15A NCAC 18C .0102 is Readopted as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .0102 DEFINITIONS**

(a) The definitions contained in G.S. 130A-2, G.S. 130A-290, and G.S. 130A-313 shall apply to this Subchapter. ~~are hereby incorporated by reference including any subsequent amendments and editions. Copies are available for public inspection at the principal address of the Division of Water Resources at 512 North Salisbury Street, Raleigh NC 27604-1170; 1634 Mail Service Center, Raleigh NC 27699-1634; or at the website of the Division at www.ncwater.org.~~

(b) The definitions contained in 40 C.F.R. 141.2 are hereby incorporated by reference including any subsequent amendments and editions except the following definitions are not adopted:

(1) ~~"Disinfection;"~~ "Contaminant;"

(2) "Maximum ~~containment~~ contaminant level;"

(3) "Person;"

(4) "Public Water System;" and

(5) "Supplier of water."

~~Copies are available for public inspection as set forth in~~ ~~Rule 18C .0102~~ [~~Paragraph (a),~~] ~~of this~~ ~~Section.~~[~~Rule.~~]~~In addition,~~ ~~copies~~ Copies of governing federal regulations may be obtained at no cost from the United States Environmental Protection Agency's (USEPA) homepage at http://water.epa.gov/lawsregs/rulesregs/sdwa/index.cfm or from the USEPA's Drinking Water Hotline at 1-800-426-4791.

(c) In addition to the definitions ~~incorporated by reference as set forth~~ referred to in Paragraph ~~(a),~~)(a) and (b) of this Rule, the following definitions shall apply to this Subchapter:

(1) "Act" means the North Carolina Drinking Water Act.

(2) "Air gap" means the unobstructed vertical distance through free atmosphere between the lowest effective opening from any pipe or faucet conveying a water or waste to a tank, plumbing fixture, receptor, or [~~any~~] other assembly and the flood level rim of the receptacle. [~~receptacle where the~~] These vertical, physical [~~separation is~~] separations shall be at least twice the effective [~~inside~~] opening of the water supply [~~outlet and~~] outlet, never less than one inch (25 mm) above the receiving vessel flood rim.

(3) "Backflow" means the undesirable reversal of flow of a liquid, gas, or other substance in a potable water distribution piping system as a result of a cross-connection.

(4) "Backflow preventer" means an assembly, device, or method that prohibits [~~designed to prevent~~] the backflow of water into potable water supply systems. [~~The definitions of specific backflow preventer types provided in the AWWA Manual of Water Supply Practices M14: Recommended Practice for Backflow Prevention and Cross Connection Control are hereby incorporated by reference including subsequent amendments and editions. An approved backflow prevention assembly is a backflow prevention device which has been designed and constructed by the manufacturer as a complete assembly with no field modifications and consists of internally loaded,~~

~~independently operating check valves located between fully ported, tightly closing, resilient seated shutoff valves, and resilient seated test cocks.~~]

~~(2)~~(5) "Class I reservoir" means a reservoir from which water flows by gravity or is pumped directly to a treatment plant or to a small intervening storage basin and thence to a treatment plant.

~~(3)~~(6) "Class II reservoir" means a reservoir from which the water flows by gravity or is pumped to a Class I reservoir prior to final entrance to a water treatment plant.

~~(4)~~(7) "Class III reservoir" means an impoundment used for electric power generation, flood ~~control,~~ control and similar purposes, and that serves as a source of raw water for a community water system.

~~(5)~~(8) "Cross-connection" means:

(A) any physical connection between a potable water supply system and any other piping system, sewer fixture, container, or device, whereby water or other liquids, mixtures, or substances may flow into or enter the potable water supply system;

(B) any potable water supply outlet ~~which~~ that is submerged or is designed or intended to be submerged in non-potable water or in any source of contamination; or

(C) an air gap, ~~providing a space between the potable water pipe outlet and the flood level rim of a receiving vessel~~ that does not meet the requirements ~~of less than twice the diameter of the potable water pipe.~~ [~~required~~] set forth in Subparagraph [~~(c)~~](2) of this [~~Rule.~~] Paragraph.

~~(6)~~(9) "Community Water System intake" means the structure at the head of a conduit into which water is diverted from a stream or reservoir for transmission to a water treatment ~~facilities~~ facility.

~~(7) "Disinfection" means a process that inactivates pathogenic organisms in water.~~

(10) "Division" means the Department of Environmental Quality, Division of Water Resources.

~~(8)~~(11) "Fecal Coliform" means bacteria ~~found in the intestine of humans and other~~ ~~warm blooded~~ [~~warm-blooded~~] ~~animals~~ that ~~are not normally disease producing but~~ serve as indicators of recent fecal contamination. Fecal Coliforms include the Family Enterobacteriaceae, Genus ~~Escherichia~~ Escherichia, Species ~~*Coli.*~~coli.

(12) High-Health Hazard: [~~An actual~~] A cross-connection or potential cross-connection involving any substance that [~~could~~] could, if introduced into the potable water supply, cause [~~illness,~~] illness or death, spread disease, or [~~would be a danger to the public health if introduced into the potable water supply.~~] have a high probability of causing such effects.

(13) Low-Health Hazard: [~~An actual or potential~~] A cross-connection or potential cross-connection involving any substance that [~~could negatively affect the aesthetics of the public water system.~~] generally would not be a health hazard but would constitute a nuisance or be aesthetically objectionable if introduced into the potable water supply.

~~(9)~~(14) "Mobile Home Park" means a site or tract of land where spaces are provided for lease or rental only ~~to mobile home occupants.~~ for the placement of mobile homes.

~~(10)~~(15) "Mobile home subdivision" means a subdivided site or tract of land in which lots are sold for ~~use by mobile home occupants.~~ the placement of mobile homes.

~~(11)~~(16) "Non-potable water supply" means waters not approved for drinking ~~or~~ [~~and~~] or other household uses.

(17) "Non-regulated public water system" means a public water system that meets the exclusion conditions [~~for the provision to the public of water for human consumption through pipes or other constructed conveyances if the system serves 15 or more service connections or which regularly serves 25 or more individuals, but to which the scope of the Article 10 North Carolina Drinking Water Act does not apply due to the regulatory exclusion criteria~~] set forth in G.S. 130A-314.

~~(12)~~(18) "Potable water supply" means water approved for drinking ~~or~~ and other household uses.

~~(13)~~(19) "Raw water" means surface water or groundwater that because of bacteriological quality, chemical quality, turbidity, color, or mineral content makes it unsatisfactory as a source for a community water system without treatment.

~~(14)~~(20) "Raw water reservoir" means a natural or artificial impoundment used for the primary purpose of storing raw water to be subsequently treated for use as a source of water for a community water system.

~~(15)~~(21)"Service connection" means a piped connection from a water main for the purpose of conveying water to a building or onto ~~a premise~~ premises for human use. A service connection begins:

(A) [~~For metered service, the service connection begins~~] at the point [~~immediately~~] downstream of [~~the~~] a service [~~meter.~~] meter; or

(B) [~~For~~] for unmetered service, [~~the service connection begins~~] at the point of connection to the potable water supply system.

~~(16)~~(22) "Water supply product" means any chemical or substance added to a public water system in conjunction with a treatment technique or material used in construction of a public water system. The term includes any material used in the manufacture of public water system components, appurtenances, ~~any~~ pipe, storage ~~tank~~ tank, or valve that comes in contact with water intended for use in a public water system.

*History Note:* *Authority G.S. 130A-311 through 130A-327; P.L. 93-523; 40 C.F.R. 141.2;*
*Eff. January 1, 1977;*
*Readopted Eff. December 5, 1977;*
*Amended Eff. April 1, 2014; July 1, 1994; August 1, 1991; January 1, 1991; September 1, 1990;~~1990.~~*
*Readopted Eff. July 1, 2019.*

15A NCAC 18C .0202 is readopted as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .0202 ~~REMOVAL OF DISSOLVED MATTER AND SUSPENDED MATTER~~ SURFACE SUPPLIES FROM CLASSIFIED WATERSHEDS**

Any surface water that is to receive treatment for removal of dissolved matter or suspended matter in order to be used for a public water system shall be obtained from a source that meets the WS-I, WS-II, WS-III, WS-IV or WS-V stream classification standards established by the Environmental Management Commission codified in 15A NCAC 02B. Copies are available for public inspection as set forth in Rule ~~.0102~~ .0102(a) of this Subchapter. ~~The source shall be protected from potential sources of pollution as determined by a sanitary survey of the watershed made by an authorized representative of the Department. The source supply shall be sufficient in capacity to satisfy the anticipated needs of the users for the period of design.~~ [~~A supplier of water initiating a new surface water supply shall complete the contaminant source inventory of their source water protection plan in accordance with Rule .1305(c)(1) of this Subchapter prior to designing the treatment processes.~~]

*History Note:* *Authority G.S. 130A-315; 130A-318; P.L. 93-523;*
*Eff. January 1, 1977;*
*Readopted Eff. December 5, 1977;*
*Amended Eff. April 1, 2014; July 1, 1994; September 1, 1990; February 1, 1987; September 1, 1979;~~1979.~~*
*Readopted Eff. July 1, 2019.*

15A NCAC 18C .0203 is readopted as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .0203 PUBLIC WELL WATER SUPPLIES**

(a) ~~Any~~ A site or sites for ~~any~~ a water supply well to be used as a community or non-transient, non-community water system shall be investigated by an authorized representative of the ~~Division of Water Resources.~~ [~~Department.~~] Department prior to approval. Approval by the ~~Division~~ Department is required in addition to any approval or permit issued by any other state agency. The site shall meet the following requirements at the time of approval:

(1) The well shall be located on a lot so that the area within 100 feet of the well ~~shall be~~ is owned or controlled by the person supplying the water. The supplier of water shall be able to protect the well lot from potential sources of pollution and to construct landscape features for drainage and diversion of pollution.

(2) The minimum horizontal separation between the well and known potential sources of pollution shall be as follows:

(A) 100 feet from any sanitary sewage disposal system, sewer, or a sewer pipe unless the sewer is constructed of water main materials and joints, in which case the sewer pipe shall be at least 50 feet from the well;

(B) 200 feet from a subsurface sanitary sewage treatment and disposal system designed for 3000 or more gallons of wastewater a day flows, unless ~~it is determined that~~ the well water source ~~utilizes~~ is from a confined aquifer;

(C) 500 feet from a septage disposal site;

(D) 100 feet from buildings, mobile homes, permanent structures, animal houses or lots, or cultivated areas to which chemicals are applied;

(E) 100 feet from surface water;

(F) 100 feet from a chemical or petroleum fuel underground storage tank with secondary containment;

(G) 500 feet from a chemical or petroleum fuel underground storage tank without secondary containment;

(H) 500 feet from the boundary of a ground water contamination area;

(I) 500 feet from a sanitary landfill or non-permitted non-hazardous solid waste disposal site;

(J) 1000 feet from a hazardous waste disposal site or in any location ~~which~~ that conflicts with the North Carolina Hazardous Waste Management Rules cited as 15A NCAC 13A;

(K) 300 feet from a cemetery or burial ground; ~~and~~ and

[~~(L) 650 feet from any site used for underground gas exploration or hydraulic fracturing, including wells, discharges, materials or vehicle storage or transport; and~~]

(L)[~~(M)~~] 100 feet from any other potential source of pollution. [~~pollution, except that backup generators and fuel to power the well may be stored temporarily onsite during a period of power outage.~~]

[~~(3) The Department may approve a permanent variance for back-up generators and generator fuel storage with secondary containment within the well lot when the well is critical to maintaining emergency supplies, is periodically subject to loss of power during emergencies, and the supplier of water is unable to provide storage outside of the 100-foot radius of the well while maintaining emergency capabilities of the well.~~]

(3)[~~(4)~~] The Department may require greater separation distances or impose other protective measures ~~when~~ if necessary to protect the well from ~~pollution; the Department shall consider as follows:~~ pollution, taking into consideration factors such as:

(A) ~~The~~ the hazard or health risk associated with the source of pollution;

(B) ~~The~~ the proximity of the potential source to the well;

(C) ~~The~~ the type of material, ~~facility~~ facility, or circumstance that poses the source or potential source of pollution;

(D) ~~The~~ the volume or size of the source or potential source of pollution;

(E) ~~Hydrogeological~~ hydrogeological features of the site ~~which~~ that could affect the movement of contaminants to the source water;

(F) ~~The~~ the effect that well operation might have on the movement of contamination; and

(G) ~~The~~ the feasibility of providing additional separation distances or protective measures.

(4)[~~(5)~~] The lot shall be graded or sloped so that surface water is diverted away from the wellhead. The ~~lot~~ well shall not have greater than a 1 percent annual chance of flooding. ~~be subject to flooding.~~

(5)[~~(6)~~] ~~When the~~If a supplier of water demonstrates that it is ~~unable~~ impracticable, taking into consideration feasibility and cost, to locate water from any other approved source and ~~when~~ an existing well can no longer provide water that meets the requirements of this Subchapter, a representative of the Division may approve a variance for a smaller well lot and reduced separation distances ~~for temporary use.~~ to meet existing demands. Additional monitoring under this Part or other conditions [~~may~~ ]shall be imposed if necessary to mitigate the increased risk from the variance.

(b) The Division of Water Resources may grant a variance from the minimum horizontal separation distances for public water supply wells set out in Parts ~~15A NCAC 18C .0203~~(a)(2)(D) and ~~15A NCAC 18C .0203(a)(2)~~(E) of this Rule.

(1) Such variance shall require the following findings:

(A) ~~The~~ the well supplies water to a non-community water system as defined in G.S. 130A-313(10)(b) or supplies water to a business or institution, such as a school, that has become a non-community water system through an increase in the number of people served by the ~~well.~~ well;

(B) ~~It~~ it is impracticable, taking into consideration feasibility and cost, for the public water system to comply with the minimum horizontal separation distance set out in Subparagraph ~~the applicable sub-subpart of 15A NCAC 18C .0203(a)(2)~~ (a)(2)(D) and (E) of this [~~Rule.~~] Rule;

(C) ~~There~~ there is no reasonable alternative source of drinking water available to the public water supply ~~system.~~ system and;

(D) ~~The~~ the granting of the variance will not result in an unreasonable risk to public health.

(2) Such variance shall require that the non-community public water supply well meet the following requirements:

(A) ~~The~~ the well shall comply with the minimum horizontal separation distances set out in Parts ~~15A NCAC 18C .0203~~(a)(2)(D) and ~~15A NCAC 18C .0203(a)(2)~~(E) of this Rule to the maximum extent ~~practicable.~~ practicable;

(B) ~~The~~ the well shall meet a minimum horizontal separation distance of 25 feet from a building, mobile home, or other permanent structure that is not used primarily to house ~~animals.~~ animals;

(C) ~~The~~ the well shall meet a minimum horizontal separation distance of 100 feet from any animal house or feedlot and from cultivated areas to which chemicals are ~~applied.~~ applied;

(D) ~~The~~ the well shall meet a minimum horizontal separation distance of 50 feet from surface ~~water.~~ water and;

(E) ~~The~~ the well shall comply with all other requirements for public well water supplies set out in Paragraph ~~15A NCAC 18C .0203~~(a) of this Rule.

*History Note:* *Authority G.S. 130A-315; 130A-318; P.L. 93-523; S.L. 2011-394;*
*Eff. January 1, 1977;*
*Readopted Eff. December 5, 1977;*
*Amended Eff. July 7, 2014; July 1, 1994; September 1, 1990; September 1, 1979;~~1979.~~*
*Readopted Eff. July 1, 2019.*

15A NCAC 18C .0305 is readopted as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .0305 APPROVALS NECESSARY BEFORE CONTRACTING OR CONSTRUCTING**

(a) No construction shall be undertaken, and no contract for construction, alteration, or installation shall be entered ~~into~~ into, unless the Department determines the system complies with G.S. 130A-317(c) and the Department issues the authorization to construct letter. This authorization shall be issued following completion and submittal of the ~~Engineer's~~ Engineer's Report and Water System Management ~~Plan~~ Plan, as specified in .0307(b) and (c), and approval of the engineering plans and specifications by the Department. Authorization to construct from the Department shall be valid for ~~twenty-four~~ 36 months from the date of the letter. Authorization to construct may only be extended if the rules governing a public water supply and site conditions have not ~~changed.~~ changed since the letter was issued. The authorization to construct and the approval ~~letter~~ for engineering plans and specifications letters from the Department shall be posted at the primary entrance of the job site ~~before construction begins.~~ during construction.

(b) Upon request, permission to drill test wells at approved sites in order to establish the quality and quantity of the ground water ~~may~~ shall be granted by the Department prior to completion and submittal of the Engineer's Report and Water System Management Plan and approval of engineering plans and specifications. All wells abandoned, either temporarily or permanently, shall be abandoned in accordance with 15A NCAC 02C ~~2C~~ .0113 (Well Construction Standards) and all local ordinances.

(c) Units of local government ~~which~~ that have an adopted water system extension ~~policy,~~ program [~~under~~] pursuant to Section .1800 of this Subchapter, upon submission to and approval ~~of a copy~~ of their ~~policy~~ program by the Department, ~~may~~ shall be excluded from the requirements of submitting engineering plans and specifications for water main ~~extensions, and that~~ extensions [~~which~~] that would not have adverse effect upon the existing system supply or pressure, provided the following requirements are met:

(1) Engineering plans and specifications for all such extensions shall be prepared by or under the direct supervision of an engineer licensed to practice in the State of North Carolina.

(2) All engineering plans shall be approved by the ~~units~~ unit of local ~~government~~ government's engineering department or its consulting engineers prior to the commencement of construction.

(3) The Department shall have approved the extension ~~policy~~ program submitted by the unit of local government prior to construction commencing.

(4) The extension ~~policy~~ program submitted for review and approval by the Department shall provide for establishing ownership, ~~operation~~ operation, and maintenance of water system ~~extensions,~~ extensions and shall constitute prior notice of proposed construction.

(5) Where design is to be based on a local government's standard specifications in lieu of written separate specifications for each extension project, the standard specifications shall have been previously approved by the Department.

(6) The local government shall have obtained from the Department a letter stating they have met the ~~aforementioned requirement~~ requirements set forth in Section .1800 of this Subchapter.~~and are~~

~~excluded from the requirement for submitting detailed engineering plans and specifications for each minor extension in keeping with the intent of this Rule.~~

(7) ~~Where such minor additions or extensions have been made, an~~ An annual up-to-date plan of the entire public water system shall be ~~submitted for review and approval~~ maintained by the supplier of water and made available on request by the Department.

*History Note:* *Authority G.S. 130A-315; 130A-317; P.L. 93-523;*
*Eff. January 1, 1977;*
*Readopted Eff. December 5, 1977;*
*Amended Eff. July 1, 1994; September 1, 1990; September 1, 1979;*
*Temporary Amendment Eff. October 1, 1999;*
*Amended Eff. August 1, 2000;~~2000.~~*
*Readopted Eff. July 1, 2019.*

15A NCAC 18C .0307 is readopted as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .0307 ENGINEER'S REPORT, WATER SYSTEM MANAGEMENT PLAN AND OTHER PLANS**

(a) The applicant shall submit to the Department an ~~Engineer's~~ Engineer's Report and Water System Management ~~Plan covering the basic factors and principles considered in planning of the project.~~ Plan.

(b) Engineer's Report. The Engineer's Report shall contain a system description for the entire project, including scheduled phase development and the following information, where applicable:

(1) description of ~~any~~ all existing water ~~system~~ systems related to this project;

(2) identification of the municipality, community, area, or facility to be served by the proposed water system;

(3) the name and address of the applicant;

(4) a description of the nature of the establishments and of the area to be served by the proposed water system;

(5) a description of the future service areas of the public water system for 5, 10, 15 and 20 years;

(6) consideration of alternative plans for meeting the water supply requirements of the area, including, for new systems, obtaining water service from an existing system;

(7) for applicants seeking State loan or grant support for the project, financial considerations, including:

(A) ~~any~~ technical alternatives;

(B) the costs of integral units; and

(C) the total costs.

(8) population records and trends, present and anticipated future water demands, and present and future yield of source or sources of water supply, including provisions to supply water to other systems;

(9) character of source or sources of water supply, including:

(A) hydrological or hydrogeological data;

(B) stream flow rates or well yields;

(C) for surface sources, analytical results for chemical, mineral, bacteriological, and physical qualities; and

(D) the location and nature of sources of pollution.

(10) proposed water treatment processes, including:

(A) the criteria and basis of design of units;

(B) the methods or procedures used in arriving at recommendations; and

(C) the reasons or justifications for any deviations from conventional or indicated process or method.

(11) for purchased water, a copy of the agreement with the supplier and the hydraulic analysis showing the supplier's capabilities for supplying the purchased water;

(12) a description of the design basis of the source, treatment, and distribution system, and the useful life of all sources, treatment, and transmission facilities including pipes, pumping stations, and storage facilities;

(13) for existing system projects intending to alter or expand a distribution system, ~~provide~~ a statement of maximum daily treated water supply and maximum daily ~~demand. Provide~~ demand, including supporting documentation and calculations; and

(14) for existing systems, a prioritized list of infrastructure improvements.

(c) Water System Management Plan. The Water System Management Plan shall ~~document, where applicable,~~ document the ability to finance, operate, and manage the system in accordance with this Subchapter for the current owner and for any entity that assumes ownership of the water system within the first 24 months of ~~operation:~~ operation. The Water System Management Plan shall include the following information, where applicable:

(1) Organization:

(A) a description of organizational structure or a chart showing all aspects of water system management and operation;

(B) an identification of positions responsible for policy decisions ensuring compliance with State rules and the day-to-day operation of the system; and

(C) ~~copies~~ a copy of ~~any~~ all contracts for management or operation of the water system by persons or agencies other than the system's owner.

(2) Ownership:

(A) identify the ownership ~~structure (sole~~ structure, such as sole proprietor, partnership, corporation, limited liability company, homeowner association, nonprofit organization, local government unit, state or federal agency, or other legal ~~entity)~~ entity, and disclose if the ownership of the system is expected to change once the system is ~~constructed, and~~ constructed and, if known, identify the future owners;

(B) provide the mailing address and street address of the ~~owner,~~ owner and the physical location of the water system;

(C) disclose any encumbrances, trust indentures, bankruptcy decrees, legal orders or proceedings, or other items that may affect or limit the owner's control over the system and describe how compliance with the requirements of this Subchapter will ~~still~~ be maintained; and

(D) describe the legal ~~authority, such~~ [~~authority (such~~] authority, such as ownership, leases or recorded ~~easements~~ [~~easements)~~] easements, allowing ~~inspection repair~~ inspection, repair, and maintenance of system components.

(3) Management qualifications:

(A) describe the qualifications of the owners and managers of the water system, including ~~any~~ training and experience in owning or managing a water system; and

(B) provide the name and Public Water Supply Identification Number of all public water systems owned within the last five years as well as ~~any~~ all systems operated under contract for another owner within the last five years. ~~For systems with penalties assessed,~~ If any system has been assessed a penalty for violating a requirement set forth in this Subchapter, describe how the owner will prevent similar violations at this system.

(4) Management training. Describe plans to keep management current with regulatory requirements for managing and operating a public water system.

(5) Policies. ~~At a minimum, the~~ The system shall have policies regarding the following procedures:

(A) cross-connection control;

(B) customer information, complaints, and public education;

(C) budget development and rate structure;

(D) response and notification if water quality violations occur;

(E) customer connection, disconnection, billing, and collection; and

(F) safety procedures.

(6) System monitoring, reporting and record keeping. ~~At a minimum~~ [~~minimum,~~] ~~the~~ The applicant shall provide:

(A) ~~A~~ a summary of the applicable system monitoring and reporting requirements; and

(B) ~~A~~ a description of procedures for keeping and compiling records and reports in accordance with ~~Rule .1526 of~~ this Subchapter.

(7) Financial Plans. The plan shall contain the following financial information, where applicable:

(A) Units of Local Government:

(i) For projects that require the unit of local government to incur debt, the unit of local government shall submit a statement from the Local Government Commission stating that debt issue has been ~~approved; or~~ approved.

(ii) For projects that do not require the unit of local government to incur debt, the unit of local government shall submit the following:

(I) a statement from the unit of local government documenting that they are in compliance with G. S. 159, Article 3, The Local Government Budget and Fiscal Control Act; and

(II) estimated revenues, ~~expenditures~~ expenditures, and rate structure for the construction, operation and maintenance, ~~administration~~ administration, and reasonable expansion of the project. This information shall be provided on a form designated by the Department and shall demonstrate that revenues are greater than expenses.

(B) The North Carolina Utilities Commission's financial determination may be used as the financial plan for systems subject to its regulations:

(i) submit a copy of the Order Granting Franchise and Approving Rates from the North Carolina Utility Commission; or

(ii) submit a copy of the Order Recognizing Continuous Extension and Approving Rates from the North Carolina Utilities Commission.

(C) Non-transient non-community water systems. Owners of existing non-transient non-community water system(s) which receive no violation of this Subchapter [~~in~~] during the preceding three years shall provide a description of [~~any~~] negative [~~impact~~] impacts the project would have on the financial ability to comply with this Subchapter. The owner of either a proposed new or existing non-transient non-community water system [~~with any~~] that was in violation of this Subchapter within the prior three years shall follow the requirements in Part [~~(c)(7)~~](D) of this [~~Rule.~~] Subparagraph.

~~(C)~~(D) All other community and non-transient non-community water systems shall document the following:

(i) analysis that compares anticipated revenues with planned expenditures for a ~~five year~~ five-year period that demonstrates a positive cash flow in each year, and a 20-year equipment replacement cost plan documenting the ~~method(s)~~ methods to finance equipment replacement;

(ii) the creation and funding of a continuous operating cash reserve greater than or equal to one-eighth of the annual operating, ~~maintenance~~ maintenance, and administrative expenses for the water system. The operating cash reserve shall be fully funded by the end of the first year of operation;

(iii) the creation and funding of an emergency cash reserve greater than or equal the cost of replacing the largest capacity pump. The emergency cash reserve shall be fully funded by the end of the fifth year of operation; and

(iv) a description of the budget and expenditure control procedures that assure budget control for the ~~applicant which includes~~ applicant, including procedures or policies to prevent misuse of funds and a demonstration that the system has adopted generally accepted accounting ~~procedures; and~~ procedures.

(v) ~~in~~ In lieu of Sub-Items (ii) and (iii) of this Paragraph, substitute documentation ~~may~~ shall be accepted in the following instances:

(I) an applicant with multiple water systems showing reserves affording greater or equal capabilities; or

(II) an applicant showing equivalent financial capacity to comply with requirements of this Section.

(8) One Water System Management Plan may be submitted on behalf of an applicant owning and operating multiple water systems or an applicant pursuing multiple alterations or expansions and may include future projected construction or system acquisitions. The applicant shall submit a new Water System Management Plan for a project not covered under the existing Water System Management Plan or ~~when~~ if violations of this Subchapter occur or continue at a system under an applicant's ownership or control.

(d) Operation and Maintenance Plan. The plan ~~does not have to be submitted to the Department but~~ shall be completed prior to submitting the applicant's certification in accordance with ~~Paragraph (c) of~~ Rule ~~.0303~~.0303(c) of this Section. This plan shall be accessible to the operator on duty at all times and available to the Department upon request. The Operation and Maintenance Plan shall include, at a minimum, a description of the location and routine operation and maintenance procedures for:

(1) components of the treatment facility;

(2) pumps, meters, valves, blowoffs, and hydrants;

(3) backflow devices;

(4) storage tanks; and

(5) all other appurtenances requiring routine operation and maintenance.

(e) Emergency Management Plan. ~~The plan~~ The Emergency Management Plan ~~does not have to be submitted to the Department, but~~ shall be completed prior to submitting the applicant certification required in ~~Paragraph (c) of~~ Rule ~~.0303~~.0303(c) of this Section. The Emergency Management Plan shall be available to personnel responsible for emergency management and operator on duty at all times and available to the Department upon request. The supplier of water shall consider using the principles, practices, forms, nomenclature, structure, and definitions found in the National Incident Management [~~System,~~] System and ~~The plan~~ shall contain the following information where applicable:

(1) For community water systems, a plan with the following elements ~~is~~ shall be required:

(A) an identification and phone numbers of personnel responsible for emergency management, including public water system, local, ~~state,~~ State, and federal emergency contacts;

(B) an identification of foreseeable natural and human-caused emergency ~~event~~ events, including water shortages and outages;

(C) a description of the emergency response plan for each identified event;

(D) a description of the notification procedures; and

(E) an identification and evaluation of all facilities and equipment whose failure would result in a water outage or water quality violations.

(2) For a supplier of water [~~who~~] that treats and furnishes water from a surface water source, completion of the Source Water Protection Plan in accordance with Rule .1305 of this Subchapter shall fulfill the Emergency Management Plan requirement.

~~(2)~~(3) For non-transient, non-community water systems, the plan shall contain the positions and phone numbers of responsible persons to contact in the event of an emergency, including public water system, local, ~~state,~~ State and federal emergency contacts.

*History Note:* *Authority G.S. 130A-315; 130A-317; P.L. 93-523;*
*Eff. January 1, 1977;*
*Readopted Eff. December 5, 1977;*
*Amended Eff. July 1, 1994; September 1, 1990; June 30, 1980; September 1, 1979;*
*Temporary Amendment Eff. October 1, 1999;*
*Amended Eff. August 1, 2000;~~2000.~~*
*Readopted Eff. July 1, 2019.*

15A NCAC 18C .0402 is readopted as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .0402 WATER SUPPLY WELLS**

(a) Well Construction. The construction of water supply wells shall conform to well construction regulations and standards of the ~~Division of Water Resources, Department of Environment and Natural Resources,~~ Department, codified in 15A NCAC 02C. ~~Copies are available for public inspection as set forth in Rule~~ .0102 [~~.0102(a)~~] ~~of this Subchapter.~~

(b) Upper Terminal of Well. A well casing shall terminate neither ~~The well casing shall neither terminate~~ below ground nor in a pit. The pump pedestal for above ground pumps of every water supply well shall project not less than six inches above the concrete floor of the well ~~house,~~ house or the concrete slab surrounding the well. ~~The~~ A well casing shall project at least one inch above the pump pedestal. For submersible ~~pumps~~ pumps, the casing shall project at least six inches above the concrete floor or slab surrounding the well head.

(c) Sanitary Seal. The upper terminal of ~~the~~ a well casing shall be sealed ~~watertight~~ watertight, with the exception of a vent pipe or vent tube having a downward-directed, screened opening.

(d) Concrete Slab or Well House Floor. ~~Every~~ A water supply well shall have a continuous bond concrete slab or well house concrete floor extending at least three feet horizontally around the outside of the well casing. Minimum thickness for the concrete slab or floor shall be four inches.

(e) Sample Tap and Waste Discharge Pipe. Faucets or spigots shall be provided for sampling both raw water prior to treatment and treated water prior to delivery to the first customer. Sample spigots shall not be threaded for hose connection. Threaded hose bibs shall be equipped with anti-siphon devices. A water sample tap and piping arrangement for discharge of water to waste shall be provided.

(f) Physical Security and Well Protection. A water supply well shall be secured against unauthorized access and protected from the weather. One of the following structures shall be provided:

(1) Well house. A well house shall be constructed as follows:

(A) Structures ~~structures~~ shall comply with applicable provisions of state and local building ~~codes;~~ codes.

(B) Drainage ~~drainage~~ shall be provided by floor drain, wall drain, ~~or~~ [~~and/or~~] or slope to ~~door;~~ door.

(C) Access ~~access~~ into the structure shall be a doorway with minimum dimensions of 36 inches wide and 80 inches ~~high;~~ high.

(D) The ~~the~~ structure shall have adequate space for the use and maintenance of the piping and appurtenances. If treatment is provided at the well, the provisions of Rule .0404(a) of this Section shall ~~apply; and~~ apply.

(E) The ~~the~~ structure shall be secured with lock and key.

(2) Prefabricated structures. A prefabricated structure shall be constructed as follows:

(A) A ~~a~~ well-head cover shall be hinged and constructed so that it can be lifted by one ~~person;~~ person.

(B) A ~~a~~ locking mechanism shall be ~~provided; and~~ provided.

(C) The structure shall not be permanently fastened to the slab. ~~permanent fastening to the slab (such as with bolts) shall not be permitted.~~

(3) Fencing and temperature protection. Fencing and temperature protection shall be constructed as follows:

(A) The ~~the~~ fence height shall be a minimum of six ~~feet;~~ feet.

(B) The ~~the~~ fence shall be constructed of chain link with locked ~~access;~~ access.

(C) The ~~the~~ fence shall enclose the well, hydropneumatic tank, and associated ~~equipment;~~ equipment.

(D) Access ~~access~~ shall be provided for maintenance and ~~operation; and~~ operation.

(E) The ~~the~~ well, piping, treatment equipment, and electrical controls shall be protected against freezing. Wrapping with insulation ~~is~~ shall be acceptable for appurtenances such as the air vent, meter, valves, and sample ~~taps~~ taps. provided they are visible and accessible. Insulation shall be jacketed.

(g) Yield:

(1) Wells shall be tested for yield and drawdown. A report or log of at least a 24-hour drawdown test to determine yield shall be submitted to the ~~Division of Water Resources~~ Department for each well.

(2) Wells shall be located so that the drawdown of any well shall not interfere with the required yield of another well.

(3) The combined yield of all wells of a public water system shall provide in ~~12 hours~~ 12-hours pumping time the ~~average daily demand~~ daily flow requirements as determined in Rule .0409 of this Section.

(4) The capacity of the permanent pump to be installed in each well shall not exceed the yield of the well as determined by the drawdown test.

(5) A residential community water system using well water as its source of supply and designed to serve 50 or more connections shall provide at least two wells. A travel trailer park or campground designed to serve 100 or more connections shall provide at least two wells. In lieu of a second well, another approved water supply source may be accepted.

(6) A totalizing meter shall be installed in the piping system from each well.

~~(h) Initial Disinfection of Water Supply Well. All new wells, and wells that have been repaired or reconditioned [reconditioned,] shall be cleaned of foreign substances such as soil, grease, and oil, and then shall be disinfected. [disinfected in accordance with Rule .1002 of this Subchapter.] A representative sample or samples of the water (free of chlorine) shall be collected and submitted to a certified laboratory for bacteriological analyses. The water supply shall not be placed into service after disinfection until bacteriological test results of representative water samples analyzed in a certified laboratory are found to be free of bacteriological contamination.~~

~~(i)~~ (h) Initial Chemical Analyses. A representative sample of water from every new water supply well shall be collected and submitted for chemical analyses to the ~~Division of Laboratory Services~~ State Laboratory of Public Health or to a certified laboratory. The results of the analysis shall demonstrate that the water is treatable to meet the water quality standards in Section .1500 of this ~~Subchapter~~ Subchapter, and ~~needed~~ this treatment shall be provided before the well is placed into service.

~~(j)~~ (i) Continuous Disinfection. Continuous application of chlorine, hypochlorite solution, or ~~some other~~ another approved and equally efficient disinfectant shall be provided for all well water supplies introduced on or after January 1, 1972. Equipment for determining residual chlorine concentration in the water shall be included in the plans and specifications.

*History Note:* *Authority G.S. 130A-315; 130A-317; P.L. 93-523;*
*Eff. January 1, 1977;*
*Readopted Eff. December 5, 1977;*
*Amended Eff. April 1, 2014; July 1, 1994; September 1, 1990; January 1, 1986; March 31, 1980;* ~~*1980.*~~
*Readopted Eff. July 1, 2019.*

15A NCAC 18C .0403 is readopted as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .0403 SURFACE WATER FACILITIES**

(a) Unimpounded Stream. Both the minimum daily flow of record of the stream and the estimated minimum flow calculated from rainfall and run-off shall exceed the maximum daily draft for which the water treatment plant is ~~designed~~ designed, with due consideration given to requirements for future expansion of the treatment plant. The Department ~~may~~ shall approve a water plant capacity greater than the minimum daily flow of record of the stream ~~when~~ if rules or regulations of other government agencies will not be violated. ~~The maximum allowable system expansion shall be based on the minimum daily flow of record of the stream.~~

~~(b) Pre-settling Reservoirs. Construction of a pre-settling or pre-treatment reservoir shall be required where wide and rapid variations in turbidity, bacterial concentrations or chemical qualities occur or where the following raw water quality standards are not met: turbidity - 150 NTU, coliform bacteria - 3000/100 ml, fecal coliform bacteria - 300/100 ml, color - 75 CU.~~

~~(c)~~(b) Impoundments. Raw water storage capacity shall be sufficient to reasonably satisfy the designed water supply demand during periods of drought.

~~(d)~~(c) Clearing of Land for Impoundment. The area in and around the proposed impoundment of class I and class II reservoirs shall be cleared as follows:

(1) The area from normal full level to five feet below the normal pool elevation of the impoundment shall be cleared and grubbed of all vegetation and shall be kept cleared until the reservoir is filled. Secondary growth shall be removed prior to flooding.

(2) The entire area below the ~~five foot~~ five-foot water depth shall be cleared and shall be kept cleared of all growth of less than six inches in diameter until the reservoir is filled. Stumps greater than six inches in diameter ~~may~~ shall be cut off at ground level.

(3) All brush, trees, and stumps shall be burned or removed from the proposed reservoir.

~~(e)~~(d) Existing Impoundments. Existing impoundments ~~may~~ shall be approved as raw water sources ~~as follows:~~ if the following conditions are met.

(1) The requirements of Paragraph (c) of this ~~Rule,~~ Rule and Section .0200 of this Subchapter shall be ~~met;~~ met.

(2) A class I or class II reservoir shall meet the requirements of Section .1200 of this ~~Subchapter; and~~ Subchapter.

(3) The supplier of water shall have an ~~engineer~~ engineer, along with other ~~qualified~~ consultants as ~~needed~~ needed, conduct a study of the impoundment and provide the Department with information to determine whether the requirements of this Subchapter are met. The study shall include: ~~include as follows:~~

(A) ~~Plans~~ plans and specifications of the impounding structure;

(B) ~~Information~~ information concerning clearing of the land for ~~impoundment~~ the impoundment, as provided in Paragraph (d) of this Rule;

(C) ~~Information~~ information concerning sources of pollution on the watershed;

(D) ~~Documentation~~ documentation of control by the supplier of water of the impoundment and ~~50-foot~~ 50-foot margin around the impoundment measured from the normal pool elevation;

(E) ~~Information~~ information concerning the quality of the water and sediments which could cause water quality ~~fluctuations~~ fluctuations, such as lake stratification, ~~turnover~~ turnover, and algae bloom; and

(F) ~~Other~~ other information necessary to show that the proposed source will meet the requirements of this Subchapter.

~~(f)~~(e) A margin of at least 50 feet around a class I and class II ~~reservoir~~ reservoir, measured from the normal pool ~~elevation~~ elevation, shall be owned or controlled by the ~~water supplier.~~ supplier of water.

~~(g)~~(f) Intakes, Pumps, Treatment Units, and Equipment. Raw water intakes, pumps, treatment ~~units~~ units, and equipment shall be designed to provide water of potable quality ~~meeting~~ that meets the water quality requirements stated in Section .1500 of this Subchapter.

*History Note:* *Authority G.S. 130A-315; 130A-317; P.L. 93-523;*
*Eff. January 1, 1977;*
*Readopted Eff. December 5, 1977;*
*Amended Eff. July 1, 1994; July 1, 1992; September 1, 1990;~~1990.~~*
*Readopted Eff. July 1, 2019.*

15A NCAC 18C .0404 is readopted as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .0404 WATER TREATMENT FACILITIES**

(a) Physical Security and Facility Protection. Treatment equipment and chemicals shall be secured against unauthorized access and shall be protected against the weather as follows:

(1) Structures shall comply with provisions of state and local building ~~codes;~~ codes.

(2) Drainage shall be provided by floor drain, wall drain, ~~or~~ [~~and/or~~] or slope to ~~door;~~ door.

(3) Access to the structure shall be a doorway with minimum dimensions of 36 inches wide and 80 inches high ~~or larger~~. The doorway shall be large enough to accommodate installation or removal of ~~equipment; and~~ equipment.

(4) The structure shall have space to facilitate operation and maintenance of treatment equipment, storage of chemicals, required piping and appurtenances, electrical controls, and laboratory testing.

(b) Mixing and Dispersion of Chemicals. Provisions shall be made for mixing and dispersion of chlorine and other chemicals applied to the water. ~~All facilities~~ Facilities treating surface water or ground water influenced by surface water shall comply with the disinfection requirements in Rule .2002 of this Subchapter.

(c) Chemical Feed ~~Machines~~ Machines:

(1) Durable chemical feed machines designed for adjustable accurate control of feed rates shall be installed for application of all chemicals necessary for ~~appropriate~~ treatment of the water. Sufficient stand-by units to assure uninterrupted operation of the treatment processes shall be provided. Continuous chemical application ~~must~~ shall be protected from electrical circuit interruption ~~which~~ that could result in ~~overfeed, underfeed~~ overfeed or [~~underfeed,~~] underfeed or otherwise interrupt the feed of chemicals.

(2) Chemical feed lines from the feeders to the points of application shall be of material sized for the ~~design flow rate, corrosion resistant, easily~~ design flow rate and corrosion resistant and shall be [~~easily~~] accessible for cleaning and protected against freezing. ~~Length~~ The length and the number of bends shall be reduced to a minimum.

(3) Piping and appurtenances shall be constructed of suitable material for the chemical being added and the specific application.

(4) A separate feeder shall be used for each chemical applied.

(d) Disinfection Equipment:

(1) Equipment designed for application of ~~chlorine,~~ chlorine or some other approved, equally efficient disinfectant shall be provided. ~~Stand-by~~ Spare units shall be ~~provided.~~ available. The plans and specifications shall describe the ~~equipment in detail.~~ equipment.

(2) Chlorinators shall be installed in tightly constructed, above ground rooms with mechanical ventilation to the outside air. The capacity of exhaust fans shall be sufficient to discharge all air in the rooms every ~~30 seconds to~~ ~~1~~ [~~one~~] ~~minute.~~ 60 seconds. The fans or their suction ducts shall be

located not more than eight inches above floor level. Provisions for entrance of fresh air shall be made. The point of discharge shall be so located as not to contaminate the air in any building or inhabited areas. Electrical switches for operation of fans shall be located outside the chlorinator rooms. Rooms used for storage of chlorine cylinders shall be designed as described in this Subparagraph. ~~above.~~

~~(e) Safety Breathing Apparatus. Self-contained emergency breathing apparatus for operators shall be stored outside rooms where gaseous chlorine is used or stored.~~

~~(f)~~(e) Meters and Gauges. Meters and gauges, including raw and finished water meters, shall be installed to indicate and record water flow entering the treatment ~~plant~~ facility and water pumped or conducted to the distribution system.

~~(g)~~(f) Prevention of Backflow and ~~Back-Siphonage.~~ Backsiphonage. ~~Submerged~~ Water treatment facilities shall not have submerged inlets and interconnections whereby non-potable water, ~~or~~ water of questionable quality, or other liquids may be siphoned or forced into or otherwise allowed to enter the finished water supply ~~shall not be permitted~~.

~~(h)~~(g) Chemical Storage. Separate space for storing at least a 30-day ~~30 days~~ supply of chemicals shall be provided. A separate room or partitioned space shall be provided for storage of dry fluoride chemicals or liquid fluoride chemicals in portable containers.

~~(i)~~(h) Laboratory. ~~Adequate space,~~ Space, equipment, and supplies shall be provided for ~~daily, routine~~ daily chemical and bacteriological tests. A layout of laboratory furniture and equipment shall be included in the plans.

~~(j) Toilet Facilities. Toilet facilities shall be provided for the plant personnel.~~

~~(k)~~(i) Waste Handling and ~~Disposal.~~ Disposal:

(1) Provisions ~~must~~ shall be made for disposal of water treatment plant ~~wastes~~ wastes, such as clarification sludge, softening sludge, iron-manganese sludge, filter backwash ~~water~~ water, and brines. Untreated waste shall not be returned to the head of the water treatment plant.

(2) Recycling of supernatant or filtrate from waste treatment facilities treating filter wash water, sedimentation basin ~~sludge~~ sludge, or clarifier basin sludge to the head of the water treatment plant may be allowed ~~when~~ if the following conditions are met:

(A) The water recycled shall be less than 10 percent by volume of the raw water entering the water treatment ~~plant.~~ [~~plant;~~] plant.

(B) A permit has been issued by the appropriate regulatory authority for discharge of wastes to sanitary sewer, stream, lagoon or spray ~~irrigation.~~ [~~irrigation; and~~] irrigation.

(C) The raw water does not contain excessive algae, finished water taste and odor problems are not ~~encountered~~ encountered, and ~~trihalomethane~~ contaminant levels ~~in the distribution system~~ do not exceed allowable levels as set forth in ~~Rule .1517 in~~ this Subchapter.

*History Note:* *Authority G.S. 130A-315; 130A-317; P.L. 93-523;*

*Eff. January 1, 1977;*
*Readopted Eff. December 5, 1977;*
*Amended Eff. July 1, 1994;~~1994.~~*
*Readopted Eff. July 1, 2019.*

15A NCAC 18C .0405 is readopted as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .0405 STORAGE OF FINISHED WATER**

(a) Ground Level ~~Storage~~ Storage:

(1) Finished Water Ground Storage Tank. Finished water ground storage tanks shall be provided with a light-proof and insect-proof cover of concrete, steel, or equivalent material approved by the ~~Division.~~ Department. The construction joints between side walls and the covers of concrete tanks or reservoirs shall be above ground level and above flood ~~level;~~ level, except that clearwells constructed below filters may be excepted from this requirement ~~when~~ if total design, including waterproof joints, gives equal protection from flooding.

(2) Access Manholes. The access manholes for finished water ground storage tanks or reservoirs shall be framed at least four inches above the tank or reservoir covers at the opening and shall be fitted with solid covers of materials that overlap the framed openings and extend down around the frames at least two inches. The covers for the openings shall be hinged at one side and fitted with a locking device.

(3) Venting. Finished water ground storage tanks or reservoirs shall have vents with screened, downward directed openings. The vent and screen shall be of corrosion resistant material.

(4) Overflow. The overflow pipes for finished water ground storage tanks or reservoirs shall not be connected directly to sewers or storm drains. Screens or other devices to prevent access by ~~rodents, insects, etc.~~ vermin, such as rodents and insects, shall be provided in the overflow pipe.

(5) Inlets and Outlets. Water supply inlets and outlets of finished water ground storage tanks and reservoirs shall be located and designed to provide circulation of the water and to meet the CT requirements in Section .2000 of this Subchapter. Baffles shall be constructed where necessary to provide thorough circulation of the water.

(6) Drain Valves. All finished water ground storage tanks and reservoirs shall be equipped with drain ~~valves.~~ valves [~~which~~] that allow for unobstructed emptying of the tank.

(b) Elevated Storage Tanks:

(1) Standards. The specifications for elevated tanks, stand-pipes, towers, paints, coatings, and other appurtenances shall meet the appropriate ANSI/AWWA Standards ~~D 100 84 and D 101 53(R86)~~ D100 11, D102 17, and D103 09 of the American Water Works Association, ~~Inc. that are hereby~~ Inc., incorporated by reference including any subsequent amendments and editions. Copies may be obtained ~~are available~~ for public inspection as set forth in Rule ~~.0102~~ [~~.0102(a)~~] .0503 of this Subchapter.

(2) Elevation of Storage Tanks. The elevation of storage tanks shall be sufficient to produce a designed minimum distribution system pressure of 20 pounds per square inch at peak demand (fire flow) and 30 pounds per square inch during peak flow.

(3) Elevated storage tanks shall be designed to minimize water age by avoiding short-circuiting of flows and dead-zones.

~~(3)~~(4) Drain. Elevated storage tanks shall be equipped with drain ~~valves.~~ valves [~~which~~] that allow for unobstructed emptying of the tank.

(c) Hydropneumatic Storage ~~Tanks (Pressure Tanks)~~ Tanks, referred to in this Rule as Pressure Tanks:

(1) Use of Pressure Tanks. Where well yields and pumping capacities are sufficient, ~~hydropneumatic (pressure)~~ pressure tanks may be used to control pumps, stabilize pressures, and provide a minimum of storage. Pressure tanks shall have the capacity to maintain a minimum pressure of 30 pounds per square inch throughout periods of peak flow. Pressure tanks shall not be considered acceptable for meeting total storage requirements for public water systems of over 300 connections, except as provided in Paragraph (d) of this Rule.

(2) Corrosion Control. Pressure tanks shall be galvanized after ~~fabrication,~~ fabrication and provided with an ANSI/NSF approved liner or coating in accordance with Rule .1537 of this Subchapter.

(3) Required Parts. Pressure tanks shall have access manholes, bottom drains, pressure gauges, and properly sized safety and vacuum relief valves.

(4) Controls. Automatic pressure and start-stop controls for the operation of pumps shall be provided.

(5) Hydropneumatic Storage Tanks. Hydropneumatic storage tanks shall conform to the construction and inspection requirements for pressure vessels adopted by the North Carolina Department of Labor and codified in 13 NCAC ~~13 that is hereby~~ 13, incorporated by reference including any subsequent amendments and editions. ~~Copies are available for public inspection as set forth in Rule .0102 [.0102(a)] of this Subchapter.~~

(6) Appurtenances to ~~hydropneumatic storage~~ pressure ~~tanks~~ tanks, such as valves, drains, gauges, sight tubes, safety devices, air-water volume controls, and chemical feed ~~lines~~ lines, shall be protected against freezing.

(d) High Yield Aquifers:

(1) Equipment. In lieu of providing elevated storage for public water systems over 300 connections in areas where aquifers are known to produce high yields, ~~e.g.,~~ such as 400-500 gpm from an eight-inch well, a system of extra well pumping capacity, auxiliary power generating equipment, ~~hydropneumatics~~ pressure tanks, controls, alarms, and monitoring systems may be provided. The design and installation of such system shall assure that reliable, continuous service is provided.

(2) Auxiliary Power. ~~Such a system~~ A system relying on high-yield aquifers under Paragraph (d) of this Rule shall have an adequate number of wells equipped with sufficient pumping capacity so that the required flow rate ~~may~~ will be maintained ~~with~~ if the single largest capacity well and pump are out of operation. Auxiliary power generating equipment shall be provided for each well sufficient to operate the pump, lights, controls, chemical feeders, alarms, and other electrical equipment. ~~equipment as may be necessary.~~

(3) Pump Control. ~~Hydropneumatic~~ Pressure tanks designed in accordance with Paragraph (c) of this Rule and Section .0800 of this Subchapter shall be provided to maintain pressure and control the pump operation.

(4) Alarm System. An alarm system shall be provided that will send a visual or audible signal to a constantly monitored location so that the water system operator will be advised of a primary power failure.

*History Note:* *Authority G.S. 130A-315; 130A-317; P.L. 93-523;*
*Eff. January 1, 1977;*
*Readopted Eff. December 5, 1977;*
*Amended Eff. April 1, 2014; July 1, 1994; September 1, 1990; October 1, 1986; June 30, 1980;* ~~*1980.*~~
*Readopted Eff. July 1, 2019.*

15A NCAC 18C .0406 is readopted as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .0406 DISTRIBUTION SYSTEMS**

(a) Water Pipe Materials. ~~Distribution mains~~ Water pipes shall be cast iron, ductile iron, ~~asbestos-cement,~~ reinforced concrete, plastic, or other material designed for potable water system service and shall ~~be the appropriate AWWA standards, section C, or NSF Standards No. 14 and No. 15 that is~~ meet AWWA standards, section C, or be certified as meeting the specifications of [~~NSF/ANSI~~] ANSI/NSF Standard 61 Drinking Water System Components – Health Effects, which is [~~which is~~] ~~hereby~~ incorporated by reference including any subsequent amendments and editions. Copies of AWWA standards may be obtained ~~are available~~ for public inspection as set forth in Rule ~~.0102~~ [~~.0102(a)~~] .0503 of this Subchapter. Copies of ANSI/NSF Standard 61 may be obtained for public inspection as set forth in Rule .1537 of this Subchapter. The pressure rating class of the pipe shall be in excess of the maximum design pressure within that section of the water distribution system. The quality of pipe to be used shall be stated in the project specifications.

~~(b) Cross-Connections~~

~~(1) No potable water supply shall be connected by any means to another source of water supply or to a storage facility unless such connection has been previously approved by the Department. No connection shall be made to any plumbing system that does not comply with the North Carolina State Building Code, volume II, or any applicable local plumbing code.~~

~~(2) No person shall introduce any water into the distribution system of a public water supply through any means other than from a source of supply duly approved by the Department or its representatives, or make a physical connection between an approved supply and unapproved supply unless authorized in an emergency by the Department or its representative.~~

~~(3) In cases where storage capacity is used only for non-potable purposes and there is installed either an elevated or ground tank or a ground reservoir, the following precautions shall be taken:~~

~~(A) When the reservoir or tank is filled from a supply other than a public water supply and the public water supply is used as a supplemental supply, the pipeline from the public water supply shall be installed in such a manner that the water will be discharged over the top or rim of the reservoir or tank. There shall be a complete physical break between the outlet end of the fill pipe and the top or overflow rim of the tank of at least twice the inside diameter of the inlet pipe.~~

~~(B) When the reservoir or tank is filled entirely by water from a public water supply:~~

~~(i) If a covered ground reservoir or covered elevated tank is used, an approved reduced pressure back-flow preventor or an approved double check valve assembly may be used. The back-flow prevention device shall be installed in such a manner as to afford adequate protection, be easily accessible, and include all necessary pressure gauges and drains~~

~~for testing. Gate valves shall be installed in the line at both ends of the back-flow prevention device.~~

~~(ii) If an uncovered ground reservoir or uncovered elevated tank is used, a complete physical break shall be provided between the reservoir or elevated tank and the public supply. The physical break between the inlet pipe and the top or overflow rim of the reservoir shall be at least twice the diameter of the inlet pipe.~~

~~(4) All cross-connections between potable water supplies and non-potable or unprotected supplies that are not specifically covered in the categories in this Paragraph will be considered special problems and the protective devices required shall be determined by the Department on the basis of the degree of health hazard involved.~~

~~(5) Persons desiring to install non-potable water supplies in conjunction with a public water supply shall submit detailed plans and specifications in triplicate showing the non-potable water supply and its relation to the potable water supply to the Department in accordance with Rule .0302(a) of this Subchapter.~~

~~(6) Any such interconnection to a potable water system is subject to the approval of the water supplier and shall not be made until authorized by the water supplier in addition to the Department.~~

~~(7) No person shall fill special use tanks or tankers containing pesticides, fertilizers, other toxic chemicals, or their residues from a public water system except at a location equipped with an over-the-rim free discharge of water or a reduced pressure backflow preventer properly installed on the public water supply that has been approved by the Department. No supplier of water shall permit the filling of such special use tanks or tankers except at locations so equipped.~~

(b) [~~Cross-Connections:~~] Cross-Connections. No person shall construct, [~~maintain~~] maintain, or operate a physical arrangement whereby a public water system [~~that~~] has a cross-connection without the use of proper backflow protection.

(1) No person shall introduce any water into the distribution system of a public water supply through any means other than from a source of supply duly approved by the Department or its [~~representatives,~~] representatives or make any physical connection between an approved supply and unapproved supply unless authorized in an emergency by the Department or its representative.

[~~(1)~~](2) Service Connection Relation to Plumbing Code. No supplier of water shall provide a service connection to any plumbing system that does not comply with the North Carolina State Building Code, Volume II, and [~~any~~] all applicable local plumbing codes. [~~code, as determined by local plumbing code officials.~~] Where required, [~~The~~] the supplier of water shall install or require to be installed [~~the~~] an appropriate testable backflow prevention assembly prior to making the service connection. Design of backflow prevention assemblies for service connections [~~do~~] shall not require Department review.

[~~(2)~~](3) Connections Requiring Departmental Review. Connections between a public water system and the [~~following~~] connection types in (A) through (D) shall require review and approval by the Department prior to making the connection. Installation of a testable backflow prevention assembly or air gap [~~is~~] shall be required [~~when~~] if the connection is non-potable or unapproved. Engineering plans and specifications shall be submitted in accordance with Section .0300 of this Subchapter.

(A) Any regulated public water system;

(B) ~~Any~~ any community non-regulated public water system. Before providing a connection, a supplier of water shall ensure that the construction of the non-regulated public water system either was approved in accordance with Rule .0301(a) of this Subchapter or that [~~proper~~] backflow prevention is provided in accordance with this Rule; [~~provided to protect the quality of the water in the public water system;~~]

(C) ~~Non-potable~~ non-potable water treatment processes within a potable water treatment plant; and

(D) ~~All~~ all cross-connections between potable water supplies and non-potable or unprotected supplies that are not specifically addressed in this Rule or AWWA M-14 Backflow Prevention and Cross Connection Control. [~~Control, which are considered special problems for which the degree of health hazard involved shall be determined by the Department.~~]

[~~(3)~~](4) Backflow Prevention Not Addressed by the Plumbing Code. The following requirements shall apply to backflow prevention not addressed by the plumbing code.

(A) Testable backflow prevention assemblies shall meet American Society of Sanitary Engineering (ASSE) standards and carry an ASSE seal, be on the University of Southern California approval list for testable backflow prevention assemblies, or be on the North Carolina State Plumbing Code approval list for approved testable backflow prevention assemblies.

[~~(B) Each assembly~~] [~~must~~] [~~shall be installed in accordance with the standard AWWA C510, AWWA C511, ASSE 1013, ASSE 1015, ASSE 1020, ASSE 1047, ASSE 1048, or ASSE 1056 applicable to the selected backflow prevention assembly, or as required by Rule .0102(c)(2) of this Subchapter for an air gap.~~]

[~~(C)~~](B) For each identified water treatment [~~process related~~] process-related hazard, the supplier of water shall provide the appropriate backflow prevention assembly or method to protect the water supply and water treatment [~~employees~~] employees, in accordance with AWWA M-14 Backflow Prevention and Cross Connection Control.

[~~(D)~~](C) [~~Filling stations for special use tanks or tankers containing pesticides, fertilizers, other toxic chemicals, or their residues.~~] No person shall fill special use tanks or tankers containing pesticides, fertilizers, other toxic chemicals, or their residues from a public

water system except at a location equipped with an over-the-rim free discharge of water or a reduced pressure backflow preventer properly installed on the public water supply. No supplier of water shall permit the filling of such special use tanks or tankers except at locations so equipped.

[~~(E)~~](D) A supplier of water shall not authorize for construction or other temporary, non-emergency [~~use;~~] use connections to hydrants that are not equipped with an approved air [~~gap;~~] gap or [~~a properly~~] an installed reduced pressure principle backflow prevention assembly.

[~~(F)~~](E) [~~Non-potable Storage. In cases where~~] If storage capacity is used only for non-potable purposes and there is installed either an elevated or ground tank or a ground reservoir, the following precautions shall be taken:

(i) [~~When~~] If the reservoir or tank is filled from a supply other than a public water supply and the public water supply is used as a supplemental supply, the pipeline from the public water supply shall be installed with an air gap.

(ii) [~~When~~] If the reservoir or tank is filled entirely by water from a public water supply and:

(I) [~~If~~] a covered ground reservoir or covered elevated tank is used, an approved reduced pressure back-flow preventer or an approved double check valve assembly [~~may~~] shall be [~~used.~~] used; or

(II) [~~If~~] an uncovered ground reservoir or uncovered elevated tank is used, an air gap [~~is~~] shall be required.

(i)

[~~(G)~~](F) Installation. The following installation requirements shall be met, where applicable.

(i) Backflow prevention assemblies shall be installed in accordance with manufacturers' recommendations and specifications [~~and be free from any field modifications~~] and shall not be modified in the field.

(ii) Back-flow prevention assemblies shall be located and installed in such a manner as to [~~afford adequate protection;~~] function as designed; be [~~easily~~] accessible for [~~regular~~] testing, maintenance, and inspection; and include all necessary test cocks and drains for testing. Valves shall be installed in the line at both ends of the back-flow prevention device to provide for replacement and maintenance.

(iii) Bypass lines parallel to a backflow prevention assembly shall have an approved backflow prevention assembly installed that is equal to that on the main line.

(iv) Reduced [~~Pressure Principle Assemblies~~] pressure principle assemblies shall be installed above ground or below ground in a vault with positive gravity drainage to atmosphere employing a drain of sufficient size to handle the full flow of discharge from a discharging assembly, 12-inch minimum clearance from vault

walls and floor, and in accordance with [~~manufacturers~~] manufacturer's recommendations. A reduced pressure principle assembly may be installed as protection for either a high-health or low-health hazard.

(v) Double [~~Check Valve Assemblies~~] check valve assemblies shall be installed either vertically or horizontal and above [~~ground,~~] ground or below ground in a vault with positive gravity drainage to the atmosphere. A double check valve assembly shall be installed as protection for a low-health hazard only.

(vi) Pressure [~~Vacuum Breaker Assemblies~~] vacuum breaker assemblies shall be installed only where there is no [~~means or potential means~~] possibility of a pressure higher than the supply pressure caused by a pump, elevated tank, boiler, [~~air/steam~~] air or steam pressure, or any other means which may cause backflow, and in accordance with [~~manufacturers~~] manufacturer's recommendations. A pressure vacuum breaker shall be installed as protection for a high-health or low-health hazard that is subject to backsiphonage [~~only,~~] only and with no backpressure.

[~~(4)~~](5) [~~Supplier of Water Shall Authorize Connections.~~] Interconnection to a public water system [~~is~~] shall be subject to the approval of the supplier of water and shall not be made until authorized by the supplier of water.

[~~(5)~~](6) [~~Recordkeeping.~~] A community or non-transient non-community public water system with five or more testable backflow prevention assemblies protecting the distribution [~~system~~] system, as required [~~under~~] pursuant to this [~~Rule~~] Rule, shall maintain the following records beginning on January 1, 2020:

(A) [~~Records~~] records of the location, type, installation date, size, [~~and size~~] and the associated degree of hazard of backflow prevention devices whose failure would create a high-health [~~hazard~~] hazard; [~~or a low-health hazard and the associated hazards;~~]

(B) [~~A~~] a description of specific ongoing plans, actions, or schedules to inventory existing backflow prevention devices under Part (b)(5)(A) of this Rule and to identify and address [~~any~~] all uncontrolled cross-connection hazards;

(C) [~~Final~~] final results of all backflow prevention assembly field testing and air gap inspections; and

(D) [~~Review~~] review of new service connections and existing service connections during a change of the account owner to ensure [~~any~~] all required backflow prevention devices are properly installed and tested.

(E) [~~A~~] a supplier of water which contracts with a third-party to implement any part of their cross-connection program may allow records required by this Paragraph to be maintained on the premises of the third-party, as long as the records are available on demand by the supplier of water.

(F) [~~Program~~] program records under Part [~~(b)(5)~~](C) of this [~~Rule~~] Subparagraph shall be maintained for a minimum of four years. Remaining records referred to in this Paragraph shall be maintained while still current [~~and/or~~] or in use.

[~~(6)~~](7) [~~Reporting.~~] Each supplier of water shall notify the Department of any known incident of backflow into the public water system that creates a risk of contamination as soon as [~~possible~~] practical upon discovery of the incident but no later than the end of the next business day. If requested by the Department, the supplier of water shall submit a written report of the incident describing the nature and severity of the backflow, the actions taken by the supplier of water in response to the incident, and the action plan intended to prevent such incidents in the future.

*History Note:* *Authority G.S. 130A-315; 130A-317; P.L. 93-523;*
*Eff. January 1, 1977;*
*Readopted Eff. December 5, 1977;*
*Amended Eff. April 1, 2014; September 1, 1990; December 1, 1988; June 30, 1980;~~1980.~~*
*Readopted Eff. July 1, 2019.*

15A NCAC 18C .0409 is readopted as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .0409 SERVICE CONNECTIONS**

(a) Local Water Supply Plan. Units of local government ~~which~~ that are operating under a local water supply plan in accordance with G.S. 143-355(l) shall not be limited in the number of service connections.

(b) No local water supply plan. A public water system ~~which~~ that does not have a local water supply plan as stated in Paragraph (a) shall limit its number of service connections as follows:

(1) A public water system shall meet the daily flow requirements specified in Table 1:

Table 1: Daily Flow Requirements

| Type of Service Connection | Daily Flow for Design |
|---|---|
| Residential | 400 gallon/connection |
| Mobile Home Parks | 250 gallon/connection |
| Campgrounds and Travel Trailer Parks | 100 gallon/space |
| Marina | 10 gallon/boat slip |
| Marina with bathhouse | 30 gallon/boat slip |
| Rest Homes and Nursing Homes | |
| with laundry | 120 gallon/bed |
| without laundry | 60 gallon/bed |
| Schools | 15 gallon/student |
| Day Care Facilities | 15 gallon/student |
| Construction, work, or summer camps | 60 gallon/person |
| Business, office, factory (exclusive of industrial use) | |
| without showers | 25 gallon/person/shift |
| with showers | 35 gallon/person/shift |
| Hospitals | 300 gallon/bed |

or;

(2) A public water system ~~serving different types of service connections~~ shall meet the ~~maximum daily demand~~ daily flow requirements calculated as follows:

(A) ~~Where~~ If records of the previous year are available that reflect daily usage, the average of the two highest consecutive days of record of the water treated shall be the value used to determine if there is capacity to serve additional service ~~connections (unusual~~ connections. Unusual ~~events~~ events, such as massive line breaks or line ~~flushings~~ flushings, shall not be ~~considered)~~ considered.

(B) ~~Where~~ If complete daily records of water treated are not available, the public water system shall multiply the daily average use based on the amount of water treated during

the previous year of record by the appropriate factor to determine maximum daily demand, as follows:

(i) A system serving a population of 10,000 or less shall multiply the daily average use by ~~2.5;or~~ [~~2.5.~~] 2.5; or

(ii) A system serving a population greater than 10,000 shall multiply the daily average use by 2.0.

(c) A supplier of water shall include the impact that demands from [~~any~~] anticipated in-ground irrigation systems, multi-family [~~units~~] units, or [~~large~~] vacation rental homes will have on the daily flow needs determined in [~~(b)~~] Paragraph (b) of this Rule.

(d) [~~Once~~] If two years of metered usage data exists, a supplier of water may recalculate the daily flow requirements based on the actual usage. If actual demands are lower than the projected demand, [~~any~~] recovered supply [~~can~~] may be used to support additional connections in accordance with Paragraph (b) of this Rule.

(e) [~~A supplier of water may use lower flows than given in Table 1 for determining the daily flow requirements for the public water system in certain instances.~~] A supplier of water shall be exempt from using Table [~~1,~~] 1 in Subparagraph (b)(1) of this Rule and any other design flow standards established by the Department or the Commission to determine the daily flow requirements, provided that a professional engineer licensed pursuant to Chapter 89C of the General Statutes prepares, seals, and signs documentation supporting alternative daily flow requirements [~~which~~] that are sufficient to sustain the water usage required in the engineering design by using low-flow fixtures [~~and/or~~] or flow reduction technologies.

*History Note:* *Authority G.S. 130A-315; ~~103A-317;~~ 130A-317; P.L. 93-523;*
*Eff. July 1, ~~1994.~~ 1994;*
*Readopted Eff. July 1, 2019.*

15A NCAC 18C .0503 is adopted as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .0503 OTHER DESIGN STANDARDS**

In ~~evaluation of~~ evaluating public water systems or water system design features, in addition to the Rules in this Subchapter, the Department shall consider standards from the American Water Works Association or Recommended Standards for Water Works – Policies for the Review and Approval of Plans and Specifications for Public Water Supplies by the Great Lakes – Upper Mississippi River Board of State and Provincial Public Health and Environmental ~~Managers,~~ Managers ~~which are~~ which are ~~hereby~~ incorporated by reference, including any subsequent amendments and editions. ~~Copies are available for public inspection as set forth in Rule .0102(a) of this Subchapter.~~ Copies of the American Water Works Association standards may be obtained from the American Water Works Association, 6666 W. Quincy Avenue, Denver, Colorado 80235 with costs determined by the American Water Works Association and available at www.awwa.org/Publications/Standards. Copies of the Recommended Standards for Water Works may be obtained from the Minnesota Department of Administration available at https://www.mnbookstore.com/other/miscellaneous-state-agency-products/miscellaneous/recommended-standards-water-14349.html and for a cost of $19.95. An electronic copy can be obtained at no cost from the Minnesota Department of Health website, located at https://www.health.state.mn.us/communities/environment/water/tenstates/standards.html.

*History Note:* *Authority G.S. 130A-315; 130A-317; P.L. 93-523;*
*Eff. July 1, 2019 (this Rule was previously codified in 15A 18C .0715).*

15A NCAC 18C .0601 is readopted as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .0601 IMPOUNDMENTS: PRE-SETTLING RESERVOIRS**

(a) [~~Pre-settling Reservoirs.~~] Construction of a pre-settling reservoir shall be required [~~where~~] if wide and rapid variations in turbidity, bacterial concentrations, or chemical qualities occur, or where the following raw water quality standards are not met: turbidity - 150 NTU, coliform bacteria - 3000/100 ml, fecal coliform bacteria - 300/100 ml, or color - 75 CU. ~~Where~~ If impoundment of the water supply stream does not or will not provide ~~a~~ raw water of acceptable quality, a pre-settling ~~or pre-treatment~~ reservoir located outside the watershed or catchment area ~~may~~ shall be required.

(b) The Department [~~may~~] shall approve alternatives to pre-settling reservoirs if a supplier of water [~~can demonstrate~~] demonstrates that engineered pretreatment providing an additional treatment barrier to low raw water quality will be installed and that the overall designed treatment process [~~is capable of compliance~~] will comply with all other applicable requirements of this Subchapter. Pilot plant studies under Rule .0714 of this Subchapter [~~will~~] shall be required to demonstrate treatment effectiveness unless operational data demonstrating treatment effectiveness for the variety of water quality that is experienced at the treatment facility are already available.

(c) The Department [~~may~~] shall approve capacity increases at existing surface water treatment facilities without addition or up-sizing of pre-settling reservoirs [~~where~~] if:

(1) historical data or full-scale pilot studies [~~can~~] demonstrate that the plant [~~can~~] will provide treatment in accordance with this Subchapter without additional [~~pre-settling,~~] pre-settling; or

(2) the use of alternative technology alleviates the need for additional pre-settling.

*History Note:* *Authority G.S. 130A-315; 130A-317; P.L. 93-523;*
*Eff. January 1, 1977;*
*Readopted Eff. December 5, 1977;~~1977.~~*
*Readopted Eff. July 1, 2019.*

15A NCAC 18C .0706 is readopted as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .0706 SEDIMENTATION ~~BASIN~~BASINS**

(a) Inlets. Inlets to sedimentation basins shall be designed to dissipate inlet velocities before the diffusion walls or before other entrance arrangements designed to provide uniform flow across the basins.

(b) Detention Period. A theoretical detention period of four hours shall be ~~considered to be a~~ the minimum standard unless ~~evidence, acceptable to the Division of Water Resources,~~ case specific engineering evidence is presented to demonstrate equivalent treatment efficiency at ~~support approval of~~ a ~~lower~~ shorter period of detention.

(c) Bottom of Basin. The bottom of the basin shall be sloped and provided with a drain valve or valves for ~~ready~~ removal of sludge.

(d) Outlet. Sedimentation basin outlets shall consist of submerged weirs or orifices. The equivalent rate of flow over or through the outlet device ~~should~~ shall not exceed 20,000 gallons per day per foot of equivalent weir length.

(e) Overflow. Sedimentation basins shall be equipped with an overflow pipe or pipes to limit the maximum water level over the filters and to prevent flooding above the walls of filters and basins.

*History Note:* *Authority G.S. 130A-315; 130A-317; P.L. 93-523;*
*Eff. January 1, 1977;*
*Readopted Eff. December 5, 1977;*
*Amended Eff. April 1, 2014;~~2014.~~*
*Readopted Eff. July 1, 2019.*

15A NCAC 18C .0708 is readopted as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .0708 GRAVITY FILTERS**

(a) Filtration Rates. The standard rate of filtration for a single media filter shall be two gallons per minute per square foot. Higher filtration rates up to four gallons per minute per square foot may be approved for dual media or multi-media filters. Filtration rates in excess of four gallons per minute per square foot may be approved subject to pilot plant or plant scale demonstrations conducted in accordance with Rule .0714 of this ~~Section.~~ Section, and demonstrated equivalent treatment efficiency based on case-specific engineering evidence.

(b) Wash Water Rate. The backwash rate of flow shall be designed to theoretically expand the filter media 50 percent.

(c) Rate Control Devices. Rate control equipment shall be provided to control or regulate the filtration rate and the backwash rate. If declining rate filtration is to be ~~utilized,~~ used, orifice plates shall be installed on each filter effluent pipe to control maximum filtration rates.

(d) Surface Washers. Filter beds shall be equipped with a revolving or fixed system of nozzles designed for agitation of the entire beds.

(e) Gauges and Flow Indicators. Gauges or meters shall be installed to indicate the rate of filtration, the loss of head, and the backwash rate for every filter.

(f) Filter Media:

(1) Filter Sand. Filter sand shall be clean silica sand having:

(A) an effective size of 0.35 mm to 0.55 ~~mm,~~ mm;

(B) a uniformity coefficient of not more than ~~1.70,~~ 1.70;

(C) a dust content ~~(passing~~ passing 150 mesh ~~tyler)~~ tyler of less than 0.5 ~~percent,~~ percent; and

(D) a minimum depth of at least 24 inches.

(2) Anthracite Filter Media. If anthracite coal is used as a single filter media, it shall have an effective size of 0.35 mm to 0.55 mm and a uniformity coefficient of 1.70 or less. Minimum depth of the media shall be 24 inches.

(3) Dual Media or Multi-media Filters. ~~Dual media and mixed media filter beds may have a wider range of gradation than single media beds. Particle sizes may range from 0.15 mm to 1.2 mm within the beds.~~ Particle sizes in dual media and mixed media filter beds shall be within 0.15 mm to 1.2 mm. Influent water quality shall be considered in specifying particle sizes of mixed media beds. The minimum depth of the filter media shall be 24 inches.

(g) Supporting Media and Underdrain System. The underdrain system and layers of gravel or other media supporting the filter media shall be designed to provide uniform filtration and uniform backwash throughout the filter media.

(h) Wash Water Troughs Elevation. The elevation of the bottom of the wash water troughs for new installations shall be above the maximum level of the expanded media during washing at the normal design wash water rate. The

elevation of the top of the wash water troughs shall provide a two-inch freeboard above the expanded media at the maximum rate of wash.

(i) Turbidity Monitoring. Turbidimeters employing the nephelometric method, ~~or measurement of~~ which measures the intensity of scattered light, shall be provided for the continuous determination of the turbidities of filtered water from each filter unit.

(j) Sampling Tap. A tap shall be installed for ~~convenient~~ sampling of the effluent from each filter.

(k) Multiple Filter Units. Two or more filter units shall be provided such that the annual average daily demand can be satisfied at the approved filtration rate with one filter removed from service.

(l) Structural Design. Filters shall have vertical walls with no protrusions or curvature. Floors of filter rooms shall be designed to prevent flooding or spillage into filters through ~~provisions of~~ overflow drainage and a minimum of ~~four inch~~ four-inch curbs around the filters.

(m) Filter to Waste. All filters shall have provisions for filtering to waste with backflow prevention.

(n) Filter Backwash. Backwash capacity to ensure ~~thorough~~ cleaning of the filters shall be provided.

*History Note:* *Authority G.S. 130A-315; 130A-317; P.L. 93-523;*
*Eff. January 1, 1977;*
*Readopted December 5, 1977;*
*Amended Eff. July 1, 1994; January 1, 1978;~~1978.~~*
*Readopted Eff. July 1, 2019.*

15A NCAC 18C .0711 is readopted as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .0711 ALTERNATIVE FILTRATION TREATMENT TECHNOLOGIES**

A public water system may propose an alternative filtration treatment technology as provided in Rule .2003 of this Subchapter. The Department shall approve alternative filtration treatment technologies when the following conditions have been met and equivalent treatment efficiency, based on case-specific engineering evidence, has been demonstrated. ~~The following conditions shall apply:~~

(1) The source waters shall be derived from WS-I, ~~WS-II~~ WS-II, or WS-III ~~watersheds~~ watersheds. ~~and shall be protected from sources of pollution as determined from a sanitary survey in accordance with Rule .0202 [.1305] of this Subchapter.~~

(2) The raw water quality standards and fluctuations shall be as specified in Rule .0710(6) ~~Item (6)~~ of this Section, except that the following maximum concentrations shall be allowed in the influent water to the water treatment plant: Turbidity - 20 NTU, coliform - 500/100 ml, fecal coliform - 50/100 ml, and color - 20 CU.

(3) Off-stream ~~pre-treatment/storage~~ pre-treatment or storage shall be provided as specified in Rule .0710 of this ~~Section~~ Section, except that the raw water quality standards of Item (2) of this Rule shall be maintained in the water treatment plant influent water.

(4) If ~~the Department determines that~~ the proposed water treatment plant employs treatment techniques that are consistent with this Subchapter, a pilot study shall be conducted in accordance with Rule .0714 of this Section.

(5) If the pilot study demonstrates ~~to the Department~~ that the proposed water treatment plant can ~~consistently~~ produce water ~~which~~ that complies with all requirements of this Subchapter, ~~detailed~~ engineering plans and specifications for the proposed plant and appurtenances shall be presented to the Department for review and approval prior to construction or letting a construction contract.

*History Note:* *Authority G.S. 130A-315; 130A-317; P.L. 93-523;*
*Eff. July 1, ~~1994.~~ 1994;*
*Readopted Eff. July 1, 2019.*

15A NCAC 18C .0713 is readopted as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .0713 PRESSURE FILTERS**

(a) Pressure filters shall not be used in treatment of surface ~~waters.~~ waters without prior coagulation and flocculation.

(b) Pressure filters ~~may~~ shall be approved for treatment of existing groundwater sources under the influence of surface water under the following conditions:

(1) ~~Design~~ design standards for gravity filters ~~in~~ shall meet the requirements set forth in Rule .0708 of this ~~Section~~ Section; ~~shall apply.~~

(2) ~~Overall~~ overall plant design shall comply with Rule .0404 of this ~~Subchapter.~~ subchapter;

(3) ~~Special~~ special design or operational features or modifications shall be provided when needed due to the water quality or the design of the proposed ~~filter.~~ filter;

(4) ~~If the Department determines that~~ if the proposed water treatment plant employs treatment techniques that are consistent with this Subchapter, a pilot plant study shall be conducted in accordance with Rule .0714 of this ~~Section.~~ section; and

(5) ~~If~~ if the pilot study demonstrates ~~to the Department~~ that the proposed plant can ~~consistently~~ produce water ~~which~~ that complies with all requirements of this Subchapter, ~~detailed~~ engineering plans and specifications for the proposed plant and appurtenances shall be presented to the Department for review and approval prior to construction or letting a construction contract.

*History Note:* *Authority G.S. 130A-315; 130A-317; P.L. 93-523;*
*Eff. July 1, ~~1994.~~1994;*
*Readopted Eff. July 1, 2019.*

15A NCAC 18C .0714 is readopted as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .0714 PILOT PLANT STUDIES**

(a) A pilot plant study proposal shall be submitted to the Department for approval before the study is conducted. ~~The following conditions shall apply:~~ The proposal shall be approved if it [~~meet~~] meets all of the following conditions and [~~include~~] includes all of the following information:

(1) An engineering report shall describe the proposed study and shall include the information and data to justify the use of the particular plant to treat the source ~~water;~~ water.

(2) The proposed plant shall employ treatment techniques that are consistent with this ~~Subchapter;~~ Subchapter.

(3) The pilot plant shall be of the same design and operation as the proposed ~~plant;~~ plant.

(4) A protocol for conducting the study shall be submitted ~~which~~ that includes the duration, testing procedures, reporting procedures, plant ~~scale~~ scale, and other factors ~~which~~ that affect the proposed plant ~~operation; and~~ operation.

(5) The study shall be conducted over a time sufficient to treat all ~~worst case~~ worst-case source water conditions expected through the year.

(b) Pilot plant finished water shall not be approved by the Department for introduction ~~introduced~~ into ~~to~~ a public water system unless case specific engineering evidence is presented to demonstrate that it will not adversely impact compliance with water quality requirements specified in this Subchapter. ~~approved by the Department.~~

(c) ~~When~~ [~~If~~] A model plant may be proposed without on-site testing if the proposed plant or pilot plant has met the following conditions:

(1) been tested under worst case conditions on similar ~~water and achieved 3.0 log removal of *Giardia* cysts and~~ water;

(2) achieved the required log inactivation and removal under Section .2000 of this Subchapter for Giardia, Cryptosporidium, and viruses; and

(3) achieved ~~and~~ a maximum of 0.3 NTU turbidity levels 95 percent of the time in filtered effluent. ~~effluent, the particular model plant may be proposed without on-site testing.~~

(d) The pilot plant shall comply with the provisions of Section .2000 of this Subchapter.

(e) If the proposal includes a change of treatment as defined in Rule .1507 Corrosion Control and Lead and Copper Monitoring of this Subchapter, the pilot study shall consider the effect of the proposed changes in compliance with [~~on~~] lead, copper, and water quality [~~parameter compliance.~~] parameters.

*History Note:* *Authority G.S. 130A-315; 130A-317; P.L. 93-523;*
*Eff. July 1, 1994;*
*Amended Eff. October 1, 2009;~~2009.~~*
*Readopted Eff. July 1, 2019.*

15A NCAC 18C .0803 is readopted as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .0803 CAPACITIES: DETERMINING TOTAL VOLUME**

The total volume of a pressure tank shall be calculated by ~~using~~ applying the principle of Boyle's ~~Law.~~ Law as set forth in this Rule. ~~The~~

(1) For a mobile home park, the total volume ~~(gallons)~~ measured in gallons shall be not less than 25 times the number of connections or 500 gallons, whichever is greater. ~~greater for a mobile home park. In the case of~~

(2) For a residential community water system ~~(community water system)~~ the total volume shall not be less than 40 times the number of connections or 500 gallons, whichever is greater. ~~In the case of campgrounds,~~

(3) For a campground, the total volume shall not be less than 10 times the number of connections or 500 gallons, whichever is greater.

*History Note:* *Authority G.S. 130A-315; 130A-317; P.L. 93-523;*
*Eff. January 1, 1977;*
*Readopted Eff. December 5, 1977;*
*Amended Eff. July 1, 1994; March 31, 1980;~~1980.~~*
*Readopted Eff. July 1, 2019.*

15A NCAC 18C .0904 is amended as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .0904 PIPE LAYING**

(a) Trenching, pipe laying, and backfilling shall be accomplished in a manner to prevent damage to and ~~mis-alignment~~ misalignment of the pipe. Water mains shall be buried to a depth below the ~~frostline~~ frost line or to a depth sufficient to provide a minimum of 30 inches cover, whichever is greater. In cases where it is impracticable to provide 30 inches of cover taking into consideration feasibility and [~~cost to provide 30 inches of cover,~~] cost, a deviation may be approved on a case-by-case basis, [~~when~~] if supported by data from the design engineer [~~including, but not limited to,~~] including consideration of pipe material, cover material, land cover, land use, land slope, the depth of the frost line, and the location of other utilities.

(b) To allow for construction and repair, a minimum distance of 12 inches [~~must~~] shall be maintained between the outside of the water main and the outside of other utilities.

(c) [~~Special Conditions. In cases where the~~] If an engineer demonstrates it is impractical to maintain [~~a~~] the separation distances [~~in~~] required by this [~~Rule when~~] Rule, taking into consideration [~~feasibility and~~] feasibility, cost, and the factors set forth in this Paragraph, a deviation may be approved on a case-by-case basis [~~basis. Such deviation must be~~] if supported by data and alterative construction criteria submitted by the design engineer. Data and alterative construction criteria submitted by the design engineer to justify the deviation [~~must~~] shall [~~describe the:~~] describe:

(1) the rationale for determining that separation criteria described in Paragraphs (a) and (b) of this Rule are impracticable;

(2) the extent of the deviation from separation criteria in Paragraphs (a) and (b) of this Rule;

(3) a consideration of pipe materials, pressure ratings, type of joints for water main and non-potable water line, and soil conditions;

(4) the ability to provide adequate work space to repair or replace pipe segments or other utility infrastructure without causing damage to or otherwise compromising the integrity of pipes; and

(5) the rationale for determining that the deviation will not result in unreasonable risk to public health.

*History Note:* *Authority G.S. 130A-315; 130A-317; P.L. 93-523;*
*Eff. January 1, 1977;*
*Readopted Eff. December 5, ~~1977.~~ 1977;*
*Pursuant to G.S. 150B-21.3A, rule is necessary without substantive public interest Eff. November 23, 2015;~~2015.~~*
*Amended Eff. July 1, 2019.*

.15A NCAC 18C .0906 is readopted as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .0906 RELATION OF WATER MAINS TO ~~SEWERS~~ NON-POTABLE WATER LINES**

(a) [~~For this rule,~~] For the purposes of this Rule, sewer shall mean any existing or proposed gravity or force main used to convey sanitary or industrial process waste.

~~(a)~~(b) Lateral Separation of Sewers and Water Mains. Water mains shall be laid at least 10 feet laterally from existing or proposed sewers, unless local conditions or barriers prevent a 10-foot lateral ~~separation in~~ separation, in which case:

(1) ~~The~~ the water main ~~is~~ shall be laid in a separate trench, with the elevation of the bottom of the water main at least 18 inches above the top of the sewer; or

(2) ~~The~~ the water main ~~is~~ shall be laid in the same trench as the ~~sewer~~ sewer, with the water main located at one side on a bench of undisturbed ~~earth.~~ earth and with the elevation of the bottom of the water main at least 18 inches above the top of the sewer.

~~(b) Crossing a Water Main Over a Sewer. Whenever it is necessary for a water main to cross over a sewer, the water main shall be laid at such an elevation that the bottom of the water main is at least 18 inches above the top of the sewer, unless local conditions or barriers prevent an 18 inch vertical separation in which case both the water main and sewer shall be constructed of ferrous materials and with joints that are equivalent to water main standards for a distance of 10 feet on each side of the point of crossing.~~

~~(c) Crossing a Water Main Under a Sewer. Whenever it is necessary for a water main to cross under a sewer, both the water main and the sewer shall be constructed of ferrous materials and with joints equivalent to water main standards for a distance of 10 feet on each side of the point of crossing. A section of water main pipe shall be centered at the point of crossing.~~

(c) Crossings. A [~~Water mains crossing sewers~~] water main that crosses a sewer shall be laid [~~to provide~~] a minimum vertical distance of 18 inches [~~between~~] from the outside of the water main and the outside of the [~~sewer. This shall be the case where the water main is either above or below the sewer with preference to the water main~~] sewer, either above or below the sewer [~~but, if practicable,~~] with preference to the water main [~~shall be~~] located above the sewer. One full length of water pipe shall be located so that both joints will be as far from the sewer as [~~possible.~~] [~~practicable.~~] possible.

(d) Water Mains and Storm Sewer Pipes. Pipes carrying storm drainage shall be separated from water lines in accordance with Rule .0904 of this Section.

(e) Water Mains and Reclaimed Water Distribution Lines. Water lines shall be located at least 10 feet horizontally from [~~and~~] or at least 18 inches above water pipes carrying treated and disinfected wastewater in reclaimed water distribution lines. Crossings shall be made in accordance with Paragraph (c) of this Rule.

(f) Special Conditions. [~~In cases where the~~] If an engineer demonstrates it is impracticable to maintain the separation distances required by this Rule, taking into consideration [~~feasibility and~~] feasibility, cost, and the factors set forth in this Paragraph, [~~to maintain the separation distances in this Rule, a~~] the deviation may be approved on a case-by-case basis, [~~when~~] if supported by data and alternative construction criteria provided by the design engineer.

Data and alternative construction criteria submitted by the design engineer to justify the deviation must [~~describe the:~~] describe:

(1) the rationale for determining that separation criteria described in this Rule are impracticable;

(2) the extent of the deviation from separation criteria in this Rule;

(3) a consideration of pipe materials, pressure ratings, type of joints for water main and non-potable water line, and soil conditions;

(4) the ability to provide adequate work space to repair or replace pipe segments or other utility infrastructure without causing damage to or otherwise compromising the integrity of pipes; and

(5) the rationale for determining that the deviation will not result in unreasonable risk to public health.

*History Note:* *Authority G.S. 130A-315; 130A-317; P.L. 93-523;*
*Eff. January 1, 1977;*
*Readopted Eff. December 5, 1977;~~1977.~~*
*Readopted Eff. July 1, 2019.*

15A NCAC 18C .1002 is readopted as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .1002 DISINFECTION [~~AND VERIFICATION~~] OF WELLS**

(a) After ~~water supply wells have been cleaned of foreign substances, including sediment, grease and oil, the wells shall be disinfected by the addition of chlorine solution in concentrations sufficient to produce a minimum chlorine residual of 100 milligrams per liter (or ppm) in the entire water column within the well casing.~~ [~~Water supply wells. Following~~] construction, servicing, maintenance, or any other activity or event that might lead to contamination of the water, [~~water supply wells~~] [~~well~~] wells shall [~~undergo disinfection and verification~~] be disinfected in accordance with ANSI/AWWA [~~Standard~~] C654-13, [~~Disinfection of Wells.~~] "Disinfection of Wells." Copies may be obtained [~~are available~~] for public inspection as set forth in Rule [~~.0102(a)~~] .0503 of this Subchapter. [~~The disinfection procedures covered are for the gravel pack, well casing, pump, and appurtenant piping.~~]

~~(b) The chlorine solution shall remain in the well for a period of 24 hours. The well shall then be pumped until the water is free of chlorine.~~ [~~For disinfection of existing wells following general servicing or maintenance, plans or specifications do not need Departmental review or approval.~~]

~~(c) A representative sample or samples of the water shall be collected and analyzed by a certified laboratory.~~ [~~The absence of total coliform bacteria in addition to the documented use of proper disinfection techniques provides verification that the disinfection process has been accomplished in compliance with the standard.~~] ~~If bacteriological tests indicate verify that the water is free of bacteriological contamination, the well may be placed in service.~~

(b) After disinfection, wells shall not be placed into service until bacteriological test results of representative water samples analyzed [~~in an approved~~] by a certified laboratory are found to be satisfactory.

[~~(d)~~] (c) Records demonstrating compliance with ANSI/AWWA Standard C654-13 shall be available for three years for [~~state inspection.~~] inspection by the Department.

*History Note:* *Authority G.S. 130A-315; 130A-317; P.L. 93-523;*
*Eff. January 1, 1977;*
*Readopted Eff. December 5, 1977;*
*Amended Eff. July 1, 1994;~~1994.~~*
*Readopted Eff. July 1, 2019.*

15A NCAC 18C .1003 is readopted as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .1003 DISINFECTION [~~AND VERIFICATION~~] OF STORAGE TANKS AND DISTRIBUTION SYSTEMS**

(a) Water distribution systems, including storage tanks and water mains, after flushing to remove sediment and other foreign matter, and after testing for leaks, ~~shall be disinfected by the addition and thorough dispersion of a chlorine solution in concentrations sufficient to produce a chlorine residual of at least 50 milligrams per liter (or ppm) in the water throughout the distribution system, including all water mains and storage tanks.~~ [~~Distribution systems. After flushing to remove sediment and other foreign matter and after checking for leaks, distribution systems~~] shall [~~undergo disinfection and verification~~] be disinfected in accordance with ANSI/AWWA Standard C652-11; "Disinfection of Water Storage Facilities" or in accordance with ANSI/AWWA [~~C651-14, Disinfection of Water Mains, if they have been newly constructed; have been removed from service for planned repairs or for maintenance that exposes them to contamination; have undergone emergency repairs because of physical failure; or under normal operation, continue to show the presence of coliform bacteria.~~] C651-14; "Disinfection of Water Mains." Copies may be obtained [~~are available~~] for public inspection as set forth in Rule [~~.0102(a)~~] .0503 of this Subchapter.

~~(b) The chlorine solution shall remain in contact with interior surfaces of the water system for a period of 24 hours. Then the water system shall be flushed with fresh water from an approved water source until the chlorine solution is dispelled.~~ [~~Water storage facilities. Water storage facilities, including storage tanks and clearwells, shall undergo disinfection and verification in accordance with ANSI/AWWA Standard C652-11 if they have been newly constructed, have been entered for construction or inspection purposes, or continue to show the presence of coliform bacteria during normal operations. Copies are available for public inspection as set forth in Rule .0102(a) of this Subchapter.~~]

~~(c) Representative~~ [~~After disinfection under paragraphs (a) and (b) of this Rule, representative~~] ~~samples of the water shall then be collected.~~ [~~collected and analyzed for coliform bacteria. The absence of total coliform bacteria in addition to the documented use of proper disinfection techniques provides verification that the disinfection process has been accomplished in compliance with the standard.~~] ~~If bacteriological tests of the samples indicate that the water quality is satisfactory, the water mains and storage tanks may be placed in service.~~ [~~New storage tanks and distribution system water lines may be placed into service after bacteriological tests of the samples indicate that the water quality is free from contamination.~~]

[~~(d) Disinfection of existing storage tanks and distribution systems following general servicing or maintenance do not require Departmental plans or specifications review or approval under Section .0300 of this Subchapter.~~]

~~(d)~~[~~(e)~~] ~~In unusual situations where large volume tanks are involved and where there is not sufficient water available to fill the tank or there is not available a suitable drainage area for the chlorinated water, an alternate disinfection procedure for tanks may be proposed. Such proposal must be submitted in writing completely describing the proposed disinfection procedure and substantiating the need for an alternate procedure in the particular circumstance. Such alternate procedure must be approved before being implemented. The conclusion of the department~~ Department ~~shall be final.~~

(b) After disinfection, water storage or distribution facilities shall not be placed into service until bacteriological test results of representative water samples analyzed [~~in an approved~~] by a certified laboratory are found to be satisfactory.

[~~(f)~~] (c) Records demonstrating compliance with ANSI/AWWA Standards [~~C651-14 and C652-11~~] C652-11 or ANSI/AWWA Standard 651-14 shall be available for three years for [~~state inspection.~~] inspection by the Department.

*History Note:* *Authority G.S. 130A-315; 130A-317; P.L. 93-523;*
*Eff. January 1, 1977;*
*Readopted Eff. December 5, 1977;*
*Amended Eff. January 1, 1978.*
*Readopted Eff. July 1, 2019.*

15A NCAC 18C .1004 is readopted as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .1004 ~~DISINFECTION~~ [~~AND VERIFICATION~~] ~~OF~~ ~~FILTERS~~ DISINFECTION OF WATER TREATMENT FACILITIES**

~~(a) After filters have been thoroughly backwashed to remove dust, silt and other foreign matter the entire filter (including filter media, supporting material and underdrain system) shall be disinfected by application of a chlorine solution having a minimum concentration of 50 milligrams per liter (or ppm).~~

~~(b) The solution shall be dispersed throughout the filter bed and remain in contact for a minimum of 24 hours.~~

(a) New water treatment facilities and existing water treatment facilities [~~temporarily~~] taken out of service for cleaning, inspection, maintenance, painting, repair, or [~~any~~] other [~~activity~~] activities or [~~event~~] events that might lead to [~~the~~] contamination of water [~~must undergo disinfection and verification~~] shall be disinfected in accordance with ANSI/AWWA Standard C653-13, [~~Disinfection~~] "Disinfection of Water Treatment [~~Plants.~~] Facilities." [~~This standard applies to treatment components, including filter basins, filter media, pump suction wells, and associated piping and appurtenances located downstream from the filter influent or from the first point of application of disinfectant in the treatment process.~~] Copies may be obtained [~~are available~~] for public inspection as set forth in Rule [~~.0102(a)~~] .0503 of this Subchapter.

[~~(b) Filters (including filter media, supporting material and underdrain system) must be thoroughly backwashed to remove dust, silt and other foreign matter from the entire filter prior to disinfection and verification.~~]

[~~(c) A representative sample or samples of the water shall be collected and analyzed by a certified laboratory. The absence of total coliform bacteria in addition to the documented use of proper disinfection techniques provides verification that the disinfection process has been accomplished in compliance with the standard. If bacteriological tests verify that the water is free of bacteriological contamination, the facility may be placed in service.~~]

~~(c)~~(d) ~~For treatment equipment that cannot tolerate chlorine, alternate disinfection procedures as recommended by the equipment manufacturer may be used if equivalent to the disinfection procedure using chlorine.~~

(b) After disinfection the water treatment facilities shall not be placed into service until bacteriological test results of representative water samples analyzed [~~in an approved~~] by a certified laboratory are found to be satisfactory.

[~~(c)~~] (c) Records demonstrating compliance with ANSI/AWWA Standard C653-13 shall be available for three years for [~~state inspection.~~] inspection by the Department.

*History Note:* *Authority G.S. 130A-315; 130A-317; P.L. 93-523;*
*Eff. January 1, 1977;*
*Readopted Eff. December 5, 1977;*
*Amended Eff. July 1, 1994;~~1994.~~*
*Readopted Eff. July 1, 2019.*

15A NCAC 18C .1406 is readopted as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .1406 CONTROL OF ~~TREATMENT~~ FLUORIDE PROCESS**

(a) ~~The treatment process shall result in the adjustment of fluoride ion (F⁻) in the treated water to 1.0 mg/liter.~~ Fluoride Levels. [~~To maintain as close to an optimal fluoride level of 0.7 mg/l as possible, a~~] Fluoride levels shall not exceed the MCL set forth in Rule .1510 of this Subchapter. A supplier of water [~~which~~] that is adding fluoride to the treated water shall maintain the following fluoride levels:

(1) [~~An~~] an operational control range for fluoride of 0.6 mg/l to 1.0 mg/l [~~is established,~~] shall be established;

(2) [~~The~~] the monthly average of the daily measurements at the entry point to the distribution system shall be within the operational control [~~range,~~] range; and

(3) [~~Eighty~~] 80 percent of the daily measurements at the entry point to the distribution system shall be within the operational control range.

[~~(4) Fluoride levels shall not exceed the MCL~~] [~~set forth~~] [~~in Rule .1510 of this Subchapter.~~]

(b) A water treatment plant operator certified ~~under~~ pursuant to 15A NCAC 18D shall conduct the necessary chemical analyses and supervise application of the fluoride.

~~(c) Samples shall be collected and analyzed from points before and after fluoridation and from one or more points in the distribution system. The minimum number of control tests required and the number of check samples to be collected and submitted to the North Carolina State Laboratory of Public Health for analysis shall be determined by the Department in conjunction with the State Health Director, based on guidance from the Center for Disease Control, and considering recommendations from the local health department and the supplier of water.~~

(c) Sample Location and Frequency.

(1) Daily Monitoring. A supplier of water shall measure the fluoride concentration at least once per day at each entry point to the distribution system with fluoridated water.

(2) Split Samples. One entry point sample collected [~~under~~] pursuant to Subparagraph (c)(1) of this [~~Rule, per month~~] Rule shall be split equally on a monthly basis. One [~~and one~~] portion shall be analyzed by water system personnel and the other portion analyzed by the North Carolina State Laboratory for Public Health or [~~other~~] another laboratory certified to analyze drinking water samples for fluoride by the North Carolina State Laboratory of Public Health. A supplier of water [~~which~~] that has all fluoride samples under this Rule analyzed by a laboratory certified to analyze drinking water samples for fluoride by the North Carolina State Laboratory for Public Health [~~is not~~] shall not be required to conduct split sampling.

(3) Distribution System Monitoring. The supplier of water of [~~Where~~] a public water system that has multiple entry points [~~and either~~] that are either not all [~~are~~] fluoridated or the fluoride level at an entry point to the distribution system is not within the range set forth in [~~Paragraph~~] Subparagraph (a)(1) of this Rule [~~the supplier of water~~] shall conduct sampling as follows:

(A) measure the fluoride concentration in the distribution system at least two times per [~~month.~~] month;

(B) [~~One~~] one sample per month shall be a split sample and analyzed in accordance with Subparagraph (c)(2) of this [~~Rule.~~] Rule;

(C) [~~Sample~~] sample sites shall be rotated throughout the distribution system at monitoring locations approved for coliform compliance [~~sampling.~~] sampling; and

(D) [~~These~~] sample results [~~are not shall not be required to be submitted to the Department, but must~~] shall be available for review by the Department upon request.

(4) Annual Raw Water Sample. A supplier of water shall measure the fluoride concentration of the raw water at least annually by a laboratory certified to analyze fluoride in drinking water by the North Carolina State Laboratory of Public Health.

(5) Discrepancies. A supplier of water shall compare the results of the split samples and shall consult with the North Carolina State Laboratory of Public Health to investigate and resolve [~~any discrepancy~~] all discrepancies greater than 15 percent within 30 [~~days.~~] days of receipt.

(d) Analysis Methods. The fluoride content of ~~the~~ water shall be determined in accordance with methods set forth in Rule .1508 of this Subchapter.

(e) Monthly Reporting. ~~Accurate records~~ Records of ~~the amount of fluoride applied to the water and the results of~~ all fluoride analyses performed in accordance with Subparagraph (c)(1) of this Rule, shall be recorded on forms approved by the Department and submitted to the Department ~~weekly.~~ monthly. The forms shall specify the sample dates, times, locations, and results. Fluoride results performed by certified laboratories in accordance with Subparagraph (c)(1) of this Rule, shall be reported by the certified laboratory electronically in a format prescribed by the Department.

(f) Reporting Exceedances. Any fluoride result above the MCL set forth in Rule .1510 of this Subchapter shall be reported to the Department as soon as possible, but in all cases within 24 hours after receipt of the analysis.

~~(f)~~(g) Fluoride Products. ~~Any~~ All fluoridation ~~product~~ products used by a public water system shall meet the requirements of Rule .1537 of this Subchapter.

(h) Discontinuation of Fluoridation. Prior to the discontinuation of fluoride addition, a supplier of water shall provide to the Department and the Department of Health and Human [~~Services~~] Services, Oral Health [~~Section~~] Section, copies of documentation by the unit of local government or the governing body operating the community water system that:

(1) the resolution provided in the formal application to add fluoride has been rescinded or [~~replaced,~~] replaced; and

(2) the local board of health has been notified.

*History Note:* *Authority G.S. 90A-29; 130A-316;*

*Eff. February 1, 1976;*
*Readopted Eff. December 5, 1977;*
*Amended Eff. April 1, 2014; July 1, 1994; September 1, 1990; December 17, 1979;~~1979;~~*
*Readopted Eff. July 1, 2019.*

15A NCAC 18C .1507 is readopted as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .1507 CORROSION CONTROL AND LEAD AND COPPER MONITORING**

(a) Control and adjustment of pH shall be provided for community water systems having water with a pH below ~~6.5; such~~ 6.5. This control and adjustment ~~to~~ shall be approved by the [~~Department.~~] Department pursuant to the rules in Section .0300 of this Subchapter. ~~Most waters are corrosive in varying degrees at pH 6.5 and slightly above, and such waters may have pH adjustment.~~ If the community water system is also required to install corrosion control treatment to comply with (c) of this Rule, it shall meet the minimum pH level required [~~under~~] pursuant to (c) of this Rule.

(b) The provisions of 40 C.F.R. 141.42 are ~~hereby~~ incorporated by ~~reference~~ reference, including ~~any~~ subsequent amendments and editions. Copies may be obtained ~~are available for public inspection~~ as set forth in Rule ~~.0102 [.0102(a) and~~] .0102(b) of this Subchapter.

(c) The provisions of 40 C.F.R. 141, Subpart I - Control of Lead and Copper are ~~hereby~~ incorporated by ~~reference~~ reference, including ~~any~~ subsequent amendments and editions. Copies may be obtained ~~are available for public inspection~~ as set forth in Rule ~~.0102[.0102(a) and~~] .0102(b) of this Subchapter.

~~(d) Travel trailer parks, campgrounds, and marina slips that are community water systems as defined by G.S. 130A-313(10), but do not serve 25 or more of the same persons more than six months per year, shall be exempt from the provisions of this Rule.~~

*History Note:* *Authority G.S. 130A-315; P.L. 93-523; 40 C.F.R. 141;*
*Eff. September 1, 1979;*
*Amended Eff. October 1, 1982; February 27, 1982;*
*Transferred and Recodified from 10 NCAC 10D .1621 Eff. April 4, 1990; Amended Eff. April 1, 2014; July 1, 1994; October 1, 1992; December 1, 1991;~~1991.~~*
*Readopted Eff. July 1, 2019.*

15A NCAC 18C .1509 is amended as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .1509 SPECIAL MONITORING FOR SODIUM**

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

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

~~(c) The Department shall notify appropriate local health officials of the sodium levels found in community water systems.~~

~~(d) Analyses conducted to determine compliance with this Rule shall be made in accordance with methods adopted by the United States Environmental Protection Agency and codified as 40 C.F.R. 141.41(d) that are hereby incorporated by reference including any subsequent amendments and editions. Copies are available for public inspection as set forth in Rule .0102 of this Subchapter.~~

~~(e) Travel trailer parks, campgrounds, and marina slips that are community water systems as defined by G.S. 130A-313(10), but do not serve 25 or more of the same persons more than six months per year shall be exempt from the provisions of this Rule.~~

(a) The provisions of 40 C.F.R. 141.41 are [~~hereby~~] incorporated by [~~reference~~] reference, including [~~any~~] subsequent amendments and editions. Copies may be obtained [~~are available for public inspection~~] as set forth in Rule .0102(a) and (b) of this Subchapter.

[~~(b) In accordance with~~] [~~40 C.F.R.~~] [~~141.41(c), the supplier of water shall notify appropriate local health officials of the sodium levels found in community water systems.~~]

*History Note:* *Authority G.S. 130A-315; P.L. 93-523; 40 C.F.R. 141;*
*Eff. February 27, 1982;*
*Transferred and Recodified from 10 NCAC 10D .1636 Eff. April 4, 1990;*
*Amended Eff. April 1, 2014; July 1, 1994; September 1, 1990;*

*Pursuant to G.S. 150B-21.3A, rule is necessary without substantive public interest Eff. November 23, 2015;~~201~~*

*Amended Eff. July 1, 2019.*

15A NCAC 18C .1511 is amended as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .1511 CONCENTRATION OF IRON**

~~(a)~~ The requirements of this Rule shall apply only to community water systems. A community water system ~~which~~ that has an iron concentration in excess of 0.30 mg/l shall provide treatment to control the water quality. Analysis of samples shall be made on an as needed basis determined by the ~~Department.~~ Department and ~~Such need~~ [~~as needed~~] ~~basis~~ shall include ~~include, but not be limited to,~~ [~~an~~] the addition of a new well or other raw water source, an approval of a new community water system, an approval of an existing system not previously approved, or problems and complaints of water quality normally associated with iron concentration.

~~(b) Travel trailer parks, campgrounds, and marina slips that are community water systems as defined by G.S. 130A-313(10), but do not serve 25 or more of the same persons more than six months per year shall be exempt from the provisions of this Rule.~~

*History Note:* *Authority G.S. 130A-315; P.L. 93-523; 40 C.F.R. 141;*
*Eff. September 1, 1979;*
*Transferred and Recodified from 10 NCAC 10D .1619 Eff. April 4, 1990;*
*Amended Eff. July 1, 1994;*
*Pursuant to G.S. 150B-21.3A, rule is necessary without substantive public interest Eff. November 23, 2015;~~2015.~~*
*Amended Eff. July 1, 2019.*

15A NCAC 18C .1512 is amended as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .1512 CONCENTRATION OF MANGANESE**

~~(a)~~ The requirements of this Rule shall apply only to community water systems. A community water system ~~which~~ that has a manganese concentration in excess of 0.05 mg/l shall provide treatment to control the water quality. Analysis of samples shall be made on an as needed basis determined by the ~~Department.~~ Department and ~~Such need~~ [~~as needed~~] ~~basis~~ shall include ~~include, but not be limited to,~~ [~~an~~] the addition of a new well or other raw water source, an approval of a new community water system, an approval of an existing system not previously approved, or problems and complaints of water quality normally associated with manganese concentration.

~~(b) Travel trailer parks, campgrounds, and marina slips that are community water systems as defined by G.S. 130A-313(10), but do not serve 25 or more of the same persons more than six months per year shall be exempt from the provisions of this Rule.~~

*History Note:* *Authority G.S. 130A-315; P.L. 93-523; 40 C.F.R. 141;*
*Eff. September 1, 1979;*
*Amended Eff. September 9, 1980;*
*Transferred and Recodified from 10 NCAC 10D .1620 Eff. April 4, 1990;*
*Amended Eff. July 1, 1994;*
*Pursuant to G.S. 150B-21.3A, rule is necessary without substantive public interest Eff. November 23, 2015;~~2015.~~*
*Amended Eff. July 1, 2019.*

15A NCAC 18C .1523 is readopted as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .1523 PUBLIC NOTIFICATION REQUIREMENTS**

~~(a) The provisions of 40 C.F.R. 141.32 are hereby incorporated by reference including any subsequent amendments and editions, except that multi-lingual notice shall be given if 30 percent or more of the consumers served by the system are non-English speaking. Copies are available for public inspection as set forth in Rule .0102 of this Subchapter.~~

~~(b)~~(a) The provisions of 40 C.F.R. 141, Subpart Q – Public Notification of Drinking Water Violations are ~~hereby~~ incorporated by ~~reference~~ reference, including ~~any~~ subsequent amendments and ~~editions.~~ [~~editions, except that under 40 C.F.R. 141.205(c)(2), multi-lingual notice shall be given if 30 percent~~] editions. As authorized by 40 C.F.R. 141.205(c)(2), [~~the Department has determined that~~] multi-lingual notice shall be given if 30 percent or more of the consumers served by the system are non-English speaking. Copies may be obtained ~~are available for public inspection~~ as set forth in Rule ~~.0102~~[~~.0102(a) and~~] .0102(b) of this Subchapter.

~~(c)~~(b) ~~Special notification for distribution system samples.~~ The special notification requirements for distribution system samples in ~~requirements of~~ this Paragraph shall be in addition ~~additional~~ to the public notice requirements set forth in ~~Paragraphs (a) and (b)~~ Paragraph (a) of this Rule and to the reporting requirements contained in Rule .1525 of this Subchapter. ~~When~~ If a distribution sample [~~which~~] that is required to be reported to the Division is taken from the plumbing of a school or daycare, place of residence, or location supplying permanent or temporary housing, the supplier of water shall notify the billing customer at the sampled address ~~is taken on property not owned or controlled by the supplier of water, the supplier of water shall notify the person authorizing the sample~~ if any individual water sample exceeds an action level, maximum contaminant level, or maximum residual disinfectant level established in this ~~Subchapter,~~ Subchapter or if any individual sample is positive for ~~coliform bacteria.~~ E. coli or any other fecal [~~indicator~~] indicator, as follows:

(1) For a contaminant listed as Tier 1 in Appendix A to 40 C.F.R. 141, Subpart Q, notice shall be provided ~~by telephone~~ within 24 hours of receipt of analytical results. If the initial contact is by telephone, ~~results and shall be followed by~~ written notice by mail or direct delivery shall also be provided within 48 hours of ~~receipt.~~ analytical results. The written notice shall include the analytical results and appropriate health effects ~~language.~~ language as required by Appendix B to 40 C.F.R. 141, Subpart Q.

(2) For a contaminant listed as Tier 2 or Tier 3 in Appendix A to 40 C.F.R. 141, Subpart Q, notice shall be provided within 48 hours of receipt of analytical results. Written notice shall be provided by mail or direct delivery ~~to the person authorizing the sample~~ and shall include the analytical results and appropriate health effects ~~language.~~ language as required by Appendix B to 40 C.F.R. 141, Subpart Q.

(3) The supplier of water shall submit a copy of the written notice and certification of delivery to the Department within 10 days of completing notification.

~~The person authorizing the sample may waive the notification required by this Paragraph. The waiver shall be documented in writing and signed by the authorizing person. The waiver is valid for five years and is renewable.~~

*History Note:* *Authority G.S. 130A-315; P.L. 93-523; 40 C.F.R. 141;*
*Eff. January 1, 1990;*
*Transferred and Recodified from 10 NCAC 10D .1642 Eff. April 4, 1990;*
*Amended Eff. April 1, 2014; October 1, 2006; August 1, 2002; April 1, 1992; December 1, 1991;*
*January 1, 1991; October 1, 1990;~~1990.~~*
*Readopted Eff. July 1, 2019.*

15A NCAC 18C .1525 is amended as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .1525 REPORTING REQUIREMENTS**

(a) The requirements of this Rule shall apply to all public water systems. The provisions of 40 C.F.R. 141.31 are ~~hereby~~ incorporated by ~~reference~~ reference, including ~~any~~ subsequent amendments and editions. Copies may be obtained ~~are available for public inspection~~ as set forth in Rule ~~.0102~~[~~.0102(a) and~~] .0102(b) of this Subchapter. Any dates set forth in the federal rule shall be applicable.

(b) ~~When~~ If a certified laboratory analyzes a compliance sample for a supplier of water, the certified laboratory shall report the results to both the Department and to the supplier of water or his or her designated representative within the ~~required~~ periods ~~as~~ set forth in 40 C.F.R. ~~141.31.~~ 141.31, except that electronic reporting conducted in accordance with 40 C.F.R. 141.31(a) shall be completed within seven days of completion of the analysis. The laboratory reporting to the Department shall include analytical results for any maximum contaminant level ~~exceedence~~ exceedance within the timeframes applicable to the system owner. Reporting shall be in a format, ~~to include~~ including electronic reporting, ~~provided~~ established by the Department and shall be filled out completely. ~~Should~~ If a certified laboratory ~~fail~~ fails to ~~properly~~ report ~~a~~ compliance sample results in accordance with this paragraph, ~~result, it shall be the responsibility of~~ the supplier of water ~~to~~ shall report results to the Department as required by this Rule.

*History Note:* *Authority G.S. 130A-315; G.S. 130A-324; G.S. 130A-329; 40 C.F.R 141;*
*Eff. September 1, 1979;*
*Amended Eff. February 1, 1987; October 1, 1984; March 31, 1981; March 31, 1980;*
*Transferred and Recodified from 10 NCAC 10D .1631 Eff. April 4, 1990;*
*Amended Eff. April 1, 2014; August 1, 2002; January 1, 1991;*
*Pursuant to G.S. 150B-21.3A, rule is necessary without substantive public interest Eff. November 23, 2015;~~2015.~~*
*Amended Eff. July 1, 2019.*

15A NCAC 18C .1527 is readopted as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .1527 CERTIFIED LABORATORIES**

~~(a) For the purpose of determining compliance with the requirements of this Section, samples may be considered only if they have been analyzed by a laboratory certified by the Division of Laboratory Services Laboratory Certification Branch. However, measurements for turbidity, free chlorine residual, temperature and pH may be performed by any person who has been instructed in the appropriate procedure by the Department or a certified laboratory. Measurements may also be performed by a person who holds a valid certificate issued by the North Carolina Water Treatment Facility Operators Board of Certification.~~

~~(b) Nothing in this Section shall be construed to preclude the Department or any duly designated representative from taking samples or from using the results from such samples to determine compliance by a supplier of water with the applicable requirements of this Section.~~

(a) The provisions of 40 C.F.R. 141.28 are [~~hereby~~] incorporated by [~~reference~~] reference, including [~~any~~] subsequent amendments and editions, with the following exceptions:

(1) [~~Laboratories~~] laboratories analyzing samples [~~under~~] pursuant to this Subchapter [~~must~~] shall be certified for that analytical method by the State Laboratory of Public Health in the Department of Health and Human Services; and

(2) [~~Measurements~~] measurements for alkalinity; bromide; fluoride calcium; daily chlorite samples at the entrance to the distribution system; conductivity; orthophosphate; pH; residual disinfectant concentrations for chlorine, chloramines, and chlorine dioxide; magnesium; silica; Specific Ultraviolet Absorbance (SUVA); temperature; Total Organic Carbon (TOC); and turbidity may be performed by any person who holds a valid certificate issued by the North Carolina Water Treatment Facility Operators Board of [~~Certification,~~] Certification (NCWTFOBOC). Measurements may also be performed by a person who has been instructed in the [~~appropriate~~] measurement procedure by a person who holds a valid certificate issued by the NCWTFOBOC or by [~~any person who has been instructed in the appropriate procedure by the Department or~~] a certified laboratory.

(b) Copies may be obtained [~~are available for public inspection~~] as set forth in Rule [~~.0102(a) and~~] .0102(b) of this Subchapter.

*History Note:* *Authority G.S. 130A-315; P.L. 93-523; 40 C.F.R. 141;*
*Eff. September 1, 1979;*
*Amended Eff. March 31, 1981;*
*Transferred and Recodified from 10 NCAC 10D .1629 Eff. April 4, 1990;*
*Amended Eff. April 1, 1992; September 1, 1990;~~1990.~~*
*Readopted Eff. July 1, 2019.*

15A NCAC 18C .1804 is amended as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .1804 NOTICE**

(a) A local approval program shall submit an annual notice to the ~~Department~~ [~~to identify~~] ~~of~~ Department, identifying each approval of ~~the~~ construction or alteration of the distribution system of a community water system. The local approval program shall retain a copy of the application and approved engineering [~~plans,~~] plans and shall provide a copy to the Department upon request. ~~The notice shall consist of one copy of the application with construction plans, any revisions made to the plans and the final approval letter.~~

(b) The local approval program shall provide notice to the department within 10 days of any change in staff, ~~budget~~ budget, or other resources ~~which~~ that may affect the program's ability to ~~effectively~~ carry out the plan review program.

(c) Upon completion of the construction or alteration of the distribution system, the applicant shall submit a statement to the local approval ~~program~~ program, signed by a registered professional ~~engineer~~ engineer, stating that construction was completed in ~~substantial~~ accordance with approved plans and specifications and revised only in accordance with 15A NCAC 18C .0306 of this Subchapter. The statement shall be based upon ~~adequate~~ observations during and upon completion of construction by the engineer or a representative of the engineer's office who is supervised by the engineer. The local approval program shall provide a copy of the statement to the ~~Department.~~ Department upon request.

*History Note:* *Authority G.S. 130A-317; 1985 S.L., c. 697, s. 3;*
*Eff. January 1, 1986;*
*Amended Eff. December 1, 1988;*
*Pursuant to G.S. 150B-21.3A, rule is necessary without substantive public interest Eff. November 23, 2015;~~2015.~~*
*Amended Eff. July 1, 2019.*

15A NCAC 18C .2002 is amended as published in 33:11 NCR 1147 with changes as follows:

**15A NCAC 18C .2002 DISINFECTION**

(a) The provisions of 40 C.F.R. 141.72 are ~~hereby adopted~~ incorporated by ~~reference~~ reference. ~~in accordance with G.S. 150B-21.6~~ including subsequent amendments and editions. Copies may be obtained ~~are available for public inspection~~ as set forth in Rule ~~.0102~~ .0102(b) of this Subchapter. These provisions are adopted with the following exceptions:

(1) Water entering the distribution system. In 40 C.F.R. 141.72 (a)(2), (a)(3), and (b)(2), "0.2 mg/l" of residual disinfectant concentration shall be replaced with "0.2 mg/l measured as free chlorine when chlorine is the ~~singular~~ only applied disinfectant and 1.0 mg/l measured as total chlorine when ammonia and chlorine are applied disinfectants."

(2) Water in the distribution system at coliform sampling sites. In 40 C.F.R. 141.72(a)(4) and (b)(3), "undetectable" shall be replaced with "less than 0.2 mg/1 measured as free chlorine when chlorine is the ~~singular~~ only applied disinfectant and less than 1.0 mg/l measured as total chlorine when ammonia and chlorine are applied disinfectants."

~~(3)~~ (b) Water in the distribution system at maximum residence time sites. For samples collected at maximum residence time sites or at other locations with high water age as required by Rule .1302(a)(2) of this Subchapter, residual disinfectant concentrations shall be at detectable levels as set forth and calculated in 40 C.F.R. 141.72(a)(4) and (b)(3).

[~~(4)~~] (c) All surface water treatment facilities shall include chemical disinfection for a minimum 0.5 log Giardia inactivation.

*History Note:* *Authority G.S. 130A-315; P.L. 93-523; 40 C.F.R. 141.72;*
*Eff. January 1, 1991;*
*Amended Eff. April 1, 2014; October 1, 2009;*
*Pursuant to G.S. 150B-21.3A, rule is necessary without substantive public interest Eff. November 23, 2015;~~2015.~~*
*Amended Eff. July 1, 2019.*