

WATERWORKS ADVISORY COMMITTEE MEETING
 Sydnor Hydro, Inc., 2111 Magnolia St, Richmond, VA 23223

Thursday March 15, 2018
9:00 am – Noon

8:45 AM Arrival, Meet and Greet (as schedules permit)

DRAFT AGENDA

Subject	Time
Call to Order, Introductions of Members and Guests	9:00 AM - 9:20 AM
Adoption of Minutes from September 2017	9:20 AM - 9:25 AM
Public Comments	9:25 AM – 9:35 AM
Overview of ODW Plans and Priorities for 2018, including 2018 General Assembly Session update.	9:35 AM – 10:15 AM
Draft Regulations Review/Issues/Discussion: Part III: Manual of Practice for Waterworks Design (beginning at 12VAC5-590-640) <ul style="list-style-type: none"> a. Membrane Filtration, Section 882 b. Ultraviolet Light (UV) Disinfection, Section 1005 c. Fluoride, Section 930 d. Cross-connection, Section 580 e. Service lines and meters, Section 1230 f. Total water production, Section 700 	10:15 AM – 11:15 AM (Include 10 minute break)
Brief Overview of the regulatory process. Forming Regulatory Advisory Panel (RAP) for follow-up discussions. Discuss comments received from NOIRA.	11:15 AM – 11:45 AM
Scheduling future meetings: allotted time for meetings, schedule for meetings, and soliciting new membership requests.	11:45 AM – Noon (adjourn)

Future meetings currently scheduled for May 17, 2018, July 19, 2018, September 20, 2018, and November 15, 2018.

DEPARTMENT OF HEALTH
Amended Waterworks Regulations

12VAC5-590-882. Membrane filtration.

A. Applicability. This section pertains to the use of membrane filtration to provide for pathogen and turbidity removal. The design requirements when using this technology for other purposes, such as for softening or organics removal, shall be established by the commissioner on an individual basis.

B. Membrane filtration systems shall meet all requirements contained in 12VAC5-590-401 E 6 b to be granted removal credit for Giardia lamblia and Cryptosporidium.

C. A demonstration study shall be conducted on the water to be treated prior to the installation of a membrane filtration system unless the owner can demonstrate to the satisfaction of the commissioner that the supply water quality range over all four seasons of a year will be adequately treated by the proposed design.

D. All membrane treatment units for pathogen and turbidity removal shall employ microfiltration or ultrafiltration using hollow fiber, positive pressure driven membrane filtration technology. They may employ either an inside-to-outside or outside-to-inside flow direction.

E. The number of membrane units shall be a function of the overall treatment facility capacity, waterworks capacity, and water demand. Multiple membrane units shall be provided where the treatment facility design capacity exceeds 0.5 MGD.

F. Approved materials and chemicals.

1. All membrane materials and associated piping, components, etc. in contact with the water shall be in accordance with 12VAC5-590-810.

2. Chemicals used in any membrane cleaning process shall be in accordance with 12VAC5-590-515.

G. Turbidity monitoring. Continuous indicating and recording equipment meeting the requirements of 12VAC5-590-770 B shall be provided for the following locations:

1. Source water;

2. Pretreated water, such as by coagulation, flocculation and sedimentation (if applicable);

3. Filtrate from each membrane unit; and

4. Combined filter effluent, where more than one membrane unit is installed.

H. Indicating and recording equipment for entry point chlorine residual monitoring shall be provided. Indicating and recording equipment for filtered water temperature monitoring shall be provided.

I. Pressure monitoring:

1. Indicating equipment shall be provided for monitoring pressure drop across any prefilter.

2. Indicating and recording equipment shall be provided for monitoring pressure drop across membrane modules, i.e., transmembrane pressure.

3. Integrity monitoring. Indicating and recording equipment for direct integrity test monitoring shall be provided and shall document the date, time, and results of every test performed on each unit.

J. Flow measurement. Equipment shall be provided for measuring or calculating the following flows:

1. Source water, gpm and totalized;
2. Filtrate from each unit, gpm and totalized;
3. Flux from each unit, gpd/sf;
4. Recirculation to each unit, gpd or percent of feed flow, if applicable;
5. Entry point, gpm and totalized; and
6. Waste.

K. An alarm system shall be provided that will report alarm conditions and shut down the treatment plant and entry point flow as necessary.

1. All alarms shall be reported to a location manned 24 hours per day or to a person on-call and shall report alarm conditions audio-visually at the water treatment plant.
2. At a minimum, the following points shall be monitored by the alarm system. Alarm and shut down set point conditions will be determined by the commissioner on an individual basis.
 - a. Feed water flow;
 - b. Feed water turbidity, if required by the commissioner;
 - c. Filtrate turbidity from each unit exceeding operational control criteria;
 - d. Membrane direct integrity test initiation, failure, and exceeding operational control criteria; and
 - e. Entry point disinfectant residual.

L. Sample taps shall be provided to monitor the following:

1. Source water;
2. Source water storage tank effluent;
3. Feed water after prefiltration;
4. Filtrate from each membrane unit;
5. Combined filtrate from all units;
6. Entry point; and
7. Additional sample taps to monitor the presence of cleaning solutions used in either the backwash or cleaning operations.

M. Equipment shall be provided, using variable frequency drive or other suitable means, to adjust the feed pump output in order not to exceed the design flux in the event modules are taken off line.

N. Pressure gauges.

1. A portable, pocket-type pressure gauge, of the correct range and accuracy for the application and with the capability of being calibrated, shall be provided to check the pressure readings of the pressure transducers installed on the membrane units.
2. At each location of a pressure transducer, a ¼-inch diameter pressure gauge with American National Standard Taper Threads (NPT) connection shall be provided to facilitate the connection of a portable, pocket-type test gauge.

O. Clean-in-place systems, including tanks, piping, all joints, and valves shall be compatible with the cleaning solution and shall be corrosion resistant.

P. An operation and maintenance manual shall be provided for all membrane filtration treatment units. The operation and maintenance manual shall include the following:

1. A maintenance schedule for each piece of equipment.
2. Operation procedures, including software user instructions.
3. A trouble shooting guide.
4. Identification of specific proprietary equipment or software not available to the owner or operator.
5. A service call number.
6. DIT requirements.
7. Chemical cleaning instructions.
8. A detailed description of the treatment units and control of each unit for optimal performance.

Q. A means shall be provided to isolate a compromised module or fiber or both. A means to visually inspect modules while simultaneously conducting the DIT shall be provided. Alternatively, sonic testing equipment providing a relative accelerometer reading shall be provided where visual inspection cannot be performed.

12VAC5-590-930. Fluoridation.

~~Where practicable and feasible, the board may require owners of waterworks to provide artificial fluoridation so as to bring the fluoride ion concentration to the optimum level as set forth in Article 1 of Part II.~~

~~A. The board recommends that all community waterworks in Virginia be optimally fluoridated. Prior to the issuance of a permit for fluoridation, plans, specifications, operating procedures, and methods of supervision shall be submitted to the division. These shall be in conformity with requirements to be determined for each individual installation by the division. Fluoridation feed systems shall be designed to deliver the optimum fluoride ion concentration of 0.7 mg/L as determined by the U.S. Department of Health and Human Services.~~

~~B. Fluoride compounds. Commercial sodium fluoride, sodium silicofluoride fluorosilicate (also called sodium silicofluoride) and fluorosilicic acid (also called hydrofluorosilicic acid) shall conform to the applicable AWWA standards or NSF/ANSI standard, as appropriate. Use of other chemicals which may be made available must be approved by the division.~~

~~C. Fluoride compound storage. Fluoride chemicals shall be isolated from other chemicals to prevent contamination. Compounds shall be stored in covered or unopened shipping containers in a separate room (except sodium fluoride saturators) with the chemical feeder. The room must be provided with mechanical ventilation to the outside of the building.~~

~~D. Chemical feed installations.~~

~~1. Chemical feed installations shall conform to [12VAC5-590-860](#).~~

~~2.1. Scales and loss-of-weight/loss-of-weight recorders for dry chemical feeders and hydrofluorosilicic acid feeders shall be provided.~~

~~3. Feeders~~ 2. Fluoride metering pumps shall have an accuracy so that the actual feed rate will be within 5.0% of the intended feed rate.

3. The point of application shall be so located to provide adequate mixing.

~~4. The point of application of hydrofluorosilicic acid, if into a pipe, shall be so located as to provide adequate mixing.~~

~~5.4. All fluoride feed lines shall be provided with adequate antisiphon/anti-siphon devices.~~

5. Design of fluoride saturators shall consider:

a. The source water hardness. The water applied to sodium fluoride saturator feeders shall be softened if the hardness exceeds 50 mg/L.

b. The fluoride source. Use only sodium fluoride in saturators.

c. A flow restrictor with a maximum flow of 2.0 gpm on all upflow saturators.

~~6. The water applied to sodium fluoride saturator feeders shall be softened if hardness exceeds 75 milligrams per liter.~~

~~7. Unless otherwise approved, fluoride shall be applied to the raw water with the feeder paced by the raw water meter.~~

6. Adequate fluoride feed rate control and mixing shall be provided.

87. Provisions shall be made for venting hydrofluorosilicic acid carboys to the outside of the building when the carboys are in use.

E. Suitable protective equipment shall be provided which includes gloves, aprons, dust mask, and goggles.

F. Suitable equipment shall be provided for ~~wet mopping~~ wet mopping and hosing dust that might accumulate in the plant. Dry feeders shall be equipped with bag loading hoppers.

G. Equipment shall be provided for measuring the quantity of fluoride ion in the water. Testing equipment shall be colorimetric or electrode type as approved by the ~~division~~ commissioner.

H. At least 90 days prior to ceasing operation of a fluoride feed system, or as soon as practical, a waterworks owner should provide written notice to the commissioner of the intent to discontinue fluoridation at the waterworks.

12VAC5-590-1005. Ultraviolet light (UV) disinfection.

A. All UV reactors shall conform to NSF/ANSI standards.

B. Each reactor train shall be equipped with an individual flow meter, or a single flow meter in conjunction with differential pressure sensors in each treatment train. Reactors shall be sized to treat the design flow.

C. Hydraulic design shall ensure that lamps are submerged, and that the entrance of air, negative pressure, or pressure surges in the reactors is prevented. Open channel flow reactors are prohibited.

D. A pressure gauge shall be provided upstream of each reactor. The design shall ensure that the reactor's maximum rated pressure cannot be exceeded.

E. Water quality parameters that may affect UV disinfection system performance shall be evaluated, including calcium, iron, manganese, hardness and alkalinity. Pretreatment shall be considered for water quality parameters that may result in lamp sleeve fouling.

F. A building to enclose and protect all UV equipment shall be provided. Adequate space between control panels, power supply, and the reactor equipment shall be provided to allow for routine operation and maintenance, including removing lamp and wiper assemblies and for off-line chemical cleaning of reactor lamps.

G. An operation and maintenance manual shall be provided for all UV reactors.

H. UV systems may be used for primary disinfection and shall be granted log inactivation credit for *Giardia lamblia*, *Cryptosporidium*, and viruses in accordance with **Table 401.7**, provided that they meet the requirements of **12VAC5-590-401 E 7 c** and this subsection.

1. Only UV reactors that have undergone independent, third-party oversight of the validation testing on a fully assembled system to determine the operating conditions under

which the reactors deliver the required UV dose shall be considered for log inactivation credit.

2. The dose-monitoring strategy shall be either the UV intensity set point approach or the calculated dose approach as described in the Ultraviolet Disinfection Guidance Manual For The Final Long Term 2 Enhanced Surface Water Treatment Rule, Office of Water (4601), EPA 815-R-06-007, November 2006. The dose-monitoring strategy shall be demonstrated through the UV reactor validation testing.

3. At least two reactors shall be provided. Reactors shall be sized to treat the design flow with the largest reactor out of service.

4. Continuous monitoring sensors shall be provided to measure UV intensity. A continuous sensor shall also be provided to measure UVT if the calculated dose approach is utilized.

a. The number of sensors provided shall be the same as that used in validation testing of the reactor.

b. Output from a continuous UVT analyzer shall be capable of being input directly into a control loop for each UV reactor, a SCADA system, or both. A bench top spectrophotometer may be provided in lieu of a continuous UVT analyzer.

c. All signals from sensors shall be displayed for operator response and for recordation.

d. At least one reference sensor for calibration of on-line UV intensity sensors shall be provided. Reference sensors shall be capable of calibration against a traceable standard.

e. Continuous recording equipment shall be provided with the monitoring sensors to store in memory or print one data point at least every 4 hours.

5. A means of flow distribution and control among multiple reactors shall be provided. The hydraulic flow profiles and piping configuration shall be identical to or more protective than that tested during equipment validation.

a. For on-site validation, the inlet and outlet piping configuration for the UV facility shall be designed according to manufacturer recommendations and to accommodate any site-specific constraints.

b. To avoid jetting flow and swirling flow, consideration shall be given to exclude expansions for at least ten (10) pipe diameters upstream of the reactor and to exclude out-of-plane 90 degree-bends in seriesd.

c. Each UV reactor shall be capable of being isolated and removed from service. Isolation valves upstream and downstream of each reactor, a drain, and sample taps for each reactor treatment train shall be provided. If the isolation valves are also used for flow control, the flow control valve shall be located downstream of the UV reactor to limit the disturbance of the flow entering the UV reactor. Bypass piping shall not be allowed.

d. The lateral piping for each UV reactor train shall be sized and configured to provide approximately equal head loss through each UV reactor train over the validated range of flow rates.

6. The control system shall be capable of meeting the monitoring and reporting requirements in 12VAC5-590-401 and 12VAC5-590-570.

7. Automatic shutdown capability under critical alarm conditions shall be provided, including: lamp/ballast failure, low liquid level, and, high temperature. Alarms shall be provided for low UV validated dose, low UV intensity, low UV transmittance, high flow rate, and mechanical wiper failure.

8. Ground-fault circuit interrupters shall be provided for all lamps. Back-up power shall be considered.

9. The owner shall develop a start-up plan and submit the plan to ODW for approval. The plan shall include functional testing, determination of validated operating conditions and control settings, performance testing, development of an operation and maintenance manual, and inspection schedules.

1. UV systems not intended for primary disinfection may be used provided that they meet the requirements of this subsection.

1. Continuous sensors to measure UV intensity shall be considered.

2. Each UV reactor shall be capable of being isolated and removed from service and be provided with bypass piping.

3. Automatic shutdown capabilities shall be provided in the event of lamp/ballast failure.

12VAC5-590-700. Metering total water production.

~~A. Waterworks providing chlorination only shall meter the water prior to treatment. The design of all community and nontransient noncommunity waterworks that provide treatment or produce greater than 300,000 gallons per month shall provide metering of total water production. If the waterworks treatment process or processes result in a waste flow, the design shall provide metering of total source water withdrawn and finished water produced. The design of all transient noncommunity waterworks that produce greater than 300,000 gallons per month shall provide metering of total water production.~~

~~B. Waterworks providing iron or manganese removal, or both, shall meter the water prior to treatment. Metering of total water production at waterworks that do not meet the conditions found in subsection A of this section is encouraged.~~

~~C. Waterworks providing softening by ion exchange, shall meter all water treated and total water delivered to the distribution system. D. Waterworks providing turbidity removal or softening by precipitation, or both, shall meter the water prior to and subsequent to treatment.~~

~~E. All waterworks shall provide metering of total water production.~~

Statutory Authority

§§ 32.1-12 and 32.1-170 of the Code of Virginia.

Historical Notes

Derived from VR355-18-007.07 § 3.7, eff. August 1, 1991; amended, Virginia Register Volume 9, Issue 17, eff. June 23, 1993.

12VAC5-590-1230. Metering Service lines and meters.

A. Each All new service connections in community waterworks service-connection
should shall be metered.

B. Water pipe and appurtenances between the water main and the service connection
shall conform to all applicable codes.

Statutory Authority

§ 32.1-12 and 32.1-170 of the Code of Virginia.

Historical Notes

Derived from VR355-18-01213 § 3.60, eff. August 1, 1991.

Article 4

~~Cross-Connection Control and Backflow Prevention in Waterworks~~

12VAC5-590-580. General requirements for cross-connection control and backflow prevention.

~~A. The purpose of this article is to require as a condition for the issuance and continued use of the operation permit for the waterworks that each owner of a waterworks~~ Every owner shall establish and enforce a program of cross-connection control and backflow prevention for each waterworks cross connection control program (CCCP) in accordance with 12VAC5-590-360. The goal of the CCCP is to prevent the intrusion of contamination into the distribution system via cross connections and backflow. The cross-connection control and backflow prevention program shall be approved by the division prior to issuance of the operation permit (see Appendix I).

~~B. The owner shall not install or allow to be installed a water service connection to any premises where cross connections to a waterworks, consumer's water system, or auxiliary water system is known to exist, unless the cross connections are adequately safeguarded to the satisfaction of the owner and the commissioner.~~

~~C. The owner, in accordance with 12VAC5-590-510 C, shall maintain acceptable working pressures in the distribution system to reduce the potential for backflow to occur.~~

12VAC5-590-590. Cross-connections. (Repealed.)

~~A. The purveyor shall not install, maintain, or allow to be installed a water service connection to any premises where cross connections to a waterworks or a consumer's water system may exist unless such cross connections are abated or controlled to the satisfaction of the water purveyor or the division.~~

~~B. The purveyor shall not install, maintain, or allow to be installed any connection whereby water from an auxiliary water system may enter a waterworks or consumer's water system unless the auxiliary water system and the method of connection and use of such system shall have been approved by the water purveyor and by the division.~~

12VAC5-590-600. Responsibilities-CCCP responsibilities.

~~A. General. Effective cross-connection control requires the cooperation of the water purveyor, the building official, the consumer, the Virginia Department of Health, and the backflow prevention device tester.~~

~~B. Water purveyor.~~

~~1. The purveyor shall establish or cause to be established and operate a cross-connection control and backflow prevention program. The owner shall establish and operate a CCCP consistent with the extent of the distribution system and the type of consumer served. This program shall include at least one designated individual who shall be responsible for the inspection of the waterworks for cross-connection and backflow prevention control assigned by the owner to be in charge of the CCCP. Requirements for this position shall include training and experience in cross-connection control programs. This program shall be carried out in accordance with the Uniform Statewide Building Code and shall be a continuing program.~~

~~2. Suggested elements of this program are contained in Appendix I. The purveyor has full responsibility for water quality and for the construction, maintenance, and operation of the waterworks beginning at the water source and ending at the service connection.~~

~~3. The purveyor shall have thorough inspections and operational tests made at least annually of backflow prevention devices which are required and installed at the service connection.~~

B. The owner shall establish appropriate procedures to complete assessments of consumers' water systems, and shall determine both the degree of hazard and the appropriateness of existing safeguards.

C. The owner shall establish procedures for completing operational tests at least annually for testable backflow prevention assemblies, devices, and methods that provide containment and after installation, relocation, or repairs.

D. The owner shall provide a public education program to residential consumers, and commercial consumers whose water supply system is similar in use, size, and complexity to a residential system, where there are no known or suspected high hazards as identified in Table 630.1.

1. The public education program shall be designed to prompt consumer self-assessments, increase the awareness of cross connections, and inform the consumer of the public health hazards of backflow.

2. The CCCP public education program shall describe, at a minimum:

a. Causes of backflow;

b. Hazards and health effects of cross connections and backflow;

c. Resources available to identify actual or potential cross connections;

d. Safeguards to use to eliminate or reduce the hazards at the point-of-use; and

e. Sources for additional information.

~~4. In the event of backflow of pollution or contamination into the waterworks, the purveyor shall promptly take or cause corrective action, to confine and eliminate the pollution or contamination. The purveyor shall immediately notify the division when backflow occurs.~~

E. In the event of backflow of contaminants into the waterworks, the owner shall promptly take or cause corrective action to confine and eliminate the contamination. The owner shall report the event to the department within one business day, in the most expeditious manner. The owner shall submit a written report by the 10th day of the month following the month during which backflow occurred addressing the incident, its causes and effects, and safeguards required or other action taken. The owner shall discontinue or refuse water service to the consumer, to ensure that the waterworks is adequately protected from cross connections and backflow, if any of the following conditions occur:

1. A required backflow prevention assembly is not installed, tested, and maintained in accordance with the applicable sections of this chapter;

2. A required backflow prevention assembly has been removed or bypassed; or

3. An unprotected or inadequately protected cross connection is known to exist on the premises and the owner has determined that there is inadequate backflow prevention at the service connection.

F. The owner shall maintain an inventory of all assemblies, methods, and devices required and installed under 12VAC5-590-610.

G. The owner shall maintain records related to the CCCP implementation, and any other records required by the commissioner in accordance with 12VAC5-590-550.

~~5. The purveyor shall take positive action to ensure that the waterworks is adequately protected at all times. If a cross connection exists or backflow occurs into a consumer's water system or if the pressure in the waterworks is lowered below 10 psi gauge, the purveyor may discontinue the water service to the consumer and water service shall not be restored until the deficiencies have been corrected or eliminated to the satisfaction of the purveyor.~~

12VAC5-590-610. Containment policy of backflow.

~~A. An approved backflow prevention device~~ Backflow prevention assemblies or backflow elimination methods shall be installed (i) at each the service connection ~~to a consumer's water system where, in the judgment of the water purveyor or the division, a health, pollution, or system hazard to the waterworks exists.~~ ~~B. When, as a matter of practicality, the backflow prevention device cannot be installed at the service connection, the device may be~~ or (ii) located downstream of the service connection but prior to any unprotected takeoffs, unless point-of-use isolation protection is provided using appropriate backflow prevention assemblies or backflow elimination methods complying with the USBC.

~~CB.~~ A backflow prevention device assembly or backflow elimination method shall be installed ~~at each service connection to a consumer's water system serving premises~~ where the following conditions exist:

1. ~~Premises on which any~~ A substance is handled in such a manner as to create an actual or potential hazard to a waterworks, ~~(this shall include premises having sources or systems containing including process fluids or used waters originating from a waterworks which are no longer under the control of the water purveyor)~~ connected to the consumer's water supply system;

2. ~~Premises having~~ There exists internal cross connections that, in the judgment of the ~~water purveyor~~ owner or the ~~division~~ commissioner, may not be easily correctable or have intricate or complex plumbing arrangements which that make it impracticable to determine whether or not cross connections exist;

3. ~~Premises where, because of~~ There are security requirements or other prohibitions or restrictions, ~~it is impossible or impractical to make a complete cross connection survey that prevent the assessment of all potential cross connections that may impair the quality of the water delivered;~~

4. ~~Premises having~~ There is a repeated history of cross connections being established or reestablished;

5. ~~Premises having fire protection systems utilizing combinations of sprinklers, fire loops, storage tanks, pumps, antifreeze protection, or auxiliary water sources including siamese connections (fire loops and sprinkler systems with openings not subject to flooding, and containing no antifreeze or other chemicals, no separate fire protection storage, or auxiliary sources, will not normally require backflow prevention); and~~

5. There are fire protection systems, lawn sprinkler systems, or irrigation systems that are connected directly to the waterworks with a separate service connection;

6. ~~Other premises specified by the division or the purveyor when cause can be shown that a potential cross connection hazard not enumerated above exists~~ 6. Cause can be shown by the commissioner or owner that a potential cross connection hazard exists.

~~D. Premises~~ C. The owner shall ensure that premises having booster pumps or fire pumps connected to the waterworks shall be equipped with a low-pressure regulating or cutoff device to shut off the booster pump when the pressure in the waterworks drops to a minimum of 10 psi gauge control devices to prevent a reduction of pump suction line pressure to less than 20 psig.

~~E. An approved~~ D. A backflow prevention device assembly or backflow elimination method shall be installed at each service connection to a consumer's water system serving, but not necessarily limited to, monitored at the following types of facilities:

1. Hospitals, mortuaries, clinics, veterinary establishments, nursing homes, and medical buildings;

2. Laboratories;

3. Piers, docks, and waterfront facilities;
4. Sewage treatment plants, sewage pumping stations, or storm water pumping stations;
5. Food and beverage processing plants;
6. Chemical plants, dyeing plants and pharmaceutical plants;
7. Metal plating industries;
8. Petroleum or natural gas processing or storage plants;
9. Radioactive materials processing plants or nuclear reactors;
10. Car washes and laundries;
- ~~11. Lawn sprinkler systems, and irrigation systems;~~
- ~~12. Fire service systems;~~
11. Buildings with commercial, industrial, or institutional occupants served through a master meter;
- ~~13~~12. Slaughter houses and poultry processing plants;
- ~~14~~13. Farms where the water is used for other than household purposes;
- ~~15~~14. Commercial greenhouses and nurseries;
- ~~16~~15. Health clubs with swimming pools, therapeutic baths, hot tubs, or saunas;
- ~~17~~16. Paper and paper products plants and printing plants;
- ~~18~~17. Pesticide or exterminating companies and their vehicles with storage or mixing tanks;
18. Lawn care companies and their vehicles with storage or mixing tanks;
19. Schools or colleges with laboratory facilities; and
- ~~20. Highrise buildings (four or more stories);~~
- ~~21. Multiuse commercial, office, or warehouse facilities; and~~
- ~~22~~20. Others specified by the purveyor owner or the division commissioner when reasonable cause can be shown for a potential backflow or cross connection hazard.

E. All temporary or emergency service connections shall be protected where reasonable cause can be shown for a potential backflow or cross connection hazard. Devices used shall be appropriately certified or approved to match the requirements of this section.

~~12VAC5-590-620. Type of protection required. (Repealed.)~~

~~The type of protection required shall depend on the degree of hazard which exists or may exist and on the method of potential backflow. Backflow occurs either by back pressure or by back siphonage.~~

~~The degree of hazard, either high, moderate, or low, is based on the nature of the contaminant; the potential of the health hazard; the probability of the backflow occurrence; and the effect on waterworks structures, equipment, and appurtenances used in the storage, collection, purification, treatment, and distribution of pure water.~~

~~Table 2.10 shall be used as a guide to determine the degree of hazard for any situation.~~

~~A. Air gaps give the highest degree of protection and shall be used whenever practical to do so in high hazard situations subject to back pressure.~~

~~B. An air gap separation and a reduced pressure principle backflow prevention device will protect against back pressure when operating properly. Vacuum breakers will not protect against back pressure, but will protect against back siphonage when operating properly.~~

~~C. Backflow prevention devices consisting of dual independent check valves with or without an intermediate atmospheric vent shall only be used in low hazard situations.~~

D. Barometric loops are not acceptable.

E. ~~An interchangeable connection or change-over device has limitations which prevent its use where back pressure is present or may occur, the auxiliary supply is not an approved source, or the waterworks line pressure is less than 20 psi. Since this type connection is one of the easiest to bypass, the use of this type device will be approved only as a temporary and continuously supervised arrangement. In most instances, an approved device or method must be included and approved by the purveyor and division.~~

12VAC5-590-630. Backflow prevention assemblies, devices, and methods for containment.

A. Any backflow prevention assembly or device shall be of the approved type and shall comply with the Uniform Statewide Building Code USBC.

B. ~~Any backflow prevention device shall be installed in a manner approved by the water purveyor and in accordance with the Uniform Statewide Building Code.~~

B. General Safeguards

1. The backflow prevention assembly or backflow elimination method used shall depend on the degree of hazard that exists or may exist. The safeguard shall ensure maintenance of the distribution system water quality and its usefulness.

2. The degree of hazard, either high or low, is based on (i) the nature of the contaminant; (ii) the potential of the health hazard; (iii) the potential method of backflow (either by backpressure or by backsiphonage); and (iv) the potential effect on waterworks structures, equipment, and appurtenances used in the storage, collection, purification, treatment, and distribution of potable water. Table 630.1 shall be used as a guide to determine the degree of hazard for any situation.

Table 630.1.

Determination of Degree of Hazard.

<u>Cross connections that meet or may meet the following conditions shall be rated at the corresponding degree of hazard.</u>	
<u>High Hazard</u>	<u>Low Hazard</u>
<u>The contaminant would be toxic, poisonous, noxious or unhealthy of questionable quality.</u>	<u>The contaminant would only degrade the quality of the water aesthetically or impair the usefulness of the water.</u>
<u>A health hazard would exist.</u>	<u>A health hazard would not exist.</u>
<u>The contaminant would disrupt the service of piped water for human consumption.</u>	<u>The contaminant would not disrupt service of piped water for human consumption.</u>
<u>High probability that backflow would be by either backpressure or backsiphonage.</u>	<u>Low probability that backflow would occur by backsiphonage.</u>
<u>Examples - sewage, used water, nonpotable water, auxiliary water systems, and mixtures of water and other liquids, gases, or other toxic or hazardous chemicals.</u>	<u>Examples - food residuals, nontoxic chemicals, and nonhazardous chemicals.</u>

3. The USBC shall be used to determine appropriateness of backflow prevention assembly and device application for containment.

~~C. Existing backflow prevention devices approved by the purveyor and the division prior to the effective date of this chapter shall, except for inspection, testing, and maintenance requirements, be excluded from the requirements of 12VAC5-590-600 A and B if the water purveyor and the division are assured that the devices will protect the waterworks.~~

C. Backflow prevention devices or assemblies with openings, outlets, or vents that are designed to operate or open during backflow prevention shall not be installed in areas subject to flooding or in pits and shall be installed in a free atmosphere. They shall not be installed in such a manner as to be able to be bypassed.

D. Persons testing and repairing backflow prevention assemblies shall be certified to do so by the DPOR, Virginia Board for Contractors, under the Tradesman Regulations.

TABLE 2.10. DETERMINATION OF DEGREE OF HAZARD	
Premises with one or more of the following conditions shall be rated at the corresponding degree of hazard.	
High Hazard	The contaminant would be toxic, poisonous, noxious or unhealthy.
-	A health hazard would exist.
-	A high probability exists of a backflow occurrence either by back pressure or by back siphonage.
-	The contaminant would disrupt the service of piped water for human consumption.
-	Examples – sewage, used water, nonpotable water, auxiliary water systems, toxic or hazardous chemicals, etc.
Moderate Hazard	The contaminant would only degrade the quality of the water aesthetically or impair the usefulness of the water.
-	A health hazard would not exist.
-	A moderate probability exists of a backflow occurrence either by back pressure or by back siphonage.
-	The contaminant would not seriously disrupt service of piped water for human consumption.
-	Examples – food stuff, nontoxic chemicals, nonhazardous chemicals, etc.
Low Hazard	The contaminant would only degrade the quality of the water aesthetically.
-	A health hazard would not exist.
-	A low probability exists of the occurrence of backflow primarily by back siphonage.
-	The contaminant would not disrupt service of piped water.
-	Examples – food stuff, nontoxic chemicals, nonhazardous, chemicals, etc.



**The Virginia Chapter
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Association**
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11/14/2017

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TO: Jeff Wells
Director of Technical Services
Office of Drinking Water
Virginia Department of Health
109 Governor St.
Richmond, VA 23219

Dear Mr. Wells,

In regards to the pending changes to the Virginia Waterworks Regulations (Regulations), the Virginia Chapter of the American Backflow Prevention Association (VA ABPA) are grateful for the opportunity to provide input. Our primary interest is to protect our drinking water from contamination through cross connections on both sides of the service connection. While we want to ensure our water is protected on both sides of the service connection, our primary focus with this tasking is focused more on the Water System Owner (Owner) since they are governed by the Virginia Waterworks Regulations (Regulations).

The VA ABPA is aware of and supports the 2013 Memorandum of Understanding between the Virginia Department of Health (VDH) and the Virginia Department of Housing and Community Development (DHCD). Additionally, the VA ABPA realizes that one of the primary objectives of the earlier Regulatory Advisory Panel (RAP) was to remove duplication between the Uniform Statewide Building Code (USBC) and the Regulations, but in the attempt to do so, we feel that some regulatory guidance and intent that serves as a means for the water system owner to ensure a safe water distribution system may have been removed in the process. Particularly with some of the additional editing that has occurred since 2015 when the RAP adjourned. We can understand wanting to avoid duplication, but when dealing with the consumers or the public water supply as a whole, having some duplicate regulations to ensure both parties are overseeing the safety of the water supply is not necessarily a bad thing. The ramifications of not doing so could prove to be catastrophic. As a comparative example, if a grease interceptor is not installed properly under the provisions of the USBC, there is the potential for grease to be introduced into the sewer system. Comparatively, if a toxic chemical, or process/industrial fluid contaminant from a consumer added piece of equipment or piping section backflows into the water system, you have the potential to adversely affect multiple consumers, in large neighborhoods, or even entire cities. Case in point – Corpus Christi, Texas 2016.

The VA ABPA feels strongly, that the owner and as such, the responsible party for the distribution system, should continue to have the authority and the ability to decide whether a containment backflow prevention assembly is required. The decision should be based on several factors including their survey and site assessments, their relationship with their building official, and their available resources to conduct regular thorough on site surveys (IE: containment is an effective means to ensure protection of your water system when continued surveys are unsustainable by the owner).

While we wholeheartedly respect and appreciate the oversight our USBC officials provide during the new construction and permitted renovation process, it still may leave the water system owner subject to potential contamination. A consumer's water supply system may have all hazards identified by the building official when the certificate of occupancy is issued at the time of construction, but later in time unknown changes performed by the consumer, or present day identifiable hazards that were not covered by the USBC at the time of construction, can leave the water system owner's system at risk. (Examples would include: older buildings with fire sprinkler systems without backflow prevention protection, added irrigation systems, potential or actual cross connections created between auxiliary water sources and public water, automatic chemical feeding systems that are added without permit, changes in production processes at factories, and the bypassing of currently installed backflow protection assemblies or devices). Typically, these scenarios occur as a matter of convenience for the consumer and are often undergone without the knowledge of the building official. They are but a few of the hazards that could potentially affect water quality in the distribution system and not be readily identified or prevented under even in the best permit inspection process. Additionally, point-of-use backflow prevention can be a very effective and economical means to provide protection, and the role that the USBC expertly fulfills by ensuring they are installed as required to ensure internal (isolation) protection at restaurants, malls, factories, etc., is paramount. However, the owner should always have the authority to decide whether a containment backflow assembly is required, or whether an isolation point-of-use device or assembly complying with the provisions of the USBC can substitute for containment.

The revision of these regulations have taken decades to address, and if passed into law we will more than likely have these new changes for decades to come. The proposed changes, in their current form as provided to our association in July of 2017, would require many municipalities to walk back their programs thus providing less safety for our water systems. Our association has members from across the state representing the cross connection control industry from both the government and private sectors. We have a vested interest and will be impacted by any changes to these regulations. We feel we shouldn't approve revised regulations that could leave any potential for risk to the water system. We have a deep appreciation and respect for both the USBC and the VDH regulatory authorities, but feel certain high hazards warrant the attention of both parties. Additionally, there are water system owners that could be vulnerable to contamination issues in localities that have not adopted the Virginia Maintenance Code if certain authorities are removed. If the water system owner is to have the responsibility to ensure the distribution system is protected, then they must have the regulatory authority to ensure their system is contained as they deem necessary, be it existing, new, or post construction conditions. Areas such as the safety of our water supply require some shared authority. As our current regulations state, it takes a joint effort across multiple agencies, parties, and individuals to have an effective cross connection control program.

Having stated as such, on behalf of our association, please find the enclosed attachment containing the recommendations from the VA ABPA in regards to the proposed regulatory revision.

Sincerely,

(Original Signed)
Thomas G. Fauber
Chapter President
Virginia Chapter of the American Backflow Prevention Association, Inc.
Williamsburg, VA
(757)259-4138



November 29, 2017

BY ELECTRONIC MAIL

Mr. Bennett Ragnauth
Virginia Department of Health
109 Governor Street
Richmond, Virginia 23219
Bennett.ragnauth@vdh.virginia.gov

Mr. Robert A. K. Payne
Virginia Department of Health
109 Governor Street
Richmond, Virginia 23219
rob.payne@vdh.virginia.gov

Re: NOIRA: 12 VAC 5-590 Waterworks Regulations

Dear Mr. Ragnauth and Mr. Payne:

I am writing on behalf of Mission H₂O to provide comments on the above-referenced Notice of Intended Regulatory Action (NOIRA), published in the Virginia Register on October 30, 2017 (34 Va. Register 508). I have also reviewed the Agency Statement provided on the Virginia Regulatory Town Hall. These comments are provided within the public comment period, which runs through November 29, 2017.

Mission H₂O is an informal stakeholder group focused on the management of Virginia's water resources and, in particular, developments affecting water supply and water availability. We have a broad membership that ranges from municipal water providers to manufacturers to agricultural operations and water supply professionals. The NOIRA directly affects our members that own and operate municipal waterworks. It also raises broader issues of interest to all of our members.

Our members are particularly interested in the proposed changes to Part II of the regulation, described in the NOIRA as "changes to source water quality and availability due to increased water demands, and new state law and regulations governing source water supply planning and withdrawal." 34 Va. Register 508. Additionally, the Agency Statement provides that Part II will "revise and clarify the procedure for determining surface water influence on groundwater sources."

Mission H₂O has been actively involved in the recent studies ordered by the General Assembly to review Virginia's water resource management programs, and the Eastern Virginia Groundwater Management Area. Many of these topics are relevant to the topics identified in the NOIRA and the Agency Statement.



Additionally, Mission H₂O has been engaged in discussions with the Department of Health and the Department of Environmental Quality regarding the definition and use of the term "safe yield." We understand that the amendments to the Waterworks Regulations may include changes to the safe yield provisions. Such changes have implications that go beyond the Waterworks Regulations, and require careful scrutiny and understanding. Several of our members participated in the regulatory advisory panel that met prior to the issuance of the NOIRA and have asked that Mission H₂O take a more active role on this regulation now that it is moving into the formal regulatory process.

For all of these reasons, Mission H₂O is interested in participating in the Regulatory Advisory Panel (RAP) for these regulatory amendments. Mission H₂O nominates Dean Dickey with the Prince William County Service Authority to serve as its representative on the RAP. Mr. Dickey's contact information is provided below. Mission H₂O also requests that I be designated as Mr. Dickey's alternate.

Mr. Dean Dickey
Prince William County Service Authority
Four County Complex Court
Woodbridge, VA 22195
ddickey@pwcsa.org
(703) 335-7900

Mission H₂O looks forward to working with you on the proposed amendments to the Waterworks Regulation. Thank you in advance for considering these comments and our nomination to the RAP.

Sincerely,

Andrea W. Wortzel
Troutman Sanders LLP
1001 Haxall Point
Richmond, VA 23219
(804) 697-1406

cc: Mission H₂O Members