Cross Connection Control

A purposeful program and ordinance overview with focus on residential hazards

Board of Commissioners General Meeting

8 May 2023

TOWN OF
HILLSBOROUGH

What is a cross connection?

- 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;
- *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
- an air gap, that does not meet the requirements of twice the diameter of the potable water pipe outlet and never less than one inch from the receiving vessel flood rim.

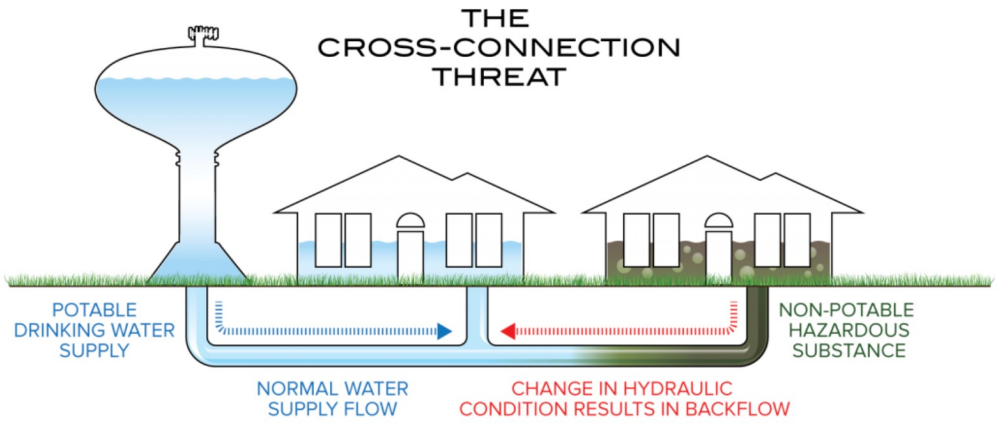
What is a cross connection? (con't)

A "cross-connection" shall mean any unprotected actual or potential connection or structural arrangement between a public or a consumer's water system and any other source or system through which it is possible to introduce any contamination or pollution, other than the intended potable water with which the system is supplied.

Bypass arrangements, jumper connections, removable sections, swivel or changeover devices, and other temporary or permanent devices through which or because of which "backflow" can or may occur are considered to be cross-connections.

What is backflow?

Backflow is the reversal of water flow, and it can present a risk to water quality in public water systems. That's why water utilities require some customers to install a backflow preventer.



Two types of backflow events

- Backpressure
  - Where pressure in private system is higher than system pressure and contaminated water is pushed into the public system
    - Could happen at higher elevations or if forced through pumps
    - Hills put the “Hills” in “Hillsborough”
- Backsiphonage
  - Where pressure in the public system drops and under certain conditions, contaminated water can be sucked into the public system
    - Could happen during a main break or upon hydrant use for flushing or fire fighting
    - Submerged hoses or fixed pipes

Types of connections

- An indirect cross-connection, as stated in the University of Southern California (USC) Manual of Cross Connection Control (Manual), Ninth Edition, is a connection that is subject to back siphonage only.
- The Manual defines a direct cross-connection as a connection that is subject to both backpressure and backsiphonage.
- Whether there is a temporary hose or permanent pipe making the connection is irrelevant.
  - However! Many local codes define as the above: direct = permanent piping and indirect = temporary like a hose

Taking chances

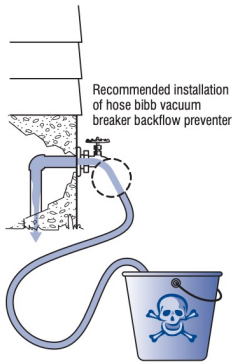
- In our lives, we have choice, and we take risks
  - We may be able to purchase a fancier car or motorcycle (the choice)
  - We may speed down the road every day and never get caught (the risk)
  - We may speed down the road and get caught and just get a ticket (moderate or low hazard – only impacts oneself)
  - We may speed down the road and kill someone (severe or high hazard – impacts many)
- A swimming pool is a choice. It carries risks of severe hazard.
- When a water purveyor does not do everything it can do to mitigate risk from contamination, there can be bad consequences.

Bad Consequences

Kool-Aid Laced With Chlordane

In August, 1978, a professional exterminator was treating a church located in a small town in South Carolina, for termite and pest control. The highly toxic insecticide chlordane was being mixed with water in small buckets, and garden hoses were left submerged in the buckets while the mixing was being accomplished. At the same time, water department personnel came by to disconnect the parsonage's water line from the church to install a separate water meter for the parsonage. In the process, the water was shut off in the area of the church building. Since the church was located on a steep hill, and as the remaining water in the lines was used by residents in the area, the church was among the first places to experience a negative pressure.

The chlordane was quickly siphoned into the water lines within the church and became mixed with the Kool-Aid being prepared by women for the vacation bible school. Approximately a dozen children and three adults experienced dizziness and nausea. Fortunately, none required hospitalization or medical attention.



Chlordane in the Water Main

In October, 1979, approximately three gallons of chlordane, a highly toxic insecticide, was sucked back (back-siphoned) into the water system of a residential area of a good sized eastern city. Residents complained that the water "looked milky, felt greasy, foamed and smelled," and as one woman put it, "It was similar to a combination of kerosene and Black Flag pesticide."

The problem developed while water department personnel were repairing a water main. A professional exterminator, meanwhile, was treating a nearby home with chlordane for termite elimination. The workman for the exterminator company left one end of a garden hose that was connected to an outside hose bibb tap in a barrel of diluted pesticide. During the water service interruption, the chlordane solution was back-siphoned from the barrel through the house and into the water mains.

Following numerous complaints, the water department undertook an extensive program of flushing of the water mains and hand delivered letters telling residents to flush their lines for four hours before using the water. Until the water lines were clear of the contaminant, water was hand-hauled into homes, and people went out of their homes for showers, meals and every other activity involving potable water. Fortunately, due to the obvious bad taste, odor and color of the contaminated water, no one consumed a sufficient quantity to endanger health.

Creosote in the Water Mains

Creosote entered the water distribution system of a southeastern county water authority in Georgia, in November, 1984, as a result of cross-connection between a ¾-inch hose that was being used as a priming line between a fire service connection and the suction side of a creosote pump. The hose continually supplied water to the pump to ensure the pump was primed at all times. However, while repairs were being made to a private fire hydrant, the creosote back-siphoned into the water mains and contaminated a section of the water distribution system.

Detailed investigation of the cause of the incident disclosed that the wood preservative company, as part of their operation, pumped creosote from collective pits to other parts of their operation. The creosote pump would automatically shut off when the creosote in the pit was lowered to a predetermined level. After the creosote returned to a higher level, the pump would restart. This pump would lose its prime quite often prior to the pit refilling, and to prevent the loss of prime, the wood preservative company would connect a hose from a ¾-inch hose bibb, located on the fire service line, to the suction side of the pump. The hose bibb remained open at all times in an effort to continuously keep the pump primed.

What is backflow prevention?

A backflow prevention device is a special kind of equipment designed to ensure that water from a private plumbing system cannot enter the public water supply (the Town of Hillsborough water system).

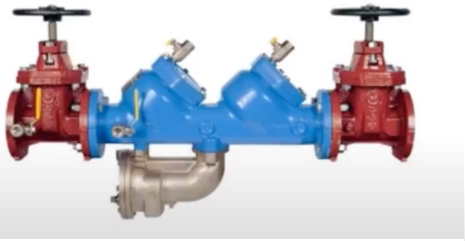
Backflow prevention is also referred to sometimes as cross-connection control or CCC.

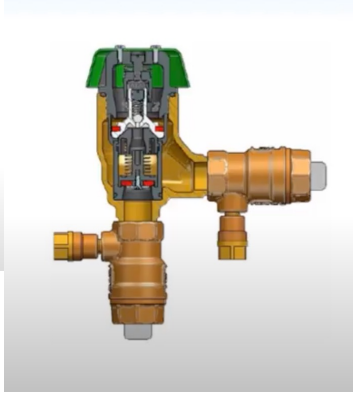
Town has 426 backflow assemblies, and counting

Source: YouTube

Backflow prevention types

- Air gap
  - For all hazards
- Dual check valve
  - Not for severe hazards
- Reduced pressure assembly
  - For all hazards
- Pressure vacuum breaker
  - Includes pressure and atmospheric vacuum breakers
  - Certain conditions for use of each





Backed by situations, science, and standards

The American Water Works Association (AWWA) recognizes water purveyors have the responsibility to supply potable water to their customers. In the exercise of this responsibility, water purveyors or other responsible authorities **must implement, administer, and maintain ongoing backflow prevention and cross connection control programs** to protect public water systems from the hazards originating on the premises of their customers and from temporary connections that may impair or alter the water in the public water systems

Backed by situations, science, and standards

- Besides regulations and known contamination events, there are many references for CCC:
  - US EPA Cross Connection Control Manual
  - University of Southern California Foundation for Cross Connection Control and Hydraulic Research (USC FCC&HR) Manual
  - American Waterworks Association Manual M14: Backflow Prevention and Cross Connection Control Recommended Practices
  - Training, Research and Education for Environmental Occupations (TREEO) Center – University of Florida – BACKFLOW PREVENTION Theory and Practice
  - American Society of Sanitary Engineering (ASSE)
  - American National Standards Institute (ANSI)
  - American Society for Testing and Materials (ASTM)
- Requires certified operators who attend school and take exams

Certified Cross Connection Control Operators

- The town has five cross connection control certified operators
- Operator responsibilities include:
  - Possess a valid certificate issued by the NC Water Treatment Facility Operators Board
  - Identify and eliminate existing and potential (?) cross connections
  - Ensure backflow assemblies installed in the system are documented and tested annually.

An operator's stress

I have yet to meet a business owner or homeowner that was not upset with me after they learned what [my utility] would require of them. We have been trying to educate the public, but that is only effective when people want to learn what you are offering. ***My job is to ensure that no cross-connections occur with our distribution system. As long as I am successful, I will toil in anonymity. However, the moment water is contaminated due the lack of backflow protection, the public will want to know why my job wasn't being done*** *and web searches for the purpose of backflow protection will spike. That is why my inspector's and I will attempt to educate one customer at a time.*

While frustration, displeasure, questions and requests for alternatives or extensions is understood by those which are asked to comply, the continued questioning about the competence of those who are passionate career water industry professionals brings mixed emotions.

I explained to my supervisor, as the ORC for CCC, it's my license, my livelihood and my freedom if I don't ensure that I protect the potential CC that I identify. I will deal with the public criticism, but I won't go to jail for negligence or out of fear.

Risk management

- In our lives, we are required to have insurance to protect against unexpected events
  - We pay big money every year for auto and home protection.
  - We may never need it, but it is there to mitigate.
  - Insurance requires us to cover those who are not insured or underinsured
- We spend a lot of staff time mitigating and planning for emergencies
- If a solar system is installed on a private home (another choice), nobody is arguing the requirement of the power company to install protective devices at the home to prevent energy back feed into the grid.
  - Why is this questioned of the experienced and certified experts running the water system for similar risk?

Risky business

- We are risking contamination from various sources by not fully enforcing our CCC ordinance.
- We are opening the town and its staff up to litigation.
- A water system has a regulatory, ethical and moral obligation to reduce risk of contamination.
- We are just doing our jobs in accordance with the code and cross connection control certified operator obligations.

Backflow prevention is insurance for our water system!

Federal Regulation

- The Safe Drinking Water Act (SDWA) of 1974 and the SDWA Amendments of 1986 are the basis of the federal drinking water regulations.
- Individual states (North Carolina) are responsible for enforcing the regulations and supervising public water systems.
  - may adopt additional or more stringent drinking water rules or regulations as long as the rules or regulations are not in conflict with SDWA and/or other federal rules or regulations.
- The water purveyor (Hillsborough) has the primary responsibility for preventing the introduction of pollutants or contaminants into the public drinking water distribution system.
- To accomplish this, water purveyors must establish and implement a CCC program.

State Regulation

- The North Carolina Department of Environmental Quality (NCDEQ), Division of Water Resources, Drinking Water Section publishes a document, *Rules Governing Public Water Systems*, which is comprised of the regulations applicable to the management of public water supply systems.
- Title 15A, Subchapter 18C, Sections .0300 and .0406, and Appendix B, Figure 2 of the *Rules Governing Public Water Systems* provides cross connection control minimum requirements and guidance.
- Water purveyors must establish a cross connection control policy and implement an operations and maintenance plan for backflow preventers.
- The addition of any unapproved supply of water to the distribution system is prohibited.
- The code has no grandfather clauses; therefore, both new and existing facilities are required to meet these requirements. After all, the potential exists.

State Regulation

- Two degrees of hazard for cross connections are defined in Appendix B, Figure 2: severe (high-health) and moderate (low health) hazards.
  - Severe hazards include cross connections that involve a health hazard/contaminant that if ingested can cause serious illness or death (aka high hazard/health)
  - Moderate hazards include cross connections that usually involve a pollutant that is not life threatening and does not cause permanent illness but does cause the water to become aesthetically objectionable or undesirable (aka low hazard/non-health)

State Regulation

- Appendix B – MINIMUM Requirements

Backflow Prevention Assembly Requirements: *Degree of hazard*	**Reduced Pressure Zone**	**Double Check Valve Assembly**	**Air Gap**
Severe	X	-------	X
Moderate	-------	X	-------

- Devices shall meet the American Society of Sanitary Engineering (ASSE) standard and carry an ASSE seal or is on the University of Southern California (USC) approval list.

State Regulation

Moderate Hazard - DCVA

- Fire sprinkler systems without booster pump facilities or chemical additives.
- Connection to tanks, lines and vessels that handle non-toxic substances.
- Lawn sprinkler systems without chemical injection or booster pumps.
- Most commercial establishments.
- Automatic service stations, bakeries and beauty shops with no health hazard and bottling plants with no back pressure.
- etc.

Severe Hazard – RPZ or Air Gap

- Lawn sprinkler systems with chemical injection or booster pump
- Wastewater treatment plants
- Connection to an unapproved water system or unapproved auxiliary water supply
- Connection to tanks, pumps, lines, steam boilers or vessels that handle sewage, lethal substances, toxic or radioactive substances
- Fire sprinkler systems with booster pump facilities or chemical additives
- Buildings with five or more stories above ground level

State Regulation

Severe Hazard – RPZ or Air Gap (continued)

- Hospitals and other medical facilities
- Morgues, mortuaries and autopsy facilities
- Metal plating facilities
- Bottling plants (subject to back pressure)
- Canneries
- Battery manufacturers
- Exterminators and lawn care companies
- Chemical processing plants
- Dairies
- Film laboratories
- Car wash facilities
- Dye works
- Laundries
- *Swimming pools*
- Waterfront facilities
- etc.

State reference to local plumbing code

- 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 all applicable local plumbing codes.
- Where required, the supplier of water shall install or require to be installed an appropriate testable backflow prevention assembly prior to making the service connection.

Local Plumbing Code

- Section P2902 of residential code
  - NC Residential Codes define swimming pools as “Any structure intended for swimming or recreational bathing that contains water over 24 inches deep. This includes in-ground, above-ground and on-ground swimming pools, hot tubs and spas”
- Section 608 of building code
- Code designed more to protect the home than the public water supply
- Orange County and the town have a contracted arrangement whereby the county performs the town’s building permitting and inspections
- Inspection is focused upon verification of installation (per manufacture requirements), freeze protection, lack of visible leaks and protection from physical damage.
- Testing is exempted from the plumbing code.
- As of June 2022, the county has issued 38 residential swimming pool permits since January 1, 2000.

Local Plumbing Code

- Town code states local plumbing inspector responsibility is to inquire about the intended use of water at any point where it is suspected that a cross-connection might be made or where one is actually called for by the plans.
  - When such is discovered, it shall be mandatory that a suitable, approved backflow prevention assembly approved by the North Carolina Building Code, North Carolina Department of Environment and Natural Resources and the town be required by the plans and be properly installed.
- There ”was” a gap between the county permitting and inspections and the town’s oversight of backflow prevention on swimming pools.
- As above ground pools and spas are difficult to detect, the town has focused on in-ground pools for now.

What constitutes a compliant CCC program?

Public Education

Public education is a vital component of a comprehensive and successful CCC program. Unfortunately, there are several examples of local and state municipalities that have banned CCC programs because they were not properly educated on the absolute necessity of the program and its associated costs.

Hazard Surveys

Hazard surveys locate and document every possible cross-connection hazard in your water system and then a backflow prevention device or assembly is installed to prevent the possible cross connection.

Periodic Inspection and Testing

Each testable backflow assembly in the water system must be tested and maintained on a REGULARLY SCHEDULED basis, enforced by the water authority. The best practice for testing and maintenance is ONCE PER YEAR to ensure proper operation of the valves.

Reporting and Record Keeping

As each backflow preventer is tested and maintained within your water system, the results must be kept and tracked in some type of filing or software system.

Enforcement

Enforcement

Enforcement

A successful and efficient CCC program MUST be enforced at all times for EVERY service within your water system. Any friendly exceptions, “grandfather” clauses, or conscious oversights can lead to the complete failure of your CCC program.

Our local ordinance

- Early 2000s water systems were required to perform vulnerability assessments
- Former director attended seminars and reached out to other utilities about their programs
  - local government, with the authority of the state, may also adopt additional or more stringent rules and regulations if they are not in conflict with the state law or regulations
- The town started creating a list of existing facilities with potential cross connections
- Section 14-56 of town code of ordinances, established 2008
  - Added more detail and enforcement conditions
  - Former ordinance mentioned cross connection but was limited in guidance

Our local ordinance

- Defines consumer as any water customer
- Establishes the town as the water purveyor
  - The specific objectives of the cross-connection control section are:
    - To protect the public potable water supply of the town from the possibility of contamination or pollution by isolating within the consumer's water system such contaminants, waterborne health hazards and other significant pollutants which could backflow into the public water systems.
    - To eliminate or control existing cross-connections, actual or potential, between the consumer's potable water system(s) and non-potable water system(s), plumbing fixtures and industrial piping systems.
    - To provide a continuing inspection program of cross-connection control which will systematically and effectively control all actual or potential cross-connections which may be installed in the future.
  - Despite what others are doing or the minimum state requirements, it is ultimately the town that determines the degree of hazard and backflow device necessary based on potential for contamination according to its responsibility in 14-56(b).

Our local ordinance

- The town will determine the degree of hazard or potential hazard to the public potable water system, the degree of protection required, and will ensure proper containment protection through an ongoing inspection program.
- The town will identify all facilities where approved backflow prevention assemblies are required to be installed.
- Provides for right of entry
- Lists the types of facilities needing backflow protection and type of protection – not all inclusive!
  - All facilities which pose a potential health hazard to the potable water system must have a reduced pressure principle backflow prevention assembly within 60 days of notification by the town.
  - an approved backflow prevention assembly may be required on all such services according to the degree of hazard present
- Institutes enforcement authority, compliance schedules and fines

The government perspective

EPA Cross Connection Control Manual AWWA Statement:
The water purveyor shall assure that effective backflow prevention measures **commensurate with the degree of hazard**, are implemented to ensure continual protection of the water in the public water distribution system. **Customers, together with other authorities are responsible for preventing contamination of the private plumbing system under their control and the associated protection of the public water system.**

The government perspective

The City of Asheville requires a Reduced Pressure Backflow Assembly or an air gap. **The level of chlorine in a private pool could not fall under anything other than a high hazard and to label it as less seems a bit irresponsible. As we are here to protect against any real or potential hazards, trusting a homeowner to protect themselves and their neighbors from excessive chlorine content is not acceptable.**

Apex only requires an RPZ if the residential pool is directly connected to the water service.

Cape Fear Public Utility Authority requires swimming pools to have either a reduced pressure principle assembly or an air gap.

Winston Salem / Forsyth County Utilities requires an RPZ to be installed for all swimming pools.

Greensboro follows the same standards as Durham in this matter.

OWASA's ordinance requires RPZ for all swimming pools, both directly and indirectly connected.

Here in Cary we require RPZ's for swimming pools, whether it is direct or indirect connected.

The City of Durham does not require an in-line testable backflow if the pool is not directly connected. If the pool is filled using a water hose, no backflow is required.

Charlotte Water does not require backflow prevention assemblies on water services for private swimming pools. However, I do not agree with this and it is my intent to change this part of our ordinance. In the other water systems I have worked, direct connections to ALL swimming pools require reduced pressure principle assemblies or physical air gaps.

The pool is a very large petri dish with chemicals and human waste we should not drink. If the homeowner cannot set up a system to show that filling the system will not create a cross-connection, then we must protect the distribution system.

Greenville Utilities does not require backflow prevention assemblies on residential private swimming pools.

Other similar governments

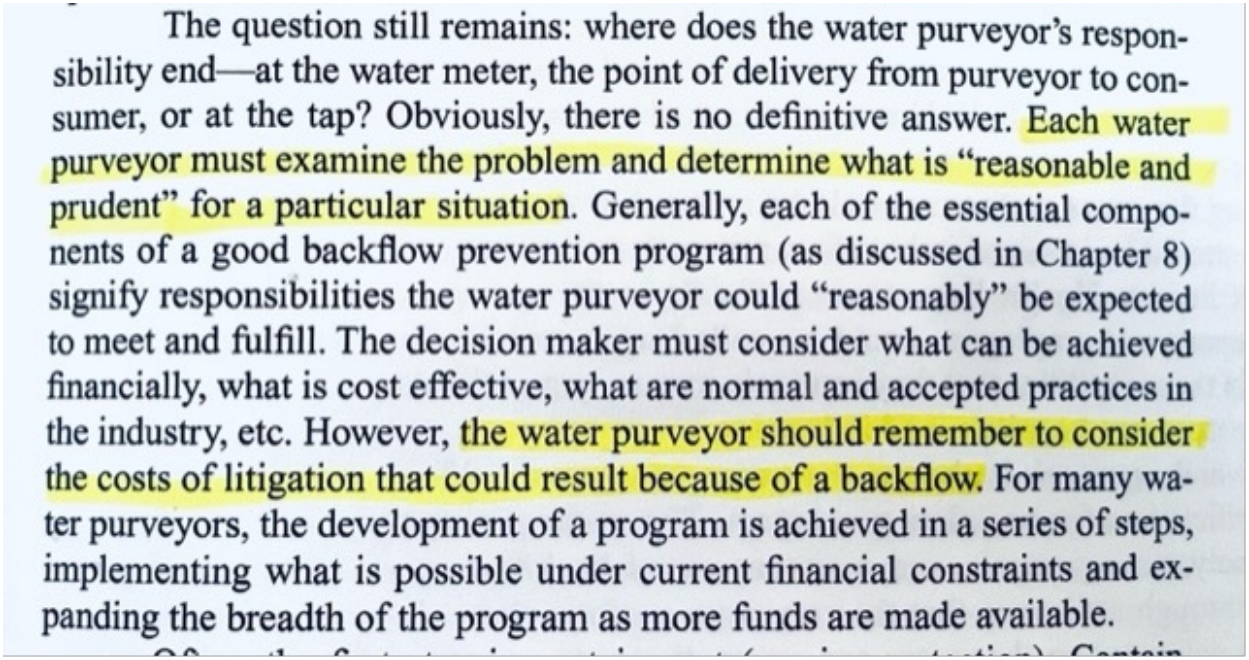
- OWASA
- Mebane
- Cary
- Winston-Salem
- Asheville
- Cape Fear
- Gastonia (Two Rivers Utilities)
- Holly Springs (exempts protective box)
- Kinston

Differing governments

- Durham, Greensboro, Apex, Mocksville allow hose bibb vacuum breakers
- Greenville Utilities exempts residential pools
- Charlotte Water exempts residential pools (but coordinator disagrees)
- Wilson requires RPZ only if direct piped filler, but DCVA if not (similar cost of installation though)
- Rocky Mount seems to only address non-residential in their policy, no code
- Salisbury does not list swimming pools specifically in list, but list not all inclusive

The academic and industry perspective

BACKFLOW PREVENTION : THEORY AND PRACTICE Third Edition UF (University of Florida) TREEO Center Pg. 43



The question still remains: where does the water purveyor's responsibility end—at the water meter, the point of delivery from purveyor to consumer, or at the tap? Obviously, there is no definitive answer. Each water purveyor must examine the problem and determine what is "reasonable and prudent" for a particular situation. Generally, each of the essential components of a good backflow prevention program (as discussed in Chapter 8) signify responsibilities the water purveyor could "reasonably" be expected to meet and fulfill. The decision maker must consider what can be achieved financially, what is cost effective, what are normal and accepted practices in the industry, etc. However, the water purveyor should remember to consider the costs of litigation that could result because of a backflow. For many water purveyors, the development of a program is achieved in a series of steps, implementing what is possible under current financial constraints and expanding the breadth of the program as more funds are made available.

The coordinator/certified operator perspective

The NC plumbing code clearly states that all hose bibbs shall have a HBVB and are to be open-ended – "continuously open to the atmosphere" which means no shut-off valve or spray handle. ***We all know that almost 100% of water hoses have a spray handle.***

Once you are aware of it, you have to take action. ***Knowing about a hazard makes you liable for any harm it causes.*** *I believe you have the right attitude and will run a successful program in Hillsborough.*

In my conversation with the pool owners, 90% have readily admitted that they placed the garden hose in the pool while it was being refilled. There is also the unforeseen incidents where the attempted air gapped hose either has pressure fluctuations, incidental child or pet knocking the hose into the pool, assigned person gets tired of hold the hose for hours…many "what ifs" as described, but from my viewpoint, that is the CC definition "any actual or potential connection between the drinking water lines and the potential sources of pollution or contamination."

Back to our code and enforcement.

Why now on residential in-ground pools?

Back to our code and enforcement.

Why now on residential in-ground pools?

- Lack of staff resources
- Really hard to identify residential hazards
- Was focused on non-residential hazards and other duties of the position
- 2020 change in state regulation requiring enforcement of program
- Currently almost 60 residential pools identified to retrofit with an RPZ
  - Letters mailed to almost 40 thus far in phases for management purposes
    - Second letter tweaked to be “softer” although simply stating ordinance. Third on hold.
- 12 have obtained permits with 10 installed and 2 pending
- Others have resisted

Why an RPZ?

- Our area is subject to both backpressure and backsiphonage.
- Swimming pools are identified as a severe hazard.
- An RPZ accounts for all hazards.
- An RPZ is testable and accessible.
- An RPZ cannot easily be removed from the system like the other mentioned devices.
- Existing ordinance covers enforcement to keep them in service while the hazard exists.
- While people can say they won't submerge a hose, it is out of our control.
  - What if they move, it is their kids, dog, visitor, house sitter?
  - Have you heard of the show Ridiculousness?

Other options?

- A hard piped unthreaded fill spigot with an approved air gap.
  - Typically, these auto fill features are placed conspicuously beneath a diving board or slide.
  - Many pools may not have these features.
  - Still requires piping below the pool deck or an unsightly trip hazard if not.
- Would require code change to include.

Why not the hose bibb vacuum breaker (HBVB)?

- Specialized application of the atmospheric vacuum breaker which is part of the pressure vacuum breaker family
- Yes, cheap! Cheap parts
  - Can degrade with use, chemicals, debris, freezing weather
- Low lifespan - 5 years or less
- Not a testable or professionally installed device
  - Does not meet our code due to hazard level of swimming pool
- Not approved for having continuous pressure or for controlling backpressure
  - Likely a shut off nozzle on end
- Multiple videos on how to remove them due to:
  - Leaking, hissing, corroding, a pain…
- Cannot control/verify they are present and working like an RPZ
- Not applicable under certain elevation differences between hose bibb and pool – must be 6” above highest point of usage

Why not the hose bibb vacuum breaker (HBVB)?

- No guidance from the following organizations for a maintenance schedule to replace HBVB's, even though they are known to fail and wear out quickly:
- USC CCC & HR (doesn't recognize HBVB as a backflow device)
- TREEO Center -University of Florida
- AWWA (One Water)
- Plumbing Code

Mixed emotions and misunderstandings

Public comments on a YouTube videos on how to remove the hose bibb vacuum breakers

I've always hated these things. We didn't have these on our house in the 70s as I was growing up. WTF? Were we poisoned by our neighbors? lol Only problem with changing these out, they will have to be brought up to code when selling the place. Not that its that expensive.

My subdivision has them but the old neighborhood next to ours doesn't. Neither does any of my families in older neighborhoods. You clarified what I already believed, these are stupid and pointless! I only hook up water hoses to water my grass. And I have an outside water softener system in between the city's main and my house lines. So I'm just removing mine permanently. Why even bother with a spigot master? Hook up the hose straight to the spigot like when we were kids.

There are reasons why backflows are required. People have pumped chemicals into the municipal water systems before. In many cities, commercial backflow preventers are required to be registered, tested/certified yearly. Residential settings are lower risk but it doesn't mean it won't happen. All it takes is someone using something like a faulty pressure washer with chemicals to pump poison into other peoples water supply.

I Googled and was not able to find an example of chemicals or anything else backflowing into a public water system.

Go put your garden hose in a bucket of chemicals and then go it the house and open up with kitchen sink spigot a few minutes later and drink the water. You'll learn real quick the purpose the the back-flow preventor. Having been in the pest control business for years, it was common to observe tech's filling up there spray rigs in the back of the work trucks. It only took once of someone having the end of the hose below the water level in the spray rig and then having the customers washer suck about 5 gal. of termiticide into her washer. It was not a good day. Most state Pest control industry now require a air-gap or back flow device on the spray rigs and if one is caught without it there is a heft fine. People have to realize yes they are a pain in the azz but they are designed to protect the health of the public.

The scenarios where a backflow preventer has been useful are so far fetched. They just don't happen! Just a move by somebody to make money by inventing a useless piece of crap that is now required under many plumbing codes.

I get the point of these backflow valves... in theory... but unless you have a habit of leaving your garden hose in your swimming pool, what exactly are you preventing? Even then, you take a drink of water and think "hmm. That tastes a little funny. Kinda like chlorine. You know, there was a fire a few miles from here today. Must have been a bit of backflow." Then you go turn all your faucets on for about 15 min and your entire house will be filled with clean water again. Pretty simple. We had to go and create this stupid "anti-backflow faucet adapter" because we haven't figured out a way to fix stupid people yet. The product is simply faulty. It doesn't last long, leaks like crazy, and after it ages, when a vacuum is out on the line, they fail half the time anyways. Like all things, it requires maintenance, but it's really still inferior to just using a little common sense when it comes to the old fashioned (and better) water spigots.

Understood hardship and concern

- Costs seen on building permit applications to date range from $3,000 to $5,000.
- Requires a certified plumber
- Requires a building trade permit
- Requires annual testing and reporting
- Unsightly protective box in yard



- Stress of quick compliance schedule and enforcement - per code
- A surprise for preexisting facilities
- Lack of knowledge

The compromising ask

- Continue to require the RPZ
- Provide more time for installation – end of year?
  - Would want to see progress – quotes, permits, etc.
- Site inspections to verify the need and determine location to minimize unsightliness
- Keep with annual inspections
- Provide list of installers from permit system
- Boxes meeting specification can be painted or screened as long as access is maintained

Questions and Comments