using the following language:

(i) Maximum contaminant level goal (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.

(ii) Maximum contaminant level (MCL). The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible.

(iii) Maximum residual disinfectant level (MRDL). The highest level of a disinfectant that is allowed in drinking water.

(iv) Maximum residual disinfectant level goal (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.

(3) Definitions for variances and exemptions. A report for a community water system operating under a variance or an exemption issued under sections 5-1.90-5-1.96 of this Subpart must include the following language: *Variances and Exemptions:* State permission not to meet an MCL or a treatment technique under certain conditions.

(4) Definitions for action level and treatment technique. A report that includes information on a contaminant that is regulated as a treatment technique (*i.e.*, turbidity) or action level (*i.e.*, lead, copper) must include one or both of the following statements:

(i) Treatment technique (TT). A required process intended to reduce the level of a contaminant in drinking water.

(ii) Action level (AL). The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

(5) Information on detected contaminants from sampling used to determine compliance. For the purpose of this subdivision (*except Cryptosporidium, Giardia,* and radon monitoring), *detected* means: at or above the contaminant's method detection limit (MDL), as defined in section 5-1.1(bl), or as prescribed by the State. Any contaminants specified in sections 5-1.40 (lead and copper) and 5-1.51 of this Subpart and section 5-1.52 Tables 8A, 8B, 8C, 8D, 9A, 9B, 9C, 9D, 10, 10A, 11, 11A, 11B, 12, 16 and 17 of this Subpart that are detected during compliance monitoring shall be displayed in one table or in several adjacent tables. Additionally, the report shall include detected monitoring results for samples collected and analyzed by the State and/or detected monitoring results of additional samples required by the State. If a system is allowed to monitor for specific contaminants less often than once a year, the table shall include the date and results of the most recent sampling and the report shall include a brief statement indicating that the data presented in the report are from the most recent testing done in accordance with the regulations. No data older than five years need be included. For the contaminants listed in section 5-1.52 tables 8A, 8B, 8C, 8D, 9A, 9B, 9C, 9D, 10, 10A, 11, 11A, 11B, 12, 16 and 17 of this Subpart the table(s) shall contain:

(i) the State MCL for that contaminant expressed as a number equal to or greater than 1.0;

(ii) the MCLG (as prescribed by the State) for that contaminant expressed in the same units as the MCL;

(iii) 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 (4) of this subdivision;

(iv) for contaminants subject to a MCL, except turbidity and total coliforms, the highest contaminant level used to determine compliance with this Subpart[1] and the range of detected levels, as follows:

(a) when compliance with the MCL is determined annually or less frequently: the highest detected level at any sampling point and the range of detected levels expressed in the same units as the MCL;

(b) when compliance with the MCL is determined more frequently than annually: the highest average of any of the sampling points used to determine compliance and the range of all sampling points expressed in the same units as the MCL;

(c) when compliance with the MCL is determined by calculating a running annual average of all samples taken at a monitoring location: the highest average of any of the monitoring locations used to determine compliance and the range of all sampling points expressed in the same units as the MCL. For the MCLs for TTHM and HAA5, systems shall include the highest locational running annual average for TTHM and

[1] When rounding of results to determine compliance with the MCL is allowed by the regulations, rounding should be done prior to converting the results to the same units presented for the MCL, TT or AL.

HAA5 and the range of individual sample results for all monitoring locations expressed in the same units as the MCL. If more than one location exceeds the TTHM or HAA5 MCL, the system shall include the locational running annual averages for all locations that exceed the MCL; and

(d) 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 report must include: the average used to determine compliance and the range of detection expressed in the same units as the MCL;

(v) surface water and groundwater under the direct influence systems are required to include information from turbidity monitoring in the report:

(a) turbidity reported pursuant to the requirements of sections 5-1.30 and 5-1.52 table 10 of this Subpart (for systems that must install filtration but have not) include the highest monthly average. The report should include health effects language prescribed by the State;

(b) turbidity reported pursuant to the requirements of sections 5-1.30(c) and 5-1.52 table 10A of this Subpart (for systems that have met the criteria of avoiding filtration) include the highest single measurement found in any one month. The report should include an explanation of the reasons for measuring turbidity; and

(c) turbidity reported pursuant to sections 5-1.30 and 5-1.52 table 10A of this Subpart (for systems that filter and use turbidity as an indicator of filtration performance) include the highest single measurement and the lowest monthly percentage of samples meeting the turbidity limits specified in section 5-1.52 table 4A of this Subpart for the filtration technology being used. The report should include an explanation of the reasons for measuring turbidity;

(vi) for lead and copper: the 90th percentile value of the most recent round of sampling, the range of detections, and the number of sampling sites exceeding the AL;

(vii) for total coliform:

(a) the highest monthly number of positive samples for systems collecting fewer than 40 samples per month; or

(b) the highest monthly percentage of positive samples for systems collecting at least 40 samples per month;

(viii) for *E. coli* detected in the distribution system: the total number of positive samples; and

(ix) the likely source(s) of detected contaminants (as prescribed by the State) shall be reported.

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 report shall include data from each separate distribution system. Alternatively, systems could produce separate reports tailored to include data for each service area. The table(s) must clearly identify any violations of MCLs or TTs and the report must contain a clear and readily understandable explanation of the violation including: the duration 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 language prescribed by the State.

(6) Information on nondetected contaminants from sampling used to determine compliance. Analytical test results for the contaminants listed in section 5-1.52 tables 8A, 8B, 8C, 8D, 9A, 9B, 9C, 9D, 10, 10A, 11, 11A, 11B, 12, 16 and 17 of this Subpart or additional monitoring required by the State which are not detected shall be:

(i) described in the report in a brief narrative; or

(ii) presented in the report as a separate table or list.

(7) Analytical results for source water samples not used to determine compliance. If the analytical results for samples of source(s) of water supply, other than those for Cryptosporidium or Giardia; used to determine compliance; or listed in section 5-1.52 tables 16 and 17 of this Subpart, are not included in the report, they shall be placed in a supplement to the report.

(8) Information on Cryptosporidium, Giardia and radon. If the system has performed any monitoring for Cryptosporidium, Giardia or radon, which indicates that Cryptosporidum or Giardia may be present in the source water or the finished water or that radon may be present in finished water, the report must include:

(i) a summary of the following: sampling sites; number of tests per year; testing results; and actions taken in response to those results; and

(ii) an explanation of the significance of the results.

(9) Compliance with the State Sanitary Code. The report must note any violation that occurred during the year covered by the report of a requirement listed in subparagraphs (i)-(v) of this paragraph, and include a clear and readily understandable explanation of the violation, any potential adverse health effects related to the violation, and the steps the system has taken to correct the violation:

(i) monitoring and reporting and recordkeeping of compliance data;

(ii) filtration and disinfection prescribed by sections 5-1.30 and 5-1.32 of this Subpart. 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 language prescribed by the State;

(iii) lead and copper control requirements. The report shall include health effects language prescribed by the state for lead, copper, or both, for systems which fail to take one or more actions prescribed by sections 5-1.40 through 5-1.48 of this Subpart;

(iv) the report must include health effects language prescribed by the State for systems which violate the TTs specified in section 5-1.51 of this Subpart for Acrylamide and Epichlorohydrin; and

(v) violation of the terms of a variance, an exemption, or an administrative or judicial order.

(10) Variances and exemptions. If a system is operating under the terms of a variance or an exemption issued under sections 5-1.90—5-1.96 of this Subpart the report must contain:

(i) an explanation of the reasons for the variance or exemption;

(ii) the date on which the variance or exemption was issued;

(iii) a brief status report on the steps the system is taking to install treatment, final alternative sources of water, or otherwise comply with the terms and schedules of the variance or exemption; and

(iv) a notice of any opportunity for public input in the review, or renewal, of the variance or exemption.

(11) Education information. The report must contain the language of subparagraph (i) of this paragraph or alternative language approved by the State. The report also must include the language of subparagraphs (ii) through (v) of this paragraph.

(i) 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 can pick up substances resulting from the presence of animals or from human activities. Contaminants that may be present in source water include: microbial contaminants; inorganic contaminants; pesticides and herbicides; organic chemical contaminants; and radioactive contaminants.

(ii) in order to ensure that tap water is safe to drink, the State and the EPA prescribe regulations which limit the amount of certain contaminants in water provided by public water systems. The State Health Department's and the FDA's regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

(iii) 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).

(iv) some people may be more vulnerable to disease causing microorganisms or pathogens 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 from their health care provider about their drinking water, EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium, Giardia and other microbial pathogens are available from the safe drinking water hotline (800-426-4791).

(v) if present, elevated levels of lead can cause serious health problems, especially for pregnant women, infants, and young children. 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. [Water Supply Name] is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline (1-800-426-4791) or at http://www.epa.gov/safewater/lead.

(12) Additional health effects statements for arsenic, nitrate, lead, total trihalomethanes and fluoride:

(i) A system which detects arsenic at levels above 5 ug/l, but less than or equal to the MCL must include in its report a short informational statement about arsenic, using language prescribed by the State.

(ii) A system which detects nitrate at levels above 5 mg/l, but below the MCL must include a short informational statement about the impacts of nitrate on children using language prescribed by the State.

(iii) A system which detects lead above the action level in more than 5 percent and up to and including 10 percent of the sites sampled (or for systems sampling less than 20 sites and even one sample is above the action level) must include a short informational statement about the special impact of lead on children using language prescribed by the State.

(iv) A system using only groundwater or using surface water as its source and serving less than 10,000 persons, which detects TTHMs above 80 ug/l, but below 100 ug/l, as an annual average, monitored and calculated as described in section 5-1.52 table 3 of this Subpart, must until January 1, 2004, include health effects language prescribed by the State.

(v) A system which detects fluoride at levels above 2 mg/l, but below the MCL must include in its report an informational statement about fluoride, using language prescribed by the State.

(13) Additional information. Each report must also include the items listed in subparagraphs (i)-(xii) of this paragraph:

(i) the name and address of the community water system and the public water system identification number;

(ii) the name and telephone number of the owner, operator, or designee of the community water system as a source of additional information concerning the report;

(iii) the telephone number of the county or district health department office which has jurisdiction over the water system;

(iv) 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;

(v) a brief statement explaining the number of people served by the community water system;

(vi) a brief description of the types of treatment that the water received before entering the distribution system;

(vii) for systems that calculate water use of all customers with meters, an accounting of the total annual amount of water withdrawn, delivered, and lost from the system;

(viii) a brief description of any water source restricted, removed from service, or otherwise limited in its use and any actions taken to secure new supplies or replace lost capacity;

(ix) water conservation measures customers can take such as, but not limited to, retrofitting plumbing fixtures, altering irrigation timing, using irrigation sensors, leak detection, proper use of water conserving appliances, daily conscientious use of water, and the estimated savings in water and energy or money from the use of such measures;

(x) a description of any major modification completed by the water system during the reporting period to include a brief description of each and its effect on the water system, and a discussion of capital improvements needed or planned;

(xi) for systems that bill their customers, the report shall include the annual average charge for water, either in annual charge per average resident user or annual charge per 1,000 gallons of water delivered; and

(xii) systems may also include such additional information as they deem necessary for public education consistent with, and not detracting from, the purpose of the report.

(14) Information for non-English speaking residents. In communities with a large proportion of non-English speaking residents, as determined by the State, the report must contain

information prescribed by the State in the appropriate language(s) expressing the importance of the report.

(15) Information on unregulated contaminants. If the system was required to monitor for contaminants listed in section 5-1.52 table 16 of this Subpart, the report must identify a person and provide the telephone number to contact for information on the monitoring results.

(16) Water systems are required to include information regarding significant deficiencies as follows:

(i) any significant deficiency that remains uncorrected at the end of the year (December 31st) or any other significant deficiency as directed by the State. A description of the significant deficiency must include: the date the significant deficiency was identified by the State; status of corrective action; the completion date if corrective action has been completed; and if corrective action has not been completed, the reason why it has not been completed. Uncorrected significant deficiencies must be reported each year until the annual report documents that corrective action is completed; and

(ii) any failure to take corrective action to correct a significant deficiency in system facilities or operation, including a description of the significant deficiency, the date the significant deficiency was identified by the State, and the reason why corrective action has not been taken.

(17) Groundwater systems and systems with groundwater sources are also required to include information regarding source sampling and process compliance monitoring as follows:

(i) report of fecal indicator positive ground water source sample, including: the date the fecal contamination of the source was identified; the likely source of the contamination, if known; the date(s) and status of any corrective action; and potential health effects language prescribed by the State;

(ii) if required to perform four-log virus treatment, failure to provide the treatment must be described including date(s) of failure and whether four-log virus treatment has resumed; and

(iii) if required to perform four-log virus treatment, failure to meet process compliance monitoring requirements must be described including date(s) of failure and whether the required process compliance monitoring has resumed.

(g) Report delivery and recordkeeping.

(1) Report distribution to consumers.

(i) Each community water system must mail or otherwise directly deliver one copy of the report to each bill-paying customer by the date specified in subdivision (h) of this section.

(ii) The system must make a good faith effort to reach consumers who do not get water bills, using methods prescribed by the State.

(iii) Each community water system serving 100,000 or more people must post the current year's report to a publicly-accessible site on the Internet.

(iv) Each community water system must make its reports available to the public upon request.

(v) If a supplement is prepared in accordance with paragraph (f)(7) of this section, the report must contain a statement that describes that the analytical results for source water samples not used to determine compliance are contained in a supplement and that the supplement is available to the customer on request. The supplement shall also be:

(a) published in a notice at least one-half page in size, in one newspaper of general circulation within the water district;

(b) made available on the Internet, along with supplements from the two prior years, if such prior supplements exist, and notice of the availability of such information on the Internet shall be clearly provided on the report and on each billing statement; or

(c) made available at all New York State documents information access centers, documents reference centers, documents depository libraries and documents research depository libraries within the water district and if no such libraries exist within the water district at a public library within the water district, and notice of the availability of the supplement at such library or libraries shall be clearly provided on the report and on each billing statement.

Such supplement need not be included in the copy of the report mailed or directly delivered to each bill-paying customer.

(2) Report distribution to State agencies.

(i) No later than the date the system is required to distribute the report to its customers, each community water system must mail one copy of the report and one copy of the supplement, if prepared, to the commissioner of the State Health Department and the county or district health department office which has jurisdiction over the water system. The system must also deliver (by September 1st) to these two agencies 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 State.

(ii) No later than the date the system is required to distribute the report to its customers, each community water system serving 1,000 or more service connections must deliver a copy of the report and a copy of the supplement, if prepared to the Commissioner of Environmental Conservation.

(iii) Investor-owned community water systems regulated by the Public Service Commission (PSC) shall also deliver a copy of the report and a copy of any supplement prepared, to that agency.

(3) Recordkeeping requirements. Any system subject to this Subpart must retain copies of the report for no less than three years.

(h) Applicable dates.

(1) All community water systems must deliver a copy of the report, to its bill-paying customers and take good faith efforts to each consumers who do not get water bills on or before May 31st of each year.

(2) Each community water system serving 100,000 or more people must post their current year's report on a publicly accessible site on the Internet by May 31st of each year.

(3) All community water systems must deliver a copy of the report and a copy of the supplement, if prepared, to the required regulatory agencies on or before May 31st of each year.

(4) A new community water system, must deliver its first report to its customers and a copy of the report and the supplement, if prepared to the required regulatory agencies by May 31st of the year after its first full calendar year in operation and annually thereafter.

(5) A community water system that sells water to another community water system, must deliver the applicable information required in paragraphs (f)(1), (5)-(10) and (13) of this section to the buyer system:

(i) by April 1st of each year; or

(ii) on a date mutually agreed upon by the seller and the purchaser, and specifically included in a contract between the parties.

(6) By September 1st, each community water system must mail a copy of the certification form to the State Health Department and the county or district health department office which has jurisdiction over the water system.

5-1.73 Water treatment plant laboratory.

(Effective Date: January 17, 2018)

Every supplier of water shall provide, or have available environmental laboratory facilities approved by the New York State Environmental Laboratory Approval Program (ELAP). Tests for the control of the operation of such public water system shall be made daily or more frequently as required by the State. The results of such tests shall be recorded on forms pursuant to section 5-1.72(d) of this Subpart.

5-1.74 Approved laboratories.

(Effective Date: January 17, 2018)

(a) For determining compliance with this Subpart, results of analyses, except for parameters listed in section 5-1.74(b), may be considered only if they have been performed by an environmental laboratory approved in accordance with Subpart 55-2 of this Title.

(b) Measurements for pH, temperature, conductivity, turbidity, disinfectant residual, alkalinity, calcium, orthophosphate, bromide, chlorite, total organic carbon (TOC) concentration, dissolved organic carbon concentration, ultraviolet (UV) absorption, and silica may be performed by any person with a demonstrated ability to perform these analyses. These analyses shall be conducted in accordance with 40 CFR part 141. All necessary documentation required by the approved methods shall be retained by the water system conducting the analyses for a period of 10 years.

(c) The owner of a water system shall ensure the approved environmental laboratory performing the analyses sends laboratory results to the department in a manner prescribed by the department.

5-1.75 Additional sampling requirements.

(Effective Date: July 3, 1991)

(a) Additional water samples for any contaminant shall be collected and analyzed from any public water system by the supplier of water as may be required by the State, to assure control of the quality of the public water system.

(b) The State may collect and analyze water samples from any public water system at any time, either by its own personnel or by contract with others.

5-1.76 Consecutive public water systems.

(Effective Date: November 9, 2011)

(a) When a public water system supplies water to one or more consecutive public water systems, the State may modify the monitoring requirements of this Subpart when the circumstances justify treating them as a single system for monitoring purposes. Any modified monitoring shall be conducted pursuant to a schedule approved by the State, in accordance with the provisions of section 5-1.52 of this Subpart.

(b) Consecutive systems must follow section 5-1.52 table 11B of this Subpart in the event of a total coliform positive sample from their distribution system. When a consecutive system that receives ground water from a wholesale system is notified of a positive total coliform sample result, the consecutive system must, within 24 hours, notify the State, the wholesale system and any other wholesale system that owns and/or operates groundwater sources that provides water used by the consecutive system. If all the water provided by the consecutive system has been subject to four-log virus treatment and process compliance monitoring, notification by the consecutive system about the total coliform sample is not required. After notification, the wholesaler must, within 24 hours, test its raw water source(s) for fecal indicator organism(s) in accordance with section 5-1.52 table 11B of this Subpart at the location(s) specified in the monitoring plan described in section 5-1.51 of this Subpart.

5-1.77 State notification.

(Effective Date: January 19, 2022)

(a) The supplier of water shall make State notification within 24 hours, or as specified in section 5-1.52 table 13 of this subpart, when the existence or potential existence of a public health hazard is discovered. The supplier of water shall make State notification within 48 hours for any other violation or situation that may pose a risk to public health. Section 5-1.52 table 13 of this Subpart lists violations and situations that require State notification.

(b) The information provided in a State notification shall include, but not be limited to, the following:

(1) a description of the violation or situation, including the contaminant of concern, and (as applicable) the contaminant level;

(2) when the violation or situation occurred;

(3) what the system is doing to correct the violation or situation; and

(4) when the water system expects to return to compliance.

(c) Groundwater systems and groundwater sources that complete corrective action to correct significant deficiencies or address fecal contamination of a groundwater source must notify the State within 30 days of the completion of the action.

5-1.78 Public notification

(Effective Date: May 16, 2018)

(a) General public notification requirements.

Each owner or operator of a public water system must provide public notification for public health hazards, and for all MCL, MRDL, treatment technique, monitoring and testing procedure violations, and for other situations posing a risk to public health. Public notification requirements are divided into three tiers to take into account the seriousness of the violation or situation and any potential adverse health effects that may be involved. The form, manner, frequency, and other requirements for each tier are described in subdivisions (c)-(e) of this section. Section 5-1.52 table 13 of this Subpart lists the required public notification (Tier 1, Tier 2, or Tier 3) for specific violations and other situations posing a risk to public health.

(1) Public water systems that sell or otherwise provide drinking water to other public 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 notification to the persons it serves.

(2) If a public water system can show that a violation in a portion of the distribution system is physically or hydraulically isolated from other parts of the distribution system, then with

written permission from the State the system may limit the notice to only persons served by that portion of the system that is out of compliance.

(3) The public water system, within 10 days of completing the public notification requirements under this Subpart for the initial public notification and any repeat notices, must submit to the State 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. Copies of public notices and certificates issued pursuant to this paragraph must be kept by the supplier of water for three years after issuance.

(4) Public notification is required when a significant deficiency is identified at a public water system that is not required to prepare an annual water supply statement (report), as directed in section 5-1.72(e) and (f) of this Subpart. If the water system has been notified by the State of a significant deficiency and it has not been corrected as directed or approved by the State, the system must notify its customers in a format prescribed or approved by the State. Notice must be provided if any significant deficiency has not been corrected within 12 months of State notification or as otherwise directed by the State. The system must continue to inform the public until the significant deficiency is corrected.

(b) Content, presentation, and standard language requirements for all public notifications.

(1) When a public water system has a violation or a situation posing a risk to public health, other than operating under a variance or exemption, the public notification must include the following elements:

(i) a description of the violation or situation, including the contaminant of concern, and (as applicable) the contaminant level;

(ii) when the violation or situation occurred;

(iii) any potential adverse health effects from the violation or situation, including the standard language under subparagraph (4)(i) or (ii) of this subdivision, whichever is applicable;

(iv) the population at risk, including subpopulations particularly vulnerable if exposed to the contaminant in their drinking water;

(v) whether alternative water supplies should be used;

(vi) what actions consumers should take, including when they should seek medical help, if known;

(vii) what the system is doing to correct the violation or situation;

(viii) when the water system expects to return to compliance;

(ix) the phone number of the water system owner, operator, or designee of the public water system as a source of additional information concerning the notice;

(x) the phone number of the county or district health department which has jurisdiction over the water system; and

(xi) a statement included in notices distributed by mail or direct delivery to encourage the notice recipient to distribute the public notice to other persons served, using the standard language under subparagraph (4)(iii) of this subdivision.

(2) When a public water system operates under a variance or exemption, each public notice must include the following elements:

(i) an explanation of the reasons for the variance or exemption;

(ii) the date on which the variance or exemption was issued;

(iii) 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

(iv) a notice of any opportunity for public input in the review of the variance or exemption.

(3) Notice presentation. Each public notice required by this section:

(i) must be displayed in a conspicuous way (where applicable);

(ii) must not contain overly technical language or very small print;

(iii) must not be formatted in a way that defeats the purpose of the notice;

(iv) must not contain language which nullifies the purpose of the notice; and

(v) must contain information for non-English speaking consumers, where appropriate. For systems serving a large proportion of non-English speaking consumers, as determined by the State, the notice must contain information prescribe by the State in the appropriate language(s) expressing the importance of the notice.

(4) Standard language.

(i) Mandatory health effects language must be included in the notification for MCL and MRDL violations, treatment technique violations, and violations of the condition of a variance or exemption. The mandatory health effects language will be developed by the department and provided to the supplier of water by the State.

(ii) 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 section 5-1.52 table 13 of 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.

(iii) Standard language to encourage distribution of the public notice to all persons served, when the notice is distributed by mail or direct delivery: 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.

(iv) Standard language for repeated failure to conduct Cryptosporidium monitoring: We are required to monitor the source of your drinking water for Cryptosporidium. Results of the monitoring are to be used to determine whether water treatment at the (treatment plant name) is sufficient to adequately remove Cryptosporidium from your drinking water. We are required to complete this monitoring and make this determination by (required bin determination date). We “did not monitor or test” or “did not complete all monitoring or testing” on schedule, and therefore, we may not be able to determine by the required date what treatment modifications, if any, shall be made to ensure adequate Cryptosporidium removal. Missing this deadline may, in turn, jeopardize our ability to have the required treatment modifications, if any, completed by the deadline required, (date). For more information, please call (name of water system contact) of (name of water system) at (phone number).

(v) Standard language for failure to determine bin classification or mean Cryptosporidium level: We are required to monitor the source of your drinking water for Cryptosporidium in order to determine by (date) whether water treatment at the (treatment plant name) is sufficient to adequately remove Cryptosporidium from your drinking water. We have not made this determination by the required date. Our failure to do this may jeopardize our ability to have the required treatment modifications, if any, completed by the required deadline of (date). For more information, please call (name of water system contact) of (name of water system) at (phone number).

(c) Tier 1 notification requirements (public health hazards, as defined in section 5-1.1[bz] of this Subpart, require Tier 1 notification). The supplier of water shall:

(1) provide public notification no later than 24 hours after the system learns of a public health hazard;

(2) initiate consultation with the State no later than 24 hours after the public water system learns of the public health hazard, and comply with any additional notification requirements established as a result of the consultation (including using additional forms of delivery for the initial notification, the duration of the posted notices, or any repeat notices);

(3) notify by telephone the chief administrative or elected official of the city, village or town, wherein the public water system is located, and the local law enforcement department having jurisdiction in the area served by the public water system, that a public health hazard exists. If there is a potential for the public health hazard to cross political boundaries, all potentially impacted chief administrative or elected officials and local law enforcement departments in the political subdivisions, served by the public water system, must also be notified; and

(4) provide the notice in a form and manner reasonably calculated to reach all persons served (including residential, transient, and nontransient users) in the required time period. Water systems are to use one or more of the following forms of delivery:

(i) appropriate broadcast media (such as radio and television);

(ii) posting of the notice in conspicuous locations throughout the area served by the water system;

(iii) hand delivery of the notice to persons served by the water system; or

(iv) another delivery method approved in writing by the State.

(d) Tier 2 notification requirements (section 5-1.52 table 13 of this Subpart lists violations and situations that require Tier 2 notification).

(1) The supplier of water must provide public notification no later than 30 days after the system learns of a violation or situation that requires Tier 2 notification. If the public water system corrects the violation within 30 days, the State may allow additional time for the initial notice of up to three months from the date the system learns of the violation.

(2) The supplier of water must repeat the notice every three months as long as the violation or situation persists. If the public notice is posted, the notice must remain in place as long as the violation or situation persists, but in no case less than seven days.

(3) The supplier of water must provide the notice in a form and manner reasonably calculated to reach all persons served in the required time period.

(i) Unless directed otherwise by the State in writing, community water systems must provide notice by: 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 by any other method reasonably calculated to reach other persons regularly served by the system if they would not normally be reached by mail or direct delivery.

(ii) Unless directed otherwise by the State in writing, noncommunity water systems must provide notice by posting the notice in conspicuous locations, and by any other method(s) reasonably calculated to reach other persons served by the system if they would not normally be reached by posting.

(4) For the turbidity violations or exceedances specified in subparagraphs (i)-(iii) of this paragraph, the supplier of water must consult with the State no later than 24 hours after the public water system learns of the violation or exceedance to determine whether a Tier 1

notification 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 notification no later than 48 hours after the system learns of the violation or exceedance. Consultation with the State is required for:

(i) a violation of the two day average maximum allowable turbidity at the entry point pursuant to section 5-1.52 table 4 of this Subpart;

(ii) a violation resulting from a single exceedance of the maximum allowable turbidity for filter effluent pursuant to section 5-1.52 table 4A of this Subpart; and

(iii) a single raw water turbidity exceedance of 5 NTU for systems operating under the avoidance criteria in section 5-1.30(c) of this Subpart.

(5) Consultation with the State is required within 24 hours after a groundwater system or groundwater source learns of any of the following:

(i) a fecal indicator positive sample from the source(s) as specified in section 5-1.52 table 6 of this Subpart;

(ii) a significant deficiency that is considered to constitute a public health hazard; or

(iii) failure of four-log virus treatment by the water system that is not resolved within four hours.

The State will determine whether Tier 1 notification is required to protect public health. When consultation does not take place within the 24-hour period, the water system must distribute Tier 1 notification no later than 48 hours after the system learns of the violation or exceedance.

(6) For repeated failure to conduct Cryptosporidium monitoring, failure to determine bin classification, or failure to calculate mean Cryptosporidium, each notification shall also include a description of what the system is doing to correct the violation and when the system expects to return to compliance or resolve the situation.

(e) Tier 3 notification requirements (section 5-1.52 table 13 of this Subpart lists violations and situations that require Tier 3 notification).

(1) The supplier of water for community and nontransient noncommunity water systems must provide public notification no later than one year after the system learns of a violation or situation that requires Tier 3 notification. The supplier of water for transient noncommunity water systems must provide public notification no later than 30 days after the system learns of a violation or situation that requires Tier 3 notification. If the public water system operates seasonally, the public notification must also be provided before the system closes for the season.

(2) The supplier of water must repeat the notice annually for as long as the violation or situation persists. If the public notice is posted, the notice must remain in place as long as the violation or situation persists, but in no case less than seven days.

(3) The supplier of water may use a single public notice for multiple violations or situations that require Tier 3 notification, as long as the timing requirements of paragraph (1) of this subdivision are met. Community water systems may use the annual water supply statement (report) (see section 5-1.72[e]-[h] of this Subpart) to provide Tier 3 notification.

(4) The supplier of water must provide the initial notice and any repeat notices in a form and manner reasonably calculated to reach all persons served in the required time period.

(i) Unless directed otherwise by the State in writing, community water systems must provide notice by: 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 by any other method reasonably calculated to reach other persons served by the system if they would not normally be reached by mail or direct delivery.

(ii) Unless directed otherwise by the State in writing, noncommunity water systems must provide notice by posting the notice in conspicuous locations, and by any other method(s) reasonably calculated to reach other persons served by the system if they would not normally be reached by posting.

(f) Notice to new billing units or new customers.

Community water systems must give a copy of the most recent public notice for any continuing violation, the existence of a variance or exemption, or other ongoing situations requiring a public notice to all new billing units or new customers prior to or at the time service begins.

(g) Information on unregulated contaminants.

Nontransient noncommunity water systems that are required to monitor for contaminants listed in section 5-1.52 table 16 of this Subpart, must post a notice that identifies a person and telephone number to contact for information on the monitoring results. The notice must be posted in conspicuous locations and no later than 12 months after the results are known.

(h) Notice by the State on behalf of the public water system.

The State may make public notification if the State determines that the public's interest will be best served, or if the State determines that the supplier of water is not acting or cannot act in a timely manner. The State may charge and collect from the supplier of water the cost of making such notification. However, the supplier of water remains legally responsible for ensuring that the requirements of this section are met.

5-1.79 Multiple distribution systems.

(Effective Date: January 6, 1993)

A water supply system or facility with multiple distribution systems on separate sources of water supply shall be considered a single public water system if all the following conditions are met:

(a) the separate sources are the same source type, with:

(1) the groundwater sources located in the same aquifer area; or

(2) the surface water intakes located in the same water body and the intakes at the same approximate depth and location;

(b) the water supply system or facility is owned and operated by the same person(s);

(c) the water supply system or facility is operated for the same purposes and for the same time period; and

(d) the water supply system or facility serves 25 or more people or 15 or more service connections.

Enhanced Treatment for Cryptosporidium

5-1.80 Applicability.

(Effective Date: December 28, 2022)

The provisions of this section, and sections 5-1.81 through 5-1.83 of this Subpart apply to all public water systems, as defined in paragraph 5-1.1(cb) of this Subpart, supplied by a surface water source(s) or ground water source(s) directly influenced by surface water, provided the system serves 15 or more service connections or serves 25 or more persons. The requirements in this section for filtered systems apply to any system with a surface water or GWUDI source that is required to provide filtration, regardless of whether the system is currently operating a filtration system. All treatment must comply with the requirements of the Microbial Toolbox Components (MTC) as described in 40 CFR 141.715 through 40 CFR 141.720. Any systems utilizing any of the MTC must retain records and report to the State as described in 40 CFR 141.721 and 141.722. Any unfiltered systems that are in compliance with the filtration avoidance criteria in section 5-1.30(c) of this Subpart, are subject to the requirements in sections 5-1.80 through 5-1.83 of this Subpart pertaining to unfiltered systems. Wholesale system compliance with sections 5-1.81 through 5-1.83 of this Subpart is based on the population of the largest system in the combined distribution system. The above systems shall comply with the following requirements:

(a) Systems shall conduct an initial and a second round of source water monitoring for each plant that treats water from a surface water source or ground water source directly influenced by surface water. This monitoring may include Cryptosporidium, E. coli, and turbidity, as described in section 5-1.81(a) through (d) of this Subpart, to determine what level, if any, of additional Cryptosporidium treatment shall be provided. Cryptosporidium monitoring shall be done using an approved method. The following method modifications must also be followed:

(1) samples must be at least 10 liters (L) or a packed pellet volume of at least 2 milliliters (mL) must be used. If a 10 L sample cannot be processed, as much sample volume as can be filtered by two filters, as described in 40 CFR 141.704(a)(1), must be processed, up to a packed pellet volume of at least 2 mL;

(2) the method-required matrix spike (MS) samples must be spiked and filtered by a laboratory certified for the method;

(3) if the volume of the MS is greater than 10 L, the volume greater than 10 L may be filtered in the field, and the filtered sample may be shipped with the 10 L sample to the laboratory where the 10 L sample is spiked and filtered through the filter that was used to collect the balance of the sample in the field;

(4) flow cytometer-counted spiking suspensions must be used for MS samples and ongoing precision and recovery samples.

(b) Systems that plan to make a significant change to their disinfection practice shall develop disinfection profiles and calculate disinfection benchmarks, as described in section 5-1.82 of this Subpart.

(c) Filtered systems shall determine their Cryptosporidium treatment bin classification, as described in section 5-1.83(a) of this Subpart, and provide additional treatment for Cryptosporidium, if required, as described in section 5-1.83(b) of this Subpart. All unfiltered systems shall determine their mean Cryptosporidium level and provide treatment for Cryptosporidium as described in section 5-1.83(c) of this Subpart. Systems shall implement Cryptosporidium treatment according to the schedule in section 5-1.83(d) of this Subpart.

5-1.81 Source water monitoring requirements at systems using surface water and ground water under the direct influence of surface water (GWUDI) sources.

(Effective Date: December 28, 2022)

(a) Source water monitoring.

(1) Initial round of source water monitoring. Systems shall conduct the following monitoring, based on the monitoring schedule prescribed in paragraph (3) of this subdivision, unless they meet the monitoring exemption criteria in paragraph (4) of this subdivision:

(i) Filtered systems serving at least 10,000 people shall sample their source water for Cryptosporidium, E. coli, and turbidity at least monthly for 24 months.

(ii) Unfiltered systems serving at least 10,000 people shall sample their source water for Cryptosporidium at least monthly for 24 months.

(iii) Filtered systems serving fewer than 10,000 people:

(a) shall sample their source water for E. coli and use an approved method to enumerate the presence of E. coli at least once every two weeks for 12 months;

(b) may avoid E. coli monitoring if the system notifies the State that it will monitor for Cryptosporidium as described in subparagraph (iv) of this paragraph. The system shall notify the State no later than three months prior to the date the system is otherwise required to start E. coli monitoring under paragraph (3) of this subdivision; and

(c) shall sample their source water for *Cryptosporidium* at least twice per month for 12 months, or at least monthly for 24 months, if, based on monitoring conducted under this subparagraph, they meet one of the following criteria:

(1) For systems using lake/reservoir sources, the annual mean *E. coli* concentration is greater than 10 E. coli/100 mL;

(2) For systems using flowing stream sources, the annual mean *E. coli* concentration is greater than 50 E. *coli*/100 mL; or

(3) The system does not conduct *E. Coli* monitoring once every two weeks for 12 months.

(4) Systems using ground water under the direct influence of surface water (GWUDI) must comply with the requirements of subclause (1) through (3) of this clause based on the *E. coli* level that applies to the nearest surface water body. If no surface water body is nearby, the system must comply based on the requirements that apply to systems using lake/reservoir sources.

(5) the State may approve an alternative to the *E. coli* concentration specified in subclause (1) and subclause (2) of this clause to trigger *Cryptosporidium* monitoring. This approval by the State will be provided to the system in writing and will include the basis for the State's determination that the alternative trigger concentration will provide a more accurate identification of whether a system will exceed the Bin 1 *Cryptosporidium* level specified in section 5-1.83(a)(2) of this Subpart.

(iv) Unfiltered systems serving fewer than 10,000 people shall sample their source water for Cryptosporidium at least twice per month for 12 months or at least monthly for 24 months.

(v) Systems may sample more frequently than required under this section if the sampling frequency is evenly spaced throughout the monitoring period.

(2) Second round of source water monitoring. Systems shall conduct a second round of source water monitoring that meets the requirements for monitoring parameters, frequency, and duration described in paragraph (1) of this subdivision, unless they meet the monitoring exemption criteria in paragraph (4) of this subdivision. Systems shall conduct this monitoring on the schedule in paragraph (3) of this subdivision.

(3) Monitoring schedule. Systems shall comply with the monitoring schedule prescribed in 40 CFR 141.701(c).

(4) Monitoring avoidance.

(i) Filtered systems are not required to conduct source water monitoring under this section if the system will provide a total of at least 5.5-log of treatment for Cryptosporidium, equivalent to meeting the treatment requirements of Bin 4 in section 5-1.83(b) of this Subpart.

(ii) Unfiltered systems are not required to conduct source water monitoring under this section if the system will provide a total of at least 3-log Cryptosporidium inactivation, equivalent to meeting the treatment requirements for unfiltered systems with a mean Cryptosporidium concentration of greater than 0.01 oocysts/L in section 5-1.83(c) of this Subpart.

(iii) If a system chooses to provide the level of treatment in subparagraph (i) or (ii) of this paragraph, as applicable, rather than start source water monitoring, the system shall

notify the State in writing no later than the date the system is otherwise required to submit a sampling schedule for monitoring under subdivision (b) of this section. Alternatively, a system may choose to stop sampling at any point after it has initiated monitoring if it notifies the State in writing that it will provide this level of treatment. Systems shall install and operate technologies to provide this level of treatment by the applicable treatment compliance date in section 5-1.83(d) of this Subpart.

(5) Plants operating only part of the year. Systems with surface water sources or ground water sources directly influenced by surface water and with plants that operate for only part of the year shall conduct source water monitoring in accordance with this section and section 5-1.80 of this Subpart, but with the following modifications:

(i) systems shall sample their source water only during the months that the plant operates unless the State specifies another monitoring period based on plant operating practices;

(ii) systems with plants that operate less than six months per year and that monitor for Cryptosporidium shall collect at least six Cryptosporidium samples per year during each of two years of monitoring. Samples shall be evenly spaced throughout the period the plant operates.

(6) New sources.

(i) A system that begins using a new source of surface water or ground water directly influenced by surface water after the system is required to begin monitoring under paragraph (3) of this subdivision shall monitor the new source on a schedule approved by the State. Source water monitoring shall meet the requirements of this section. The system also shall meet the bin classification of section 5-1.83(a) of this Subpart and Cryptosporidium treatment requirements of section 5-1.83(b) or (c) of this Subpart, as applicable, for the new source on a schedule approved by the State.

(ii) The requirements of this paragraph also apply to new systems that use surface water or ground water directly influenced by surface water, that begin operation after the monitoring start date applicable to the system's size under paragraph (3) of this subdivision.

(iii) The system shall begin a second round of source water monitoring no later than six years following initial bin classification or determination of the mean Cryptosporidium level, as applicable.

(b) Sampling schedules.

(1) Systems required to conduct source water monitoring under this section shall submit a sampling schedule that specifies the calendar dates when the system will collect each required sample. Systems shall submit sampling schedules to the State no later than three months prior to any applicable date referenced in paragraph (a)(3) of this section. If the State does not respond to a system regarding its sampling schedule, the system shall sample at the reported schedule.

(2) Systems shall collect samples within two days before or two days after the dates indicated in their sampling schedule, unless one of the following conditions applies:

(i) If an extreme condition or situation exists that may pose danger to the sample collector, or that cannot be avoided and causes the system to be unable to sample in the scheduled five-day period, the system shall sample as close to the scheduled date as is feasible, unless the State approves an alternate sampling date. The system shall submit an explanation for the delayed sampling date to the State concurrent with the shipment of the sample to the laboratory.

(ii) If a system is unable to report a valid analytical result for a scheduled sampling date due to equipment failure, loss of or damage to the sample, failure to comply with the analytical method requirements, including the quality control requirements in subdivision (d) of this section, or the failure of an approved laboratory to analyze the sample, then the system shall collect a replacement sample. The replacement sample shall be collected no later than 21 days after receiving information that an analytical result cannot be reported for the scheduled date, unless the system demonstrates that collecting a replacement sample within this time frame is not feasible, or the State approves an alternative resampling date. The system shall submit an explanation for the delayed sampling date to the State concurrent with the shipment of the replacement sample to the laboratory.

(3) Systems that fail to meet the criteria of paragraph (2) of this subdivision for any source water sample required under subdivision (a) of this section shall revise their sampling schedules to add dates for collecting all missed samples. Systems shall submit the revised schedule to the State for approval prior to when the system begins collecting the missed samples.

(c) Sampling locations.

(1) Systems required to conduct source water monitoring under subdivision (a) of this section shall collect samples for each plant that treats a surface water or GWUDI source. Where multiple plants draw water from the same influent, such as the same pipe or intake, the State may approve one set of monitoring results to be used to satisfy the requirements for all plants.

(2) Systems shall collect source water samples prior to chemical treatment, such as coagulants, oxidants, and disinfectants, unless the State determines that collecting a sample prior to chemical treatment is not feasible for the system and that the chemical treatment is unlikely to have a significant adverse effect on the analysis of the sample.

(3) Systems that recycle filter backwash water shall collect source water samples prior to the point of filter backwash water addition.

(4) Bank filtration.

(i) Systems that receive Cryptosporidium treatment credit for bank filtration, as applicable, shall collect source water samples in the surface water prior to bank filtration.

(ii) Systems that use bank filtration as pretreatment to a filtration plant shall collect source water samples from the well (*i.e.*, after bank filtration). Use of bank filtration during monitoring shall be consistent with routine operational practice. Systems collecting samples after a bank filtration process may not receive treatment credit for the bank filtration.

(5) Multiple sources. Systems with plants that use multiple water sources, including multiple surface water sources and blended surface water and ground water sources, shall collect samples as specified in subparagraph (i) or (ii) of this paragraph. The use of multiple sources during monitoring shall be consistent with routine operational practice.

(i) If a sampling tap is available where the sources are combined prior to treatment, systems shall collect samples from that tap.

(ii) If a sampling tap where the sources are combined prior to treatment is not available, systems shall collect samples at each source near the intake on the same day and select one of the following options for sample analysis:

(a) systems may composite samples from each source into one sample prior to analysis. The volume of sample from each source shall be weighted according to the proportion of the source in the total plant flow at the time the sample is collected; or

(b) systems may analyze samples from each source separately and calculate a weighted average of the analysis results for each sampling date. The weighted average shall be calculated by multiplying the analysis result for each source by the fraction the source contributed to total plant flow at the time the sample was collected and then summing these values.

(6) Additional requirements. Systems shall submit a description of their sampling location(s) to the State at the same time as the sampling schedule. This description shall address the position of the sampling location in relation to the system's water source(s) and treatment processes, including pretreatment, points of chemical treatment, and filter backwash recycle. If the State does not respond to a system regarding sampling location(s), the system shall sample at the reported location(s).

(d) Reporting source water monitoring results.

(1) Systems shall report results from the source water monitoring no later than 10 days after the end of the first month following the month when the sample is collected.

(2) Systems shall report the following information, as applicable, for the source water monitoring samples required under subdivision (a) of this section:

(i) Systems shall report the following data elements for each Cryptosporidium analysis: PWS ID; facility ID sample collection date sample type (field or matrix spike); sample volume filtered (in liters, to the nearest 0.25 liter); confirmation that 100 percent of filtered volume was examined; and the number of oocysts counted.

(a) For matrix spike samples, systems shall also report the sample volume spiked and estimated number of oocysts spiked. These data are not required for field samples.

(b) For samples in which less than 10 liters are filtered or less than 100 percent of the sample volume is examined, systems shall also report the number of filters used and the packed pellet volume.

(c) For samples in which less than 100 percent of sample volume is examined, systems shall also report the volume of resuspended concentrate and volume of this resuspension processed through immunomagnetic separation.

(ii) Systems shall report the following data elements for each E. coli analysis: PWS ID; facility ID; sample collection date; analytical method number; method type; source type; E. coli/100 mL; and turbidity. Systems serving fewer than 10,000 people that are not required to monitor for turbidity are not required to report turbidity with their E. coli results.

5-1.82 Requirements when making a significant change in disinfection practice.

(Effective Date: January 17, 2018)

(a) Following the completion of initial source water monitoring under section 5-1.81(a)(1) of this Subpart, a system that plans to make a significant change to its disinfection practice, as defined in subdivision (b) of this section, shall develop disinfection profiles and calculate disinfection benchmarks for Giardia lamblia and viruses, in accordance with 40 CFR 141.709. Prior to changing the disinfection practice, the system shall notify the State and shall include in this notice the following information:

(1) a completed disinfection profile and disinfection benchmark for Giardia lamblia and viruses prepared as described in 40 CFR 141.709;

(2) a description of the proposed change in disinfection practice;

(3) an analysis of how the proposed change will affect the current level of disinfection.

(b) Significant changes to disinfection practice are defined as follows:

(1) changes to the point of disinfection;

(2) changes to the disinfectant(s) used in the treatment;

(3) changes to the disinfection process; or

(4) any other modification identified by the State as a significant change to disinfection practice.

5-1.83 Treatment technique requirements.

(Effective Date: January 19, 2022)

(a) Bin classification for filtered systems.

(1) Following completion of the initial round of source water monitoring under section 5-1.81(a)(1) of this Subpart, filtered systems shall calculate an initial Cryptosporidium bin concentration for each plant for which monitoring was required, such calculation shall be done in accordance with 40 CFR 141.710(b)(1) through 40 CFR 141.710(b)(5). Calculation of the bin concentration shall use the Cryptosporidium results reported under section 5-1.81 of this Subpart.

(2) Filtered systems shall determine their initial bin classification from the following table and using the Cryptosporidium bin concentration calculated under paragraph (1) of this subdivision:

BIN CLASSIFICATION TABLE FOR FILTERED SYSTEMS

System Characteristic	*Cryptosporidium* Concentration[1]	Bin Classification
Required to monitor for *Cryptosporidium*	*Cryptosporidium* <0.075 oocyst/L	Bin 1
	0.075 oocysts/L≤*Cryptosporidium*<1.0 oocyst/L	Bin 2
	1.0 oocyst/L≤*Cryptosporidium*<3.0 oocysts/L	Bin 3
	Cryptosporidium≥3.0 oocysts/L	Bin 4
Serving fewer than 10,000 people and NOT required to monitor for *Cryptosporidium*	Not applicable	Bin 1

[1]Based on calculations in paragraph (1) or (3) of this subdivision, as applicable.

(3) Following completion of the second round of source water monitoring required under section 5-1.81(a)(2) of this Subpart, filtered systems shall recalculate their Cryptosporidium bin concentration using the Cryptosporidium results reported under section 5-1.81(a)(2) of this Subpart, and following the procedures in 40 CFR 141.710(b)(1) through 40 CFR 141.710(b)(4). Systems shall then reevaluate their bin classification using the bin concentration from the second round of monitoring and the table in paragraph (2) of this subdivision.

(4)

(i) Filtered systems shall report their initial bin classification under paragraph (2) of this subdivision to the State for approval no later than six months after the system is required to complete initial source water monitoring based on the schedule referenced in section 5-1.81(a)(3) of this Subpart.

(ii) Systems shall report their bin classification under paragraph (3) of this subdivision to the State for approval no later than six months after the system is required to complete the second round of source water monitoring based on the schedule referenced in section 5-1.81(a)(3) of this Subpart.

(iii) The bin classification report to the State shall include a summary of source water monitoring data and the calculation procedure used to determine bin classification.

(b) Filtered system additional Cryptosporidium treatment requirements.

(1) Filtered systems shall provide the level of additional treatment for Cryptosporidium specified in this paragraph based on their bin classification as determined under subdivision (a) of this section and according to the schedule in subdivision (d) of this section.

	If the system uses the following filtration treatment in full compliance with section 5-1.30(b) of this Subpart (as applicable), then the additional *Cryptosporidium* treatment requirements are:			
System Classification	Conventional Filtration Treatment (including softening)	Direct Filtration	Slow Sand or Diatomaceous Earth Filtration	Alternative Filtration Technologies
Bin 1	No additional	No additional	No additional	No additional
Bin 2	1-log	1.5-log	1-log	([1])
Bin 3	2-log	2.5-log	2-log	([2])
Bin 4	2.5-log	3-log	2.5-log	([3])

[1]As determined by the State such that the total *Cryptosporidium* removal and inactivation is at least 4.0-log.
[2]As determined by the State such that the total *Cryptosporidium* removal and inactivation is at least 5.0-log.
[3]As determined by the State such that the total *Cryptosporidium* removal and inactivation is at least 5.5-log.

(2)

(i) Filtered systems shall use one or more of the treatment and management options, as approved by the State, to comply with the additional Cryptosporidium treatment required in paragraph (1) of this subdivision.

(ii) Systems classified in Bin 3 and Bin 4 shall achieve at least 1-log of the additional Cryptosporidium treatment required under paragraph (1) of this subdivision using either one or a combination of the following, as approved by the State: bag filters, bank filtration, cartridge filters, chlorine dioxide, membranes, ozone, or UV.

(3) Failure by a system in any month to achieve treatment credit at least equal to the level of treatment required in paragraph (1) of this subdivision is a violation of the treatment technique requirement.

(4) If the State determines during a sanitary survey or an equivalent source water assessment that, after a system completed the monitoring conducted under section 5-1.81(a)(1) or (2) of this Subpart, significant changes occurred in the system's watershed that could lead to increased contamination of the source water by Cryptosporidium, the system shall take actions specified by the State to address the contamination.

(c) Unfiltered system Cryptosporidium treatment requirements.

(1) Determination of mean Cryptosporidium level.

(i) Following completion of the initial source water monitoring required under section 5-1.81(a)(1) of this Subpart, unfiltered systems shall calculate the arithmetic mean of all Cryptosporidium sample concentrations reported for such monitoring. Systems shall report this value to the State for approval no later than six months after the month the system is required to complete initial source water monitoring based on the schedule referenced in section 5-1.81(a)(3) of this Subpart.

(ii) Following completion of the second round of source water monitoring required under section 5-1.81(a)(2) of this Subpart, unfiltered systems shall calculate the arithmetic mean of all Cryptosporidium sample concentrations reported under that monitoring. Systems shall report this value to the State for approval no later than six months after the month the system is required to complete the second round of source water monitoring based on the schedule referenced in section 5-1.81(a)(3) of this Subpart.

(iii) If the monthly Cryptosporidium sampling frequency varies, systems shall first calculate a monthly average for each month of monitoring. Systems shall then use these monthly average concentrations, rather than individual sample concentrations, in the calculation of the mean Cryptosporidium level in subparagraph (i) or (ii) of this paragraph.

(iv) The report to the State of the mean Cryptosporidium levels calculated under subparagraphs (i) and (ii) of this paragraph shall include a summary of the source water monitoring data used for the calculation.

(2) Cryptosporidium inactivation requirements. Unfiltered systems shall provide the level of inactivation for Cryptosporidium specified in this paragraph, based on their mean Cryptosporidium levels as determined under paragraph (1) of this subdivision and according to the schedule in subdivision (d) of this section.

(i) Unfiltered systems with a mean Cryptosporidium level of 0.01 oocysts/L or less shall provide at least 2-log Cryptosporidium inactivation.

(ii) Unfiltered systems with a mean Cryptosporidium level of greater than 0.01 oocysts/L shall provide at least 3-log Cryptosporidium inactivation.

(3) Inactivation treatment technology requirements. Unfiltered systems shall use chlorine dioxide, ozone, or UV to meet the Cryptosporidium inactivation requirements of this section.

(i) Systems that use chlorine dioxide or ozone and fail to achieve the Cryptosporidium inactivation required in paragraph (2) of this subdivision on more than one day in the calendar month are in violation of the treatment technique requirement.

(ii) Systems that use UV light and fail to achieve the Cryptosporidium inactivation required in paragraph (2) of this subdivision by meeting the criteria in footnote 4 of section 5-1.52 Table 14K are in violation of the treatment technique requirement.

(4) Use of two disinfectants. Unfiltered systems shall meet the combined Cryptosporidium inactivation requirements of this section and Giardia lamblia and virus inactivation requirements of section 5-1.30(c)(3) of this Subpart using a minimum of two disinfectants, and each of two disinfectants must separately achieve the total inactivation required for either Cryptosporidium, Giardia lamblia, or viruses. Systems that fail to install a second disinfectant to treat for Cryptosporidium are in violation of the treatment technique requirement.

(d) Schedule for compliance with Cryptosporidium treatment requirements.

(1) Following initial bin classification under subdivision (a) of this section, filtered systems shall provide the level of treatment for *Cryptosporidium* required under subdivision (b) of this section, in accordance with the schedule in 40 CFR 141.713(c).

(2) Following initial determination of the mean *Cryptosporidium* level under subparagraph (c)(1)(i) of this section, unfiltered systems shall provide the level of treatment for Cryptosporidium required under subdivision (c) of this section, in accordance with the schedule in 40 CFR 141.713(c).

(3) If the bin classification for a filtered system changes following the second round of source water monitoring, as determined under paragraph (a)(3) of this section, the system shall provide the level of treatment for Cryptosporidium required under subdivision (b) of this section on a schedule approved by the State.

(4) If the mean Cryptosporidium level for an unfiltered system changes following the second round of monitoring, as determined under subparagraph (c)(1)(ii) of this section, and if the system shall provide a different level of Cryptosporidium treatment under subdivision (c) of this section due to this change, the system shall meet this treatment requirement on a schedule approved by the State.

Variances and Exemptions

5-1.90 Variance from a maximum contaminant level.

(Effective Date: May 16, 2018)

(a) The supplier of water may request, and the department may grant, one or more variances from an MCL contained in sections 5-1.51 and 5-1.52 tables 1, 3, 5 and 7 of this Subpart to any public water system based on a finding that:

(1) because of characteristics of the raw water sources which are reasonably available to it, the public water system cannot meet the requirements respecting such MCL despite

application of the best available technology, treatment techniques or other means which are generally available, taking costs into consideration; and

(2) the granting of a variance will not result in an unreasonable risk to health.

(b) At the time of the granting of the variance, the department shall prescribe, and the supplier of water shall follow, a schedule for:

(1) compliance, including increments of progress, to meet each MCL covered by the variance; and

(2) implementation of such control measures as the department may require.

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Current through April 30, 2021

5-1.91 Variance from required use of any specified treatment technique.

(Effective Date: August 26, 2020)

(a) The supplier of water may request, and the department may grant, one or more variances from any treatment technique requirement, except filtration and disinfection, in accordance with section 5-1.30(b), (c) and (g) of this Subpart on a finding that such treatment technique is not necessary to protect the health of persons served by the public water system because of the raw water source or sources of such system.

(b) As a condition to the granting of a variance under subdivision (a) of this section, the supplier of water shall perform monitoring and other requirements as prescribed by the department.

(c) Notwithstanding subdivisions (a) and (b) of this section, section 5-1.30 of this Subpart shall govern the conditions under, and the manner which, a waiver of mandatory disinfection treatment for a ground source of water supply may be granted.

(d) The technologies listed in this section are the best technology, treatment techniques, or other means available for achieving compliance with the maximum contaminant levels for organic chemicals listed in section 5-1.52 table 3 of this Subpart:

BEST AVAILABLE TECHNOLOGIES (BATs)

Contaminant	Best Available Technologies		
	PTA[1]	GAC[2]	OX[3]
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	
Dalapon		X	
Di(2-ethylhexyl)adipate	X	X	
Di(2-ethylhexyl)phthalate		X	
2,4-D		X	
Dibromochloropropane	X	X	
1,1-Dichloroethylene	X	X	
para-Dichlorobenzene	X	X	
o-Dichlorobenzene	X	X	
1,2-Dichloroethane	X	X	
cis-1,2-Dichloroethylene	X	X	
trans-1,2-Dichloroethylene	X	X	
Dichloromethane	X		
1,2-Dichloropropane	X	X	
Dinsoeb		X	
1,4-Dioxane			X
Endothal		X	
Endrin		X	
Ethylbenzene	X	X	
Ethylene dibromide	X	X	
Glyphosate			X
Heptachlor		X	
Heptachlor epoxide		X	
Hexachlorobenzene		X	
Hexachlorocyclopentadiene	X	X	
Lindane		X	
Methoxychlor		X	
Monochlorobenzene	X	X	
Oxamyl (Vydate)		X	
PCBs		X	
Pentachlorophenol		X	

Perfluorooctanesulfonic acid (PFOS)		X	
Perfluorooctanoic acid (PFOA)		X	
Picloram		X	
Simazine		X	
Styrene	X	X	
2,3,7,8-TCDD (Dioxin)		X	
Tetrachloroethylene	X	X	
Toluene	X	X	
Toxaphene		X	
2,4,5-TP		X	
1,2,4-Trichlorobenzene	X	X	
1,1,1-Trichloroethane	X	X	
1,1,2-Trichloroethane	X	X	
Trichloroethylene	X	X	
Vinyl chloride	X		
Xylenes (total)	X	X	
TTHM, HAA5, Bromate, Chlorite[4]			

[1]Packed Tower Aeration

[2]Granular Activated Carbon

[3]Oxidation (Chlorination or Ozonation) and Advanced Oxidation Process (AOP)

[4]For surface water systems or ground water systems influenced by surface water, GAC10, as defined in section 5-1.1 of this Subpart, is the BAT for compliance with the TTHM and HAA5 MCL as a Running Annual Average (RAA). The other BAT for RAA compliance is enhanced coagulation for TTHM and HAA5 precursor removal, as described in section 5-1.60 of this Subpart. For compliance with the MCLs for TTHM and HAA5 as LRAAs, the following are the BATs: enhanced coagulation or enhanced softening, plus GAC10; GAC20, as defined in section 5-1.1 of this Subpart; or nanofiltration with a molecular weight cutoff less than or equal to 100 Daltons. Refer to section 5-1.65 of this Subpart for BATs for TTHM, HAA5, Bromate, and Chlorite.

(e) The following are the best technologies, treatment techniques, or other means available for achieving compliance with the maximum contaminant levels for the inorganic chemicals and radionuclides in section 5-1.52, tables 1 and 7 of this Subpart:

Technologies for Achieving MCL Compliance	
Chemical Name	Best Available Technologies
Antimony	2,7
Arsenic	1,2,5,6,7,9,13[6]
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
Fluoride	1,7
Mercury (Hg)	2[1],4,6[1],7[1]
Nickel	5,6,7
Nitrate	5,7
Nitrite	5,7,9
Selenium	1,2[3],6,7,9
Thallium	1,5
Gross Alpha (excluding radon and uranium)	7
Combined radium (226 and 228)	5,6,7
Uranium	5,6,7,12[4]
Beta particle and photo radioactivity	5,7

[1]BAT only if influent Hg concentrations $\leq$10 µg/L.

[2]BAT for Chromium III only.

[3]BAT for Selenium IV only.

[4]Assumes that the system already has coagulation/filtration in place.

[5]BAT for Arsenic V. Pre-oxidation may be required to convert Arsenic III to Arsenic V.

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

Key to Best Available Technologies (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 = Enhanced coagulation/filtration

13 = Oxidation/Filtration

(f) The following are the affordable technologies, treatment techniques, or other means available to systems serving 10,000 persons or fewer for achieving compliance with the MCL for arsenic as listed in section 5-1.52 table 1 of this Subpart:

Technology for Arsenic MCL Compliance at Systems Serving ≤10,000	
Small system compliance technology[1]	**Affordable for listed small system categories**
Activated Alumina (centralized)	All systems Serving 25-10,000
Activated Alumina (Point-of-Use)[2]	All systems Serving 25-10,000
Coagulation/Filtration[3]	Systems serving 501-10,000
Coagulation-assisted Microfiltration	Systems serving 501-10,000
Electrodialysis reversal[4]	Systems serving 501-10,000
Enhanced coagulation/filtration	All systems Serving 25-10,000
Enhanced lime softening (pH>10.5)	All systems Serving 25-10,000
Ion Exchange	All systems Serving 25-10,000
Lime Softening[3]	Systems serving 501-10,000
Oxidation/Filtration[5]	All systems Serving 25-10,000
Reverse Osmosis (centralized)[4]	Systems serving 501-10,000
Reverse Osmosis (Point-of-Use)[2]	All systems Serving 25-10,000

[1]Small System Compliance Technologies for Arsenic V. Pre-oxidation may be required to convert Arsenic III to Arsenic V.

[2]When point-of-use or point-of-entry 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.

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

[4]May not be appropriate for areas where water quantity may be an issue.

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

(g) The community water systems and nontransient noncommunity water systems must install and/or use any treatment method identified in subdivisions (d) and (e) of this section as a condition for granting a variance except as provided in subdivision (h) of this section. If after the

system's installation of the treatment method, the system cannot meet the MCL, that system shall be eligible for a variance.

(h) If a system can demonstrate through comprehensive engineering assessments, which may include pilot plant studies, that the treatment methods identified in subdivisions (d) and (e) of this section would only achieve a *de minimis* reduction in contaminants, the State may issue a schedule of compliance that requires the system being granted the variance to examine other treatment methods as a condition of obtaining the variance.

(i) If the State determines that a treatment method identified in subdivision (g) of this section is technically feasible, the State may require the system to install and/or use that treatment method in connection with a compliance schedule. The State's determination shall be based upon studies by the system and other relevant information.

5-1.92 Exemption from a maximum contaminant level or any treatment technique requirement.

(Effective Date: December 28, 2022)

(a) The supplier of water may request, and the department may grant, one or more exemptions from any treatment technique requirement, except for filtration and disinfection of a surface water source in accordance with 5-1.30(b), (c) and (g) of this Subpart, and/or any MCL, except for *Escherichia coli (E. coli*). Exemptions may be granted to any public water system based on a finding that:

(1) because of compelling factors which may include economic factors, the public water system is unable to comply with such MCL or treatment technique requirement;

(2) the public water system was in operation on the effective date of such MCL or treatment technique requirement; and

(3) the granting of an exemption will not result in an unreasonable risk to health.

(4) The supplier of water has not been granted a variance under section 5-1.90 of this Subpart.

(b) Exemptions, if granted, will be issued with a mandatory compliance strategy to include, but not be limited to the following:

(1) a specific time which to achieve compliance, including increments of progress to meet the MCL or treatment technique covered by the exemption;

(2) control measures as the department may require to ensure the public health; and

(3) appropriate modifications and/or improvements to the existing system or facility as may be necessary for the system or facility to fully conform to the requirements of this Subpart.

(c) Such schedule prescribed by the department pursuant to subdivision (b) of this section shall require compliance with each MCL or treatment technique requirement no later than 12 months after the issuance of the exemption.

(d) The final date for compliance provided in any schedule in the case of any exemption may be extended by the State for a period not to exceed three years after the date of the issuance of the exemption if the public water system establishes that:

(1) the system cannot meet the standard without capital improvements which cannot be completed within the period of such exemption;

(2) in the case of a system which needs financial assistance for the necessary improvements, the system has entered into an agreement to obtain such financial assistance; or

(3) the system has entered into an enforceable agreement to become a part of a regional public water system; and the system is taking all practicable steps to meet the standard.

(e) In the case of a system which serves a population of no more than 3,300 and which needs financial assistance for the necessary improvements, an exemption granted under paragraph (a)(1) or (2) of this section may be renewed for one or more additional two-year periods not to exceed six years, if the system establishes that it is taking all practicable steps to meet the requirements of subdivision (a) of this section.

5-1.93 Variance or exemption requests.

(Effective Date: March 11, 1992)

(a) All requests for a variance or an exemption shall be in a form prescribed by and submitted in writing to the department. Suppliers of water may submit a joint request for variances or exemptions when they seek similar variances or exemptions under similar circumstances. The department shall act on any request for a variance or an exemption submitted pursuant to section 5-1.90, 5-1.91 or 5-1.92 of this Subpart within 90 days of receipt of the request.

(b) Requests for exemptions to the filtration requirements outlined in section 5-1.30(b) of this Subpart must be made by June 29, 1992, except for systems with groundwater sources determined to be directly influenced by surface water. For systems with groundwater sources directly influenced by surface water the request for an exemption must be submitted no later than six months after notification of the determination of direct influence. Before an exemption to a filtration requirement can be granted, the supplier of water must demonstrate to the department that the granting of the exemption will not pose an unreasonable risk to public health and that the system is in compliance with sections 5-1.30(c)(5), (c)(8), (g) and 5-1.52 tables 3, 6, 9 and 11 of this Subpart.

(c) Systems with unfiltered surface water sources or groundwater sources directly influenced by surface water must have a disinfection capability that achieves at least 99 percent inactivation of *Giardia lamblia* cysts before an exemption to a filtration requirement can be granted.

5-1.94 Notice and opportunity for public hearing.

(Effective Date: January 17, 2018)

(a) Before a variance proposed to be granted by the department under section 5-1.90 or 5-1.91 of this Subpart may take effect, the department shall provide notice and opportunity for public hearing on the proposed variance. A notice given pursuant to the preceding sentence may cover the granting of more than one variance and a hearing held pursuant to such notice shall include each of the variances covered by the notice.

(b) Before a compliance or implementation schedule prescribed by the department pursuant to the granting of a variance under section 5-1.90 of this Subpart or an exemption under section 5-1.92 of this Subpart may take effect, the department shall provide notice and opportunity for public hearing on the proposed compliance or implementation schedule, or both. A notice given pursuant to the preceding sentence may cover the proposal of more than one such schedule and a hearing held pursuant to such notice shall include each of the schedules covered by the notice.

(c) Public notice of an opportunity for hearing pursuant to subdivision (a) or (b) of this section shall be circulated in a manner designated to inform potentially interested persons of the proposed action. Requests for hearing shall be submitted to the department within 30 days after issuance of such public notice.

(d) Notice of public hearings to be held pursuant to a request submitted by an interested person or on the department's own motion shall be given not less than 15 days before the time scheduled for the hearing, in a form and manner to be prescribed by the department. Notices of public hearing shall be circulated in a manner designated to inform interested persons of the hearing.

(e) If no timely request for hearing is submitted and the department does not determine to hold a public hearing on his own motion, the proposed variance or schedule prescribed pursuant to the granting of a variance or exemption shall become effective 30 days after notice of opportunity for hearing is given pursuant to subdivision (c) of this section. If a public hearing is held, the department shall take an action with respect to such proposed variance or schedule within 30 days after the end of the public hearing.

5-1.95 [Reserved]

5-1.96 Enforceability of final schedule prescribed pursuant to granting of variance or exemption.

(Effective Date: May 27, 1998)

Once a schedule prescribed pursuant to the granting of a variance under section 5-1.90 of this Subpart or an exemption under section 5-1.92 of this Subpart has become final pursuant to section 5-1.94(e) of this Subpart, the conditions or requirements of any such schedule shall be enforceable, on the application of the commissioner, by any court of competent jurisdiction in the same manner as an order of the commissioner under section 1107 of the Public Health Law.

Separability

5-1.100 Separability

(Effective Date: June 24, 1977)

If any provisions of this Part are held invalid, such invalidity shall not affect other provisions which can be given effect without the invalid provisions.

APPENDIX 5-A Recommended Standards for Water Works 2018 Edition

"Recommended Standards for Water Works, 2018 edition" reported by the Water Supply Committee of the Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers. Available for viewing at the Department of State, One Commerce Plaza, 99 Washington Avenue, Albany, NY 12231 and the Bureau of Water Supply Protection, Department of Health, Corning Tower, Empire State Plaza, Albany, NY 12237

APPENDIX 5-B Standards for Water Wells

(Statutory Authority: Public Health Law 206(18))
Effective Date: November 23, 2005

Sec. 5-B.1 Application and Definitions
5-B.2 Water Well Location and Protection
5-B.3 Water Well Construction
5-B.4 Well Yield and Water Flow
5-B.5 Water Well Pumps: Construction, Installation, Repair and Maintenance
5-B.6 Water Well Capping and Abandonment
5-B.7 Separability

Table 1 Required Minimum Separation Distances to Protect Water Wells From Contamination
Table 2 Standards for Well Casing, Grouting, Diameter, and Screens

Section 5-B.1 Application and Definitions.

(a) Applicability

(1) This regulation applies to water wells used for drinking, culinary and/or food processing purposes and is the minimum standard for construction, renovation, development and abandonment of such water wells. Additional requirements may need to be met for certain water wells that serve a public water system as defined in Subpart 5-1 of this Title.

(2) Installation of new and replacement water wells shall meet all of the applicable provisions of this Appendix. Deviations may only be allowed at the discretion of the Department or local health department in accordance with: a waiver issued pursuant to Part 75 of this Title; or a variance issued pursuant to Subpart 5-2 of this Title; or a written approval issued by the Department or local health department prior to December 1, 2005; or a written approval granted by a local health department pursuant to a local sanitary code.

(3) Other state agencies, regional authorities, and local health departments with authority to regulate water wells may establish additional requirements for water wells within their respective jurisdictions.

(b) Definitions - As used in this regulation, the following words and terms shall have the indicated meaning:

(1) Adequate means sufficient to accomplish the purpose for which something is intended, and to such a degree that no unreasonable risk to health or safety is presented. An item installed, maintained, designed and assembled, an activity conducted, or act performed, in accordance with generally accepted standards, principles or practices applicable to a particular trade, business, occupation or profession, is adequate within the meaning of this Appendix.

(2) Air lift test means a method of performing a water well yield test by pumping air through an inductor pipe to force water out of an eductor pipe. The inductor pipe is submerged to a depth generally about 60 percent below the static water level to allow for successful completion of the test. The drill pipe is utilized as the inductor pipe/air delivery mechanism and the casing and/or borehole as the eductor. The flow rate of water in gallons per minute (gpm) is determined as the water exits the top of the well. The drop of air pressure in the inductor pipe can be used to estimate the drawdown in the well.

(3) API means American Petroleum Institute.

(4) ASTM means American Society for Testing and Materials.

(5) Bailing test means a method of estimating well yield by bailing a known quantity of water from static water level and maintaining a stabilized water level over a measured period of time.

(6) Contaminant includes but is not limited to any physical, chemical, microbiological or radiological substance or matter in water that can be present at levels of public health concern.

(7) Decommissioning means the act of filling, sealing and plugging water wells in accordance with the requirements of Section 5-B.6(a) of this regulation such that the continued existence of the well will neither pose a health or safety hazard nor serve as a conduit for contaminant migration to or within the aquifer.

(8) Department means the New York State Department of Health.

(9) Drive shoe means a beveled cutting edge attachment to the bottom of the first section of permanent steel casing to protect the casing as it is being driven and to provide firm seating in consolidated geologic materials.

(10) gpm means gallons per minute.

(11) Grout means a material that has a low permeability, such as neat cement, bentonite slurry, bentonite chips, bentonite pellets, granular bentonite, or other materials that have equivalent sealing properties.

(12) Hydrofracturing means the procedure of pumping water and/or sand and/or small particles of high-strength plastic into a geologic formation to induce fracture and increase yield.

(13) Local health department means a city, county, or part-county department of health.

(14) NSF means the National Sanitation Foundation International, formerly known as National Sanitation Foundation.

(15) Person means an individual, corporation, company, association, partnership, State agency, or municipality, including a county.

(16) Pitless adapter means an assembly of parts that will permit water from a well to flow through the wall of the well casing, or extension thereof, into a pipe leading to a building or other point of water use, and that shall be constructed and installed in a manner to prevent the entrance of contaminants into the well and the water produced.

(17) Pitless unit means a factory produced assembly that is threaded or welded to the casing below grade which provides access to the well for maintenance and repair and shall be constructed and installed in a manner to prevent the entrance of contaminants into the well and the water produced.

(18) Potable water means water which meets the water quality requirements established in Subpart 5-1 of the State Sanitary Code.

(19) Public water supply well means a water well used or intended for use for a public water system as defined in Subpart 5-1 of the State Sanitary Code.

(20) SDR means "standard dimension ratio" which means the ratio of average outside pipe diameter to minimum pipe wall thickness.

(21) Stabilized water level occurs when water in a well has achieved steady state during a period of constant rate withdrawal of groundwater (i.e. stabilized drawdown).

(22) Static water level is the natural water level in a well not being pumped or in a well fully recovered after pumping, as measured from the top of the well casing or the ground surface.

(23) UL means Underwriters Laboratories.

(24) USDA means the United States Department of Agriculture.

(25) USFDA means the United States Food and Drug Administration.

(26) Water well (well) shall mean any excavation for the purpose of obtaining ground water for drinking, culinary and/or food processing purposes, with installed components (including well casing, screen, grout, adapters, et. al.).

(27) Water well drilling or water well drilling activities shall mean the construction or reconstruction of water wells, the establishment or repair of a connection through the well casing and the repair of water wells including repairs which require the opening of the well casing.

(28) Well casing means watertight, non-porous material used to maintain a well opening and provide access to the interior of the well.

(29) Well development or redevelopment of a water well means actions to remove clay, silt, fine sand and/or organic/inorganic deposits from the aquifer and/or gravel packing to increase porosity and permeability of the aquifer formation and to minimize continued pumping of clay, silt and fine sand while obtaining water without changing the physical construction of the well. Such actions include bailing, jetting, air lifting, pumping, surging, hydrofracturing and/or chemical treatment.

(30) Well renovation means changes or repairs to water well.

(31) Well yield means a sustainable quantity of water per unit of time that may flow from or be pumped continuously from a well and is usually expressed as gallons per minute (gpm).

Section 5-B.2 Water Well Location and Protection

(a) A well shall be located so that adequate access to the well for inspection, maintenance, repair, renovation, treatment, and testing is provided.

(b) A well shall be located where it is not subject to seasonal flooding or surface water contamination, or it shall be constructed in such a manner that seasonal floodwater cannot enter the well.

(c) A well shall be located upgradient of any potential or known source of contamination unless property boundaries, site topography, location of structures and accessibility require a different location. The minimum horizontal separation distances from potential sources of contamination listed in Table 1 shall be maintained.

(d) The ground surface immediately surrounding a well casing shall be graded to divert surface water away from the well. Concrete shall not be used for grading purposes.

Section 5-B.3 Water Well Construction

(a) Acceptable water well construction methods include well drilling, driving, boring, jetting and excavating into an aquifer to obtain groundwater for a source of water supply. Acceptable water well drilling methods include cable–tool drilling, percussion drilling, air or mud/direct or reverse rotary drilling, sonic drilling, driving water well casing, and boring with earth augers to obtain groundwater.

(b) All of the following provisions apply to water well construction.

(1) Wells shall be constructed according to the requirements of Table 2.

(2) A well shall be constructed to maintain existing natural protection against contamination of aquifers and other geologic materials penetrated during well drilling and installation.

(3) A well shall be constructed to preclude and prevent entry of all known sources of contamination into the well.

(4) A well shall have a minimum casing length extending from one foot above finished grade to nineteen feet below finished grade upon completion of well drilling, with the following exceptions:

(i) The required total length of casing may exceed twenty feet depending upon geologic conditions and shall be in accord with the standards for the construction of wells listed in Table 2; and

(ii) Where the only viable source of groundwater available is from a shallow aquifer where the well must be completed at a depth less than nineteen feet below grade, the Department or local health department having jurisdiction may allow use of well casing of less than twenty feet total length along with such additional measures as needed, including but not limited to increased separation distances per Table 1, Note 1, to ensure provision of potable water.

(5) If a well is located in a well house, the floor of the well house shall be at least six inches above grade and the permanent casing shall extend at least six inches above the floor.

(6) Upon completion of well drilling and until such time as the well is equipped with a pump, the top of the casing shall be secured with a watertight and vermin proof well cap.

(7) Casing and joints must be of sufficient strength and construction to ensure that integrity, shape, and ability to properly function are maintained during and after installation.

(8) Steel pipe that is used as permanent well casing shall be new pipe that contains a label or imprint indicating compliance with ASTM specification A53, A106, A500 or A589 or API specification 5L.

(9) A driven steel permanent casing terminating in bedrock shall be fitted with a drive shoe that is firmly seated in the bedrock.

(10) PVC pipe that is used as permanent casing shall be new pipe that contains a label or imprint indicating compliance with ASTM specification F 480 and NSF or UL standards and shall be Schedule 80 or SDR 21 or heavier. PVC pipe that is installed at depths of more than 200 feet shall be SDR 17 or heavier.

(11) Casing pipe that is manufactured from thermoplastic materials other than PVC shall be new pipe that contains a label or imprint indicating compliance with ASTM specification F 480 (i.e., SDR water pipe) and NSF or UL standards for use with drinking water.

(12) PVC and other thermoplastic materials may be used as casing in bedrock if not driven and if sealed with grout, provided such use complies with other requirements in this Appendix.

(13) Steel, PVC and other materials used as temporary casing in well construction shall be clean and free of contaminants. PVC and thermoplastic materials other than PVC used as temporary casing shall contain a label or imprint indicating compliance with NSF or UL standards for use with drinking water.

(14) A well shall be sufficiently straight and vertical to allow normal installation and operation of the pump.

(15) The upper twenty feet of a water well casing shall not be used as a suction line unless the well casing is protected by a standard weight or heavier outer casing.

(16) Where bedrock is present within 19 feet of the ground surface, an oversized borehole shall be drilled and the permanent casing in the oversized borehole shall be sealed with grout

to a minimum depth of 19 feet below grade, or five feet into the competent bedrock, whichever is deeper.

(17) Annular space between the well casing and borehole shall be grouted in accordance with Table 2. Where inner and outer well casings are used, the annular space between these casings shall be sealed with grout.

(18) An artesian well that overflows at land surface shall be constructed, equipped, and operated to provide for controlling the rate of discharges to conserve groundwater and to prevent the loss of artesian head by minimizing uncontrolled continuous waste discharges. Discharges to waste pipe, where installed, shall not be directly connected to a sewer or other source of contamination and shall be equipped with an air gap or backflow prevention device. Discharge pipes shall be properly screened to prevent entry of vermin.

(19) Wells completed in unconsolidated material or at the unconsolidated-consolidated material interface shall be screened if necessary and sufficiently developed to produce sand-free water and to minimize the entrance of fine materials into the well.

(20) Lead packers, lead plugs, or lead wool shall not be used as a well component.

(21) No solder containing more than 0.2 percent lead shall be used in making joints and fittings in any drinking water supply system or any water user's water lines.

(22) Wells shall be developed by air lift, bailing, surging, jetting, hydrofracturing and/or chemical treatment until sand free. Rock cuttings produced during water well drilling and well development shall be cleaned out of the well. As a final stage, the well may be pumped to waste at a pumping rate which equals or exceeds that of a permanent pump, until the water is clear as reasonably possible considering the groundwater conditions of the area. The permanent pump shall not be used to develop the well without the owner's consent.

(23) Water that is used for well construction and development purposes or is otherwise introduced into the well, other than water from the well itself, shall be obtained from a public water system or, if necessary, from a non-public drinking water source provided such non-public source is not surface water nor otherwise known or suspected to be contaminated.

(24) A connection to a water well casing that is made below the ground shall be protected by a pitless adapter or by a pitless unit (threaded or welded joints). A below ground connection shall not be submerged in water during installation. Pitless adapters or pitless units to be used shall contain a label or imprint indicating compliance with the Water Systems Council Pitless Adapter Standard (PAS -97).

(25) A pitless adapter or pitless unit shall provide adequate clearance within the internal diameter of a water well to permit insertion or withdrawal of water system components from within the well through the top of the well casing and be constructed and installed to exclude dirt or other foreign matter from the interior of the well casing.

(26) Extensions of existing water well casings to at least 12 inches above grade shall be constructed of the same material as the existing casing.

(27) Any chemicals or other additives, including disinfectants, used during construction shall be of a specification acceptable for use in water wells and any excess not required for operation of the well shall be cleaned out of the well.

(28) A water well shall be designed, operated, and maintained in a manner that will preclude cross-connections or any other piping connections which may introduce contaminants into the water supply or aquifer. A physical connection between a water supply that is in compliance with the requirements of these rules and another water supply that is not in compliance with the requirements of these rules is prohibited unless acceptable cross connection control is provided.

(29) All drilling fluids used for drilling operations shall be of food grade quality or NSF or UL approved or shall be water that complies with paragraph 5-B.3(b)(23) of this Appendix.

Section 5-B.4 Well Yield and Water Flow

(a) The purpose of the water well yield test is to provide evidence that a water well will produce a sustainable flow rate for an extended period of time and to quantify that flow rate. Before being put into use, new and redeveloped wells shall be tested for well yield. The yield test for water well flow rates shall meet the following performance requirements:

(1) water well yield tests shall be performed for a period of time adequate to quantify well yield.

(2) water level and flow rate observations shall be made and recorded, at a minimum, before the start of the yield test, immediately upon the cessation of water withdrawal, and periodically during drawdown, and recovery periods. Frequency of measurements shall be made as necessary for the test method.

(3) water discharged during a yield test shall be discharged in a manner that avoids short circuiting of the water back into the aquifer.

(4) for wells that have been subjected to hydrofracturing the yield test shall not commence until redevelopment has been completed and, as a minimum, until the volume of water pumped/discharged into the aquifer has been removed from the well.

(5) the well yield determined for new wells shall be recorded on the Well Completion Report form submitted for that well to the New York State Department of Environmental Conservation. Data generated during the yield test shall be provided to the owner of the well, and provided upon request to the State or local agency(ies) having jurisdiction.

(b) The standard well yield test should include:

(1) A minimum four-hour period of stabilized drawdown while pumping at a constant flow rate.

(2) During the period of stabilized drawdown the stabilized water level shall not fluctuate more than plus or minus 0.5 foot (i.e., within a vertical tolerance of one foot) for each 100

feet of water in the well (i.e., initial water level to bottom of well) over the duration of constant flow rate of pumping. Water level measurement may be determined by steel tape, calibrated pressure gauge attached to an air line terminating at least five feet above the pump intake, electric sounder, or pressure transducer.

(3) The recovery period shall include observation of the water level in the well after cessation of pumping from the drawdown level back to at least 90 percent of the initial water level or for a period of 24 hours, whichever occurs first. If the water level does not recover to 90 percent after 24 hours, the tested flow rate may not be sustainable for an extended period of time.

(c) The well yield test requirements set forth in subdivision 5-B.4(b) may be modified, or an alternative yield test that meets the minimum performance requirements set forth in subdivision 5-B.4(a) may be used as follows:

(1) where the local health department having jurisdiction has determined that adequate hydrogeologic information and uniform conditions exist; or

(2) when an experienced hydrogeologist or licensed professional engineer directs and certifies the test; or

(3) for facilities planned for well water use of less than 500 gallons per day, pumping, bailing or air lift test methods may be used.

(4) the well yield of a flowing artesian well may be determined by direct flow measurement if the artesian flow rate equals or exceeds the desired water use rate.

Section 5-B.5 Water Well Pumps: Construction, Installation, Repair and Maintenance

All of the following provisions apply to water well pumps, construction, installation, repair, and maintenance:

(a) All water supply system equipment shall be easily accessible for maintenance or repair.

(b) A pump shall be installed so that there are no unprotected openings into the interior of the pump or the well casing.

(c) Drop pipe shall be: a continuous unspliced length, except where spliced and adequately joined to accommodate use of a check valve or where spliced and adequately joined to support a depth extension on an existing well pump, of plastic pipe approved for use with drinking water with a minimum working pressure of 160 pounds per square inch containing a label or imprint indicating compliance with NSF or UL; or threaded and coupled schedule 80 or heavier PVC pipe containing a label or imprint indicating compliance with NSF or UL; or threaded and coupled galvanized steel, stainless steel or copper pipe. In addition, drop pipe should be sufficiently sized and installed to accommodate potential working stresses considering well depth, pumping level, pump size, and pump setting.

(d) A hand pump shall have a closed, downward facing, screened spout and a sealed pump rod packing assembly. A weep hole shall be installed in a hand pump discharge riser pipe below the frost line to protect the riser pipe and pump head from freezing.

(e) A casing vent shall be provided on all well caps and seals, except for those used on double pipe-packer jet installations. A vent shall be screened, downward facing, and terminate at least 12 inches above grade or six inches above the floor of a well house.

(f) Vent screening shall be 20 to 30 mesh per inch screen, shall not reduce the vent open area by more than 50 percent, and shall be stainless steel or other non-corrodible material.

(g) Well caps and seals shall be tightly secured to the well casing, watertight, vermin- proof, and provide venting as noted in this section. Split caps shall not be used.

(h) Only lubricants with a label indicating compliance as USDA, USFDA, or NSF approved food contact grade formulations shall be used as submersible pump motor and vertical turbine shaft lubricants.

(i) After a new well has been constructed or an existing well has been repaired or serviced in a manner that requires the opening of the well casing, the well shall be pumped to waste until the pumped water is reasonably clear. After pumping to waste, the well, pumping equipment, and building plumbing shall be disinfected before being put into use.

Section 5-B.6 Water Well Capping and Abandonment

(a) All water well capping, abandonment and decommissioning shall be in accord with requirements in Appendix 5-A of this title.

Section 5-B.7 Separability

If any provisions of this Appendix are held invalid, such invalidity shall not affect other provisions which can be given effect without the invalid provisions.

Table 1 Required Minimum Separation Distances to Protect Water Wells From Contamination

Contaminant Source	Distance (Feet)[1]
Chemical storage sites not protected from the elements (e.g., salt and sand/salt storage)[2]	300
Landfill waste disposal area, or hazardous or radiological waste disposal area[2]	300
Land surface application or subsurface injection of effluent or digested sludge from a Municipal or public wastewater treatment facility	200
Land surface application or subsurface injection of septage waste	200
Land surface spreading or subsurface injection of liquid or solid manure [3]	200
Storage Areas for Manure piles [4]	200
Barnyard, silo, barn gutters and animal pens [5, 6]	100
Cesspools (i.e. pits with no septic tank pretreatment)	200
Wastewater treatment absorption systems located in coarse gravel or in the Direct path of drainage to a well	200
Fertilizer and/or pesticide mixing and/or clean up areas	150
Seepage pit (following septic tank) [5]	150
Underground single walled chemical or petroleum storage vessels	150

Absorption field or bed [5]	100
Contained chemical storage sites protected from the elements (e.g. salt and sand/salt storage within covered structures) [7]	100
Septic system components (non-watertight) [5]	100
Intermittent sand filter without a watertight liner [5]	100
Sanitary Privy pit [5]	100
Surface wastewater recharge absorption system constructed to discharge storm water from parking lots, roadways or driveways [5]	100
Cemeteries	100
Sanitary privy with a watertight vault	50
Septic tank, aerobic unit, watertight effluent line to distribution box	50
Sanitary sewer or combined sewer	50
Surface water recharge absorption system with no automotive-related Wastes (e.g., clear-water basin, clear-water dry well)	50
Stream, lake, watercourse, drainage ditch, or wetland	25
All known sources of contamination otherwise not shown above	100

Notes for Table 1:

1. The listed water well separation distances from contaminant sources shall be increased by 50% whenever aquifer water enters the water well at less than 50 feet below grade. If a 50% increase in separation distances can not be achieved, then the greatest possible increase in separation distance shall be provided with such additional measures as needed to prevent contamination. See also Note 6 to Table 2.

2. Water wells shall not be located in a direct line of flow from these items, nor in any contaminant plume created by these items, except with such additional measures (e.g., sentinel groundwater monitoring, hydraulic containment, source water treatment) as needed to prevent contamination.

3. Based upon on-site evaluations of agricultural properties done per agricultural environmental management (AEM) or comprehensive nutrient management plan (CNMP) programs by a certified nutrient management planner or soil and water conservation district (SWCD) official, water wells may be located a minimum of 100 feet from areas subject to land spreading of manure.

4. Water wells may be located 100 feet from temporary (30 days or less) manure piles/staging areas that are controlled to preclude contamination of surface or groundwater or 100 feet from otherwise managed manure piles that are controlled pursuant to regulation in a manner that prevents contamination of surface or groundwater.

5. When these contamination sources are located in coarse gravel or are located upgrade and in the direct path of drainage to a water well, the water well shall be located at least 200 feet away from the closest part of these sources.

6. Animal pen does not include small pet shelters or kennels housing 3 or fewer adult pets.

7. Chemical storage sites as used in this entry do not include properly maintained storage areas of chemicals used for water treatment nor areas of household quantities of commonly used domestic chemicals.

Table 2. Standards for Well Casing, Grouting, Diameter, and Screens

Water-bearing Formation	Overlying Material	Minimum Casing Length or Depth [1]	Oversize Drillhole For Grout, Diameter [1]	Casing and Grout Placement[1]	Well Diameter		
					Cased Portion	Uncased Portion	Well Screen Diameter [2] (where applicable)
1. Sand or gravel	Unconsolidated caving material; sand or sand and gravel	19' minimum; but 5' below pumping level [3]	None required	Grouting not required.	2″ minimum	Does not apply	2″ minimum
2. Sand or gravel	Clay, hardpan, till, silt, or similar material to depth of more than 15′	5′ below pumping level [3]	Casing size plus 2″ if pressure placement of grout is used, Casing size plus 4″ if gravity placement of grout is used. [4,5,6]	Upper drillhole shall be kept at least one-third filled with clay slurry while driving permanent casing; after casing is in the permanent position, annular space shall be filled with grout [5]	2″ minimum	Does not apply	2″ minimum
3. Sand or gravel	Clay, hardpan, till, silt, or similar material containing layers of sand or gravel within 15′ of ground surface.	5′ below pumping level [4]	Casing size plus 2″ if pressure placement of grout is used, Casing size plus 4″ if gravity placement of grout is used. [4,5,6]	Annular space around casing shall be filled with grout.	2″ minimum	Does not apply	2″ minimum

4. Creviced, shattered or otherwise fractured shale, limestone, igneous, metamorphic or similar rock types or sandstone	Unconsolidated caving material, chiefly sand or sand and gravel to a depth of 19′ or more.	Through caving overburden	None required	Casing shall be firmly seated in rock. Grouting not required.	6″ minimum	6″ preferred	Does not apply
5. Creviced, shattered or otherwise fractured shale, limestone, igneous, metamorphic or similar rock types or sandstone	Clay, hardpan, till, shale, or similar material to a depth of 19′ or more	Through overburden	Casing size plus 2″ if pressure placement of grout is used, Casing size plus 4″ if gravity placement of grout is used. [4, 5,6]	Casing shall be firmly seated in rock. Annular space around casing shall be grouted.	6″ minimum	6″ preferred	Does not apply
6. Creviced, shattered or otherwise fractured shale, limestone, igneous, metamorphic or similar rock types or sandstone	Unconsolidated materials to a depth of less than 19′	19′ minimum	Casing size plus 2″ if pressure placement of grout is used, Casing size plus 4″ if gravity placement of grout is used. [4,6]	Casing shall be firmly seated in rock. Annular space around casing shall be grouted.	6″ minimum	6″ preferred	Does not apply

Notes for Table 2:

1. In the case of a flowing artesian well, attempts should be made to install and seal the well in a manner that protects the artesian aquifer, prevents erosion of overlying geologic materials, and confines the flow to within the well casing, giving due consideration to practicality, cost, and safety.

2. These diameters shall also be applicable in circumstances where the use of perforated casing is deemed practicable. Well points commonly designated on the trade as 1 1/4" pipe shall be considered as being 2" nominal diameter well screens for purposes of these regulations.

3. As used in this table, the term "pumping level" shall refer to the lowest elevation of the water in a well during pumping, determined to the best knowledge of the water well contractor taking into consideration usual seasonal fluctuations and drawdown.

4. Pressure placement includes methods of grout placement using pumps and tremie tubes or using grout displacement through the casing, or otherwise from the bottom up around the casing, with one or more drillable plugs. When pressure placement is used with a borehole diameter of only 2" greater than the casing diameter, casing shall be assembled without couplings unless installed per the "Casing and Grout Placement" technique described on

Line "2" of this Table. Gravity placement includes any method that relies on gravity to draw grout, either dry or as a slurry, down into the annular space between the casing and borehole or between an inner casing and outer casing.

5. For wells constructed by cable tool, hollow rod, jetting, or other drilling method where the permanent casing is driven, and where neither temporary casing nor an oversize borehole are used, dry driven grout methods using granular bentonite may be used. These methods use continuous feeding of granular bentonite into a starter hole or continuous mounding around the casing as the casing is driven. Collar flared joints or weld beads extending beyond the outside diameter of the permanent casing shall be used with sufficient spacing to ensure that the grout seal is continuous and extends downward into the saturated zone (i.e., beneath the water table).

6. The oversized borehole for grout placement should be as deep as necessary, based upon local hydrogeologic conditions and potential contaminant sources, to prevent contamination from entering the well. Grout should be placed along the full length of casing, particularly where the presence of non-caving unconsolidated materials, coarse gravel, or creviced, shattered, or fractured rock may result in pathways of contamination to a well water system. Where this is not feasible because of practicality, cost or safety, grout shall be placed at least to a minimum depth of 19 feet. See also Note 1 to Table 1.

APPENDIX 5-C Acceptable Methods for the Analysis of Contaminants in Drinking Water

(Effective Date: August 25, 2020)

Table of Contents

I. Approved methods for analysis of water samples to determine compliance with this Subpart

II. Sample Compositing Requirements

A. Inorganic Chemical Compositing Requirements

B. Water Sample Compositing Requirements for Pesticides, Dioxin, and PCBs

I. Approved methods for analysis of water samples to determine compliance with this Subpart

All samples shall be analyzed using approved methods as recognized by the United States Environmental Protection Agency (EPA) and/or the New York State Environmental Laboratory Approval Program (ELAP). A list of approved methods is available from ELAP on The Wadsworth Center's website at https://www.wadsworth.org/sites/default/files/WebDoc/I180_0_07.pdf or by request from the Records Access Officer, Department of Health, Corning Tower, Room 2364, Albany, New York 12237-0044. Method references are cited in 40 CFR 141 at 141.21(f), 141.24(e), 141.40(c), 141.131(a)(2), 141.704(a), 141.707(c) and 141.852(c).

Test strips for free chlorine, Method D99–003, may be used for compliance monitoring only when approval of the State has been provided in writing. Method D99–003, Revision 3.0, "Free Chlorine Species (HOCl− and OCl−) by Test Strip," November 21, 2003, is available from Industrial Test Systems, Inc., 1875 Langston St., Rock Hill, SC 29730 or from the Records Access Officer, Department of Health, Corning Tower, Room 2364, Albany, New York 12237-0044.

II. Sample Compositing Requirements

A. Inorganic Chemical Sample Compositing Requirements

The State may reduce the total number of samples which must be analyzed in accordance with Tables 8A-8D of section 5-1.52 of this Subpart by allowing the use of compositing. Composite samples from a maximum of five samples are allowed, provided that the detection limit of the method used for analysis is less than one-fifth of the MCL. Compositing of samples shall be done in an ELAP certified laboratory. 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 shall be taken within 14 days at each sampling point included in the composite. Each of the follow-up samples shall be analyzed for the contaminant(s) that exceeded one-fifth of the MCL in the composite sample.

B. Water Sample Compositing Requirements for Pesticides, Dioxin, PCBs, PFOA, PFOS and 1,4-Dioxane

The State may reduce the total number of samples collected and analyzed in accordance with Table 9C of section 5-1.52 of this Subpart by allowing the use of compositing. Composite samples from a maximum of five samples are allowed, provided that the detection limit of the method used for analysis is less than one-fifth of the MCL. Compositing of samples shall be done in an ELAP certified laboratory.

(a) If the concentration in the composite sample is greater than or equal to the detection limit of any organic chemicals listed in section 5-1.52 Table 9C, then a separate follow-up sample shall be taken within 14 days at each sampling point included in the composite. Each of the follow-up samples shall be analyzed for the contaminant(s) which were detected in the composite sample.

(b) If duplicates or residual portions of the original sample taken from each sampling point used in the composites are available, the system may use such samples if additional sampling is necessary. Additional samples shall be analyzed and the results reported to the State within 14 days of collection.

(c) In systems serving fewer than 3,300 persons, the State may permit compositing among different systems provided the five-sample limit is maintained. In systems serving 3,300 or more persons, the State may permit compositing of samples from up to five sampling locations within the system, provided the reporting limit is maintained.

APPENDIX 5-D Special Requirements for Wells Serving Public Water Systems

(Statutory authority: Public Health Law, §§206[18], 225)
Effective Date: November 23, 2005

5-D.1 Application and Definitions

5-D.2 Water Well Location and Protection

5-D.3 Water Well Construction

5-D.4 Well Yield and Water Flow

5-D.5 Well Pumps and Components

5-D.6 Water Well Capping and Abandonment

5-D.7 Separability

Table 1 Required Minimum Separation Distances to Protect Public Water Supply Wells From Contamination

Table 2 Yield Test and GWUDI Determination Requirements for Wells Serving Public Water Systems

Section 5-D.1 Application and Definitions

a. 1. This Appendix applies to water wells that serve a public water system as defined in Subpart 5-1 of the State Sanitary Code. Additional requirements for these wells are contained in Appendix 5-A (*Recommended Standards for Water Works*) and Appendix 5-B (*Standards for Water Wells*) of this Part. Other state agencies, regional authorities, and local agencies with authority to regulate water wells may also have additional requirements.

2. The Department or local health department may allow deviations from a standard on a case by case basis in accordance with procedures and criteria established by the Department. Such deviations may only be allowed upon approval in writing by the Department or local health department.

b. Definitions used in Appendix 5-B shall apply within this Appendix.

Section 5.D.2 Water Well Location and Protection

a. Wells serving public water systems shall be located such that the owner of the water system possesses legal title to lands within 100' of the well and the owner controls by ownership, lease, easement or other legally enforceable arrangement the land use activities within 200' of the well. Hydrogeologic evaluations and source water assessments should be used to determine appropriate separation from potential contaminant sources. Where no evaluations are available,

the minimum separation distances shall be those specified for public water system wells in Table 1.

b. Where these ownership/control distances or separation distances specified in subdivision (a) of this Section cannot be achieved, including but not limited to the installation of in-kind replacement wells at existing well fields, and alternative water sources have been considered, use of such well location may be allowed by the Department or local health department having jurisdiction along with such additional measures as needed to prevent contamination of the water well and/or to otherwise provide potable water. Additional measures may include evaluation of local hydrogeology, including consideration of available water and soil quality information and historic water quality trends, and may include consideration of available source water assessments.

Section 5.D.3 Water Well Construction

a. A well shall be constructed to preclude and prevent entry of all known sources of contamination into the well to the extent reasonably achievable. Where the only viable source of water supply available is contaminated and alternative water sources have been considered, the local health department having jurisdiction may allow construction and use of a well in contaminated ground water with such additional measures (e.g., treatment and monitoring) as needed to ensure provision of potable water.

b. Well casing shall extend a minimum of 18 inches above finished grade. If a well is located in a well house, the floor of the well house shall be at least six inches above grade and the permanent casing shall extend at least twelve inches above the floor.

Section 5.D.4 Well Yield and Water Flow

Before being put into use, new and redeveloped public water supply wells shall be tested for yield as specified in this section. Where adequate hydrogeologic information and uniform conditions exist, or when an experienced hydrogeologist or licensed professional engineer directs and certifies the test, yield testing requirements may be modified by the local health department having jurisdiction. Additional yield test requirements may need to be met for other agencies having jurisdiction.

a. Pumping yield tests shall be done for the minimum duration of time specified in Table 2. For wells completed in unconsolidated deposits, constant flow rate testing may be used. For wells completed in rock, a minimum of six hours of stabilized drawdown should be observed either at the end of the test or as a second test except as allowed under subdivision (d) of this section or except where the Department or local health department allows constant rate testing.

b. Where water wells use ground water sources potentially influenced by surface water as indicated in Table 2, water quality shall be tested and/or monitored during the pumping yield test in accordance with Department guidance for the determination of ground waters under the direct influence of surface water.

c. Periodic water level observations shall be made and recorded during initial drawdown, stabilized drawdown, and recovery periods. The recorded data shall be provided in tabular form to the local agency(ies) having jurisdiction. During the period of stabilized drawdown the stabilized water level shall not fluctuate more than plus or minus 0.5 foot (i.e., within a vertical tolerance of one foot) for each 100 feet of water in the well (i.e., initial water level to bottom of well) over the duration of constant flow rate of pumping. The water level at the endpoint of the stabilized drawdown period shall not be lower than the water level at the beginning point of that period. Water level measurement may be determined by steel tape, calibrated pressure gauge attached to an air line terminating at least five feet above the pump intake, electric sounder, or pressure transducer.

d. If a stabilized pumping level is not achieved during the required test period or if the well does not recover to 90% of the initial water level within 24 hours after cessation of pumping, a thorough evaluation of the expected sustained performance of the well during seasonal or multi-year dry periods shall be prepared. This evaluation may involve additional hydrogeologic investigation. Such evaluation may be used in lieu of satisfying the objectives of subdivision (c) of this section only at the discretion of the reviewing agency(ies) having jurisdiction.

e. The test shall be conducted at a pumping rate at least equal to the design pumping rate based on system demand.

f. Water discharged during a yield test shall be discharged in a manner that avoids short circuiting of the pumped water back into the aquifer.

g. For wells that have been subjected to hydrofracturing, the yield test shall not commence until redevelopment has been completed and, as a minimum, until the volume of water pumped/discharged into the aquifer has been removed from the well. After pumping, the hydrofractured well shall receive a water well yield test as outlined in this section.

Section 5.D.5 Well Pumps and Components

a. Well caps and seals shall be tightly secured to the well casing, watertight, vermin- proof, and provide venting as noted in this section. Split caps shall not be used. Well caps shall be lockable and secured with sturdy, weatherproof locks or otherwise secured to prevent tampering.

Section 5.D.6 Water Well Capping and Abandonment

a. All water well capping, abandonment and decommissioning shall be in accord with requirements in Appendix 5-A of this title.

Section 5.D.7 Separability

If any provisions of this Appendix are held invalid, such invalidity shall not affect other provisions which can be given effect without the invalid provisions.

Table 1 Required Minimum Separation Distances to Protection Public Water Supply Wells from Contamination

Contaminant Source	Distance (Feet)[1]
Chemical storage sites not protected from the elements (e.g., salt and sand/salt storage)[2]	300
Landfill waste disposal area or hazardous or radiological waste disposal area[2]	300
Land surface application or subsurface injection of effluent or digested sludge from a Municipal or public wastewater treatment facility	300
Land surface application or subsurface injection of septage waste	300
Land surface spreading or subsurface injection of liquid or solid manure	200
Storage Areas for Manure piles[3]	200
Barnyard, silo, barn gutters and animal pens[3]	200
Cesspools (i.e. pits with no septic tank pretreatment)	200
Wastewater treatment absorption systems located in coarse gravel or in the direct path of drainage to a well	200
Fertilizer and/or pesticide mixing and/or clean up areas	200
Seepage pit (following septic tank)	200
Underground single walled chemical or petroleum storage vessels	200
Absorption field or bed	200
Contained chemical storage sites protected from the elements (e.g. salt and sand/salt storage within covered structures[4]	200
Septic system components (non-watertight)	200
Intermittent sand filter without a watertight liner	200
Sanitary privy pit	200
Surface wastewater recharge absorption system for stormwater from parking lots, roadways or driveways	200
Cemeteries	200
Sanitary privy with a watertight vault	200
Septic tank, aerobic unit, watertight effluent line to distribution box	100
Sanitary sewer or combined sewer	50
Surface water recharge absorption system with no automotive related wastes (e.g., clear-water basin, clear-water dry well)	None[5]
Stream, lake, watercourse, drainage ditch, or wetland	None[5]
All known sources of contamination otherwise not shown above	200

Notes for Table 1:

1. The listed water well separation distances from contaminant sources shall be increased by 50% whenever aquifer water enters the water well at less than 50 feet below grade. If a 50% increase in separation distances can not be achieved, then the greatest possible increase in separation distance shall be provided with such additional measures as needed to prevent contamination.

2. Water wells shall not be located in a direct line of flow from these items, nor in any contaminant plume created by these items, except with such additional measures (e.g., sentinel groundwater monitoring, hydraulic containment, source water treatment) as needed to prevent contamination.

3. Water wells may be located 100 feet from temporary (30 days or less) manure piles/staging areas that are controlled to preclude contamination of surface or groundwater or 100 feet from otherwise managed manure piles that are controlled pursuant to regulation in a manner that prevents contamination of surface or groundwater. Wells serving public water systems may be located 100 feet from temporary barnyards, silos, barn gutters, or animal pens that are similarly controlled to prevent contamination of surface or ground water.

4. Chemical storage sites as used in this entry do not include properly maintained storage areas of chemicals used for water treatment.

5. Wells serving public water systems may be located near water bodies or surface water recharge systems but are subject to monitoring to determine if groundwater at the point of withdrawal is directly influenced by surface water and corresponding treatment requirements. Such wells must also be protected from floodwater pursuant to subdivision 5-B.2(b) of this Part.

Table 2 Yield Test and GWUDI[1] Determination Requirements for Wells Serving Public Water Systems

Well Geologic Formation and Casing Depth	Type of Public Water System (see Subpart 5-1)[2]			
	CWS, NTNCWS		TNCWS	
	Duration (hrs)[3]	GWUDI Testing	Duration (hrs)	GWUDI Testing
For Wells Located 200 feet or less from Surface Water				
All geology and casing depths	72	Yes	Per 5-B.4 if allowed by LHD[4]	Yes
For Wells Located greater than 200 feet from Surface Water				
Sand and gravel; ≤ 50 ft casing	24	Yes	Per 5-B.4 if allowed by LHD[4]	Yes
Sand and gravel; >50 ft casing	24	No	Per 5-B.4 if allowed by LHD[4]	No
Non-Carbonate Rock; ≤50 ft casing	72	Yes	Per 5-B.4 if allowed by LHD[4]	Yes
Non-Carbonate Rock; >50 ft casing	72	No	Per 5-B.4 if allowed by LHD[4]	No
Carbonate Rock; All Casing Depths[5]	72	Yes	Per 5-B.4 if allowed by LHD[4]	Yes

Notes for Table 2:

1. GWUDI means ground water source directly influenced by surface water source. Where well water sources may be potentially influenced by surface water, appropriate water quality testing shall be done in accordance with Department guidance to determine if the well water source is directly influenced by surface water.

2. CWS means community water system as defined in 10 NYCRR Subpart 5-1. NTNCWS means nontransient noncommunity water system as defined in 10 NYCRR Subpart 5-1. TNCWS means a public water system that is neither a CWS nor a NTNCWS.

3. Specified duration is the minimum required pumping period and must include a minimum of six hours of stabilized drawdown at the end of the test except as allowed under subdivision 5-D.4(d) of this Appendix.

4. LHD means local health department as defined in Appendix 5-B.

5. For wells located in areas that have the potential to draw water from carbonate aquifers, the local health department may determine based upon a hydrogeologic assessment, records of well logs, and/or other local geologic data that the aquifer is unlikely to show a surface water influence associated with karst topography. Where such determination is made, GWUDI testing need not be done.