Privately-Owned, Looped Water Mains

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I am going to jump right into this one by explaining what a privately-owned, looped water main (PLWM) is, where they are found, and the code requirements to safeguard the community water system.

Anywhere private water main is connected to the municipal system at two or more locations you have a privately-owned, looped water main. PLWMs are found in hundreds of community water systems across Wisconsin. They can be owned by mobile home parks, strip malls, big-box stores, elementary schools, large campuses such as the University of Wisconsin, medical complexes, or a business. The length of private main can be a hundred feet to over a mile long.

Historically, the State of Wisconsin prohibited such connections to protect the water quality of the municipal water system.

“All water mains on private property which are, or in the future may be, connected to the distribution system at more than one point, thereby allowing flow through the piping system, shall be owned and maintained by the waterworks owner.” ~ Section NR 111.24(1) Wis. Adm. Code

In practice however, these systems continue to be installed for various reasons: redundancy, fire protection, water quality, and to reduce the utilities book value and expenses. Some of the private mains were installed without plan review by the Department of Safety and Professional Service (DSPS, formerly DCOMM) while others, for one reason or another, were not flagged during the plan review process.

In the 1992 code change, the Department of Natural Resources (DNR) acknowledged the existence of these PLWM systems and decided to manage the risk by requiring backflow protection. Check valves would now be required at each connection point to the municipal water system.

“Water mains to be connected to the publicly owned distribution system at more than one point may be privately owned and maintained provided that a check valve is installed on the water main at each point of connection to the distribution system to prevent water from flowing back into the distribution system. Each check valve shall be located in a manhole or vault and shall be immediately preceded and followed by a buried or exposed shut-off valve on the main. The water supplier shall have access to the manholes and valves for inspection purposes. (NOTE: A drain fitting may be added on the piping between the check valve and the gate valve on the public water system side of the check valve. The gate valve may be closed and the drain fitting opened to periodically check for leakage through the check valve. Refer to s. SPS 382.40 for standards for the construction of private water mains.).” ~ Section NR 811.69(3) Wis. Adm. Code Renumbered and noted added in 2010

In the 20 years since the code change requiring check valves, water utilities and regulatory staff have been working to identify unprotected PLWMs; but we acknowledge that they continue to exist. Identifying these systems can be a challenge for both the municipality as well as the regulatory agency.

During the sanitary survey process, DNR staff typically reviews the distribution system by examining the water system map. Since PLWMs are private, they will not be shown on the distribution system map. Conversely, some are listed on the map but are not identified as private. These systems can easily fly under our radar since we promote looping municipal water main, they are considered infrequently, and the current water operator may not have been involved in the design or construction of these systems. Some utilities even take care of these systems as if they were their own and may be unaware of the check-valve requirement. It may take years before one realizes that a private water main is looped or doesn’t have the required check-valves.

So what happens when you uncover a PLWM without the required check valves?
You have a few options to correct the problem. None will be easy to resolve and all will require you to work closely with the owner of the water main, regulatory agencies and will have to accommodate budgeting processes. There are three corrective actions available.

**Install Check Valves**
The first option is to install check valves as required by code. This is a reviewable project subject to DSPS and/or WDNR approval. The checks are installed near the connection points and require shutoff valves on both sides of the checks. These valves must be located in a manhole or vault and be accessible to the water utility for periodic inspection.

Some municipalities have decided not to take this approach due to concerns with the reliability of check valves. This may include the argument that they are not an approved backflow protection device in buildings under DSPS plumbing code and there can be over-pressurization concerns in the private system in the event of equipment failure (i.e. boiler). While we cannot eliminate all risks, checks are a Department approved backflow protection device at the water main connection point and are accepted by DSPS when they review new private water main projects.

The DNR’s position is that check valves do offer satisfactory backflow and flow-through protection for this particular application and pressurization concerns can be resolved by installing pressure relief valves, if necessary. Along with backflow protection and individual pressure relief valves in building fixtures, most PLWMs have enough pipe volume and open fixtures in customer buildings to prevent problems. In fact, there are hundreds of boosted areas within water systems across the state without dedicated pressure relief valves.

**Take Ownership**
The second option available is to take ownership of the private main and establish easements for maintenance purposes. Taking ownership requires DNR approval and is our preferred approach. Municipal water systems have the resources to properly test, operate, and maintain water main. They also have certified operators that know what they are doing. However, this may not be an acceptable approach to the current owner.

Before proceeding too far in this direction, you will need to verify whether the water main, valves, and hydrants meet DNR design and construction standards. Obviously, you do not want you to take ownership if the system is prone to failure. You will need to submit any prior DSPS approvals, WDNR Water Main Approval Form (3300-66), and easement information to the DNR for review and approval.

Some utilities will decide not to take this approach for a couple reasons. It takes additional resources to operate, maintain, and replace the infrastructure. It also adds book value to your assets subject to annual “Payment In Lieu of Taxes” (PILOT) fee. While some PILOT is recaptured through hydrant fees, this may itself be objectionable to the municipality if the system has a large number of hydrants.

If the utility takes ownership, the water line will need to be added to the distribution system map. Your valve exercising and flushing plans will also need to be updated to reflect the new line.

**Eliminate the Loop**
The last option available is to eliminate the loop entirely by dead-ending the water main in both directions. You will need prior approval from DSPS. This is likely an easy fix if the water main is short, fire protection is not jeopardized, and you have reasonable water use on both dead-ends to maintain satisfactory water quality. You should model fire flow in both the private and public system. This will help you determine whether minimum pressure and fire flow requirements are met as well as identify the best location for the dead-end.

Closing a valve does not qualify for “dead-ending” purposes. It must be terminated physically. Flushing hydrants should also be installed on both sides so solids and film can be removed.

**“But My Situation is Different…”**
There will always be special cases that challenge the status quo and these need to be considered carefully. Here is one such case, recently raised at a regulated community, in western Wisconsin.

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We have PLWMs that were designed and constructed to meet municipal code and are being operated and maintained by the water utility as if it was our own. For all practical purposes, these systems are functioning as a municipal system and the only issue is ownership. Why upset the apple cart?
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This situation brings up a whole slew of regulatory questions and brings to light several weaknesses in the legal framework meant to protect public health. This is a situation where the private water system, one that purchases and distributes water to various customers, falls under the regulatory radar. Since this water system is not collecting or treating their water, or has metered sales over or above wholesale, they are essentially an unregulated public water system and are not subject

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to the same testing, operation, or maintenance requirements as regulated public water systems (s. NR 810.01 Wis. Admin. Code). As such, other than the check-valve requirement, there is no DNR authority to ensure the components (water mains and valves) of this water system are properly maintained and operated to prevent contamination either within the private system or back into the municipal water system. In addition, while the municipal water system may have some authority in this matter through its local ordinance, the DNR cannot require bacteriological testing in the private system.

There is another concern with this arrangement that needs to be considered. Municipalities should not be operating and managing private water systems using revenue from rate payers, unless agreements are in place and the Public Service Commission (PSC) approves the arrangement. PSC will evaluate the user charge system to ensure the cost of this service does not fall on your other water customers.

And finally, this arrangement may conflict with the municipality’s insurance policy covering employee work conducted on private property.

No matter how well these systems are designed, operated, and maintained, the Department has not made exceptions to the check-valve requirement for PLWMs.

Summary
There are many unprotected, privately-owned, looped water mains in Wisconsin and more going in all the time. Being connected to the public water system at more than one location is certainly desirable in some cases, but it can pose water quality risks. If the municipal system does not take ownership of these lines or cannot find a way to safely dead-end them, check-valves are needed to prevent back flow or flow through. No matter how bad these private systems are operated or maintained, the community water system has some defense in the form of backflow or flow through protection.

So take a look at your maps and customers with an eye for finding these private water mains that are looped and do not have the required check valves. If you have a large number of unprotected, privately-owned, looped systems, it could take a couple budgeting cycles to resolve. Since there are a few options for their resolution, each case must be considered on its own merits and be acceptable to the owner of the private main as well as your board. The DNR realizes that these issues take time to resolve and is willing to allow time for discussion and resolution.

Small Systems

The Small Systems Committee is busy preparing for the activities leading up to the Annual Conference & Exhibition!

We hope that your small system was able to participate in the Water Taste Test at the State Fair on August 5th. Several committees have worked hard to make this event happen at a venue that brings significant public attention to public drinking water systems.

Members are also getting the word out regarding a “Call for Artifacts” for the Water Museum to be held in the exhibit hall during the conference. We are asking current and retired members to consider volunteering for the museum as curators - if you are interested, please contact Ann Perry Witmer (Ann.Witmer@Foth.com) or Lori Huntoon (lorihuntoonpg@gmail.com).

We are also continuing to plan for a mentoring program, as well as hands-on workshops at multiple locations throughout the state - places and dates to be determined.

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WWA NEEDS YOU!

Join a committee by visiting
www.wiawwa.org/committee-signup
or fill out the form at the Annual Conference.