Maintaining Pipes & Storage Tanks
A Guide for Public Water Systems

The Importance of Maintaining Pipes and Storage Tanks

Storage tanks and a network of piping (also known as a distribution system) is an integral part of a water system’s ability to provide safe, clean water to consumers. If not regularly inspected and properly maintained, contaminants can enter the drinking water through the pipes and tanks or could result in an inability to maintain the pressure needed to deliver water to the tap. This document is intended to provide guidelines on how to make sure piping and storage tanks stay in good shape, so that you can continue to provide your consumers with safe drinking water.

Pipes
Leaks and Pressure problems

Leaks not only cause water loss after you’ve invested in pumping and treating, but they also create a pathway for contaminants to enter the water system. Water losses create unnecessary stress to water sources and system infrastructure, so it is important to know some signs to look for that may indicate a leak. Common signs include an increased demand for water during a time when it is not expected, (such as the middle of the night or very early morning hours), or if there is pump cycling when no demand is expected.

Positive water pressure within a water system not only helps deliver water to the tap, but also helps keep contaminants out. When there is low or no pressure, contaminants can backflow into the water system. Ideally, standard service to your customers should be no less than 35 psi, and a minimum of 20 psi should be maintained at all times and under all conditions. If pressure falls below 20 psi in any part of the water system, the risk of contaminants backflowing into the water system is greatly increased. You should investigate and remedy all unexpected changes in pressure, either too low or too high. The operation of a pressure relief valve may indicate the pressure in a system is too high.

Cross Connections and Backflow Prevention

A cross connection is a physical connection between a source of potable water and a source that is unsafe, potentially unsafe, or undesirable to drink. Cross connections make it possible for potentially hazardous contaminants to enter, or backflow, into a drinking water supply. Common examples include: lack of air gap between water feed line or hose used to fill a treatment solution tank and the tank itself; fire sprinkler systems connected to the potable water system; and unused equipment or an unapproved source connected into the water system.

Identify, and eliminate all cross connections within your water system. If you can’t eliminate a cross connection, then it should be protected with an appropriate backflow prevention device, depending on the type of hazard. Backflow prevention devices/valves are determined to be acceptable, based on the system characteristics (low hazard, high hazard, back siphonage, back pressure) and approved devices are certified by a recognized organization and permanently labeled on the device. For more information on determining the type of backflow needed to protect a specific type of cross connection, consult Table 6-2 of the Maine Internal Plumbing Code. Backflow prevention devices should be tested regularly, with a frequency of no less than once per year.
Pipes (cont.)

Protection from Freezing
Make sure your pipes have proper protection from freezing:
- Year-round outdoor piping should be buried and/or insulated adequately;
- Seasonal piping should be properly and safely dewatered when not being used;
- Indoor piping should be in a climate-controlled space (as simple as an insulated building with a space heater) or wrapped in insulation or heat tape.

Tanks

General
Storage tanks should be kept in good condition and inspected for structural issues on a regular basis. Consider the following:
- Look for signs of: rust (metal tanks), spalling concrete (concrete tanks), cracked foundation (elevated tanks);
- Ensure level controls are functioning properly;
- Check for (and remediate, if necessary) algal or other growth inside the tank;
- Check for sufficient storage to keep up with demands. Short pump cycling may indicate that insufficient storage is present;
- Check contact tanks (for chlorination disinfection) to make sure they do not have a bypass valve present; and
- Is your hydronuematic tank water logged? Possible signs include:
  - Very short pump cycling;
  - Tapping tank without any appreciable noise change from bottom (where water should be) to the top (where air should be);
  - Sweat line near the top; and
  - Sight glass almost or completely full of water (conventional hydronuematic tank only).

Overflows and Vents
If not properly maintained, tank overflows and vents can introduce contamination into a storage tank. For this reason, they should be inspected and maintained regularly. Look for evidence of insects or animals gaining entry into the tank. Ensure that vents are screened properly and that overflows are protected against animals or other contamination entering the pipe (e.g. screening or a flapper). Ensure that overflows are not draining directly into a sewer, storm drain, or submersed in a body of water.

Security
Ensuring that your storage tanks are secure and will deter vandalism is an important part of protecting your water system and the health and safety of your water system’s consumers. Bladder tanks should be kept inside a locked room, while other tanks should be fenced in with a locked gate. Security lighting and cameras add another layer of protection to both deter vandalism and determine when, or if, the security of a tank has been breached. Additionally, access hatches and ports should be locked and access ladders should have protections against unauthorized use (high off ground and locked with a restriction plate).