

Water Flushing Guide for School Building Owners and Facilities Managers Before Reopening for the 2020-21 School Year

Purpose

With nearly six months of dormant conditions in most Vermont schools, the Vermont Agency of Education, the Vermont Department of Health, and the Vermont Department of Environmental Conservation developed the following guidance for school building owners and facilities managers to maintain and restore drinking water quality within schools upon reopening for the 2020 – 2021 school year.

Effects of Extended Periods of Water Stagnation

When buildings are closed or are vacant for extended periods of time, the stagnation of potable water within plumbing can lead to poor water quality. **This can lead to health issues unrelated to COVID-19.**

To protect public health, it is important for you to address stagnant water in the school building's plumbing before water consumption and usage resumes when schools reopen.

Legionella and Legionnaires' disease

There are four factors that influence how well *Legionella* bacteria can reproduce and create biofilms in potable water systems that could lead to Legionnaire's disease: water temperatures between 77 and 108°F (25-42°C), water stagnation, presence of organic matter and absence of disinfectant (for example, chlorine).

When water is stagnant, it can lead to low or undetectable levels of disinfectant. This increases the risk for growth and spread of *Legionella* and other pathogens. Additionally, hot water temperatures can decrease, or cold water temperatures can increase, bringing the water into the *Legionella* growth range.

To minimize the risk of Legionnaires' disease and other waterborne diseases after periods, use the ANSI/ASHRAE Standard 188-2018 to develop a water management program. You can also find guidance from CDC's [Developing a Water Management Program to Reduce Legionella Growth & Spread in Buildings: A Practical Guide to Implementing Industry Standards](#).

Find [labs that perform Legionella in drinking water analysis](#).

Lead, Copper and Disinfection Byproducts

When water is not used frequently, changes in water chemistry can lead to plumbing corrosion. Corrosion can lead to metals leaching into the water, such as lead and copper.

Stagnation can also lead to increased disinfection byproducts (DBPs) in the water. DBPs are a family of chemicals formed when disinfectants react with naturally occurring organic matter and other substances in the water.

Maintaining Water Quality While Buildings are Closed and How to Develop a Water Management Program

The following steps outline what you need to develop a water management program to maintain the water quality while the building is vacant for an extended period.

Consider consulting with a water management specialist to ensure that the appropriate steps have been taken to reopen your building (unless you already have a water management program in place). Every water management program should reflect the building's unique characteristics and include a flushing strategy and thermal regulation plan for reopening the building now and for future low- or no-use events, including school vacations and holidays.

Review and Understand the Plumbing Configuration and Water Usage in your Building

It is important to ensure that the building water system is working properly.

- Inspect the mechanical and plumbing components to identify leaks, depressurization, adequate backflow prevention, and to assess functionality. You may want to consult with a plumber to check the water system over.
- If your school is served by on-site septic, you will want to identify the wastewater system's capacity to make sure not to inundate your wastewater system when flushing is performed.
- If you receive water from a public water system, contact your water utility if you have questions on the status of water usage and water quality and to coordinate maintenance activities, if necessary.

Maintain Devices

You will want to maintain:

- Any water treatment systems used in the building, such as point-of-entry or point-of-use filters or water softeners.
- The hot water system, including keeping the temperature as per CDC guidelines to prevent *Legionella* growth. Consider using anti-scald devices.
- All non-drinking water building water systems and devices according to the manufacturer's specifications (for example, sprinkler systems, eye-wash stations, safety showers and decorative fountains/water features).

Flush the plumbing system

Be sure to flush the building's plumbing system regularly. Ongoing flushing draws particles through and out of the system and brings in disinfectant from the municipal system or fresh water from the well that can help control biological growth. The longer the drinking water was not in use, the longer it takes to restore drinking water quality.

Flush all water-using appliances like ice machines, humidifiers, and dishwashers. Consult with a plumber or water management specialist to set up a flushing plan, unless you have a thorough understanding of the building plumbing system and all water-using appliances. Incomplete flushing could result in contaminated water remaining in the system.

Restoring Water Quality in Buildings with Low or No Use

Flushing the entire water system is the best practice to restore water quality after a building has been vacant for an extended period and if steps were not taken to maintain water quality. (If you followed the steps described above to maintain water quality while the building was closed, these steps may not be necessary but could be considered as additional precautionary measures.)

In addition to the steps listed in the section above, take these steps:

- Clean showerheads, faucets and other fixtures that can produce aerosols that people could inhale.
- Drain and clean water storage facilities and hot water heaters following the manufacturer's instructions.
- Regenerate or replace point-of-entry and point-of-use treatment devices, such as filters and water softeners following the equipment manufacturer's instructions.
- Check water quality parameters, such as temperature, pH, and disinfectant levels, in the water entering the building and at points of use after flushing to verify that fresh water is being flushed through the entire plumbing system.
- Follow appropriate regulations and policies for worker safety and health while performing all activities. Consider using personal protective equipment (PPE) when flushing and reduce water splashing and aerosolization to limit exposure to harmful chemicals and bacteria.

For larger buildings, the initial flushing might not be enough to reduce contaminants and microorganisms to safe levels. It is generally recommended to do a 12-week period of flushing where you open all fixtures at least once per day, and for more comprehensive, whole building flushing to occur weekly. If there is reason to believe that there is *Legionella* growth, then a shock disinfection with chlorine or superheat-and-flush disinfection is recommended. These procedures should only be done by a trained professional.

Additional Guidance for Facilities on Public Non-Transient Non-Community Water Systems

[Contact the Department of Environmental Conservation Groundwater and Drinking Water Division](#) to discuss specific requirements for restarting operations.

Water Quality Monitoring

Considerations for Lead and Copper Rule Compliance Sampling

Lead and Copper Rule compliance samples should be collected during normal operation of the water system.

The most common source of lead and copper in drinking water is corrosion of plumbing materials throughout the water system. Plumbing materials that can be made with lead and copper include pipes, valves, solder, fixtures, and faucets. This includes water system equipment, service lines, and plumbing materials. Metals such as lead and copper are likely to increase with more time to dissolve in stagnant water, higher water temperature, and less steady chemical treatment of water in systems that add chemicals.

Please contact Amy Galford at amy.galford@vermont.gov or 802-585-4891 for any questions or concerns related to Lead and Copper Rule compliance sampling.

Considerations for Stage 2 Disinfectants & Disinfection Byproducts Rule Compliance Sampling

Disinfection byproducts can form when chlorine reacts with naturally occurring organic carbon in the water. Disinfection byproducts are low in most Vermont water systems. In general, more disinfection byproducts form when water is warmer, when chlorine is very high, and when more time has passed since the water was chlorinated. Flushing the water system after long periods of stagnation or shock chlorination of a well will significantly help reduce disinfection byproducts.

Please contact Amy Galford at amy.galford@vermont.gov or 802-585-4891 for any questions or concerns related to Disinfection Byproducts Rule compliance sampling.

Considerations for Act 66 Lead in Schools & Childcare Drinking Water Program Sampling

Act 66 sampling **should not be completed during periods of extensive water stagnation**, such as during extended school closures throughout the COVID-19 pandemic or during non-routine operation, such as reduced capacity in response to the COVID-19 pandemic.

Please contact Catie Bartone at catharine.bartone@vermont.gov or 802-272-0411 for any questions or concerns related to sampling and remediation under the Act 66 Lead in Schools & Childcare Drinking Water Program.

Considerations for Drinking Water Fountains and other High-Contact Fixtures

According to current Health Department and Agency of Education guidance, drinking water fountains should be regularly cleaned and sanitized. In addition, staff and students should be encouraged to bring their own water to school to reduce using and touching school drinking water fountains.

Drinking water fountains may provide a means to transmit coronavirus. Coupled with the difficulty of frequently cleaning and disinfecting the equipment, the school or school district

will need to determine whether keeping drinking water fountains online is the best option, or if disconnecting drinking water fountains is preferable.

The school or school district is ultimately responsible in deciding whether to keep drinking water fountains in use. This decision hinges on a few important pieces of information, including whether or not the students and staff have sufficient access to other potable drinking water sources (for example, water bottle filler stations or bottled water) and the capacity of the cleaning staff to frequently clean and disinfect the drinking water fountains.

If a school does decide that disconnecting water fixtures in response to COVID-19 is the most appropriate option, a comprehensive flushing protocol must be implemented prior to returning the fixtures to use. See page 8 in [Drinking Fountains and Public Health: Improving National Water Infrastructure](#) for helpful guidance on disinfection of drinking water fountains.

Questions?

For any further questions or concerns related to this guidance document, please contact Catie Bartone at catharine.bartone@vermont.gov or 802-272-0411.

Please see the published reports below for additional guidance:

Vermont Agency of Education Guidance

- [Safety and Health Guidance for Reopening Schools, Fall 2020](#)
- [COVID-19 Guidance for Vermont Schools](#)

Vermont Department of Health Reopening Guidance

- [Health Guidance for Childcare and School Age Camps/Care](#)
- [Health and Safety Guidance on Reopening Schools](#)

Vermont Department of Health Lead in Drinking Water Guidance

- [Lead Testing in Drinking Water: What Schools Need to Do](#)
- [Lead Testing in Drinking Water in Schools](#)

Vermont Department of Environmental Conservation Guidance

- [State Drinking Water Guidance and Recommendations when Reopening Buildings](#)
- [Information on Maintaining or Restoring Water Quality in Buildings During Extended Periods of Low Use](#)

United States Environmental Protection Agency Guidance

- [Maintaining or Restoring Water Quality in Buildings with Low or No Use](#)
- [Restoring Water Quality in Buildings for Reopening](#)

United States Centers for Disease Control & Prevention Guidance

- [Schools & Childcare Programs: Plan, Prepare, & Respond](#)
- [Preparing K-12 School Administrators for a Safe Return to School in Fall 2020](#)
- [Guidance for Reopening Buildings After Prolonged Shutdown or Reduced Operation](#)
- [Reopening Guidance for Cleaning and Disinfecting Public Spaces, Workplaces, Businesses, Schools, and Homes](#)